REPORT TO

NSW HEALTH INFRASTRUCTURE

ON

REMEDIATION ACTION PLAN

FOR

PROPOSED GUNNEDAH HOSPITAL REDEVELOPMENT

AT

MARQUIS STREET, GUNNEDAH, NSW

Date: 19 May 2023
Ref: E35091UPDrpt3-RAP

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Executive Summary

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to prepare a Remediation Action Plan (RAP) for the proposed Gunnedah Hospital Redevelopment at Marquis Street, Gunnedah, NSW. The site location is shown on Figure 1 and the RAP applies to the land within the nominated site boundaries as shown on Figure 2 in Appendix A. The site is limited to the proposed development area based on consultation with the client and the client's representatives.

This report has been prepared to support the Review of Environmental Factors (REF) for the proposed hospital redevelopment, with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021 (formerly known as SEPP55).

JKE has previously completed a Preliminary Site Investigation (PSI) and a Detailed Site Investigation (DSI) for the proposed hospital development. The investigations identified Organochloride Pesticides (OCPs) in fill beneath a building at concentrations that exceeded the human health-based site assessment criteria (SAC). Bonded/non-friable Asbestos Containing materials (ACM) was also identified on the ground surface and in fill, however, the asbestos concentrations in fill were below the Health Screening Level (HSL) SAC. The DSI recommendations included the preparation of a RAP.

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

- Provide a framework for further investigation of the site, to be implemented when access is available;
- Provide a methodology to remediate and validate the site based on the information available at the date of this report;
- Provide a contingency plan for the remediation works;
- Outline site management procedures to be implemented during remediation work; and
- Provide an unexpected finds protocol to be implemented during the development works.

Based on the available data and the Conceptual Site Model (CSM), an Interim Environmental Management Plan (IEMP)/Asbestos Management Plan (AMP) must be prepared and implemented so that potential human-health risks from OCPs and asbestos remain low and acceptable until further investigation and remediation occurs, and a Long-Term Environmental Management Plan (LTEMP) is prepared.

Prior to the commencement of remediation, and following establishment of a contractor works area and demolition of the required buildings, an investigation is to occur to further characterise the soil and groundwater conditions and facilitate a more comprehensive and complete assessment of the risks driving the remediation. The additional pre-remediation investigation requirements are outlined in Section 5 and an amended/updated RAP is to be prepared where necessary following this investigation

Based on the current data, the proposed remediation strategy outlined in this RAP includes implementation of a management strategy in relation to the occurrence of OCPs in soil beneath buildings that are not being demolished. Contingency alternate/additional remediation options have also been provided in Section 8.1, including 'excavation and off-site disposal' and 'cap and contain' of contaminated fill in-situ, should additional contamination be identified during the pre-remediation investigation.

JKE is of the opinion that the site can be made suitable for the proposed development via remediation and the implementation of this RAP. Site validation reporting is to occur as specified in this RAP to document that the procedures have been followed and to demonstrate that the site is suitable on completion of the remediation, subject to implementation of an LTEMP.

JKE has assessed that the remediation falls within Category 2. This must be confirmed by the client's expert planner. Prior notice of Category 2 remediation work must be given to council at least 30 days prior to commencement of remediation in accordance with Clause 4.13 of SEPP Resilience and Hazards 2021.

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

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Abbreviations

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Asbestos Containing Material	**ACM**
Asbestos Management Plan	**AMP**
Asbestos Removal Control Plan	**ARCP**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
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JK Environments	**JKE**
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Standing Water Level	**SWL**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRHs**
Trip Spike	**TS**
Upper Confidence Limit	**UCL**
Validation Assessment Criteria	**VAC**
Virgin Excavated Natural Material	**VENM**
Work Health and Safety	**WHS**

Units

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

1 INTRODUCTION

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to prepare a Remediation Action Plan (RAP) for the proposed Gunnedah Hospital Redevelopment at Marquis Street, Gunnedah, NSW. The site location is shown on Figure 1 and the RAP applies to the land within the nominated site boundaries as shown on Figure 2 in Appendix A. The site is limited to the proposed development area based on consultation with the client and the client's representatives.

This report has been prepared to support the Review of Environmental Factors (REF) for the proposed hospital redevelopment, with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021[1] (formerly known as SEPP55).

JKE has previously completed a Preliminary Site Investigation (PSI)[2] and a Detailed Site Investigation (DSI)[3] for the proposed hospital development. The investigations identified Organochloride Pesticides (OCPs) in fill beneath a building at concentrations that exceeded the human health-based site assessment criteria (SAC). Bonded/non-friable Asbestos Containing materials (ACM) was also identified on the ground surface and in fill, however, the asbestos concentrations in fill were below the SAC. Preparation of a RAP was recommended. Key information from the PSI and DSI is summarised in Section 2 and throughout this report where relevant.

1.1 Proposed Development Details

The proposed development details at the time of preparation of this RAP have been revised since preparation of the DSI. JKE understands that the revised proposed development includes:

- Demolition of the former day care centre (a new day care centre is not proposed), former maternity, former birthing buildings and demolition of the former incinerator located to the west of the engineering building;
- A new single level building situated over the central portion of the site. The building is to be occupied for hospital services including inpatient, emergency, birthing/maternity and sterile supplies department. The ground floor concrete slab will be suspended between bored piers with the floor slab either supported by sacrificial formwork or formed over a subgrade comprising engineered fill and natural ground;
- A new electrical and communications plant room building to the south-east of the existing engineering building;
- The existing the general wards, emergency and imagery building in the north section of the site will be reconfigured internally. Excavations are not proposed within this building foot print;
- Additional car parking areas and access roads will be provided over the, southern and eastern portions of the site. The new parking areas will generally involve extending existing parking areas;
- Earthworks necessary to reach the design surface levels are expected to include cut/fill. The cut excavations (up to approximately 1.25m Below Ground Level [BGL]) are primarily located in the south

[1] State Environmental Planning Policy (Resilience and Hazards) 2021 (NSW) (referred to as SEPP Resilience and Hazards 2021)
[2] JK Environments, (2022a). *Report to NSW Health Infrastructure on Preliminary (Stage 1) Site Investigation for Gunnedah Hospital Redevelopment at Marquis Street, Gunnedah, NSW. (Report ref: E35091UPDrpt, dated 1 August 2022) (referred to as PSI)*
[3] JKE, (2023). *Report to NSW Health Infrastructure on Detailed Site Investigation for Gunnedah Hospital Redevelopment at Marquis Street, Gunnedah, NSW. (Report ref: E35091UPDrpt2, dated 28 February 2023)* (referred to as DSI)

and south east sections of the site, with fill proposed in the central and north sections of the site. It is estimated that the cut/fill earthworks will result in a surplus of approximately 518m^3 of surplus soil which is proposed to be disposed of off-site. JKE anticipate that further surplus soils would be generated during construction activities including installation of underground services, piling etc.; and

- Landscaping of sections of the site, including but not limited to the gathering, central and birthing courtyards, and general landscaping including turfing of other external areas.

Selected proposed development plans are attached in Appendix B.

1.2 Remediation Goal, Aims and Objectives

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

The objectives of the RAP are to:

- Provide a framework for further investigation of the site, to be implemented when access is available;
- Provide a methodology to remediate and validate the site based on the information available at the date of this report;
- Provide a contingency plan for the remediation works;
- Outline site management procedures to be implemented during remediation work; and
- Provide an unexpected finds protocol to be implemented during the development works.

1.3 Scope of Work

The RAP was prepared generally in accordance with a JKE proposal (Ref: EP57443UPD) of 6 October 2022 and written acceptance from the client of 26 October 2022. The scope of work included a review of the PSI, DSI, and the Conceptual Site Model (CSM), review of the proposed development details, consultation with the client/client's representatives, and preparation of the RAP.

The RAP was prepared with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[4], SEPP Resilience and Hazards 2021 Resilience and Hazards 2021 and other guidelines made under or with regards to the Contaminated Land Management Act (1997)[5], including the Consultants Reporting on Contaminated Land (2020)[6] guidelines.

A list of reference documents/guidelines is included in the appendices.

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

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

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

2 SITE INFORMATION

2.1 Summary of JKE Previous Reports

2.1.1 PSI

The PSI included all land within the wider hospital boundary and was designed to make a preliminary assessment of site contamination. A geotechnical investigation was undertaken in conjunction with the PSI by JK Geotechnics (JKG). The results of the geotechnical investigation were presented in a separate report (Ref: 35091URrpt). The geotechnical report must be read in conjunction with this RAP.

The primary aims of the PSI were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make a preliminary assessment of the soil and groundwater contamination conditions. The PSI included a review of historical information and sampling from eight boreholes and six testpits, which were nominated by the client.

The identified Areas of Environmental Concern (AEC) included: fill material; use of pesticides; hazardous building materials; electrical transformer; diesel generator; and an Incinerator. The location of the diesel generator and incinerator are shown on Figure 2 in Appendix A.

The PSI identified fill at most locations. The fill is historically imported soils and/or site-won soil placed during previous earthworks. A marginally elevated concentration of nickel was encountered above the ecological SAC in one sample and asbestos (as bonded ACM) was found in the subsurface fill soil in another sample obtained from TP2 located in the south-east section of the site. All asbestos concentration were below the SAC.

JKE recommend the following:

- *"Undertake DSI to address the data gaps identified by the PSI. The extent of 'the site' for the DSI should be confirmed by the client as it is noted that not all areas of the hospital are being redeveloped. In JKE view, it would be reasonable to limit the DSI to broadly capture the proposed development footprint;*
- *Prepare and implement an Asbestos Management Plan (AMP) for asbestos in soil; and*
- *If the DSI identifies a need for remediation, a Remediation Action Plan (RAP) prepared and implemented."*

The PSI sampling locations are shown on the Figures attached in Appendix C and the PSI laboratory results tables are also attached Appendix C.

2.1.2 DSI

The DSI was limited to the proposed development footprint which was defined as 'the site' for the purpose of the investigation. It is noted that the DSI site area varies slightly compared to the site area defined for the RAP.

The primary aim of the DSI was to further characterise the soil and groundwater contamination conditions in order to assess site risks in relation to contamination and establish whether remediation is required. A

secondary aim was to provide preliminary waste classification data for off-site disposal of soil waste which may be generated during the proposed development works. The objectives were to: assess the soil and groundwater contamination conditions via implementation of the Sampling Analysis and Quality Plan (SAQP); assess the potential risks posed by contamination to the receptors identified in the CSM; provide a preliminary waste classification for the in-situ soil; assess whether the site is suitable or can be made suitable (via remediation) for the proposed development, from a contamination viewpoint; and assess whether further intrusive investigation and/or remediation is required.

The investigation included a review of historical information presented in the PSI and soil sampling from 30 boreholes or testpits, and groundwater sampling from three groundwater monitoring wells. The AEC identified in the DSI included: fill material; use of pesticides; hazardous building materials; an electrical transformer; a diesel generator; an incinerator and a potential off-site diesel Underground Storage Tank (UST – see Figure 2 in Appendix A). We note that the potential UST is located within the wider hospital area to the south of the maintenance/engineering building and outside of the proposed redevelopment area (i.e. outside the site applicable under the RAP).

The PSI and DSI identified: nickel concentrations in the fill samples TP4 (0-0.1m), BH201 (0.5-0.8m) and BH205 (0-0.1m) marginally above the ecological Site Assessment Criteria (SAC); Asbestos Containing Materials (ACM) in fill in TP2, TP234 and TP226; and Organochloride Pesticides (OCPs) aldrin and dieldrin in the fill samples TP216 (0-0.1m) and TP220 (0-0.1m) above the human health SAC.

The DSI identified copper in the groundwater sample MW205, and a mercury concentration for duplicate sample GW-DUPB-1 (MW205) that were above the ecological SAC. The chromium, copper and zinc concentrations for the groundwater sample MW219 were also above the ecological SAC.

Based on the findings of the PSI and DSI, JKE indicated that remediation of soil contamination will be required. JKE considered that groundwater remediation will not likely be required, however, the DSI report concluded that RAP will need to include provisions to further investigate the groundwater prior to proceeding with remediation.

JKE recommend the following:

- *"Preparation and implementation an Asbestos Management Plan (AMP) for asbestos in soil;*
- *Preparation and implementation of a Remediation Action Plan (RAP) for the site that provides a suitable framework to manage and remediate the known contamination risks and also provides a robust framework to address the data gaps identified, prior to proceeding with remediation;*
- *Validation of the site in accordance with the RAP; and*
- *Preparation and implementation of a Long-Term Environmental Management Plan (LETMP), if needed".*

The DSI sampling locations are shown on the Figures attached in Appendix C and the DSI laboratory results tables are also attached Appendix C.

2.1.3 Hazardous Building Material Survey

JKE has previously undertaken a hazardous building materials survey (HBMS)[7] for the proposed Gunnedah Hospital redevelopment. The survey identified both friable and non-friable asbestos in building materials, lead in paint and potential polychlorinated biphenyls (PCB) containing electrical equipment.

2.2 Site Identification

Table 2-1: Site Identification

Current Site Owner (certificate of title):	Health Administration Corporation
Site Address:	10-24 Anzac Parade, Gunnedah, NSW (site address commonly referred to as Marquis Street, Gunnedah, NSW)
Lot & Deposited Plan:	Part of Lot 3 in DP792209
Current Land Use:	Hospital and associated facilities
Proposed Land Use:	Continued hospital and associated facilities
Local Government Area:	Gunnedah Shire Council
Current Zoning:	R2: Low Density Residential
Site Area (m^2) (approx.):	11,250
RL (AHD in m) (approx.):	280
Geographical Location (decimal degrees) (approx.):	Latitude: -30.983401 Longitude: 150.251313

2.3 Site Location, Topography and Regional Setting

The site is located generally in the central section of the wider hospital grounds. The site is located in a predominantly residential and recreational area of Gunnedah and is bound by the wider hospital grounds to the north and west, Anzac Parade to the east and largely by Reservoir Street to the south.

The regional topography slopes slightly towards the north. The site topography is consistent with its surrounds and has a gentle slope towards the north at approximately 1°-2°.

2.4 Summary of Site Inspection

A walkover inspection of the site was undertaken by JKE on 2 June 2022 for the PSI and 12 December 2022 for the DSI. In summary:

[7] JK Environments, (2022b). *Report to Health Infrastructure on Hazardous Building Materials Survey for Gunnedah Hospital Redevelopment at Marquis Street, Gunnedah, NSW*. (Report ref: E35091BTrptRev2-HAZ, dated 7 December 2022) (referred to as HBMS)

- The site formed part of the Gunnedah District Hospital and Community Health Service Centre property. Activities across the wider property included general hospital use, education and a disused day care centre;
- The site was generally occupied by several buildings that were largely constructed on-grade. The buildings were used for various purposes including hospital wards, surgery, pathology, admin/recreation, generator/fuel storage and equipment storage;
- Carparks and internal driveways on site were paved with asphaltic concrete, whilst other open areas were concrete, brick paved or grassed;
- Minor area of exposed fill material (i.e. historically imported or disturbed soils) was observed in raised garden beds and landscaped areas on site;
- Parts of the site appear to have been levelled to account for the slope and accommodate the existing development;
- An above ground diesel generator and an incinerator were identified in the south section of the site (refer to Figure 2 attached);
- What appeared to be a breather vent pipe possibly associated with a petroleum UST was observed by JKE from Reservoir Street protruding from the roof of the hospital maintenance/engineering building located to the south of the site (within the wider hospital grounds). There we no other indicators of a potential UST (e.g. gatic cover, fuel bowser etc) and there were no visible (e.g. spills, staining) indicators of contamination;
- Numerous Fibre Cement Fragment (FCF)/suspected ACM were identified on the surface in the north/central section of the site below/adjacent to elevated covered walk way connecting two hospital buildings. Signage on the external fibre cement wall at the southern end of the main hospital building in the central section of the site identified that the fibre cement sheeting was ACM;
- Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds;
- Landscaped and grassed areas were observed in areas of the site not covered by hardstand. Native trees up to approximately 5m high were observed along the southern site boundary and in other landscaped areas. Small shrubs were observed adjacent to some of the hospital buildings. No obvious indicators of plant stress or dieback were observed; and
- JKE did not observe any land uses in the immediate surrounds that were identified as potential contamination sources for the site.

2.5 Interview with Site Personnel

During the DSI fieldwork, a discussion was held between JKE and a hospital employee from the maintenance/engineering department. Based on JKE observation of a potential UST breather vent pipework, JKE queried the hospitals employee if there were any potential USTs in this area of the hospital. It was indicated there was a former UST located to the south of the maintenance/engineering building (refer to Figure 2) and the UST was formerly used to store diesel which powered the former boiler heating system. The hospital's employee indicated that the boiler systems and UST were decommissioned approximately 30 years ago, however details if the decommissioning were unknown.

2.6 Summary of Geology, Soils and Hydrogeology

2.6.1 Regional Geology

Regional geological information reviewed for the DSI indicated that the site is underlain is underlain by Colluvial and residual deposits, with Werrie Basalt located approximately 45m to the east of the site.

The PSI and DSI generally encountered fill ranging in depths from approximately 0.7mBGL (BH206 and BH225) to 2.2mBGL (BH219), however the vertical extent of fill was unbale to be confirmed at all sampling locations due to the use of hand equipment and termination of sampling within fill that could not be penetrated with such equipment. Natural silty clay and sandy clay alluvial soils were encountered beneath the fill at some of the sampling locations and extended to the termination depth of the respective boreholes/testpits and to a maximum depth of 8.0mBGL in borehole BH219. Bedrock was not encountered.

2.6.2 Hydrogeology and Receiving Water Bodies

Hydrogeological information reviewed for the PSI and DSI indicated that the regional aquifer on-site and in areas immediately surrounding the site includes porous, extensive aquifers of low to moderate productivity. There was a total of 196 registered bores within the report buffer of 2km of the site. The majority of the bores were registered for monitoring purposes. There were a number of bores registered for dewatering and water supply purposes to the north of the site.

There is no abstraction and use of groundwater at the site or in the vicinity, and the use of groundwater is not proposed as part of the development. There is a reticulated water supply in the area and consumption of groundwater is not expected to occur.

During the DSI groundwater seepage was encountered in boreholes BH205 and BH206 during drilling at depths of approximately 4mBGL. Standing Water Levels (SWLs) measured in the monitoring wells installed at the site prior to sampling ranged from approximately 1.1mBGL (MW206) to 7.34mBGL (MW219).

Considering the local topography and surrounding land features, JKE anticipated groundwater to flow towards the Namoi River, which is located approximately 1.2km to the north. This water body is a potential receptor of groundwater and excess surface water flows from the site.

As part of the DSI a contour plot was prepared for the groundwater levels using AutoCAD as shown on Figure 4 attached in Appendix C. Groundwater flow generally occurs in a down gradient direction perpendicular to the groundwater elevation contours. The contour plot indicates that groundwater generally flows from west to the east. This was not consistent with expectations based on the topography and location of the nearest down-gradient water body of the Namoi River. This discrepancy may be a result of the limited data that was available and/or the potential occurrence of different aquifers present at the site.

3 REVIEW OF CONCEPTUAL SITE MODEL

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is presented in the following sub-sections and is based on a review of information and the results from the PSI/DSI.

3.1 Summary of Contamination (Site Characterisation)

The primary contamination-related risks at the site are associated with historical importation of fill (soil), historical application of pesticides beneath/adjacent to the buildings and historical demolition of former buildings containing hazardous building materials including asbestos.

As discussed previously, the PSI and DSI generally encountered fill ranging in depths from approximately 0.7mBGL (BH206 and BH225) to 2.2mBGL (BH219), however the vertical extent of fill was unbale to be confirmed at all sampling locations. The fill typically comprised silty sand, silty clayey sand, gravelly silt, silty gravel with inclusions of gravel, ash brick and concrete fragments. Metal and ceramic fragments were encountered in the fill in TP210. FCF/ACM were encountered in the fill material in TP2, TP234, in the testpit fill spoil at TP226 and on the surface in the central section of the site (the ACM concentrations were all below the health-based SAC). The building materials debris within the fill appeared more prevalent in the south-east section of the site.

A summary of the primary soil contaminants of concern evaluated as part of the preliminary Tier 1 risk assessments in the DSI is provided below:

- Human health risks – OCPs (aldrin and dieldrin) at concentrations of 11.7mg/kg for the fill samples TP216 (0-0.1m) and 20.3mg/kg and TP220 (0-0.1m), which exceeded the Health Investigation Level C (HIL-C) SAC of 10mg/kg. The maximum concentration of 23.7mg/kg was identified in the laboratory duplicate sample from TP220; and
- Human health risks – ACM on the surface of the site and within the top 10cm at sampling location TP234. The presence of ACM within the top 10cm is deemed and human health SAC exceedance (although we note that the concentration in TP234 did not exceed the Health Screening Level – HSL). All bulk field screening asbestos concentrations were below the human health SAC. However, the occurrence of ACM, particularly in the south-east section of the site, appears to be heterogenous. Discovery of further ACM during excavation and construction is highly likely.

The OCPs (aldrin and dieldrin), ACM results above the human health SAC and other detections of asbestos in fill are shown on the Figure 3 attached in Appendix C and the laboratory results tables from the PSI/DSI are also attached Appendix C.

The groundwater contaminants of concern evaluated as part of the preliminary Tier 1 risk assessments in the DSI included heavy metals (copper, zinc, mercury and chromium) identified at concentrations above the ecological freshwater SAC. The copper and zinc elevations were marginally above the SAC and were considered to likely be attributed to regional groundwater background concentrations rather than onsite contamination source. The mercury concentration in GW-DUPB-1 (MW205) was considered to be a potential anomaly. However, the chromium concentration in MW219 of 42µg/L for the groundwater sample MW219

was well above the ecological SAC of 3.3µg/L and it was considered there could be a potential chromium contamination source on-site in the vicinity of MW219.

The heavy metals (copper, zinc, mercury and chromium) groundwater results above the ecological SAC and are shown on DSI Figure 3 attached in Appendix C and the laboratory results tables from the DSI are also attached Appendix C.

All Total Recoverable Hydrocarbons (TRHs); Benzene, Toluene, Ethylbenzene, Xylene (BTEX) soil and groundwater results were below the relevant SAC. Traces of TRH F2 were only encountered in the groundwater sample obtained from MW219 and a Photo-ionisation Detector (PID) of >500ppm was also encountered at MW219 prior to sampling. Hydrocarbon odours, stains or sheens were not observed during the installation, development, and sampling of groundwater monitoring well MW219.

Based on the calculated groundwater directional flow from west to east and the location of the reported former diesel UST to the south of the maintenance/engineering building there is a potential for the source of TRH F2 in MW219 to be associated with diesel from the former UST, associated pipework and/or adjacent impacted soils. Notwithstanding, the concentrations reported to date do not pose an unacceptable risk and do not warrant remediation in our opinion.

The DSI preliminary Tier 1 risk assessment identified soil and groundwater data gaps which are to be further investigated prior to proceeding with remediation. The pre-remediation investigation requirements are outlined in Section 5.

3.2 Review of CSM

The table below includes a review of the CSM and this CSM has been used to design the remediation strategy. The CSM will require further review as additional pre-remediation site data becomes available.

Table 3-1: CSM Review

Contaminant source(s) and contaminants of concern	Further detailed site characterisation is required to confirm the extent of remediation and whether other/further contamination risks exist that warrant remediation. Until this occurs, it has been assumed that localised areas of fill are contaminated with asbestos (as bonded ACM), and OCPs exist in surficial soils beneath the building in the northern area of the site. Asbestos (as bonded ACM) and OCPs are the primary contaminants of concern. Contaminants of potential concern (CoPC) requiring further characterisation in soil include: heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); TRHs; BTEX; and Polychlorinated Biphenyls (PCBs). The CoPC in groundwater include: TRHs; BTEX and naphthalene (BTEXN); and heavy metals mercury and chromium.
Affected media	Soil/fill has been identified as the affected medium for remediation. The potential for groundwater remediation is considered low, however this will also need to be further assessed by a pre-remediation investigation.

Receptor identification	Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, recreational water users within the Namoi River. Ecological receptors include terrestrial organisms and plants within unpaved areas (including the proposed landscaped areas), and freshwater ecology in the Namoi River.
Exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants including the primary contaminants of concern OCPs and asbestos) and vapours (volatile TRHs, naphthalene and BTEX). Primary and secondary contact with groundwater is also a potential exposure pathway. The potential for exposure would typically be associated with the construction and excavation works, future use of the site, and off-site migration of groundwater into recreational waters. Potential exposure pathways for ecological receptors include primary/direct contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings.
Evaluation of data gaps	Additional data is required following prior to and following demolition to better inform the remediation and attempt to delineate and characterise the nature and extent of contamination. The primary data gaps include: • Low soil sampling density, not meeting the minimum NSW EPA or NEPM requirements. Due to the presence of buildings and existing active hospital use sampling was unable to be undertaken in some areas; • The vertical extent of fill was unbale to be fully assessed due to the presence of significant undetectable underground services (particularly in the south-east section of the site), which resulted in a need to use hand equipment and/or limit sampling to shallow depths; • The source and extent of chromium, mercury and TRHs/BTEXN in groundwater, and the groundwater flow direction requires further assessment; and • Additional soil sampling and analysis is required to delineate the horizontal and vertical extent of the OCP impacts, including soil sampling of surface and near surface upper layers around the building footprints. An investigation framework is provided in Section 5 to address these gaps.

3.3 Remediation Extent

The remedial extent has not been completely confirmed at this stage. However, based on the DSI and review of the CSM it is assumed that:

- Localised OCPs impacts to surface soil exist beneath the general wards, emergency and imagery building in the north section of the site, and remediation is required to address potential human health risks;
- ACM is present in the fill in the south-east section of the site and remediation may be required to address human health risks; and
- Groundwater impacts from TRHs and heavy metals are minor and remediation is not required to address unacceptable ecological or human health risks.

These assumptions and the potential extent of any of the other remediation associated with the occurrence of the contaminants of concern or CoPC in soil are to be re-evaluated as part of the additional investigation and reporting process specified in Section 5.

For the purpose of this RAP, remediation will be limited to: OCP contaminated surface soil beneath the building, validation of imported materials and validation of unexpected finds within the site boundaries. At this stage, the RAP is not proposing remediation of asbestos as the ACM concentrations were all below the HSL-based SAC and the occurrence of ACM in the top 10cm of soil at one location is not immediately deemed to warrant remediation.

4 INTERIM SITE CONTAMINATION MANAGEMENT

The DSI identified localised OCPs impacts to surface soil located in the subfloor space beneath the general wards, emergency and imagery building in the north section of the site. Additionally, ACM was identified in the fill in the south-east section of the site and on the surface in the central section of the site.

Due to the detection of ACM in the fill soil and on the surface of the site, an AMP is required under the Work Health and Safety Regulation 2017 (NSW)[8].

An Interim Environmental Management Plan (IEMP)/AMP must be prepared and implemented so that potential human-health risks from OCPs and asbestos remain low and acceptable until further investigation and remediation occurs, and a Long-Term Environmental Management Plan (LTEMP) is prepared.

[8] NSW Government, (2017). *Work Health and Safety Regulation 2017 (NSW).* (referred to as WHS Regulation 2017)

5 PRE-REMEDIATION INVESTIGATION REQUIREMENTS

A construction-phase AMP must be prepared by a suitably qualified consultant prior to the commencement of any demolition activities or soil disturbance.

Prior to the commencement of remediation, and following establishment of a contractor works area and demolition of the required buildings, an investigation is to occur to further characterise the soil and groundwater conditions and facilitate a more comprehensive and complete assessment of the risks driving the remediation.

The primary objectives of this investigation are to: confirm the extent of soil remediation; confirm the contaminants of concern being remediated; confirm whether groundwater remediation is necessary; and facilitate the preparation of an addendum to the RAP or an updated RAP, if necessary.

A Sampling, Analysis and Quality Plan (SAQP) is to be prepared for the investigation following consultation with the client and project manager. The investigation is to include the following (as a minimum):

- Further assessment of the status of the off-site former diesel UST must be undertaken including a Ground Penetrating Radar (GPR) to assess the location and approximate size of the UST, presence and locations of any UST fill/dip points, and assessment of the UST contents for liquids/fuel contents where applicable;
- Soil sampling from the 23 sampling locations shown on Figure 2 attached in Appendix A. The locations have been selected to address the following:
    - To complete the grid-based (probabilistic) sampling plan proposed by the DSI and meet the minimum sampling density outlined in the NSW EPA Sampling Design Part 1 – Application (2022)[9] with an increased grid-based (probabilistic) sampling plan proposed in the south-east section of the site proposed to meet the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[10] for sites where there is a "*known*" or "*Likely*" asbestos impacts;
    - To further assess the extent and potential for contamination at previous sampling location where the vertical extent of fill was unable to assessed;
    - Target potential point sources of contamination beneath the buildings once demolished (sampling locations 301, 302 and 318) and beneath the incinerator once demolished (sampling location 303);
    - Target potential offsite (sampling location 304) and onsite (sampling location 305) contamination in the vicinity of the offsite UST located to the south of the existing engineering building;
    - Target potential offsite contamination at sampling location 323; and
    - Further assess the potential for surface soil OCP contamination immediately adjacent to the general wards, emergency and imagery building in the north section of the site (surface soil sampling locations SS1 to SS3).

[9] NSW EPA, (2022). *Sampling design part 1 - application.* (referred to as EPA Sampling Design Guidelines 2022)

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

- Soil sampling is be undertaken though the vertical extent of the fill and at least 0.5m into the underlying natural soil, except for at locations 303, 304 and 305 where sampling must extend to a minimum depth of 3.5mBGL to assess the soils down to and likely below the expected level of the UST. Surface soil samples are to be collected from intervals of approximately 0-0.1m and 0.2-0.3m below the existing ground surface at sampling locations SS1 to SS2 to assess the upper layer of soils which most likely to have been impacted by OCP application around the building footprint;
- Field asbestos quantification of bulk (10L) samples as specified in NEPM (2013) is required at all sampling locations (except SS1 to SS3) together with soil sampling for laboratory analysis;
- Resampling of the DSI groundwater monitoring wells MW206, MW206 and MW219 shown on the DSI Figure 3 attached in Appendix C;
- Installation and sampling from the proposed groundwater monitoring well locations 304, 305, 311 and 323, to assess potential onsite/offsite groundwater contamination;
- Further assessment of groundwater directional flow at the site by way of survey and preparation of a groundwater contour plan;
- Analysis of the surface soil sample locations SS1 to SS3 should be undertaken for OCPs at both sampling depth intervals. Analysis for the remainder of the soil sampling locations should at a minimum include:
    - Analysis of one sample per distinct fill profile for: heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); TRH/BTEX; PAHs; PCBs; and OCP;
    - Analysis of fill samples where ACM is encountered or suspected for asbestos (500ml NEPM 2013 analysis);
- Analysis for the groundwater sampling locations should at a minimum include: heavy metals (chromium and mercury); TRHs; and BTEXN; and
- Appropriate quality assurance/quality control (QA/QC) analysis in accordance with NEPM (2013) requirements, including inter- and intra-laboratory duplicates, trip blanks, trip spikes and rinsate samples.

Surface soil samples SS1 to SS3 are to be collected with hand tools. Soil sampling from the remainder of the proposed sampling locations is preferably to be undertaken from test pits. However, underground services may limit the potential use of an excavator for test pit soil sampling unless the contractors can accurately pinpoint all underground services and/or if disconnection/removal of underground services is necessary to facilitate the proposed development works. If this is the case borehole sampling is to be adopted. Geotechnical advice must be sought regarding procedures for backfilling of test pits so that unfavourable ground conditions such as potential soft spots etc are not created.

On completion of the pre-remediation investigation, a report is to be prepared in accordance with Consultants Reporting Guidelines. The outcome of the investigation is to be used to prepare an addendum to the RAP or an updated RAP if necessary.

In the event that the remedial strategy is revised, the client's expert planner must assess the requirement to notify the consent authority and/or modify the development consent.

6 REMEDIATION OPTIONS

6.1 Soil Remediation

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

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

Or if the above are not practicable:

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

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

The NEPM 2013 and the WA DoH 2021 guidelines prefer the following asbestos remediation hierarchy:

1. Minimisation of public risk;
2. Minimisation of contaminated soil disturbance; and
3. Minimisation of contaminated material/soil moved to landfill.

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

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

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

6.2 Soil Remediation Options Assessment

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

Table 6-1: Consideration of Remediation Options

Option	Discussion	Assessment/Applicability
Option 1 **On-site treatment of contaminated soil**	On-site treatment can provide a mechanism to reuse the processed material, and in some instances, avoid the need for large scale earthworks. Treatment options are contaminant-specific and can include bio-remediation, soil washing, air sparging and soil vapour extraction, thermal desorption and physical removal of bonded ACM fragments from surface soil. Depending on the treatment option, licences may be necessary for specific individual waste streams due to the potential for air pollution and the formation of harmful by-products during incineration processes. Licences for re-use of treated material/waste may also be required.	Not applicable at the site due to the combination of contaminants of concern present in fill. Additionally, the OCP contaminated soils cannot be accessed for treatment as they are located in the subfloor space of the general ward, emergency and imagery building which is to remain as part of the development. According the NSW EPA position statement[12] on the WA DoH 2021 Physical removal of ACM is not a remedial approach to 'clean' asbestos contaminated soils or stockpiles for reuse. Removal of surface ACM via picking might be a valid approach for surficial ACM impacts, where the surface ACM has been attributed to onsite building demotion impacts and ACM is not present within the fill soil.
Option 2 **Off-site treatment of contaminated soil**	Contaminated soils are excavated, transported to an approved/licensed treatment facility, treated to remove/stabilise the contaminants then returned to the subject site, transported to an alternative site or disposed to an approved landfill facility. This option is also contaminant-specific. The cost per tonne for transport to and from the site and for treatment is considered to be relatively high. The material would also have to be assessed in terms of suitability for reuse as part of the proposed development works under the waste and resource recovery regulatory framework.	Treatment of fill with OCPs and ACM impacts is not viable remediation option as noted above.
Option 3 **Consolidation and isolation of impacted soil by**	This would include the consolidation of contaminated soil within an appropriately designed cell, or capping contaminated soils in-situ beneath appropriate clean capping materials (such as pavement and/or clean soil) to reduce the potential for future exposure.	This option is suitable should the pre-remediation investigation encounter further contaminants of concern (e.g. ACM at

[12] NSW EPA https://www.epa.nsw.gov.au/your-environment/contaminated-land/other-contamination-issues/managing-asbestos-in-and-on-land/position-statement-wa-managment-of-asbestos-sites Visited 17 April 2023

Option	Discussion	Assessment/Applicability
cap and containment	The capping and/or containment must be appropriate for the specific contaminants of concern. A LTEMP would be required and an LTEMP would need to be publicly notified and made to be legally enforceable (e.g. via listings in the Section 10.7 planning certificate and on the land title).	concentrations greater than the HSL-based SAC). This option is sustainable as it minimises waste disposal to landfill. This option is not preferred if contaminated fill quantities are small, where the costs for construction of the capping system are higher than the landfill disposal fees or where the site owner does not want to manage the capped contamination under a LTEMP.
Option 4 **Removal of contaminated material to an appropriate facility and reinstatement with clean material**	Contaminated soils would be classified in accordance with NSW EPA guidelines for waste disposal, excavated and disposed of off-site to a licensed landfill. The material would have to meet the requirements for landfill disposal. Landfill gate fees (which may be significant) would apply in addition to transport costs.	Applicable for the fill outside of building footprints to remain. Not applicable for contamination beneath buildings that are not being demolished. Not the preferred option if contaminated fill quantities are significant and large and disposal costs are substantial, to the extent that remediation becomes unviable.
Option 5 **Implementation of management strategy**	Contaminated soils would be managed in such a way to reduce risks to the receptors. This may include monitoring of the conditions over time so that there is an on-going minimisation of risk, potentially involving capping systems and management procedures to be implemented likely under the framework of a LTEMP.	The implementation of a management strategy to restrict access and potential exposure to the OCP contaminated soils is a suitable remediation option. A LTEMP would be required, which should include WHS and PPE requirements for potential future disturbance of soils in these areas. This option would also be applicable in relation to ACM, however, would need to be applied concurrently with Option 4 if the ACM concentrations are found to exceed the HSL-based SAC.

6.3 Rationale for the Preferred Option for Soil Remediation

Based on the available soil data and CSM, the preferred option for remediation is Option 5 ('implementation of a management strategy'). This option is considered most appropriate for the proposed development based on the following:

- On and off-site treatment technologies are not considered to be economically viable or technically achievable for the contaminants of concern;
- The OCPs impacts have been identified beneath the general wards, emergency and imagery building in the north section of the site. This building will be retained as part of the proposed development;
- The DSI did not identify asbestos at concentrations exceeding the HSL-based SAC and so based on the current dataset it is not definitive that remediation of ACM will be required. On this basis, the decisions around managing or remediating ACM in soil will be further evaluated based on the outcome of the pre-remediation investigation (as outlined in Section 5 of this RAP).

Following completion of the pre-remediation data gap investigation, the contingency remediation options outlined in Section 8 must be considered. Alternate/contingency remediation approaches are to be documented as an addendum to the RAP or an updated RAP prepared.

6.4 Roles and Responsibilities

Table 6-2: Roles and Responsibilities

Role	Responsibility
Client and Project Manager	The client and their nominated representatives. The client/project manager is required to appoint the project team for the remediation and must provide all investigation reports including this RAP to the remediation contractor, determining authority and any other relevant parties involved in the project. The project manager is required to review all documents prepared for the project and manage the implementation of the procedures outlined in this RAP. The project manager is to take reasonable steps so that the remediation contractor and others have understood the RAP and will implement it in its totality. The project manager will review the RAP and other documents and will update the parties involved of any changes to the development or remediation sequence (in consultation with the validation consultant). Further details are outlined in the sections below.
Remediation Contractor	To be appointed. The remediation contractor is required to review all documents prepared for the project, apply for any relevant removal licences or permits and implement the remediation requirements outlined in this RAP. The remediation contractor is required to collect all necessary documentation associated with the remediation activities and forward this documentation onto the validation consultant, client and project manager as they become available. Further details are outlined in the sections below.
Validation Consultant	To be appointed.

Role	Responsibility
	The validation consultant[13] provides consulting advice and validation services in relation to the remediation. This includes carrying out the pre-remediation investigations, preparing any addendum or updated RAP if necessary and preparing the site validation report. The validation consultant is required to review any deviation to this RAP or in the event of unexpected finds if and when encountered during the site work. The validation consultant is required to liaise with the client, project manager and remediation contractor on all matters pertaining to the site contamination, remediation and validation. The validation consultant must have a Licensed Asbestos Assessor on staff so that any asbestos impacted fill can be appropriately managed under the purview of the site validation assessment.

6.5 Pre-commencement

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

6.6 Summary of Remediation, Validation and Associated Tasks

The following general sequence of works is anticipated:

- Site establishment;
- Demolition/removal of structures;
- Completion of pre-remediation investigation sampling/analysis and associated reporting; and
- Remediation (and validation) of the site via the preferred remediation options and validation of this process.

6.6.1 Construction-Phase AMP

As indicated in Section 5, a construction-phase AMP is to be prepared and implemented during the proposed construction and remediation works.

6.6.2 Site Establishment

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

[13] The consultant must be a certified practitioner (specialising in site contamination), under one of the NSW EPA endorsed certification schemes

The validation consultant must be advised if any soil, gravel or engineering materials (e.g. DGB, roadbase etc) are to be imported for the site establishment works. These must be validated by the validation consultant in accordance with Section 7.1.2 of this RAP to confirm they are suitable to be imported to site.

6.6.3 Demolition/Removal of Structures and Surface ACM Clearance

Demolition of buildings/structures is to occur with regards to the findings of the JKE HBMS and must be undertaken in accordance with the relevant codes, standards, guidelines and regulations. All structures and materials are to be removed from the site and clearance certificates are to be provided for the removal of all hazardous materials.

Following demolition works an 'emu pick' of the demolition areas for any visible surface fragments of FCF/ACM should be undertaken by a licensed Class B asbestos contractor.

On completion of the pick, a SafeWork NSW Licensed Asbestos Assessor (LAA) is to undertake a surface clearance inspection for ACM and prepare a clearance certificate.

6.6.4 Remediation

The following must be implemented:

- Completion of the pre-remediation data gap investigation (outlined in Section 5). Any requirements for additional/alternative remediation as a result of the investigation findings are to be implemented in accordance with the associated updated or addendum RAP;
- Preparation of a survey plan including coordinates showing the extent of the building footprint/s where OCPs have been detected above the human health SAC;
- Installation of caution signage with the wording "*Restricted Access Authorised Persons Only*" must be displayed at entry points to the sub-floor space of the buildings where OCPs in soils require management. JKE note that the signage wording is similar to that displayed at the entry points to the subfloor space of the birthing suite building, with additional signage at these entry points suggesting the potential for asbestos in the sub-floor space. The birthing suite building is to be demolished as part to the proposed development;
- Validation of soil waste transported from the site (outlined in Section 6.7.1);
- Validation of material imported to the site (outlined in Section 7.1.2); and
- Preparation and implementation of a LTEMP (outlined in Section 7.4).

6.7 Remediation Documentation

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

- Waste disposal dockets;
- Asbestos management documentation, including all relevant notifications, licences, clearance certificates and air monitoring reports (additional details in this regard are to be outlined in the AMP);
- Survey plan showing the extent of the building footprint/s where OCPs have been detected above the human health SAC;

- Photographs of remediation works, including evidence of installed restricted access signage;
- Waste tracking documentation (see below and the example waste tracking form in Appendix D); and
- Imported materials documentation (see below and the example imported material tracking form in Appendix D).

Copies of these documents must be forwarded to the project manager and the validation consultant for assessment and inclusion in the validation report.

6.7.1 Waste

All waste removed from the site is to be appropriately classified, tracked and managed in accordance with the relevant guidelines and regulations. The remediation contractor is to maintain adequate records and retain all documentation for waste disposal activities including:

- A summary register (in Microsoft Excel format) including details such as waste disposal dates, waste materials descriptions, disposal locations (i.e. facility details) and reconciliation of this information with the associated waste classification documentation and the waste disposal docket numbers;
- Waste tracking records and transport certificates (where waste is required to be tracked/transported in accordance with the regulations); and
- Disposal dockets for the waste (i.e. weighbridge dockets for each load).

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

A review of the disposal facility's Environment Protection Licence (EPL) issued under the Protection of the Environment Operations (POEO) Act (1997)[14] is to be undertaken to assess whether the facility is appropriately licensed to receive the waste.

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

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

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

6.7.2 Imported Materials

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

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

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

7 VALIDATION PLAN

Validation is necessary to demonstrate that remedial measures described in the RAP have been successful and that the site is suitable for the intended land use. The sampling program for the validation is outlined in Section 7.1. This is the minimum requirement based on the remedial strategy provided. Additional validation sampling may be required based on the outcome of the post-demolition investigation and/or observations made during remediation, however, that would be reflected in the updated/amended RAP where necessary.

7.1 Validation Inspections and Sampling

The following subsections outline the validation requirements for each aspect of the remediation:

7.1.1 OCP Management

Validation in relation to the OCP in soil management requires the following:

- Survey plan including coordinates showing the extent of the building footprint/s where OCPs have been detected above the human health SAC and where the associated soils beneath require long term management under the LTEMP; and
- Inspection by the validation consultant to document with photographs the restricted access signage and to document the locations where the subfloor access points and signage exists.

7.1.2 Imported Materials

A minimum of three samples from each imported material type must be collected and analysed for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRHs, BTEX, PAHs, OCP/OPPs, PCBs and asbestos (500ml NEPM 2013 analysis). Additional analysis may be required depending on the material type and/or history of the material/source site, at the validation consultant's discretion.

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

Where applicable, documentation must be supplied to the validation consultant to confirm the material has been classified with reference to a relevant Resource Recovery Order/Exemption.

The VAC for imported materials are outlined in Section 7.2.

7.2 Validation Assessment Criteria and Data Assessment

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

Table 7-1: Validation Assessment Criteria (VAC)

Validation Aspect	VAC
Waste classification of fill	In accordance with the procedures and criteria outlined in Part 1 of the Waste Classification Guidelines 2014, and any other exemptions/approvals as required.
Imported materials	Material imported as general fill must only be VENM or ENM. VENM is defined in the Protection of the Environment Operations Act (1997)[15] as material: • That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • That does not contain sulfidic ores or other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette. ENM and recycled materials are to meet the criteria of the relevant exemption/order under which they are produced. Analytical results for VENM and other imported materials will need to be consistent with expectations for those materials. For VENM, it is expected that: - Heavy metal concentrations are to be less than the most conservative Added Contaminant Limit (ACL) concentrations for an URPOS exposure setting presented in Schedule B1 of the NEPM 2013, except for lead which should be nominally less than 100mg/kg. We note the lead ACL is 1,100mg/kg and this concentration is not deemed to be representative of VENM; and - Organic compounds are to be less than the laboratory PQLs and asbestos to be absent. All materials imported onto the site must also be adequately assessed as being appropriate for the final use of the site. A risk-based assessment approach is to be adopted with regards to the tier 1 screening criteria presented in Schedule B1 of NEPM 2013. Aesthetics: all imported materials are to be free of staining and odours. Imported landscaping materials must be visually free of any anthropogenic materials such as plastic, metal, slag etc.

Data should initially be assessed as above or below the VAC. Statistical analysis may be applied if deemed appropriate by the consultant and undertaken in accordance with the NEPM 2013.

For imported materials, further assessment of risk can be considered in relation to site specific circumstances/application and available documentation for each material type, although such assessment and importation/use of materials on site should not be contrary to waste exemptions/orders or waste definitions.

[15] Protection of Environment Operations Act 1997 (NSW) (POEO Act 1997)

7.3 Overarching Validation Sampling, Analysis and Quality Plan (SAQP)

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

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

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

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

7.3.1 Step 1 - State the Problem

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

7.3.2 Step 2 - Identify the Decisions of the Study

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

- Was the remediation undertaken in accordance with this RAP, or subsequent addendum/updated RAP?
- If there were any deviations, what were these and how do they impact the outcome of the validation?
- Are any of the validation results above the VAC?
- Is the site suitable for the proposed development from a contamination viewpoint, subject to implementation of an LTEMP?

7.3.3 Step 3 - Identify Information Inputs

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

- Existing relevant data from previous reports;
- Site information, including site observations and inspections;
- Pre-remediation investigation data;
- Survey data;
- Laboratory analysis of soils where applicable; and
- Field and laboratory QA/QC data.

7.3.4 Step 4 - Define the Study Boundary

The remediation and validation will be confined to the site boundaries as shown in Figure 2 in appendix A. The extent of remediation will be further assessed by the pre-remediation investigation outlined in Section 5.

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

7.3.5.1 VAC

The validation data will be collected and assessed in accordance with Section 7.1. The following decision rules will apply:

- If all concentrations of the contaminants of concern are below the VAC, then the data will be compared directly to the VAC without statistical analysis; and
- If the concentration of a contaminant of concern exceeds the VAC, and if statistical analysis is deemed appropriate, then statistical analysis will be undertaken. This will include calculation of the 95% upper confidence limit (UCL) value for the data set, with regards to the NEPM (2013) framework and other relevant guidelines made under the CLM Act 1997. The UCL will be considered acceptable where the UCL is below the VAC, the standard deviation of the data is less than 50% of the VAC and none of the individual concentrations are more than 250% of the VAC.

7.3.5.2 Field and Laboratory QA/QC

Appropriate QA/QC samples are to be obtained during the validation (where applicable) and analysed for the same suite of contaminants as the primary samples. As a minimum, QA/QC sampling should include duplicates (5% inter-laboratory and 5% intra-laboratory) and trip blanks. Rinsate samples should be obtained if re-usable sampling equipment is utilised. Trip spikes must also be obtained during the imported materials validation, or if the remediation contaminants of concern are volatile.

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

Field Duplicates

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

Trip Blanks

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

Laboratory QA/QC

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

A summary of the typical limits is provided below:

RPDs

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

Laboratory Control Samples (LCS) and Matrix Spikes

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

Surrogate Spikes

- 60-140% recovery acceptable for general organics.

Method Blanks

- All results less than PQL.

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

7.3.5.3 Appropriateness of PQLs

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

7.3.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results is to be undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected.

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. For the validation assessment, the null hypothesis (H_0) is that the 95% UCL for the contaminant of concern is greater than the VAC. The alternative hypothesis (H_A) is that the 95% UCL for the contaminant of concern is less than the VAC.

Potential outcomes include Type I and Type II errors as follows:

- Type I error of determining that the soil is acceptable for the proposed land use when it is not (wrongly rejects true H_0), includes an alpha (α) risk of 0.05; and
- Type II error of determining that the soil is unacceptable for the proposed land use when it is (wrongly accepts false H_0), includes beta (β) risk of 0.2.

7.3.7 Step 7 - Optimise the Design for Obtaining Data

The design is to be optimised via the collection of validation data to demonstrate the success of the key aspects of the remediation.

7.3.8 Sampling Plan

The proposed sampling plan for the validation is described in Section 7.1.

7.4 Validation Report and LTEMP

As part of the site validation process, a site validation report will be prepared by the validation consultant. The report will present the results of the validation assessment and will be prepared in accordance with the Consultants Reporting Guidelines.

A LTEMP will be prepared concurrently with the site validation report by the validation consultant, in accordance with the Consultants Reporting Guidelines. Based on the current dataset, the LTEMP will include, as a minimum, the protocols and procedures for managing the occurrence of OCPs in soil beneath the relevant existing/remaining buildings. The management plan will be deemed to be a passive management approach whereby the restriction of access is maintained via protocols to be integrated into the client's site management systems, and where signage is maintained etc. Refer to Section 10 for further details.

Where the pre-remediation investigation identifies additional contamination and if a decision is made (via the updated/addendum RAP) to cap/contain and manage that contamination on site, the scope of the LTEMP must also address this outcome so that risks posed by contamination at the site are low and acceptable in the context of the hospital land use.

The LTEMP is also to prepared be prepared in accordance with the NSW EPA Practice Note, Preparing Environmental Management Plans for Contaminated Land (2022)[16]. The LTEMP must clearly state:

- Its objectives;
- Who is responsible for implementing it;
- The time frames for completing the actions it specifies, and who will undertake those actions;
- Its key stakeholders, and how they have been engaged in developing it;
- A mechanism for monitoring its implementation; and
- Where it will be recorded and how the public will be made aware of it.

[16] NSW EPA, (January, 2022). Practice Note: *Preparing Environmental Management Plans for Contaminated Land*

A key requirement of the LTEMP is that it legally enforceable and is publicly notified. JKE recommend that early engagement be undertaken with the relevant authorities and stakeholders so that the mechanisms for the LTEMP legal enforceability and public notification can be established and executed.

8 CONTINGENCY PLAN

A review of the proposed development and remediation works has indicated that the greatest risks that may affect the success of the remediation/validation approach documented in this RAP include:

- The identification additional contamination by the pre-remediation data gap investigation, requiring consideration for alternate/additional remediation options;
- Unexpected finds during soil disturbance; and
- Validation failure of imported materials.

A contingency discussion for each of the above aspects is provided below.

8.1 Contingency Alternate/Additional Soil Remediation Options

8.1.1 Excavation of Impacted Soil and Off-site Disposal

As a contingency and considering surplus soils are to be disposed of off-site during earthworks, the potential for excavation and off-site disposal of contaminated soils should be considered following review of the pre-remediation investigation results and the CSM.

In the event this contingency is triggered, an addendum or updated RAP must be prepared by the validation consultant outlining the remedial methodology and validation requirements.

The excavation and off-site disposal contingency remediation approach would require: contaminated soils to be classified in accordance with NSW EPA guidelines for waste disposal; a waste classification letter to be prepared; the contaminated soil to be excavated and disposed of off-site to a licensed landfill; and for the resulting excavation to be validated by sampling and analysis to confirm contamination does not remain at the base and walls of the excavation.

8.1.2 Consolidation and Isolation of Impacted Soil by Cap and Containment

If consolidation and capping the contaminated soil is preferred and is assessed to be applicable over off-site disposal of soil according to the NSW EPA and NEPM 2013 remediation hierarchy, the rationale for this must be outlined in the updated/addendum RAP and it must be recognised that the contaminated will be managed under the LTEMP. This remediation option would also be applicable were contaminated fill cannot be removed from the site for physical or practical reasons (e.g. if the contamination extends beneath buildings that are to remain, or where there are tree protection zones etc).

In the event this contingency is triggered, an addendum or updated RAP must be prepared by the validation consultant outlining the remedial methodology and validation requirements.

In summary, the capping of impacted soil contingency remediation approach requires consideration of the following:

- Details for the earthworks, including geotechnical requirements (including but not limited to compaction capping layers, batter requirements, and consideration of root-affected/organic content

in root-affected soils to be excavated), and materials management practices to minimise the potential for cross contamination with the remediation areas;

- Careful execution of the earthworks and consolidation of impacted soils;
- Consideration of any structural requirements for the development, including but not limited to piling through the capped material;
- Survey plans including survey coordinates showing the horizontal extent of the capped material. preferably the contaminated soils should be capped beneath the proposed hardstand areas wherever possible, rather than in landscaped areas;
- A barrier system is to be installed over the capered material, including a hi visibility marker layer (e.g. geofabric) and potentially a physical barrier (e.g. geogrid) in accessible soil areas.
- Clean layers are to be installed over the capped material and barrier system. The materials used for the clean layers must validated by the validation consultant; and
- The project team must discuss the capping requirements so that the cap is robust and fit for purpose. Generally, JKE would accept concrete hardstand capping directly over the marker layer for paved areas, at least 0.5m of clean soil capping over the marker layer for landscaped areas, and all new services to be installed in trenches lined with a marker layer and backfilled with clean material. Alternative capping thicknesses (e.g. a reduced depth of capping) could be considered where 0.5m of clean soil capping is not practicable. However, a robust rational for implementing such an approach needs to be documented; and
- The thickness of the clean capping layer above the barrier system must be confirmed via survey of relative levels (RLs) prior and post installed of the clean capping layer. The horizontal extent of the marker layers must also be documented by survey.

For capping in tree zones and landscaped areas, advice must be sought from an expert (e.g. an arborist) to confirm suitability of geofabric/marker layer(s) and capping materials.

Further information relating to the LTEMP are presented in Section 7.4.

8.2 Unexpected Finds

Residual hazards that may exist at the site would generally be expected to be detectable through visual or olfactory means. At this site, these types of hazards may include odorous or stained hydrocarbon impacted soils, FCF or ACM beyond the areas where this material is identified during investigations, and/or friable asbestos etc. The procedure to be followed in the event of an unexpected find is presented below:

- In the event of an unexpected find, all work in the immediate vicinity must cease and the remediation contractor must contact the validation consultant and the client/project manager;
- Temporary barricades should be erected to isolate the area from access to workers;
- The validation consultant is to attend the site, adequately characterise the potential contamination and provide advice in relation to site management and remediation. In the event that remediation differs from that outlined in this RAP, an addendum RAP must be prepared in consultation with the project stakeholders and submitted to the consent authority; and
- Contamination must be remediated and validated in accordance with the advice provided, and the results should be included in the validation report.

8.3 Importation Failure for VENM or other Imported Materials

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

9 SITE MANAGEMENT PLAN FOR REMEDIATION WORKS

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

9.1 Interim Site Management/Asbestos Management Plan

As discussed in Section 4, an IEMP/AMP is to be prepared and implemented to manage so that potential human-health risks from contamination remain low and acceptable until further investigation, remediation occurs and a LTEMP is prepared.

A construction-phase AMP must also be prepared and implemented as noted previously.

9.2 Project Contacts

Emergency procedures and contact telephone numbers should be displayed in a prominent position at the site entrance gate and within the main site working areas. The contact details of key project personnel are summarised in the following table:

Table 9-1: Project Contacts

Role	Company	Contact Details
Project Manager	Ranbury	Hadyn Douglas M: 0400 850 173 E: hdouglas@ranbury.com.au
Remediation Contractor	To be appointed	-
Validation Consultant	To be appointed	-
Certifier	To be appointed	-
NSW EPA	Pollution Line	131 555
Emergency Services	Ambulance, Police, Fire	000

9.3 Security

Appropriate fencing must be installed as required to secure the site and to isolate the remediation areas. Warning signs should be erected, which outline the PPE required for remediation work.

9.4 Timing and Sequencing of Remediation Works

The anticipated sequence of remediation works is outlined in Section 6.6. The client must engage with the determining authority so that the remediation can occur as outlined in these steps.

9.5 Site Soil and Water Management Plan

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

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

No stockpiles of soil or other materials shall be placed on footpaths.

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

9.6 Noise and Vibration Control Plan

The guidelines for minimisation of noise on construction sites outlined in AS-2460 (2002)[17] should be adopted. Other measures specified in the REF should also be complied with. Noise producing machinery and equipment should only be operated between the hours approved by the determining authority (refer to REF).

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

9.7 Dust Control Plan

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

- Wind over a cleared surface;

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

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

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

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

If stockpiles are to remain on-site or soil remains exposed for a period of longer than several days, dust monitoring should be undertaken at the site. If excessive dust is generated all site activities should cease until either wind conditions are more acceptable or a revised method of excavation/remediation is developed. Reference is also to be made to the construction-phase AMP in this regard.

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

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

9.8 Dewatering

Dewatering is not expected to be required under the scope of remediation and is therefore not applicable under the RAP.

Groundwater must not be pumped to sewer or stormwater without obtaining prior approval from the relevant authorities.

9.9 Air Monitoring

Reference is to be made to the construction-phase AMP for details regarding asbestos air fibre monitoring. Air monitoring must only be carried out by personnel registered and accredited by NATA (National Association of Testing Authorities). Filter analysis must only be carried out within a NATA certified laboratory. The monitoring results must conform to the requirements of the NOHSC Guidance note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003 (2005)].

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

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

9.10 Odour Control Plan

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

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

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

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

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

- If continued complaints are received, alternative odour management strategies should be considered and implemented.

9.11 Work Health and Safety (WHS) Plan

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

As a minimum requirement, personnel must wear appropriate protective clothing, including long sleeve shirts, long trousers, steel cap boots and hard hats. Additional asbestos-related PPE will be required and this will be specified in the construction-phase AMP . Washroom and lunchroom facilities should also be provided to allow workers to remove potential contamination from their hands and clothing prior to eating or drinking.

9.12 Waste Management

Prior to commencement of remedial works and excavation for the proposed development, the remediation contractor should develop a waste management or recycling plan to minimise the amount of waste produced from the site.

9.13 Incident Management Contingency

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

9.14 Hours of Operation

Hours of operation should be between those approved by the determining authority under the development approval process.

9.15 Community Consultation

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

10 CONCLUSION

Investigations at the site by JKE have identified OCPs impacts to surface soil beneath the general wards, emergency and imagery building in the north section of the site, with remediation considered necessary to address human health risks. Additionally, ACM is present in the fill in the south-east section of the site and remediation may be required to address human health risks. The asbestos concentrations identified in soil to date have not exceeded the HSL-based assessment criteria.

Prior to the commencement of remediation, and following establishment of a contractor works area and demolition of the required buildings, an investigation is to occur to further characterise the soil and groundwater conditions and facilitate a more comprehensive and complete assessment of the risks driving the remediation. The additional pre-remediation investigation requirements are outlined in Section 5 and an amended/updated RAP is to be prepared where necessary following this investigation.

Based on the available data and the CSM, the proposed remediation strategy includes implementation of a management strategy in relation to the occurrence of OCPs in soil beneath buildings that are not being demolished. Contingency alternate/additional remediation options have also been provided in Section 8.1, including 'excavation and off-site disposal' and 'cap and contain' of contaminated fill in-situ, should additional contamination be identified during the pre-remediation investigation.

JKE is of the opinion that the site can be made suitable for the proposed development via remediation and the implementation of this RAP. Site validation reporting is to occur as specified in this RAP to document that the procedures have been followed and to demonstrate that the site is suitable on completion of the remediation, subject to implementation of an LTEMP.

The RAP has met the objectives outlined in Section 1.2.

10.1 Regulatory Requirements

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

Table 10-1: Regulatory Requirement

Guideline / Legislation / Policy	Applicability
SEPP Resilience and Hazards 2021	We have assessed that the remediation falls within Category 2. This must be confirmed by the client's expert planner. Prior notice of Category 2 remediation work must be given to council at least 30 days prior to commencement of remediation in accordance with Clause 4.13 of SEPP Resilience and Hazards 2021. Under Section 4.14 of SEPP Resilience and Hazards 2021, a notice of completion of remediation work is to be given to council within 30 days of completion of the work regardless of whether the remediation is classed as Category 1 or Category 2 remediation work. The notice of completion of remediation works must be in accordance with Section 4.15 of SEPP Resilience and Hazards 2021.

Guideline / Legislation / Policy	Applicability
POEO Act 1997	Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner. Appropriate waste tracking is required for all waste that is disposed off-site. Activities should be carried out in a manner which does not result in the pollution of waters.
POEO (Waste) Regulation 2014	Waste must be classified and disposed of lawfully in accordance with the regulation. Part 7 of the POEO Waste Regulation 2014 set outs the requirements for the transportation and management of asbestos waste and Clause 79 of the POEO Waste Regulation requires waste transporters to provide information to the NSW EPA regarding the movement of any load in NSW of more than 10 square meters of asbestos sheeting, or 100 kilograms of asbestos waste. To fulfil these legal obligations, asbestos waste transporters must use WasteLocate.
Work Health and Safety Regulation (2017)	Sites with asbestos become a 'workplace' when work is carried out there and require a register and AMP. This would apply to the demolition activities in the event that the hazardous building materials survey identifies asbestos in the structures, or in the event of an unexpected find in fill. Appropriate SafeWork NSW notification will be required for licensed (e.g. Class A or Class B) asbestos removal works or handling. The asbestos identified in soil to date was non-friable and therefore could be removed by a Class B licensed contractor.
NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997	The requirement to notify the EPA should be assessed as part of the site validation process.

11 LIMITATIONS

The report limitations are outlined below:

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

Important Information About This Report

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

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

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

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

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

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

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

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

Misinterpretation of Site Assessments by Design Professionals

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

Logs Should not be Separated from the Assessment Report

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

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

Read Responsibility Clauses Closely

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

Appendix A: Report Figures

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

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

Title: **SITE LOCATION PLAN**

Location: GUNNEDAH HOSPITAL, MARQUIS STREET, GUNNEDAH, NSW

Project No: E35091UPD

Figure No: 1

JKEnvironments

PLOT DATE: 16/05/2023 11:29:04 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35091UPD GUNNEDAH\CAD\E35091UPD.DWG

ELECTRICAL TRANSFORMER

MARQUIS STREET

DIESEL GENERATOR

INCINERATOR

POTENTIAL UST

RESERVOIR STREET

ANZAC PARADE

SS1 SS2 SS3

301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325

LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE WIDER HOSPITAL BOUNDARY
- PROPOSED SOIL SAMPLING LOCATION
- PROPOSED SOIL SAMPLING AND GROUNDWATER MONITORING WELL LOCATION
- ✕ SS1 PROPOSED SURFACE SOIL SAMPLING LOCATION

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

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

Title: **PRE-REMEDIATION INVESTIGATION LOCATION PLAN**

Location: GUNNEDAH HOSPITAL, MARQUIS STREET, GUNNEDAH, NSW

Project No: E35091UPD

Figure No: 2

JKEnvironments

PLOT DATE: 16/05/2023 11:29:20 AM DWG FILE: K:\5C EIS JOBS\35000\SIE35091UPD GUNNEDAH\CAD\E35091UPD.DWG

Appendix B: Selected Proposed Development Plans

MARQUIS STREET

DOCTORS ACCOMMODATION

LPG

RURAL HEALTH CENTRE

PATHOLOGY

PUBLIC ENTRY

GENERAL MEDICAL - B WING

FUNCTION ROOM

MSB & GENERATOR

MORTUARY

SERVICE YARD

BACK OF HOUSE

FORMER KITCHEN

FORMER COMMUNITY HEALTH

ADMINISTRATION

TRAINING

GENERAL MEDICAL - A WING

TREATMENT

ALKIRA NURSING HOME

ENGINEERING

KITCHEN

DENTAL CLINIC

PHYSIO

KIOSK

MATERNITY WARD

CHAPEL

GENERAL WARDS

GAZEBO

PLAYGROUND

BIRTHING SUITE

GUNNEDAH HOSPITAL

DAY SURGERY

EDUCATION CENTRE

LPG

CSSD

EMERGENCY

AMB BAY

IMAGING

DAY CARE CENTRE

BULK OXYGEN

HELIPAD

STAFF ACCOMMODATION

CLINICS

AMBULANCE STATION

LIONS PARK

RESERVOIR STREET

ANZAC PARADE

DESIGN DEVELOPMENT
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
G	FOR REF SUBMISSION	26.04.2023	LS	DC
F	FOR REF SUBMISSION	13.04.2023	SA	DC
E	FOR INFORMATION	17.01.2023	LS	DC
1	EW TENDER ADDENDUM	03.11.2022	LS	DC
D	100% SCHEMATIC ISSUE	17.10.2022	LS	EC
C	FOR COORDINATION	15.08.2022	LS	EC
B	70% SCHEMATIC ISSUE	15.07.2022	LS	EC
A	40% SCHEMATIC ISSUE	10.06.2022	LS	EC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH, NSW 2380

Project Number
21-0218

Drawing
SITE FLOOR PLAN - EXISTING

Scale (A1) 1 : 400
Date Printed 26/04/2023 1:07:01 PM

Drawing Number AR-00-1000
Issue G

File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt

MARQUIS STREET

DOCTORS ACCOMMODATION

FORMER LPG

RURAL HEALTH CENTRE

PATHOLOGY

PUBLIC ENTRY

GENERAL MEDICAL - B WING

SPRINKLER & HYDRANT TANKS & PUMPSET

MSB & GENERATOR

MORTUARY

FORMER FUNCTION

FORMER ADMINISTRATION

FORMER BACK OF HOUSE

FORMER MEDICAL RECORDS

FORMER COMMUNITY HEALTH

TRAINING

GENERAL MEDICAL - A WING

TREATMENT

SERVICE YARD

FORMER KITCHEN

FORMER MEDICAL RECORDS

ALKIRA NURSING HOME

ENGINEERING

KITCHEN

FORMER DENTAL CLINIC

FORMER PATH.

FORMER PHYSIO

KIOSK

PLANT

BIRTHING SUITE

GENERAL WARDS

GAZEBO

PLAYGROUND

FORMER MATERNITY WARD

MATERNITY WARD

FORMER BIRTHING SUITE

GUNNEDAH HOSPITAL

DAY SURGERY

EDUCATION CENTRE

FORMER LPG

CSSD

EMERGENCY

AMB BAY

IMAGING

FORMER DAY CARE CENTRE

BULK OXYGEN

HELIPAD

STAFF ACCOMODATION

CLINICS

AMBULANCE STATION

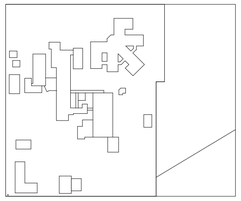
LIONS PARK

RESERVOIR STREET

ANZAC PARADE

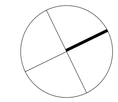
Notes

Verify all dimensions and levels on site and report any discrepancies to dwp for direction prior to the commencement of work.
Drawings are to be read in conjunction with all other contract documents.
Use figured dimensions only. Do not scale from drawings.
dwp cannot guarantee the accuracy of content and format for copies of drawings issued electronically. The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.



LEGEND

- TEMPORARY DECANT ACCOMMODATION
- TO BE DEMOLISHED
- EXISTING



DESIGN DEVELOPMENT
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
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D	FOR INFORMATION	16.03.2023	LS	DC
C	FOR INFORMATION	09.03.2023	LS	DC
B	FOR INFORMATION	24.02.2023	LS	DC
A	FOR INFORMATION	24.02.2023	LS	DC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH, NSW 2380

Project Number
21-0218

Drawing
SITE FLOOR PLAN - EARLY WORKS DECANT

Scale (A1)
As indicated

Date Printed
26/04/2023 1:07:19 PM

Drawing Number
SK-EW-1000

Issue
E

File Name: BIM 360://21-0218.-Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt

MARQUIS STREET

RESERVOIR STREET

ANZAC PARADE

HARDSTAND FOR FIRE APPLIANCE

FIRE SPRINKLER AND HYDRANT BOOSTER VALVE

ENTRY / EXIT

MAIN CARPARK

DOCTORS ACCOMMODATION

SUBSTATION

SERVICES ENTRY / EXIT ONLY

SPRINKLER & HYDRANT TANKS & PUMPSET

EMERGENCY GENERATOR

MAIN SWITCH BOARD

MORTUARY

SERVICES ENTRY / EXIT ONLY

ELECTRICAL & COMMS PLANT ROOM

RAINWATER REUSE PLANT

FUNCTION ROOM

MAIN ENTRY

RURAL HEALTH CENTRE

FRONT OF HOUSE

FORMER COMMUNITY HEALTH

BACK OF HOUSE

RETAINING WALL

MEDICAL RECORDS

PATH.

PHYSIO

DENTAL

KITCHEN

LOADING ZONE

ENGINEERING

RETAINING WALL

ALKIRA NURSING HOME

FUTURE INFUSION SHOWN DASHED

CHAPEL

GATHERING COURTYARD

CENTRAL COURTYARD

FUTURE EXTENSION SHOWN DASHED

MATERNITY

DAY SURGERY

FORMER GENERAL WARD

INPATIENT

BIRTH SUITE

BIRTHING COURTYARD

CSSD

THEATRE

FORMER EMERGENCY

EDUCATION CENTRE

FLEET CARPARK (17 SPACES)

TURNING SPACE

AMBULANCE BAY 1

AMBULANCE BAY 2

ENTRY / EXIT

EMERGENCY

FUTURE IMAGING SHOWN DASHED

FUTURE EXTENSION SHOWN DASHED

IMAGING

OUTDOOR WAITING

SHORT TERM PARKING

DROP-OFF ZONE

EMERGENCY ENTRY

HELIPAD

STAFF ACCOMMODATION

AMBULANCE ENTRY

AMBULANCE STATION

AMBULANCE EXIT

ENTRY

EXIT

LIONS PARK

Notes

SITE LEGEND

- TURFED AREA
- MASS PLANTING OF NATIVE GRASSES
- MASS PLANTING AREA
- PAVING TYPE 1
- PAVING TYPE 2
- ROADWAYS/PARKING
- EXISTING BUILDINGS

SCHEMATIC DESIGN

NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
A	FOR REF SUBMISSION	26.04.2023	LS	DC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH, NSW 2380

Project Number
21-0218

Drawing
OPTION 2 - SITE FLOOR PLAN - STAGE 1 - LANDSCAPING

Scale (A1)
As indicated

Date Printed
26/04/2023 1:07:39 PM

Drawing Number
SK-S1-9241

Issue
A

File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-A0-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt

MARQUIS STREET

HARDSTAND FOR FIRE APPLIANCE

FIRE SPRINKLER AND HYDRANT BOOSTER VALVE

ENTRY / EXIT

MAIN CARPARK

DOCTORS ACCOMMODATION

SUBSTATION

SERVICES ENTRY / EXIT ONLY

SPRINKLER & HYDRANT TANKS & PUMPSET

EMERGENCY GENERATOR

MAIN SWITCH BOARD

MORTUARY

SERVICES ENTRY / EXIT ONLY

FUNCTION ROOM

MAIN ENTRY

RURAL HEALTH CENTRE

FRONT OF HOUSE

FORMER COMMUNITY HEALTH

RETAINING WALL

BACK OF HOUSE

MEDICAL RECORDS

LOADING ZONE

ENGINEERING

KITCHEN

DENTAL

PATH.

PHYSIO

RETAINING WALL

ALKIRA NURSING HOME

ELECTRICAL & COMMS PLANT ROOM

RAINWATER REUSE PLANT

FUTURE INFUSION SHOWN DASHED

CHAPEL

GATHERING COURTYARD

CENTRAL COURTYARD

MATERNITY

FORMER GENERAL WARD

DAY SURGERY

FUTURE EXTENSION SHOWN DASHED

INPATIENT

BIRTH SUITE

BIRTHING COURTYARD

CSSD

THEATRE

FORMER EMERGENCY

FLEET CARPARK (17 SPACES)

EDUCATION CENTRE

TURNING SPACE

EMERGENCY

FUTURE IMAGING SHOWN DASHED

FUTURE EXTENSION SHOWN DASHED

IMAGING

AMBULANCE BAY 1

AMBULANCE BAY 2

ENTRY / EXIT

OUTDOOR WAITING

SHORT TERM PARKING

DROP-OFF ZONE

EMERGENCY ENTRY

HELIPAD

STAFF ACCOMMODATION

AMBULANCE ENTRY

AMBULANCE STATION

AMBULANCE EXIT

ENTRY

EXIT

LIONS PARK

RESERVOIR STREET

ANZAC PARADE

Notes

SCHEMATIC DESIGN

NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
A	FOR REF SUBMISSION	26.04.2023	LS	DC

Architect/ Designer
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Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH, NSW 2380

Project Number
21-0218

Drawing
OPTION 2 - SITE ROOF PLAN - STAGE 1

Scale (A1)
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Date Printed
26/04/2023 1:07:53 PM

Drawing Number
SK-S1-9242

Issue
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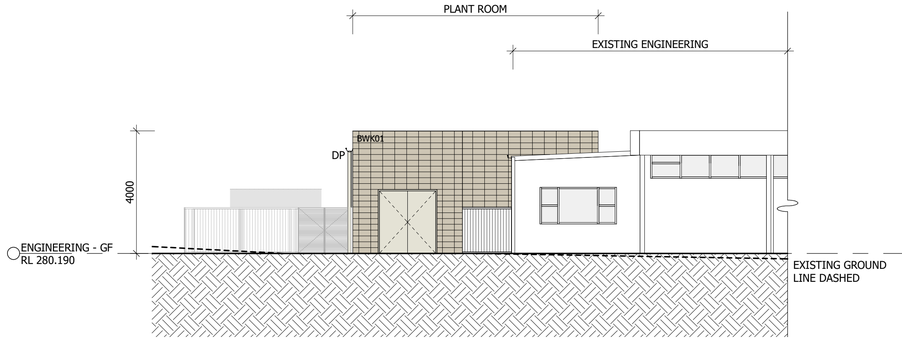
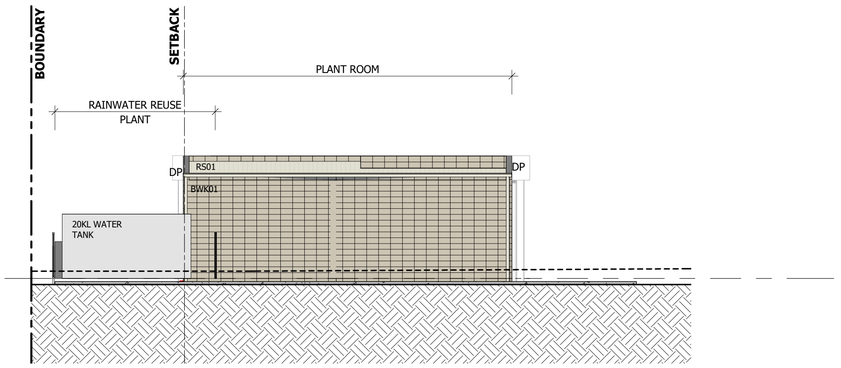


1 PLANT BUILDING - NORTH ELEVATION
1 : 100

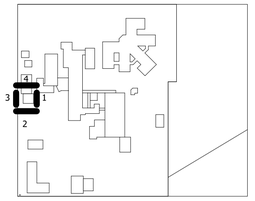


2 PLANT BUILDING - EAST ELEVATION
1 : 100

3 PLANT BUILDING - SOUTH ELEVATION
1 : 100

4 PLANT BUILDING - WEST ELEVATION
1 : 100

Notes



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C	FOR REF SUBMISSION	13.04.2023	SA	DC
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B	100% SCHEMATIC ISSUE	17.10.2022	LS	EC
A	EARLY WORKS PTE	26.09.2022	SA	EC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL
REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH,
NSW 2380

Project Number
21-0218

Drawing
BUILDING ELEVATIONS
- EARLY WORKS &
DECANT

Scale (A1)
1 : 100

Date Printed
26/04/2023 1:07:59 PM

Drawing Number
AR-EW-2001

Issue
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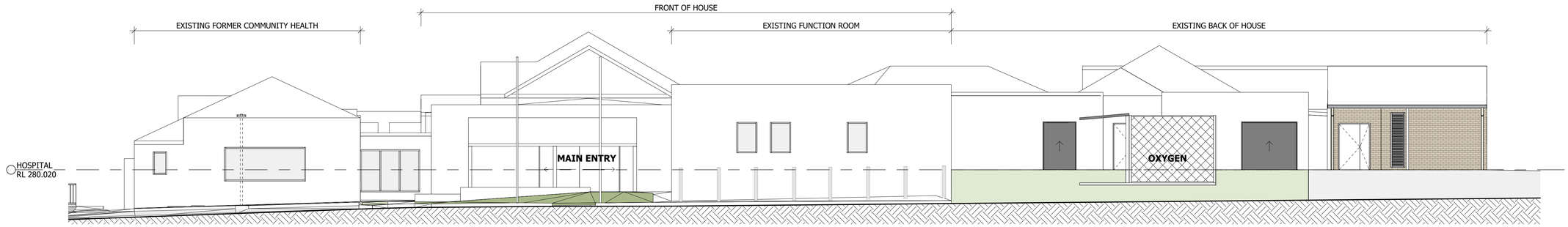

1 MAIN ENTRY - WEST ELEVATION
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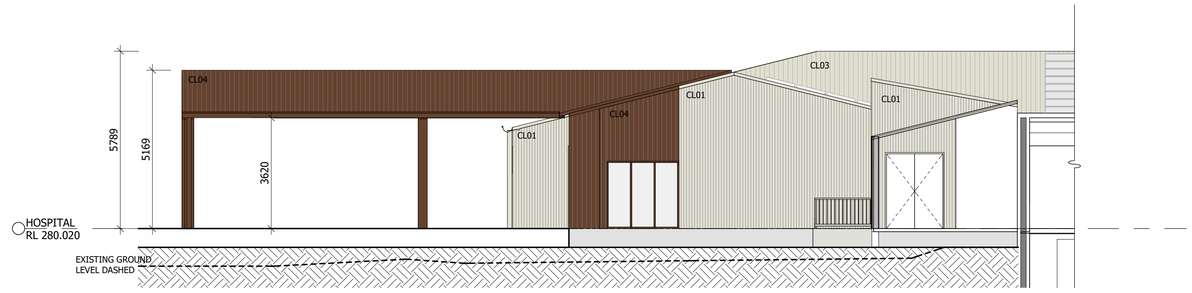

2 EMERGENCY - NORTH ELEVATION
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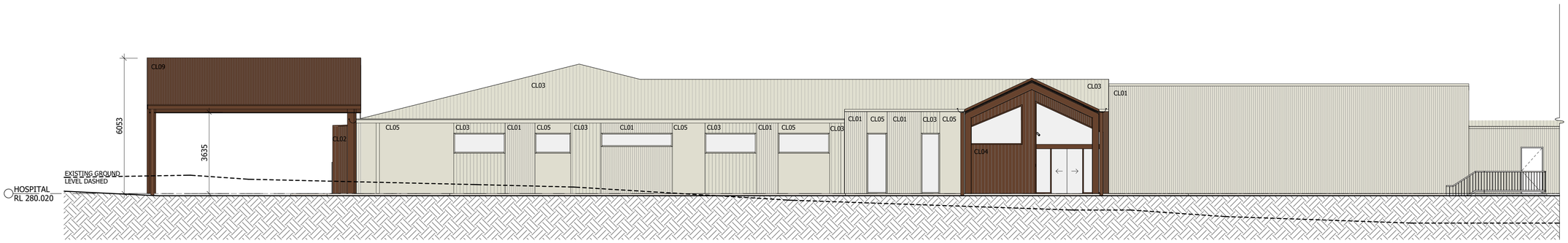
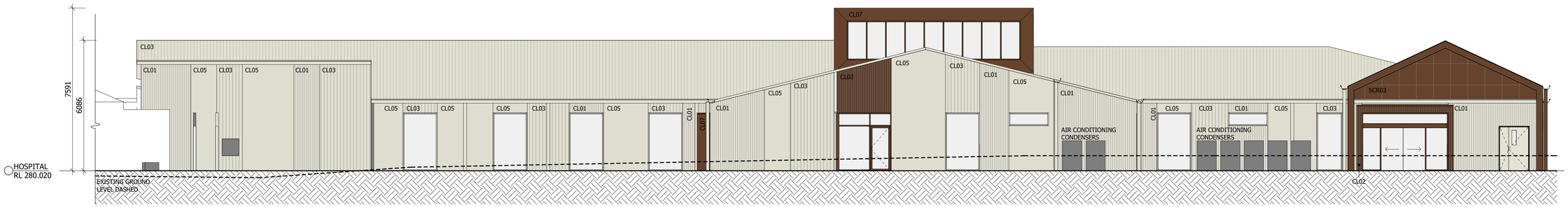
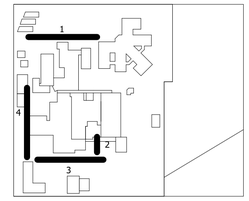


3 EMERGENCY ENTRY - EAST ELEVATION
1 : 100



4 INPATIENT UNIT & AMBULANCE ENTRY - SOUTH ELEVATION
1 : 100

Notes



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NOT TO BE USED DURING CONSTRUCTION

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E	FOR INFORMATION	17.01.2023	LS	DC
D	100% SCHEMATIC ISSUE	17.10.2022	LS	EC
C	FOR INFORMATION	29.09.2022	LS	EC
B	70% SCHEMATIC ISSUE	15.07.2022	LS	EC
A	40% SCHEMATIC ISSUE	10.06.2022	LS	EC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL
REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH,
NSW 2380

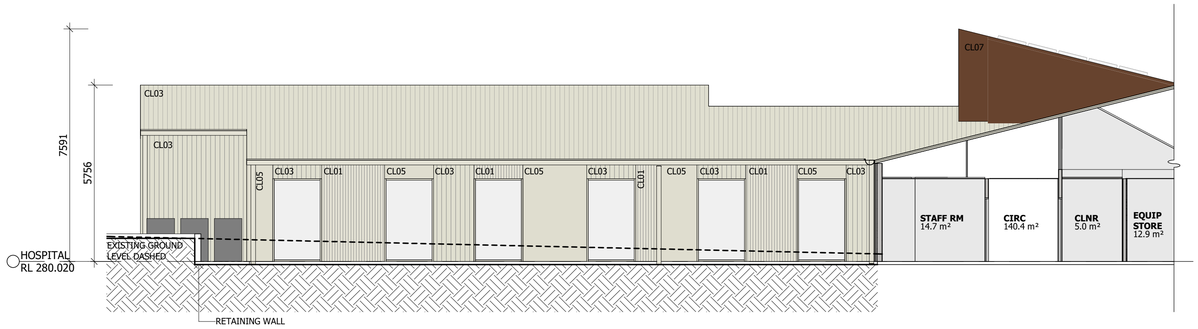
Project Number
21-0218

Drawing
BUILDING ELEVATIONS

Scale (A1) 1 : 100
Date Printed 26/04/2023 1:08:10 PM

Drawing Number AR-MW-AA2001
Issue G

File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt



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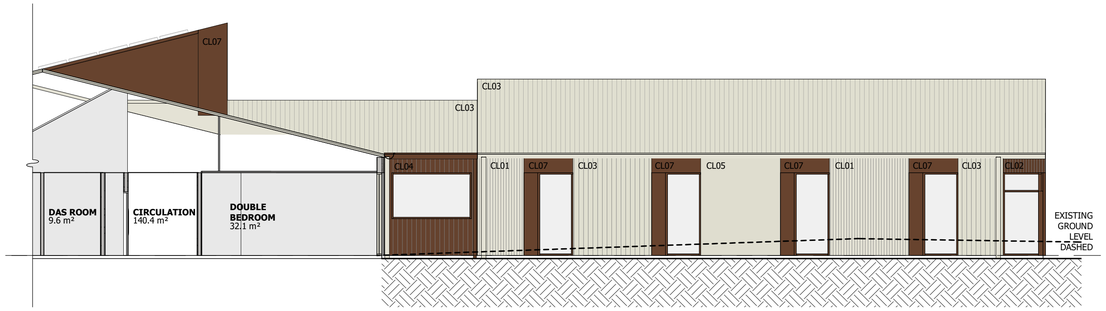
1 : 100



2 INPATIENT UNIT - WEST ELEVATION
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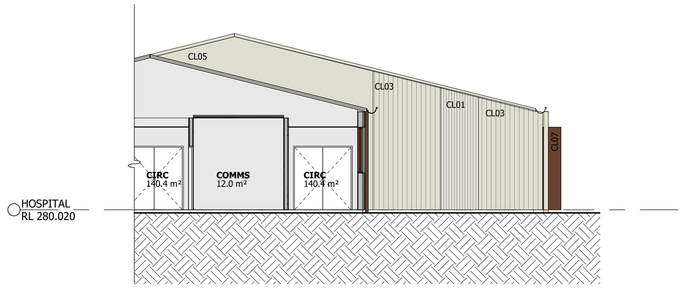
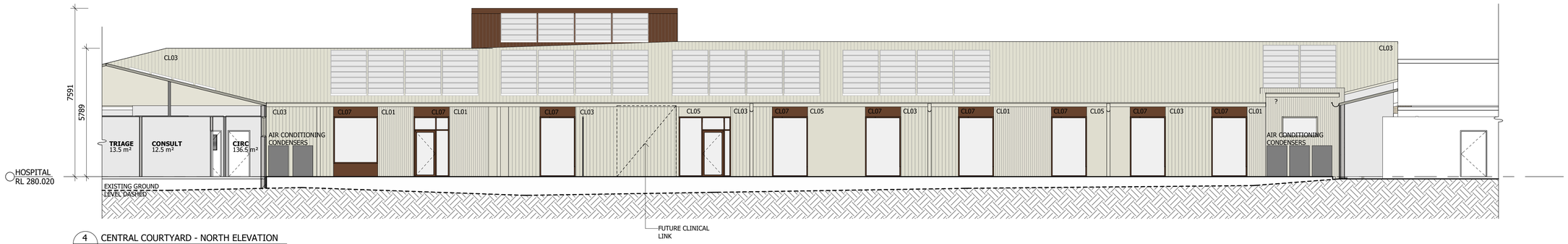
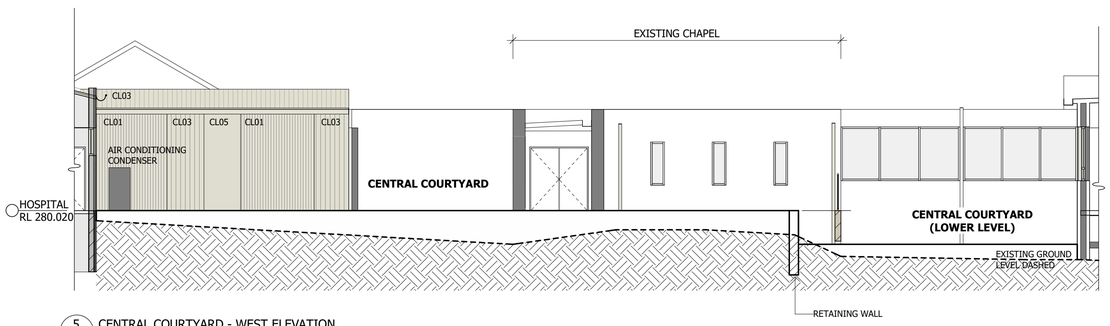


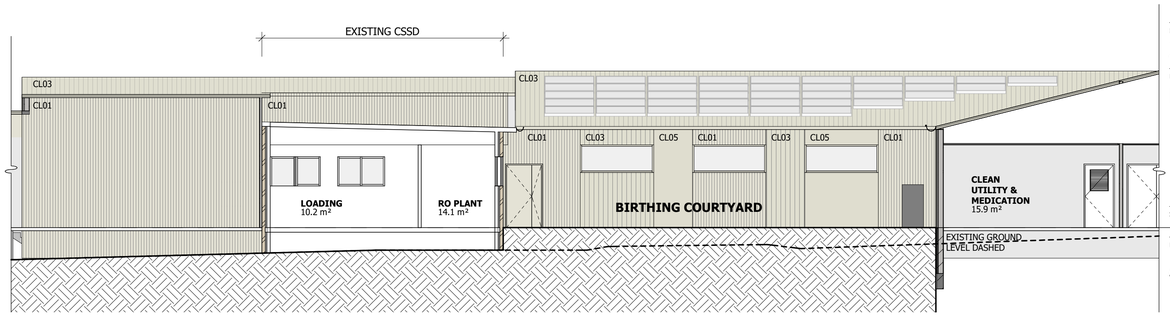
3 INPATIENT UNIT - NORTH ELEVATION
1 : 100



4 CENTRAL COURTYARD - NORTH ELEVATION
1 : 100

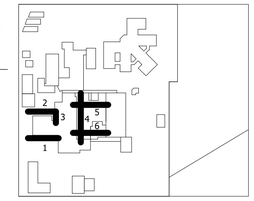


5 CENTRAL COURTYARD - WEST ELEVATION
1 : 100



6 BIRTHING COURTYARD - WEST ELEVATION
1 : 100

Notes



DESIGN DEVELOPMENT
NOT TO BE USED DURING CONSTRUCTION

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B	100% SCHEMATIC ISSUE	17.10.2022	LS	EC
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Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL
REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH,
NSW 2380

Project Number
21-0218

Drawing
BUILDING ELEVATIONS

Scale (A1)
1 : 100

Date Printed
26/04/2023 1:08:22 PM

Drawing Number
AR-MW-AA2002

Issue
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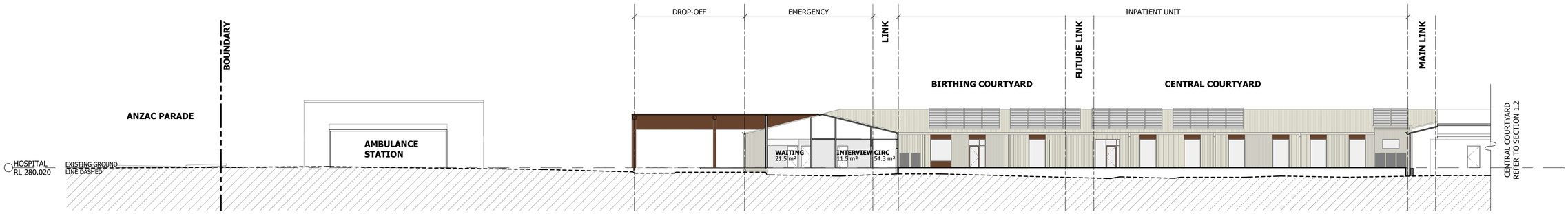
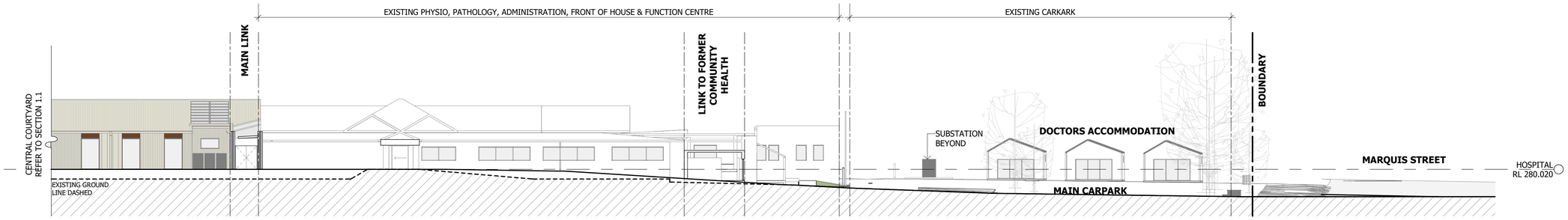
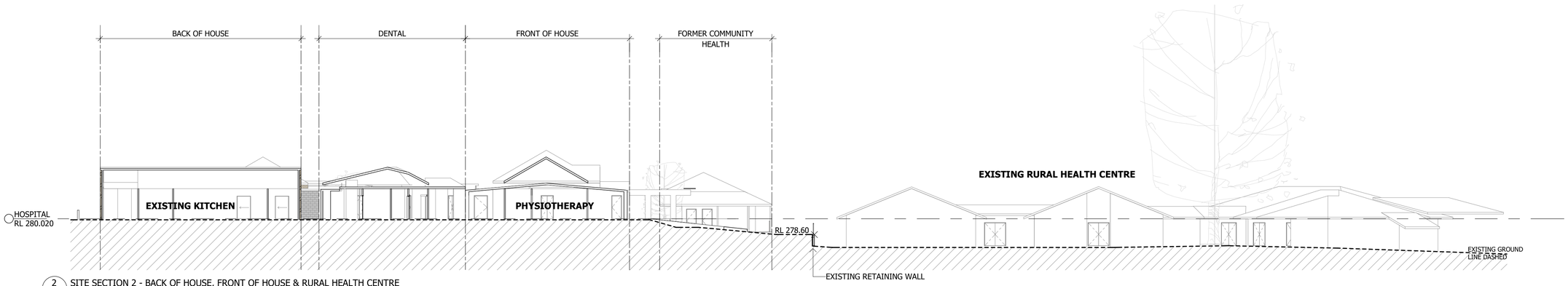
File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt



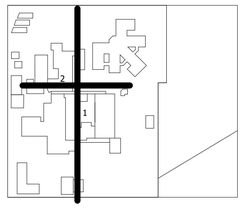
1.1 SITE SECTION 1.1 - EMERGENCY ENTRY
1 : 200



1.2 SITE SECTION 1.2 - EXISTING HOPSITAL - MAIN ENTRY
1 : 200



2 SITE SECTION 2 - BACK OF HOUSE, FRONT OF HOUSE & RURAL HEALTH CENTRE
1 : 200



DESIGN DEVELOPMENT
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
F	FOR REF SUBMISSION	26.04.2023	LS	DC
E	FOR REF SUBMISSION	13.04.2023	SA	DC
D	FOR INFORMATION	17.01.2023	LS	DC
C	100% SCHEMATIC ISSUE	17.10.2022	LS	EC
B	70% SCHEMATIC ISSUE	15.07.2022	LS	EC
A	40% SCHEMATIC ISSUE	10.06.2022	LS	EC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH, NSW 2380

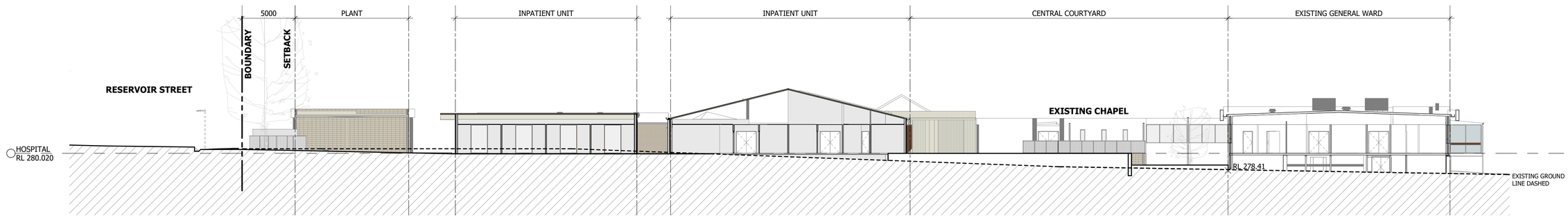
Project Number
21-0218

Drawing
SITE SECTIONS

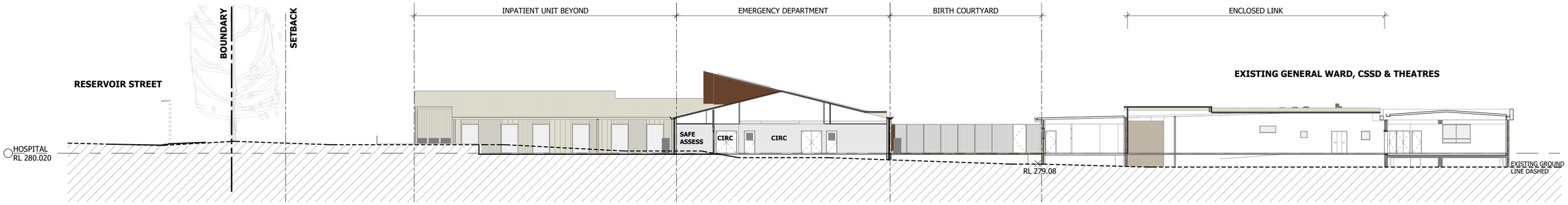
Scale (A1) 1 : 200
Date Printed 26/04/2023 1:08:33 PM

Drawing Number AR-MW-AA3001
Issue F

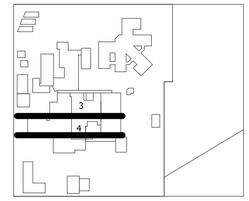
File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt



3 SITE SECTION 3 - MAIN COURTYARD
1 : 200



4 SITE SECTION 4 - BIRTHING COURTYARD
1 : 200



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NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
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E	FOR REF SUBMISSION	13.04.2023	SA	DC
D	FOR INFORMATION	17.01.2023	LS	DC
C	100% SCHEMATIC ISSUE	17.10.2022	LS	EC
B	70% SCHEMATIC ISSUE	15.07.2022	LS	EC
A	40% SCHEMATIC ISSUE	10.06.2022	LS	EC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL
REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH,
NSW 2380

Project Number
21-0218

Drawing
SITE SECTIONS

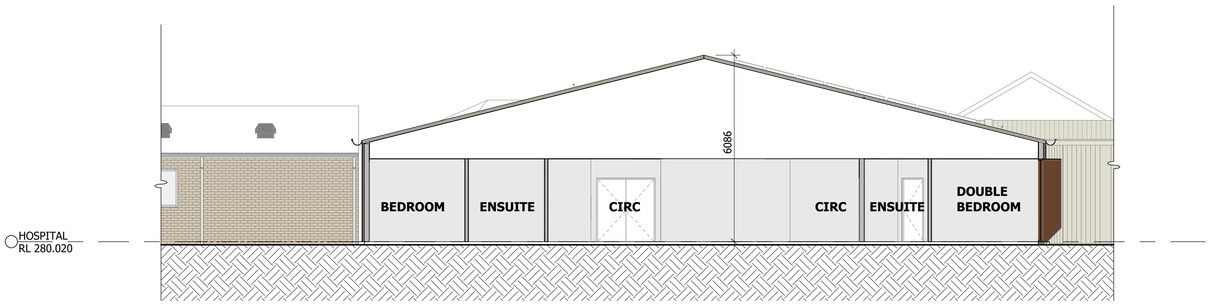
Scale (A1)
1 : 200

Date Printed
26/04/2023 1:08:43 PM

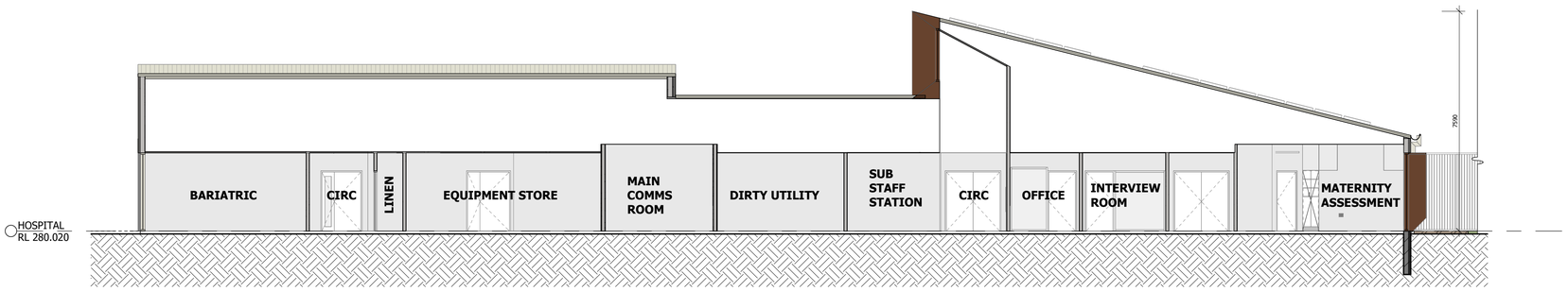
Drawing Number
AR-MW-AA3002

Issue
F

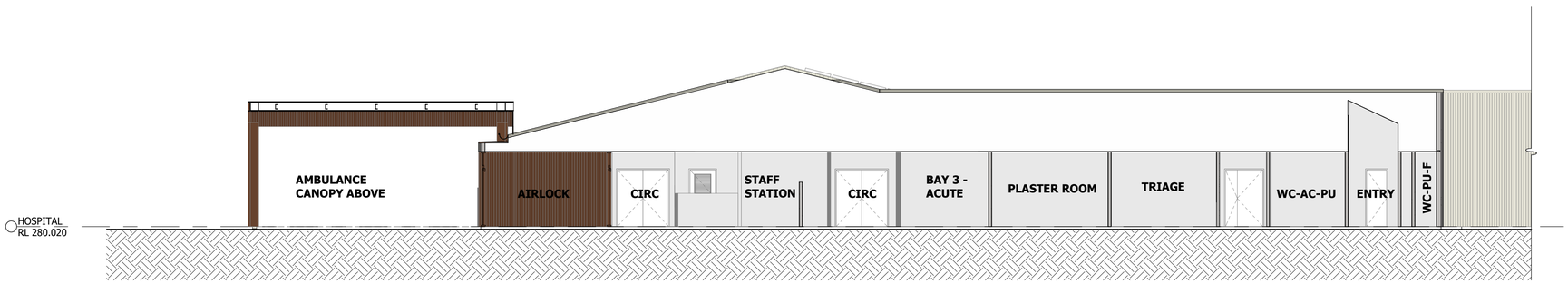
File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt



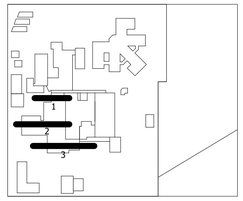
1 INPATIENT UNIT
1 : 100



2 INPATIENT UNIT - HIGHLIGHT WINDOW OVER SUB STAFF STATION
1 : 100



3 AMBULANCE ENTRY & EMERGENCY
1 : 100



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NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
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C	FOR REF SUBMISSION	13.04.2023	SA	DC
B	FOR INFORMATION	17.01.2023	LS	DC
A	100% SCHEMATIC ISSUE	17.10.2022	LS	EC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL
REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH,
NSW 2380

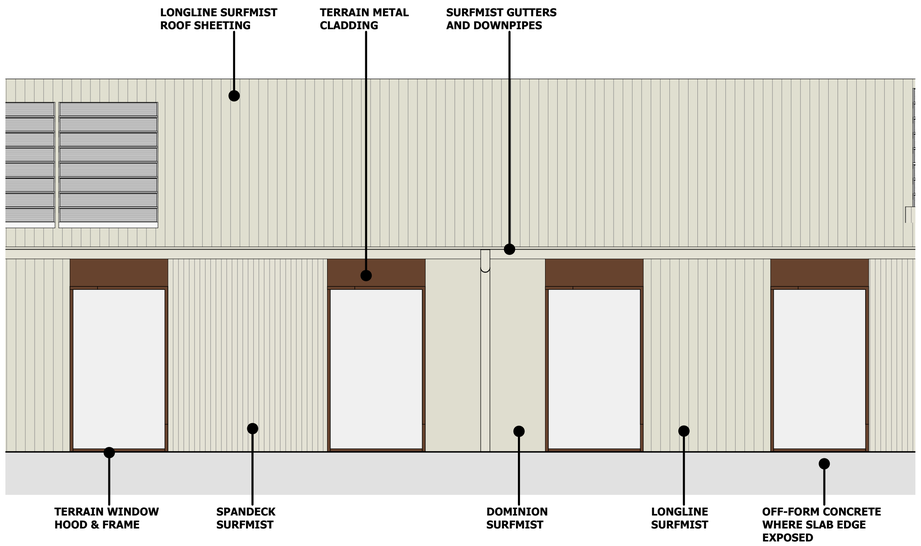
Project Number
21-0218

Drawing
BUILDING SECTIONS

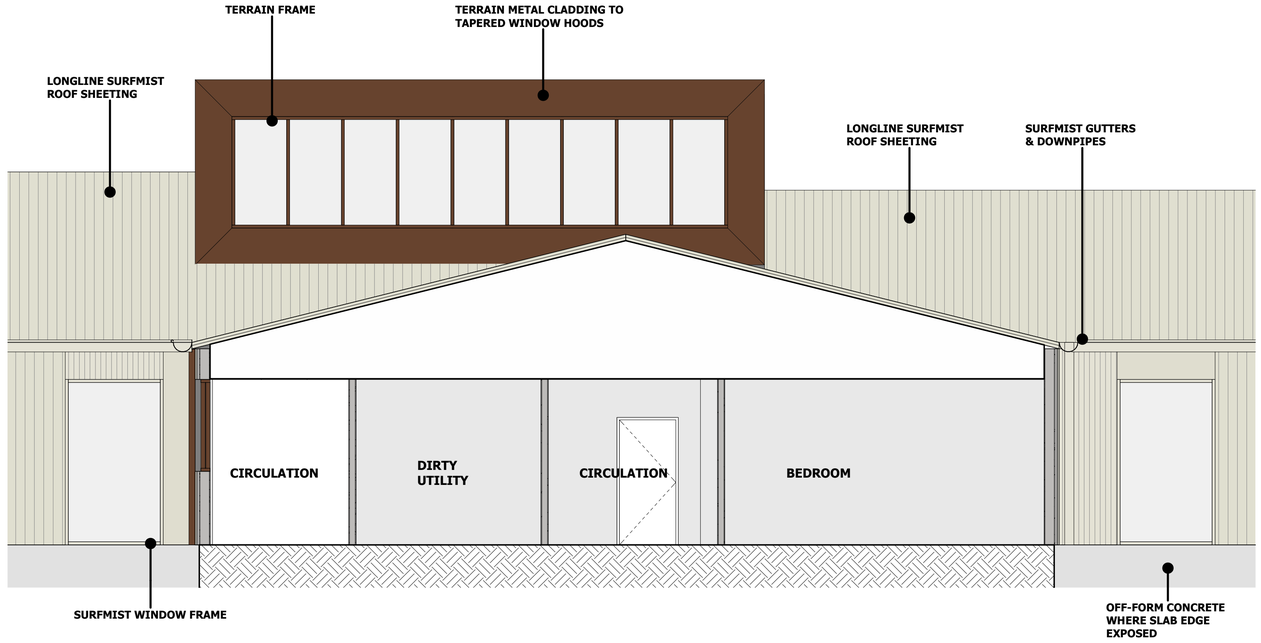
Scale (A1) 1 : 100
Date Printed 26/04/2023 1:08:53 PM

Drawing Number AR-MW-AA3010
Issue D

File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt

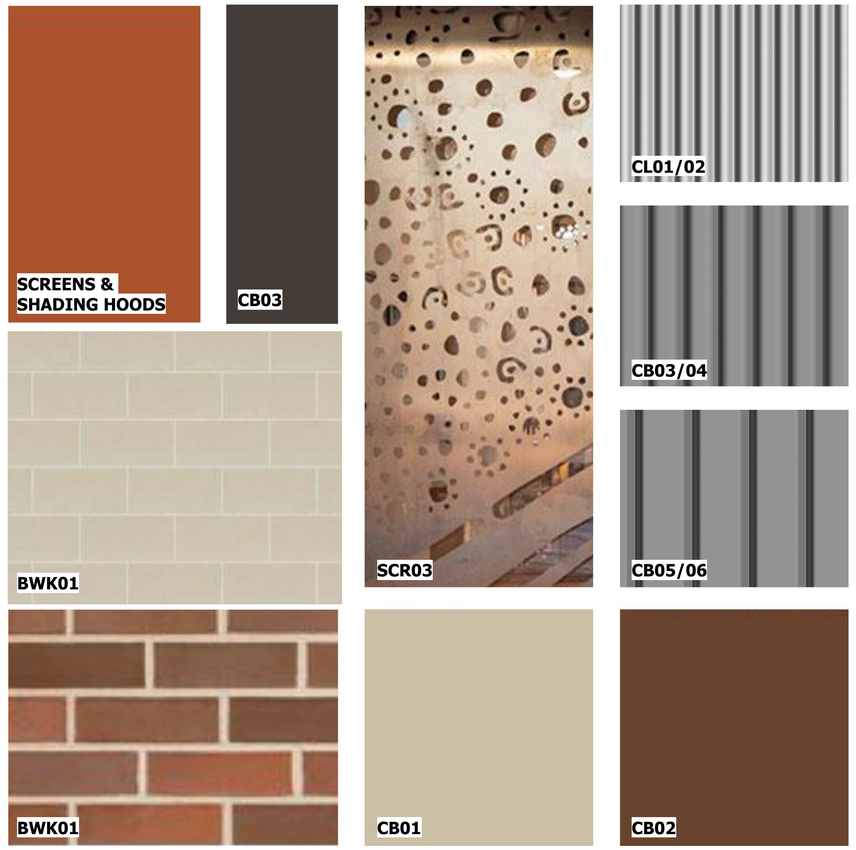


1 TYPICAL FACADE ELEVATION
1 : 50



2 TYPICAL FACADE ELEVATION
1 : 50

CONTEXT - AGRICULATURAL FARMING OF LIVERPOOL PLAINS
1 : 200



EXTERNAL FINISHES
1 : 200

DESIGN DEVELOPMENT
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
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C	FOR REF SUBMISSION	13.04.2023	SA	DC
B	FOR INFORMATION	17.01.2023	LS	DC
A	100% SCHEMATIC ISSUE	17.10.2022	LS	EC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL REDEVELOPMENT

Location
MARQUIS STREET, GUNNEDAH, NSW 2380

Project Number
21-0218

Drawing
FACADE CONCEPT

Scale (A1) 1 : 50
Date Printed 26/04/2023 1:09:02 PM
Drawing Number AR-00-AA6900
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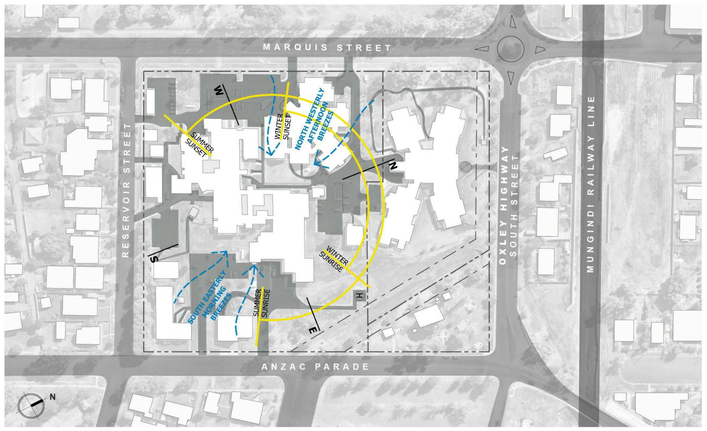
File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt



SITE ANALYSIS

Climate:
Gunnedah is located between the tropical and temperate climate zones.

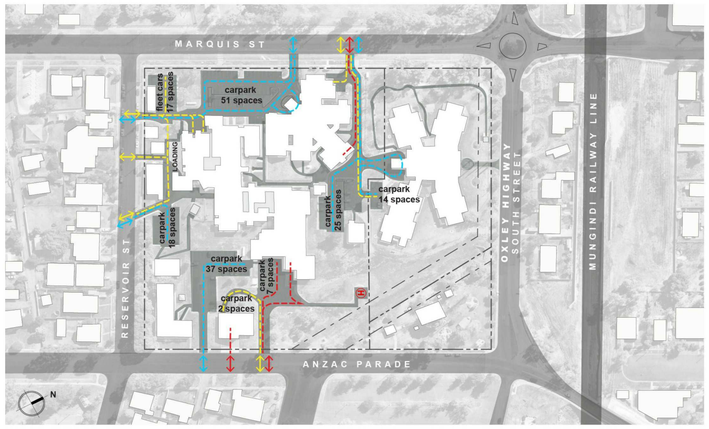
Temperature:
Very warm to hot summers averaging 18.2 to 34 degrees. Cool to mild winters averaging 2.9 to 16.8 degrees.Temperatures regularly rise above 40 degrees in summer and drop below 0 degrees in winter.

Wind:
Gunnedah experiences mild to moderate wind conditions predominantly from the north west and south east directions. Average wind speeds range from 10 to 14km/h.

Rainfall:
Average annual rainfall is between 500 and 600mm, with 43% falling in the summer months.Heavy downpours in catchment areas occasionally cause flooding of the Namoi River.

LEGEND

- Solar access and orientation
- Prevailing winds



TRAFFIC CIRCULATION

The site has a number of vehicle entry and exit locations.

Marquis Street to the west provides for:

- Public car park for the Hospital and Rural Health Centre,
- Shared public/service and emergency access to the car at the rear of the Rural Health Centre and the entrance to Alkira Nursing Home.

Reservoir Street to the south provides for:

- The service road entry/exit for engineering and support services (linen, food, and mortuary),
- Public car park shared entry exit with engineering services,
- Vehicle access past engineering has been restricted with the introduction of bollards.

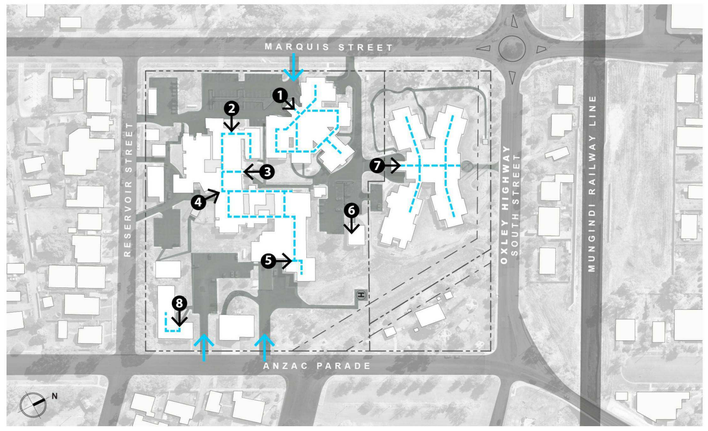
Anzac Parade to the east provides for:

- Separate entry/exits for public car parking and emergency vehicles.

Helipad located in the north east sector of the site has a path link to the emergency entrance.

LEGEND

- Emergency entry & exit
- Public entry & exit
- Support entry & exit
- Emergency access
- Public access
- Support access
- Helipad



PEDESTRIAN CIRCULATION

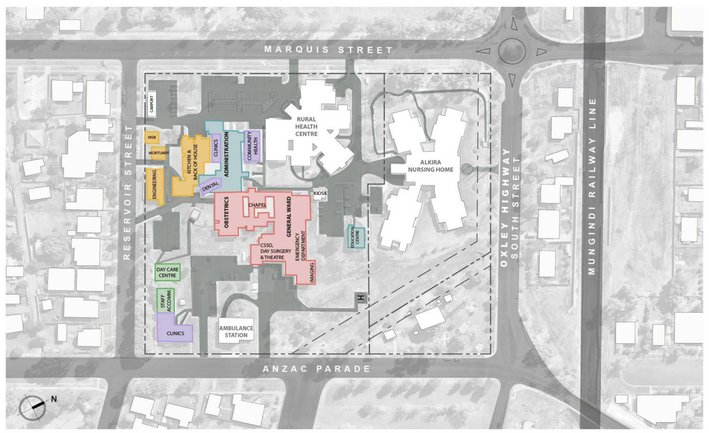
The hospital has a number of entry locations that relate to the internal functions:

- The main entrance is from the Marquis Street car park leading through the administration areas,
- A secondary entry is from the east leading into the administration area or directly into the inpatient unit,
- Maternity entry is from the Reservoir Road car park; this is the current hospital entry during the Covid 19 pandemic,
- A separate entry to emergency and imaging from the car park from Anzac Parade,
- Due to the Covid19 pandemic, the imaging waiting area is used for emergency waiting,
- Theatre access for patients is through the main hospital entries,
- Community health services currently are housed in the Rural Health Centre with entry from the Marquis Street car park.

LEGEND

- Pedestrian access to the site
- Public building access points
- Public circulation

1	Rural Health Centre entry
2	Community Health entry
3	Former Main Hospital entry
4	Current Main Hospital and Covid Screening entry
5	Emergency & Imaging entry
6	Education Centre entry
7	Alkira Nursing Home entry
8	Clinic entry



EXISTING BUILDINGS

The existing buildings on site include:

- Gunnedah Rural Health Centre,
- Gunnedah Hospital with separate associated service and support buildings,
- Alkira Nursing Home,
- Gunnedah Ambulance Station,
- Lions Park structures.

LEGEND

- Administration zone
- Allied health areas
- Clinical hospital zones
- Back of house
- Staff support areas

TOPOGRAPHY

The existing site has a cross fall in the order of 3 metres from the south-western sector to the north-eastern sector draining to the storm water easement/overland flow path.

The site levels surrounding the hospital buildings follow the site cross falls. A number of low points give rise to issues with overland flow routes draining back to the hospital, most notably at the Maternity building entrance.

Gunnedah Rural Health Centre has a floor level of RL 277.6 - the building is accessible from the entrance car park.

Gunnedah Hospital has an existing floor level of RL 279.9 as detailed on the part survey performed by Brown & Krippner in 2016 for the kitchen and cssd extensions to the hospital. The original kitchen is noted as RL 279.95, the existing CSSD is noted as RL 279.97.

LEGEND

- Contour lines
- Easement
- Drainage culvert
- Overland flow outlet
- Highest site levels
- Lowest site levels

FLORA AND FAUNA

Gunnedah Hospital is located on a large rural town site that consists of the single storey hospital buildings spread across the campus interspersed with open green spaces, numerous established trees and smaller shrubs. There is very little formal garden planting or landscaped zones on the site.

Dominant vegetation over the Gunnedah region comprises various types of eucalypt woodlands with common species including White Box, Poplar Box, Tumbledown Gum, White Cypress Pine, Ironbarks and River Red Gum.

Koalas were formally a prominent species of animal that inhabited the region with conservation efforts focused on preserving and increasing the population. The primary food tree species for the koala habitat across Gunnedah includes the River Red Gum and the Coolibah. Other native animals found throughout Gunnedah include snakes, possums, kangaroos, birds and fish.

LEGEND

- Existing Trees
- Landscaped Areas

Notes

DESIGN DEVELOPMENT
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
B	FOR REF SUBMISSION	26.04.2023	LS	DC
A	FOR REF SUBMISSION	13.04.2023	SA	DC

Architect/ Designer
dwp
www.dwp.com

Client
NSW HEALTH INFRASTRUCTURE

Project
GUNNEDAH HOSPITAL REDEVELOPMENT

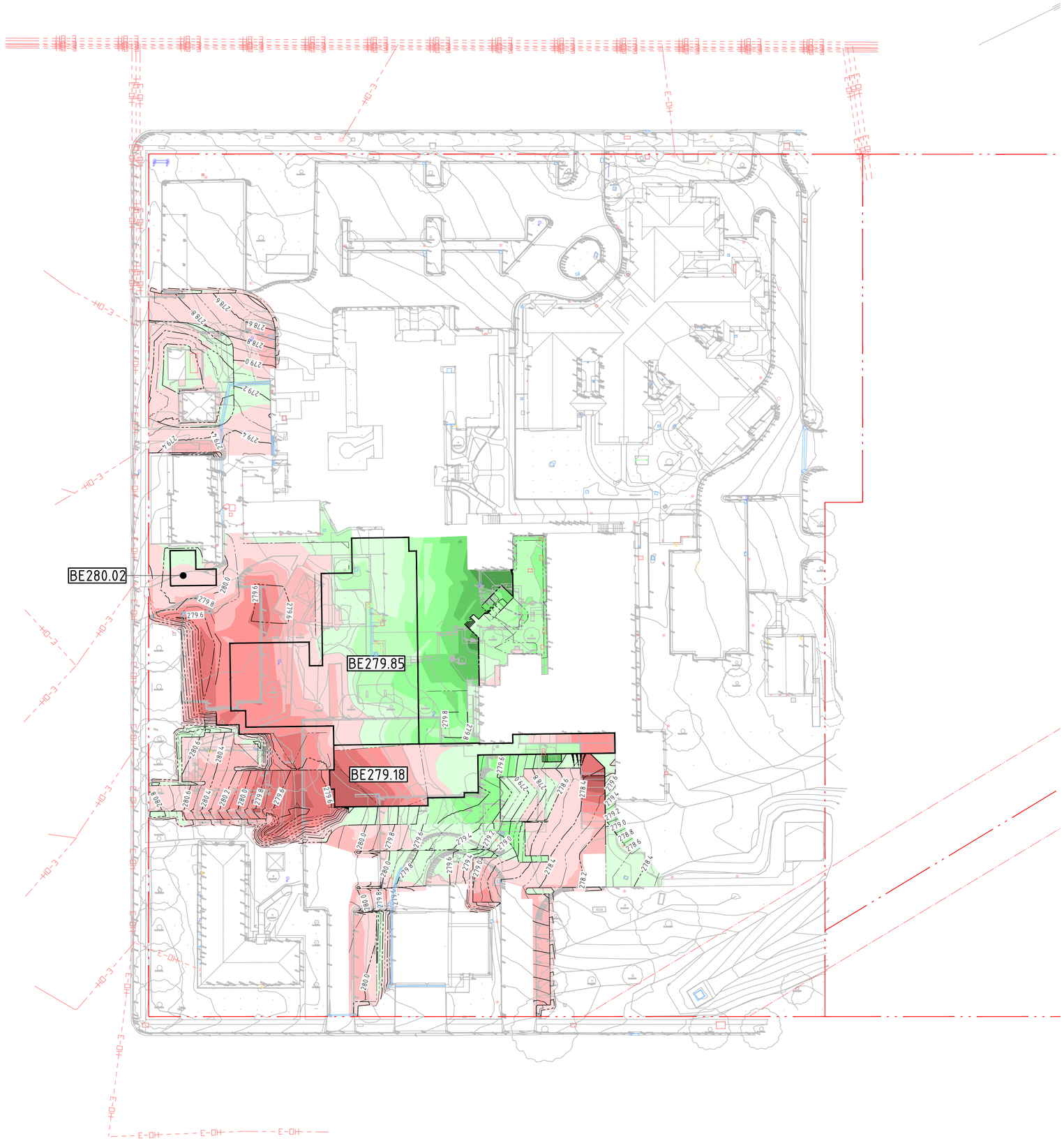
Location
MARQUIS STREET, GUNNEDAH, NSW 2380

Project Number
21-0218

Drawing
SITE ANALYSIS DIAGRAMS

Scale (A1) 1 : 200
Date Printed 26/04/2023 1:09:10 PM
Drawing Number AR-00-AA9020
Issue B

File Name: BIM 360://21-0218_Gunnedah Hospital Redevelopment/21-0218-AR-GUNNEDAH HOSPITAL REDEVELOPMENT-R21.rvt



LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- EASEMENT LINE
- BEXX.XX — BULK EARTHWORKS PAD LEVEL
- EXISTING CONTOURS
- BULK EARTHWORKS CONTOURS

DEPTH OF CUT

	- 999m	TO	- 2.0m
	- 2.0m	TO	- 1.5m
	- 1.5m	TO	- 1.25m
	- 1.25m	TO	- 1.0m
	- 1.0m	TO	- 0.75m
	- 0.75m	TO	- 0.5m
	- 0.5m	TO	- 0.25m
	- 0.25m	TO	- 0.0m

DEPTH OF FILL

	0.0m	TO	0.25m
	0.25m	TO	0.5m
	0.5m	TO	0.75m
	0.75m	TO	1.0m
	1.0m	TO	1.25m
	1.25m	TO	1.5m
	1.5m	TO	2.0m
	2.0m	TO	999m

GENERAL NOTES

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
2. CAD FILES / DTM FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).
3. NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS. NOTE ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.
4. NO ALLOWANCE HAS BEEN MADE FOR DETAILED EARTHWORKS; ie SERVICE TRENCHING, DETAILED EXCAVATION, FOOTINGS, RETAINING WALLS AND THE LIKE. CONTRACTOR IS TO ALLOW FOR REMOVAL OF ALL EXCESS MATERIAL GENERATED BY THE WORKS.
5. THE CONTRACTOR SHALL USE FINAL SURFACE LEVELS AND TYPICAL PAVEMENT DETAILS FOR ACTUAL EARTHWORKS LEVELS.
6. BULK EARTHWORKS ARE BASED ON THE FOLLOWING DEPTHS FROM FINISHED SURFACE LEVELS;
   - 6.1. ASPHALT VEHICLE PAVEMENT 410mm
   - 6.2. CONCRETE VEHICLE PAVEMENT 280mm
   - 6.3. BUILDING SUSPENDED SLAB 200mm
   - 6.4. BUILDING SLAB ON GROUND 160mm
   - 6.5. FOOTPATHS 150mm
   - 6.6. LANDSCAPE AREA 300mm
7. APPROXIMATE BULK EARTHWORK VALUES AS FOLLOWS;
   - 7.1. CUT -1,745 cu.m
   - 7.2. FILL 1,227 cu.m
   - 7.3. BALANCE 518 cu.m (EXPORT FILL)
   - 7.4. A 150mm STRIP HAS BEEN ALLOWED FOR EQUATING TO APPROX. 1303 cu.m
   - 7.5. TEMPORARY BATTERS BEYOND SITE BOUNDARY HAS BEEN EXCLUDED FROM BULK EARTHWORK VALUES.

REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
A	ISSUED FOR INFORMATION	TB		AC	04.05.23
B	ISSUED FOR INFORMATION	TB		AC	09.05.23

ARCHITECT

dwp

CLIENT

NSW GOVERNMENT Health Infrastructure

PROJECT

GUNNEDAH HOSPITAL REDEVELOPMENT

MARQUIS STREET, GUNNEDAH, NSW 2380

NORTHROP
Sydney
Level 11, 345 George Street, Sydney, N.S.W. 2000
Ph (02) 9241 4188 Email: sydney@northrop.com.au
ABN 81 094 433 100

SCALE 1:500@ A1 (0 5 10 15 20 25m)

DRAWING TITLE

CUT AND FILL PLAN - OPTION 02

NOT FOR CONSTRUCTION

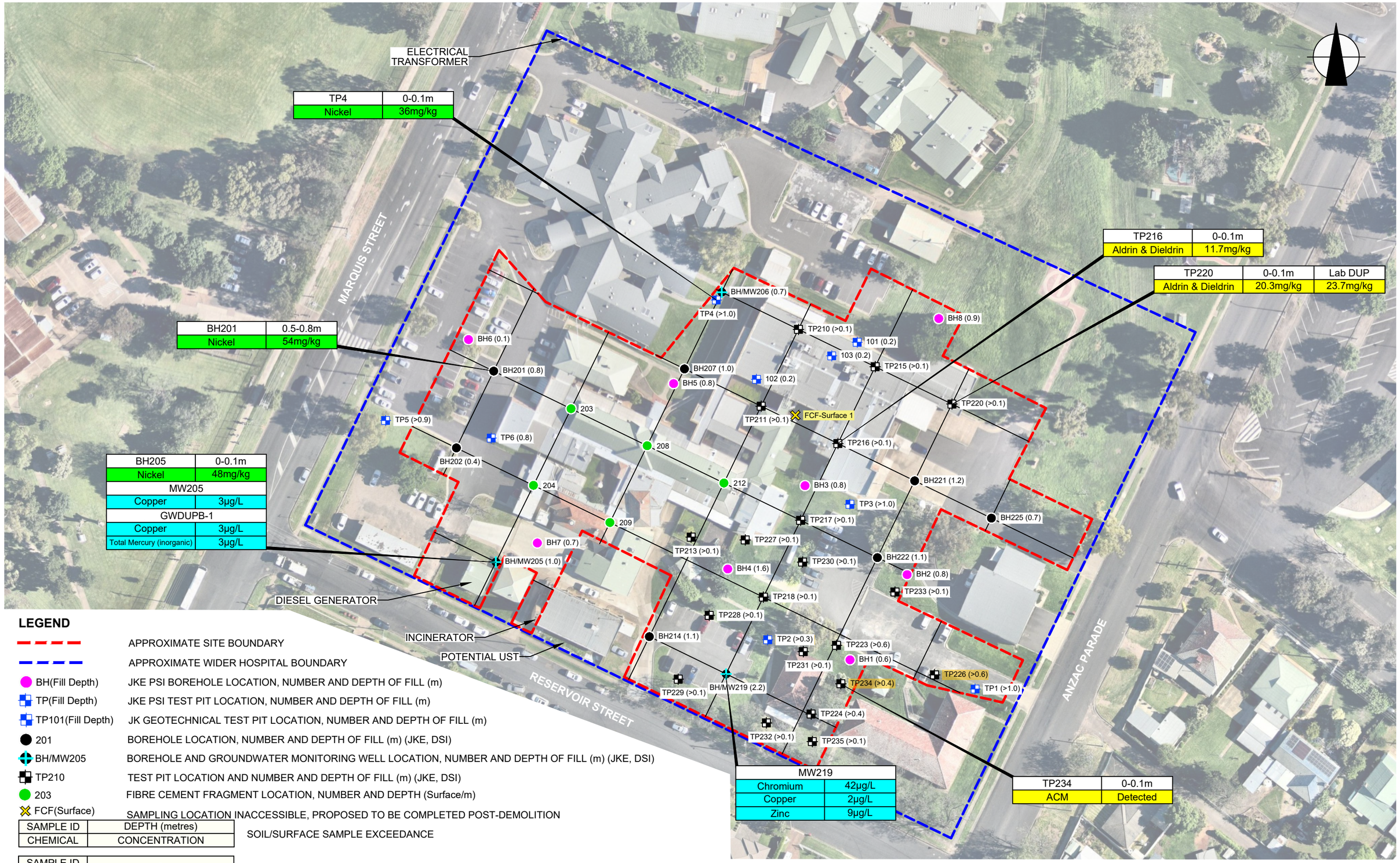
JOB NUMBER	DRAWING NUMBER	REVISION
220254	GHR-CI-MW-30301	B

DRAWING SHEET SIZE = A1

DESIGNED: A. CARVALHAES DRAWN: M. MAI JOB MANAGER: A. CARVALHAES VERIFIER: -

Appendix C: JKE PSI and DSI Figures and Summary Data Tables

DSI Figures



LEGEND

	APPROXIMATE SITE BOUNDARY
	APPROXIMATE WIDER HOSPITAL BOUNDARY
BH(Fill Depth)	JKE PSI BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
TP(Fill Depth)	JKE PSI TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)
TP101(Fill Depth)	JK GEOTECHNICAL TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)
201	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, DSI)
BH/MW205	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, DSI)
TP210	TEST PIT LOCATION AND NUMBER AND DEPTH OF FILL (m) (JKE, DSI)
203	FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)
FCF(Surface)	SAMPLING LOCATION INACCESSIBLE, PROPOSED TO BE COMPLETED POST-DEMOLITION

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION

SOIL/SURFACE SAMPLE EXCEEDANCE

SAMPLE ID	-
CHEMICAL	CONCENTRATION (µg/L)

GROUNDWATER SAMPLE EXCEEDANCE

- SOIL/SURFACE CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK
- SOIL/SURFACE CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK
- GROUNDWATER CONTAMINATION ABOVE SAC
- ASBESTOS DETECTED IN FILL

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 10 20 30 40 50
SCALE 1:1000 @A3 METRES

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

Title: **SAC EXCEEDANCE PLAN**

Location: GUNNEDAH HOSPITAL, MARQUIS STREET, GUNNEDAH, NSW

Project No: E35091UPD

Figure No: 3

JKEnvironments

PLOT DATE: 21/02/2023 9:16:25 AM DWG FILE: K:\5C EIS JOBS\35000\S\E35091UPD GUNNEDAH\CAD\E35091UPD.DWG

ELECTRICAL TRANSFORMER

MARQUIS STREET

BH/MW206 (0.7)
TP4 (>1.0)
BH6 (0.1)
BH201 (0.8)
BH207 (1.0)
BH5 (0.8)
TP5 (>0.9)
203
TP6 (0.8)
BH202 (0.4)
208
204
212
209
BH7 (0.7)
BH/MW205 (1.0)
TP213 (>0.1)
BH4 (1.6)
BH214 (1.1)
TP229 (>0.1)
BH/MW219 (2.2)
TP232 (>0.1)
277.0
276.5
276.0
275.5
275.0
274.5
TP210 (>0.1)
101 (0.2)
103 (0.2)
TP215 (>0.1)
102 (0.2)
TP211 (>0.1)
FCF-Surface 1
TP216 (>0.1)
BH3 (0.8)
TP3 (>1.0)
TP217 (>0.1)
TP227 (>0.1)
TP230 (>0.1)
TP218 (>0.1)
TP228 (>0.1)
TP2 (>0.3)
TP231 (>0.1)
TP224 (>0.4)
TP235 (>0.1)
BH8 (0.9)
TP220 (>0.1)
BH221 (1.2)
BH225 (0.7)
BH222 (1.1)
BH2 (0.8)
TP233 (>0.1)
TP223 (>0.6)
BH1 (0.6)
TP234 (>0.4)
TP226 (>0.6)
TP1 (>1.0)
DIESEL GENERATOR
INCINERATOR
POTENTIAL UST
RESERVOIR STREET
ANZAC PARADE

LEGEND

APPROXIMATE SITE BOUNDARY	
APPROXIMATE WIDER HOSPITAL BOUNDARY	
BH(Fill Depth)	JKE PSI BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
TP(Fill Depth)	JKE PSI TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)
TP101(Fill Depth)	JK GEOTECHNICAL TEST PIT LOCATION, NUMBER AND DEPTH OF FILL (m)
201	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, DSI)
BH/MW205	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, DSI)
TP210	TEST PIT LOCATION AND NUMBER AND DEPTH OF FILL (m) (JKE, DSI)
203	SAMPLING LOCATION INACCESSIBLE, PROPOSED TO BE COMPLETED POST-DEMOLITION
FCF(Surface)	FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)
276.5	GROUNDWATER CONTOUR INTERVALS (m)
	INFERRED GROUNDWATER FLOW DIRECTION

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 10 20 30 40 50
SCALE 1:1000 @A3 METRES

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

Title: **GROUNDWATER CONTOUR PLOT**

Location: GUNNEDAH HOSPITAL, MARQUIS STREET, GUNNEDAH, NSW

Project No: E35091UPD

Figure No: 4

JKEnvironments

PLOT DATE: 21/02/2023 9:15:06 AM DWG FILE: K:\5C EIS JOBS\35000\SIE35091\UPD GUNNEDAH\CAD\E35091UPD.DWG

DSI Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC:	Ambient Background Concentration
ACM:	Asbestos Containing Material
ADWG:	AustralianDrinking Water Guidelines
AF:	Asbestos Fines
ANZG	Australian and New Zealand Guidelines
B(a)P:	Benzo(a)pyrene
CEC:	Cation Exchange Capacity
CRC:	Cooperative Research Centre
CT:	Contaminant Threshold
EILs:	Ecological Investigation Levels
ESLs:	Ecological Screening Levels
FA:	Fibrous Asbestos
GIL:	Groundwater Investigation Levels
GSW:	General Solid Waste
HILs:	Health Investigation Levels
HSLs:	Health Screening Levels
HSL-SSA:	Health Screening Level-SiteSpecific Assessment
kg/L	kilograms per litre
NA:	Not Analysed
NC:	Not Calculated
NEPM:	National Environmental Protection Measure
NHMRC:	National Health and Medical Research Council
NL:	Not Limiting
NSL:	No Set Limit
OCP:	Organochlorine Pesticides
OPP:	Organophosphorus Pesticides
PAHs:	Polycyclic Aromatic Hydrocarbons
%w/w:	weight per weight
ppm:	Parts per million
PCBs:	Polychlorinated Biphenyls
PCE:	Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
pH_{KCL} :	pH of filtered 1:20, 1M KCL extract, shaken overnight
pH_{ox} :	pH of filtered 1:20 1M KCl after peroxide digestion
PQL:	Practical Quantitation Limit
RS:	Rinsate Sample
RSL:	Regional Screening Levels
RSW:	Restricted Solid Waste
SAC:	Site Assessment Criteria
SCC:	Specific Contaminant Concentration
S_{Cr}:	Chromium reducible sulfur
S_{POS}:	Peroxide oxidisable Sulfur
SSA:	Site Specific Assessment
SSHSLs:	Site Specific Health Screening Levels
TAA:	Total Actual Acidity in 1M KCL extract titrated to pH6.5
TB:	Trip Blank
TCA:	1,1,1 Trichloroethane (methyl chloroform)
TCE:	Trichloroethylene (Trichloroethene)
TCLP:	Toxicity Characteristics Leaching Procedure
TPA:	Total Potential Acidity, 1M KCL peroxide digest
TS:	Trip Spike
TRH:	Total Recoverable Hydrocarbons
TSA:	Total Sulfide Acidity (TPA-TAA)
UCL:	Upper Level Confidence Limit on Mean Value
USEPA	United States Environmental Protection Agency
VOCC:	Volatile Organic Chlorinated Compounds
WHO:	World Health Organisation

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also refered to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using Open UCL (Bet Ver 3.02). Statistical calculation is usually undertaken using data fr fill samples.

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with low traffic have been quoted).

Waste Classification and TCLP Table:

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

QA/QC Table:

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

JKEnvironments

TABLE S1
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-C: 'Public open space; secondary schools; and footpaths'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			300	90	300	17000	600	80	1200	30000	300	3	10	340	400	10	70	400	10	250	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH201	0.05-0.3	Fill: silty sandy gravel	<4	<0.4	**25**	**21**	**48**	**0.6**	**27**	**56**	**0.09**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH201 (lab duplicate)	0.05-0.3	Fill: silty sandy gravel	<4	<0.4	**25**	**21**	**54**	**0.6**	**28**	**63**	**0.07**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH201	0.5-0.8	Fill: silty sandy clay	<4	<0.4	**46**	**34**	**13**	<0.1	**54**	**47**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH201	0.8-0.95	Silty clay	<4	<0.4	**25**	**18**	**6**	<0.1	**25**	**19**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH202	0.05-0.3	Fill: silty sandy gravel	<4	<0.4	**21**	**18**	**10**	<0.1	**15**	**31**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH205	0-0.1	Fill: silty sand	<4	<0.4	**29**	**25**	**18**	<0.1	**48**	**41**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH205	0.5-0.8	Silty clay	<4	<0.4	**24**	**14**	**8**	<0.1	**21**	**60**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH205	1.5-1.8	Silty clay	<4	<0.4	**18**	**14**	**5**	<0.1	**21**	**17**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH206	0-0.1	Fill: silty sand	<4	<0.4	**21**	**17**	**17**	**0.3**	**19**	**34**	**0.2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH207	0-0.1	Fill: silty sand	<4	<0.4	**22**	**17**	**30**	**0.5**	**25**	**35**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH207	0.5-0.8	Fill: silty sand	<4	<0.4	**17**	**12**	**7**	**0.1**	**19**	**20**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH207	1.0-1.2	Silty clay	<4	<0.4	**23**	**17**	**6**	<0.1	**25**	**16**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP210	0-0.1	Fill: silty sandy gravel	<4	<0.4	**20**	**65**	**19**	**0.3**	**24**	**64**	**0.4**	<0.5	<0.1	<0.1	<0.1	**0.4**	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP210 (lab duplicate)	0-0.1	Fill: silty sandy gravel	<4	<0.4	**20**	**68**	**18**	**0.3**	**21**	**57**	**0.3**	<0.5	<0.1	<0.1	<0.1	**0.4**	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP211	0.05-1.5	Fill: silty clayey sand	<4	<0.4	**17**	**14**	**20**	<0.1	**17**	**58**	**0.85**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP213	0-0.1	Fill: silty sand	<4	<0.4	**15**	**22**	**28**	**0.2**	**14**	**51**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH214	0.05-0.25	Fill: silty sand	<4	<0.4	**20**	**17**	**5**	<0.1	**17**	**24**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH214	0.8-0.95	Fill: silty clay	<4	<0.4	**14**	**11**	**4**	<0.1	**17**	**11**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP215	0-0.1	Fill: gravelly silt	<4	<0.4	**22**	**22**	**27**	<0.1	**26**	**42**	**0.52**	<0.5	<0.1	<0.1	<0.1	**8.7**	**0.8**	<0.1	<0.1	<0.1	<0.1	NA
TP216	0-0.1	Fill: gravelly silt	<4	<0.4	**29**	**21**	**9**	<0.1	**24**	**27**	<0.05	<0.5	<0.1	<0.1	<0.1	**11.7**	**0.3**	<0.1	<0.1	<0.1	<0.1	NA
TP217	0-0.1	Fill: silty sandy gravel	<4	<0.4	**20**	**19**	**30**	<0.1	**20**	**69**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP218	0-0.1	Fill: silty clayey sand	<4	<0.4	**20**	**16**	**18**	**0.1**	**21**	**38**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH219	0.05-0.4	Fill: silty sand	<4	<0.4	**13**	**43**	**17**	**0.3**	**9**	**49**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH219	1.5-1.8	Fill: silty clay	<4	<0.4	**23**	**17**	**8**	<0.1	**28**	**23**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH219	2.2-2.5	Silty clay	<4	<0.4	**25**	**12**	**7**	<0.1	**16**	**14**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP220	0-0.1	Fill: gravelly silt	<4	<0.4	**20**	**18**	**10**	<0.1	**24**	**34**	<0.05	<0.5	<0.1	<0.1	<0.1	**20.3**	**0.5**	<0.1	<0.1	<0.1	<0.1	Not Detected
TP220 (lab duplicate)	0-0.1	Fill: gravelly silt	<4	<0.4	**20**	**17**	**10**	<0.1	**25**	**36**	<0.05	<0.5	<0.1	<0.1	<0.1	**23.7**	**0.6**	<0.1	<0.1	<0.1	<0.1	NA
BH221	0-.15-0.35	Fill: silty sand	<4	<0.4	**18**	**15**	**12**	<0.1	**21**	**40**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH221	1.5-1.8	Silty clay	<4	<0.4	**27**	**17**	**6**	<0.1	**29**	**17**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH222	0.0.5-0.25	Fill: silty sand	<4	<0.4	**10**	**12**	**9**	<0.1	**11**	**26**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH222	1.1-1.3	Silty clay	<4	<0.4	**18**	**14**	**5**	<0.1	**23**	**16**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP223	0-0.1	Fill: silty clayey sand	<4	<0.4	**18**	**6**	**6**	<0.1	**12**	**9**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP224	0.15-0.4	Fill: silty sandy gravel	<4	<0.4	**13**	**15**	**8**	<0.1	**16**	**29**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP224 (lab duplicate)	0.15-0.4	Fill: silty sandy gravel	<4	<0.4	**14**	**14**	**9**	<0.1	**18**	**28**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH225	0.05-0.3	Fill: silty sand clay	<4	<0.4	**20**	**16**	**6**	<0.1	**25**	**22**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP226	0-0.1	Fill: silty clayey sand	<4	<0.4	**25**	**17**	**9**	<0.1	**32**	**37**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP226	0.4-0.6	Fill: silty clayey sand	<4	<0.4	**21**	**16**	**9**	<0.1	**23**	**39**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP227	0-0.1	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
TP228	0-0.1	Fill: silty clayey sand	<4	<0.4	**21**	**15**	**17**	**0.2**	**20**	**31**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP234	0-0.1	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
SDUPB-1	NA	Fill soil	<4	<0.4	**18**	**15**	**11**	**0.3**	**19**	**34**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUPD-1	NA	Fill soil	<4	<0.4	**18**	**14**	**21**	**0.1**	**17**	**42**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUPC-1	NA	Fill soil	<4	<0.4	**27**	**19**	**17**	**0.6**	**27**	**39**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUPC-1 (lab duplicate)	NA	Fill soil	<4	<0.4	**23**	**17**	**14**	**0.5**	**24**	**36**	NA	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA
SDUPF-1	NA	Fill soil	<4	<0.4	**15**	**22**	**31**	**0.1**	**14**	**54**	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
FCF-Surface1	NA	Fibre cement fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Detected**
TP226-spoil	NA	Fibre cement fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Detected**
Total Number of Samples			43	43	43	43	43	43	43	43	42	42	33	33	33	33	33	33	33	32	32	7
Maximum Value			<PQL	<PQL	46	68	54	0.6	54	69	0.85	<PQL	<PQL	<PQL	<PQL	23.7	0.8	<PQL	<PQL	<PQL	<PQL	Detected
Statistical Analysis on Fill Samples																						
Number of Fill Samples			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	38	NC	NC	NC	NC	NC	NC
Mean Value			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1.197	NC	NC	NC	NC	NC	NC
Standard Deviation			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3.931	NC	NC	NC	NC	NC	NC
% UCL			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	95 (Chebyshev UCL)	NC	NC	NC	NC	NC	NC
UCL Value			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3.997	NC	NC	NC	NC	NC	NC

Concentration above the SAC — **VALUE**
Asbestos Detected — **Detected**
Concentration above the PQL — **Bold**
Standard deviation exceeds data assessment criteria — **VALUE**

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

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH201	0.05-0.3	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH201 (lab duplicate)	0.05-0.3	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH201	0.5-0.8	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH201	0.8-0.95	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH202	0.05-0.3	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH205	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH205	0.5-0.8	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH205	1.5-1.8	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH206	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH207	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH207	0.5-0.8	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1.3
BH207	1.0-1.2	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP210	0-0.1	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP210 (lab duplicate)	0-0.1	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP211	0.05-1.5	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP213	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH214	0.05-0.25	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH214	0.8-0.95	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP215	0-0.1	Fill: gravelly silt	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP216	0-0.1	Fill: gravelly silt	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP217	0-0.1	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP218	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH219	0.05-0.4	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH219	1.5-1.8	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH219	2.2-2.5	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP220	0-0.1	Fill: gravelly silt	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP220 (lab duplicate)	0-0.1	Fill: gravelly silt	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH221	0-.15-0.35	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH221	1.5-1.8	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH222	0.0.5-0.25	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH222	1.1-1.3	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP223	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP224	0.15-0.4	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP224 (lab duplicate)	0.15-0.4	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH225	0.05-0.3	Fill: silty sand clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP226	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP226	0.4-0.6	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP228	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUPB-1	NA	Fill soil	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUPD-1	NA	Fill soil	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUPC-1	NA	Fill soil	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUPF-1	NA	Fill soil	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples					42	42	42	42	42	42	42	42
Maximum Value					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	1.3

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

HSL SOIL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
BH201	0.05-0.3	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH201 (lab duplicate)	0.05-0.3	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH201	0.5-0.8	Fill: silty sandy clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH201	0.8-0.95	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH202	0.05-0.3	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH205	0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH205	0.5-0.8	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH205	1.5-1.8	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH206	0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH207	0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH207	0.5-0.8	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH207	1.0-1.2	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP210	0-0.1	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP210 (lab duplicate)	0-0.1	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP211	0.05-1.5	Fill: silty clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP213	0-0.1	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH214	0.05-0.25	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH214	0.8-0.95	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP215	0-0.1	Fill: gravelly silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP216	0-0.1	Fill: gravelly silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP217	0-0.1	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP218	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH219	0.05-0.4	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH219	1.5-1.8	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH219	2.2-2.5	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP220	0-0.1	Fill: gravelly silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP220 (lab duplicate)	0-0.1	Fill: gravelly silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH221	0-.15-0.35	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH221	1.5-1.8	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH222	0.0.5-0.25	Fill: silty sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH222	1.1-1.3	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP223	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP224	0.15-0.4	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP224 (lab duplicate)	0.15-0.4	Fill: silty sandy gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH225	0.05-0.3	Fill: silty sand clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP226	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP226	0.4-0.6	Fill: silty clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP228	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUPB-1	NA	Fill soil	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUPD-1	NA	Fill soil	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUPC-1	NA	Fill soil	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUPF-1	NA	Fill soil	0m to <1m	Sand	45	110	0.5	160	55	40	3

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

			C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH201	0.05-0.3	Coarse	<25	<50	<100	<100
BH201 (lab duplicate)	0.05-0.3	Coarse	<25	<50	<100	<100
BH201	0.5-0.8	Fine	<25	<50	<100	<100
BH201	0.8-0.95	Fine	<25	<50	<100	<100
BH202	0.05-0.3	Coarse	<25	<50	<100	<100
BH205	0-0.1	Coarse	<25	<50	<100	<100
BH205	0.5-0.8	Fine	<25	<50	<100	<100
BH205	1.5-1.8	Fine	<25	<50	<100	<100
BH206	0-0.1	Coarse	<25	<50	<100	<100
BH207	0-0.1	Coarse	<25	<50	<100	<100
BH207	0.5-0.8	Coarse	<25	<50	<100	<100
BH207	1.0-1.2	Fine	<25	<50	<100	<100
TP210	0-0.1	Coarse	<25	<50	<100	<100
TP210 (lab duplicate)	0-0.1	Coarse	<25	<50	<100	<100
TP211	0.05-1.5	Coarse	<25	<50	<100	<100
TP213	0-0.1	Coarse	<25	<50	<100	<100
BH214	0.05-0.25	Coarse	<25	<50	<100	<100
BH214	0.8-0.95	Fine	<25	<50	<100	<100
TP215	0-0.1	Fine	<25	<50	<100	<100
TP216	0-0.1	Fine	<25	<50	<100	<100
TP217	0-0.1	Coarse	<25	<50	<100	<100
TP218	0-0.1	Coarse	<25	<50	<100	<100
BH219	0.05-0.4	Coarse	<25	<50	<100	<100
BH219	1.5-1.8	Fine	<25	<50	<100	<100
BH219	2.2-2.5	Fine	<25	<50	<100	<100
TP220	0-0.1	Fine	<25	<50	<100	<100
TP220 (lab duplicate)	0-0.1	Fine	<25	<50	<100	<100
BH221	0-.15-0.35	Coarse	<25	<50	<100	<100
BH221	1.5-1.8	Fine	<25	<50	<100	<100
BH222	0.0.5-0.25	Coarse	<25	<50	<100	<100
BH222	1.1-1.3	Fine	<25	<50	<100	<100
TP223	0-0.1	Coarse	<25	<50	<100	<100
TP224	0.15-0.4	Coarse	<25	<50	<100	<100
TP224 (lab duplicate)	0.15-0.4	Coarse	<25	<50	<100	<100
BH225	0.05-0.3	Fine	<25	<50	<100	<100
TP226	0-0.1	Coarse	<25	<50	<100	<100
TP226	0.4-0.6	Coarse	<25	<50	<100	<100
TP228	0-0.1	Coarse	<25	<50	<100	<100
SDUPB-1	NA	Coarse	<25	<50	<100	<100
SDUPD-1	NA	Coarse	<25	<50	<100	<100
SDUPC-1	NA	Coarse	<25	<50	<100	<100
SDUPF-1	NA	Coarse	<25	<50	<100	<100
Total Number of Samples			43	43	43	43
Maximum Value			<PQL	<PQL	<PQL	<PQL

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

MANAGEMENT LIMIT ASSESSMENT CRITERIA						
Sample Reference	**Sample Depth**	**Soil Texture**	C_6-C_{10} (F1) plus BTEX	$>C_{10}$-C_{16} (F2) plus napthalene	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)
BH201	0.05-0.3	Coarse	700	1000	2500	10000
BH201 (lab duplicate)	0.05-0.3	Coarse	700	1000	2500	10000
BH201	0.5-0.8	Fine	800	1000	3500	10000
BH201	0.8-0.95	Fine	800	1000	3500	10000
BH202	0.05-0.3	Coarse	700	1000	2500	10000
BH205	0-0.1	Coarse	700	1000	2500	10000
BH205	0.5-0.8	Fine	800	1000	3500	10000
BH205	1.5-1.8	Fine	800	1000	3500	10000
BH206	0-0.1	Coarse	700	1000	2500	10000
BH207	0-0.1	Coarse	700	1000	2500	10000
BH207	0.5-0.8	Coarse	700	1000	2500	10000
BH207	1.0-1.2	Fine	800	1000	3500	10000
TP210	0-0.1	Coarse	700	1000	2500	10000
TP210 (lab duplicate)	0-0.1	Coarse	700	1000	2500	10000
TP211	0.05-1.5	Coarse	700	1000	2500	10000
TP213	0-0.1	Coarse	700	1000	2500	10000
BH214	0.05-0.25	Coarse	700	1000	2500	10000
BH214	0.8-0.95	Fine	800	1000	3500	10000
TP215	0-0.1	Fine	800	1000	3500	10000
TP216	0-0.1	Fine	800	1000	3500	10000
TP217	0-0.1	Coarse	700	1000	2500	10000
TP218	0-0.1	Coarse	700	1000	2500	10000
BH219	0.05-0.4	Coarse	700	1000	2500	10000
BH219	1.5-1.8	Fine	800	1000	3500	10000
BH219	2.2-2.5	Fine	800	1000	3500	10000
TP220	0-0.1	Fine	800	1000	3500	10000
TP220 (lab duplicate)	0-0.1	Fine	800	1000	3500	10000
BH221	0-.15-0.35	Coarse	700	1000	2500	10000
BH221	1.5-1.8	Fine	800	1000	3500	10000
BH222	0.0.5-0.25	Coarse	700	1000	2500	10000
BH222	1.1-1.3	Fine	800	1000	3500	10000
TP223	0-0.1	Coarse	700	1000	2500	10000
TP224	0.15-0.4	Coarse	700	1000	2500	10000
TP224 (lab duplicate)	0.15-0.4	Coarse	700	1000	2500	10000
BH225	0.05-0.3	Fine	800	1000	3500	10000
TP226	0-0.1	Coarse	700	1000	2500	10000
TP226	0.4-0.6	Coarse	700	1000	2500	10000
TP228	0-0.1	Coarse	700	1000	2500	10000
SDUPB-1	NA	Coarse	700	1000	2500	10000
SDUPD-1	NA	Coarse	700	1000	2500	10000
SDUPC-1	NA	Coarse	700	1000	2500	10000
SDUPF-1	NA	Coarse	700	1000	2500	10000

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

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		5,100	3,800	5,300	7,400	120	18,000	5,300	15,000	1,900	
Site Use		**RECREATIONAL - DIRECT SOIL CONTACT**									
Sample Reference	**Sample Depth**										
BH1	0-0.1	<25	<50	**100**	<100	<0.2	<0.5	<1	<1	<1	0
BH1 (lab duplicate)	0-0.1	<25	<50	**130**	<100	<0.2	<0.5	<1	<1	<1	0
BH1	1.0-1.45	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	3.9
BH2	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH3	0-0.1	<25	<50	**100**	<100	<0.2	<0.5	<1	<1	<1	0
BH4	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH5	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH7	0.15-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH8	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.1
TP1	0-0.1	<25	<50	**140**	<100	<0.2	<0.5	<1	<1	<1	0.1
TP2	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP2 (lab duplicate)	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP3	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP4	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP5	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDUP1	-	<25	<50	**100**	**110**	<0.2	<0.5	<1	<1	<1	0
SDUP2	-	<25	<50	**170**	<100	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples		19	19	19	19	19	19	19	19	19	19
Maximum Value		<PQL	<PQL	170	110	<PQL	<PQL	<PQL	<PQL	<PQL	NA

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

TABLE S5
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HSL-C:Public open space; secondary schools; and footpaths

FIELD DATA															LABORATORY DATA											
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.02**			**0.001**			**0.001**											**0.02**	**0.001**
13/12/2022	BH201	0.05-0.5	No	NA	7,240	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH202	0.05-0.4	No	NA	6,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH205	0-0.1	No	10	10,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH205	0.1-1.0	NA	NA	2,410	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	313438	BH205	0.5-0.8	535.18	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
13/12/2022	BH206	0-0.1	No	10	10,180	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH206	0.1-0.7	NA	NA	4,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH207	0-0.1	No	NA	7,150	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH207	0.1-1.0	No	NA	4,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH214	0.05-0.8	No	NA	6,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH214	0.8-1.1	NA	NA	2,250	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH219	0.05-0.8	No	NA	5,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH219	0.8-1.8	NA	NA	6,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH221	0.125-1.3	NA	NA	5,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH222	0.05-1.1	No	NA	5,560	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13/12/2022	BH225	0.05-0.7	No	NA	9,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP210	0-0.1	No	10	10,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP211	0.05-0.15	No	10	11,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	313438	TP211	0.05-0.15	744.23	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
15/12/2022	TP213	0-0.1	No	10	10,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP215	0-0.1	No	10	10,130	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP216	0-0.1	No	10	12,770	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP217	0-0.1	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP218	0-0.2	No	10	11,680	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP220	0-0.1	No	10	13,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	313438	TP220	0-0.1	761.13	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
15/12/2022	TP223	0-0.1	No	10	10,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP223	0.1-0.6	NA	10	10,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP224	0.05-0.15	No	10	13,180	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP224	0.15-0.4	No	10	11,170	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP226	0-0.1	No	10	11,660	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP226	0.1-0.6	NA	10	11,480	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP227	0-0.1	No	10	10,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	313438	TP227	0-0.1	604.51	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
14/12/2022	TP228	0-0.1	No	10	11,480	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP229	0-0.1	No	NA	9,140	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP230	0-0.1	No	10	11,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP231	0-0.1	No	10	10,310	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP232	0-0.1	No	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP233	0-0.1	No	10	10,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15/12/2022	TP234	0-0.1	Yes	10	14,860	15.94	2.391	0.0161	No ACM <7mm observed	--	--	No FA observed	--	--	313438	TP234	0-0.1	542.06	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
15/12/2022	TP234	0.1-0.4	NA	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14/12/2022	TP235	0-0.1	No	10	10,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Concentration above the SAC **VALUE**

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

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																		
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																			
BH201	0.05-0.3	Fill: silty sandy gravel	Coarse	NA	NA	NA	<4	**25**	**21**	**48**	**27**	**56**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.09**
BH201 (lab	0.05-0.3	Fill: silty sandy gravel	Coarse	NA	NA	NA	<4	**25**	**21**	**54**	**28**	**63**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.07**
BH201	0.5-0.8	Fill: silty sandy clay	Fine	NA	NA	NA	<4	**46**	**34**	**13**	**54**	**47**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH201	0.8-0.95	Silty clay	Fine	NA	NA	NA	<4	**25**	**18**	**6**	**25**	**19**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH202	0.05-0.3	Fill: silty sandy gravel	Coarse	NA	NA	NA	<4	**21**	**18**	**10**	**15**	**31**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH205	0-0.1	Fill: silty sand	Coarse	NA	NA	NA	<4	**29**	**25**	**18**	**48**	**41**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH205	0.5-0.8	Silty clay	Fine	NA	NA	NA	<4	**24**	**14**	**8**	**21**	**60**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH205	1.5-1.8	Silty clay	Fine	NA	NA	NA	<4	**18**	**14**	**5**	**21**	**17**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH206	0-0.1	Fill: silty sand	Coarse	NA	NA	NA	<4	**21**	**17**	**17**	**19**	**34**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.06**
BH207	0-0.1	Fill: silty sand	Coarse	NA	NA	NA	<4	**22**	**17**	**30**	**25**	**35**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH207	0.5-0.8	Fill: silty sand	Coarse	NA	NA	NA	<4	**17**	**12**	**7**	**19**	**20**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH207	1.0-1.2	Silty clay	Fine	NA	NA	NA	<4	**23**	**17**	**6**	**25**	**16**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP210	0-0.1	Fill: silty sandy gravel	Coarse	NA	NA	NA	<4	**20**	**65**	**19**	**24**	**64**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.07**
TP210 (lab	0-0.1	Fill: silty sandy gravel	Coarse	NA	NA	NA	<4	**20**	**68**	**18**	**21**	**57**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.06**
TP211	0.05-1.5	Fill: silty clayey sand	Coarse	NA	NA	NA	<4	**17**	**14**	**20**	**17**	**58**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.1**
TP213	0-0.1	Fill: silty sand	Coarse	NA	NA	NA	<4	**15**	**22**	**28**	**14**	**51**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH214	0.05-0.25	Fill: silty sand	Coarse	NA	NA	NA	<4	**20**	**17**	**5**	**17**	**24**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH214	0.8-0.95	Fill: silty clay	Fine	NA	NA	NA	<4	**14**	**11**	**4**	**17**	**11**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP215	0-0.1	Fill: gravelly silt	Fine	NA	NA	NA	<4	**22**	**22**	**27**	**26**	**42**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.06**
TP216	0-0.1	Fill: gravelly silt	Fine	NA	NA	NA	<4	**29**	**21**	**9**	**24**	**27**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP217	0-0.1	Fill: silty sandy gravel	Coarse	NA	NA	NA	<4	**20**	**19**	**30**	**20**	**69**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP218	0-0.1	Fill: silty clayey sand	Coarse	NA	NA	NA	<4	**20**	**16**	**18**	**21**	**38**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH219	0.05-0.4	Fill: silty sand	Coarse	NA	NA	NA	<4	**13**	**43**	**17**	**9**	**49**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH219	1.5-1.8	Fill: silty clay	Fine	NA	NA	NA	<4	**23**	**17**	**8**	**28**	**23**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH219	2.2-2.5	Silty clay	Fine	NA	NA	NA	<4	**25**	**12**	**7**	**16**	**14**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP220	0-0.1	Fill: gravelly silt	Fine	NA	NA	NA	<4	**20**	**18**	**10**	**24**	**34**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP220 (lab	0-0.1	Fill: gravelly silt	Fine	NA	NA	NA	<4	**20**	**17**	**10**	**25**	**36**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH221	0-.15-0.35	Fill: silty sand	Coarse	NA	NA	NA	<4	**18**	**15**	**12**	**21**	**40**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH221	1.5-1.8	Silty clay	Fine	NA	NA	NA	<4	**27**	**17**	**6**	**29**	**17**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH222	0.0.5-0.25	Fill: silty sand	Coarse	NA	NA	NA	<4	**10**	**12**	**9**	**11**	**26**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH222	1.1-1.3	Silty clay	Fine	NA	NA	NA	<4	**18**	**14**	**5**	**23**	**16**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP223	0-0.1	Fill: silty clayey sand	Coarse	NA	NA	NA	<4	**18**	**6**	**6**	**12**	**9**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP224	0.15-0.4	Fill: silty sandy gravel	Coarse	NA	NA	NA	<4	**13**	**15**	**8**	**16**	**29**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP224 (lab	0.15-0.4	Fill: silty sandy gravel	Coarse	NA	NA	NA	<4	**14**	**14**	**9**	**18**	**28**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH225	0.05-0.3	Fill: silty sand clay	Fine	NA	NA	NA	<4	**20**	**16**	**6**	**25**	**22**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP226	0-0.1	Fill: silty clayey sand	Coarse	NA	NA	NA	<4	**25**	**17**	**9**	**32**	**37**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP226	0.4-0.6	Fill: silty clayey sand	Coarse	NA	NA	NA	<4	**21**	**16**	**9**	**23**	**39**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP228	0-0.1	Fill: silty clayey sand	Coarse	NA	NA	NA	<4	**21**	**15**	**17**	**20**	**31**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUPB-1	NA	Fill soil	Coarse	NA	NA	NA	<4	**18**	**15**	**11**	**19**	**34**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUPD-1	NA	Fill soil	Coarse	NA	NA	NA	<4	**18**	**14**	**21**	**17**	**42**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUPC-1	NA	Fill soil	Coarse	NA	NA	NA	<4	**27**	**19**	**17**	**27**	**39**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUPC-1 (lab	NA	Fill soil	Coarse	NA	NA	NA	<4	**23**	**17**	**14**	**24**	**36**	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUPF-1	NA	Fill soil	Coarse	NA	NA	NA	<4	**15**	**22**	**31**	**14**	**54**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.07**
Total Number of Samples				0	0	0	43	43	43	43	43	43	42	33	42	42	42	42	42	42	42	42	42
Maximum Value				NA	NA	NA	<PQL	46	68	54	54	69	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.1

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

EIL AND ESL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**	pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
BH201	0.05-0.3	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH201 (lab duplicate)	0.05-0.3	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH201	0.5-0.8	Fill: silty sandy clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
BH201	0.8-0.95	Silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
BH202	0.05-0.3	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH205	0-0.1	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH205	0.5-0.8	Silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
BH205	1.5-1.8	Silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
BH206	0-0.1	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH207	0-0.1	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH207	0.5-0.8	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	300	2800	50	85	70	105	20
BH207	1.0-1.2	Silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
TP210	0-0.1	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP210 (lab duplicate)	0-0.1	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP211	0.05-1.5	Fill: silty clayey sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP213	0-0.1	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH214	0.05-0.25	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH214	0.8-0.95	Fill: silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
TP215	0-0.1	Fill: gravelly silt	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
TP216	0-0.1	Fill: gravelly silt	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
TP217	0-0.1	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP218	0-0.1	Fill: silty clayey sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH219	0.05-0.4	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH219	1.5-1.8	Fill: silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH219	2.2-2.5	Silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
TP220	0-0.1	Fill: gravelly silt	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
TP220 (lab duplicate)	0-0.1	Fill: gravelly silt	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
BH221	0-.15-0.35	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH221	1.5-1.8	Silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
BH222	0.0.5-0.25	Fill: silty sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH222	1.1-1.3	Silty clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	--	180	120	1300	5600	65	105	125	45	20
TP223	0-0.1	Fill: silty clayey sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP224	0.15-0.4	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP224 (lab duplicate)	0.15-0.4	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH225	0.05-0.3	Fill: silty sand clay	Fine	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	1300	5600	65	105	125	45	20
TP226	0-0.1	Fill: silty clayey sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP226	0.4-0.6	Fill: silty clayey sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP228	0-0.1	Fill: silty clayey sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
SDUPB-1	NA	Fill soil	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
SDUPD-1	NA	Fill soil	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
SDUPC-1	NA	Fill soil	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
SDUPC-1 (lab duplicate)	NA	Fill soil	Coarse	NA	NA	NA	100	200	80	1200	35	150	--	180	--	--	--	--	--	--	--	--	--
SDUPF-1	NA	Fill soil	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20

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

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH201	0.05-0.3	Fill: silty sandy gravel	<4	<0.4	**25**	**21**	**48**	**0.6**	**27**	**56**	**0.09**	**0.09**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH201 (lab duplicate)	0.05-0.3	Fill: silty sandy gravel	<4	<0.4	**25**	**21**	**54**	**0.6**	**28**	**63**	**0.07**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH201	0.5-0.8	Fill: silty sandy clay	<4	<0.4	**46**	**34**	**13**	<0.1	**54**	**47**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH201	0.8-0.95	Silty clay	<4	<0.4	**25**	**18**	**6**	<0.1	**25**	**19**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH202	0.05-0.3	Fill: silty sandy gravel	<4	<0.4	**21**	**18**	**10**	<0.1	**15**	**31**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH205	0-0.1	Fill: silty sand	<4	<0.4	**29**	**25**	**18**	<0.1	**48**	**41**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH205	0.5-0.8	Silty clay	<4	<0.4	**24**	**14**	**8**	<0.1	**21**	**60**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH205	1.5-1.8	Silty clay	<4	<0.4	**18**	**14**	**5**	<0.1	**21**	**17**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH206	0-0.1	Fill: silty sand	<4	<0.4	**21**	**17**	**17**	**0.3**	**19**	**34**	**0.2**	**0.06**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH207	0-0.1	Fill: silty sand	<4	<0.4	**22**	**17**	**30**	**0.5**	**25**	**35**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH207	0.5-0.8	Fill: silty sand	<4	<0.4	**17**	**12**	**7**	**0.1**	**19**	**20**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH207	1.0-1.2	Silty clay	<4	<0.4	**23**	**17**	**6**	<0.1	**25**	**16**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP210	0-0.1	Fill: silty sandy gravel	<4	<0.4	**20**	**65**	**19**	**0.3**	**24**	**64**	**0.4**	**0.07**	<0.1	<0.1	<0.1	**0.4**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP210 (lab duplicate)	0-0.1	Fill: silty sandy gravel	<4	<0.4	**20**	**68**	**18**	**0.3**	**21**	**57**	**0.3**	**0.06**	<0.1	<0.1	<0.1	**0.4**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP211	0.05-1.5	Fill: silty clayey sand	<4	<0.4	**17**	**14**	**20**	<0.1	**17**	**58**	**0.85**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP213	0-0.1	Fill: silty sand	<4	<0.4	**15**	**22**	**28**	**0.2**	**14**	**51**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH214	0.05-0.25	Fill: silty sand	<4	<0.4	**20**	**17**	**5**	<0.1	**17**	**24**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH214	0.8-0.95	Fill: silty clay	<4	<0.4	**14**	**11**	**4**	<0.1	**17**	**11**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP215	0-0.1	Fill: gravelly silt	<4	<0.4	**22**	**22**	**27**	<0.1	**26**	**42**	**0.52**	**0.06**	<0.1	<0.1	<0.1	**9.5**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP216	0-0.1	Fill: gravelly silt	<4	<0.4	**29**	**21**	**9**	<0.1	**24**	**27**	<0.05	<0.05	<0.1	<0.1	<0.1	**12**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP217	0-0.1	Fill: silty sandy gravel	<4	<0.4	**20**	**19**	**30**	<0.1	**20**	**69**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP218	0-0.1	Fill: silty clayey sand	<4	<0.4	**20**	**16**	**18**	**0.1**	**21**	**38**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH219	0.05-0.4	Fill: silty sand	<4	<0.4	**13**	**43**	**17**	**0.3**	**9**	**49**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH219	1.5-1.8	Fill: silty clay	<4	<0.4	**23**	**17**	**8**	<0.1	**28**	**23**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH219	2.2-2.5	Silty clay	<4	<0.4	**25**	**12**	**7**	<0.1	**16**	**14**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP220	0-0.1	Fill: gravelly silt	<4	<0.4	**20**	**18**	**10**	<0.1	**24**	**34**	<0.05	<0.05	<0.1	<0.1	<0.1	**20.8**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP220 (lab duplicate)	0-0.1	Fill: gravelly silt	<4	<0.4	**20**	**17**	**10**	<0.1	**25**	**36**	<0.05	<0.05	<0.1	<0.1	<0.1	**24.3**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH221	0-.15-0.35	Fill: silty sand	<4	<0.4	**18**	**15**	**12**	<0.1	**21**	**40**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH221	1.5-1.8	Silty clay	<4	<0.4	**27**	**17**	**6**	<0.1	**29**	**17**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH222	0.0.5-0.25	Fill: silty sand	<4	<0.4	**10**	**12**	**9**	<0.1	**11**	**26**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH222	1.1-1.3	Silty clay	<4	<0.4	**18**	**14**	**5**	<0.1	**23**	**16**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP223	0-0.1	Fill: silty clayey sand	<4	<0.4	**18**	**6**	**6**	<0.1	**12**	**9**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP224	0.15-0.4	Fill: silty sandy gravel	<4	<0.4	**13**	**15**	**8**	<0.1	**16**	**29**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP224 (lab duplicate)	0.15-0.4	Fill: silty sandy gravel	<4	<0.4	**14**	**14**	**9**	<0.1	**18**	**28**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH225	0.05-0.3	Fill: silty sand clay	<4	<0.4	**20**	**16**	**6**	<0.1	**25**	**22**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP226	0-0.1	Fill: silty clayey sand	<4	<0.4	**25**	**17**	**9**	<0.1	**32**	**37**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP226	0.4-0.6	Fill: silty clayey sand	<4	<0.4	**21**	**16**	**9**	<0.1	**23**	**39**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP227	0-0.1	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
TP228	0-0.1	Fill: silty clayey sand	<4	<0.4	**21**	**15**	**17**	**0.2**	**20**	**31**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP234	0-0.1	Fill: silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
SDUPB-1	NA	Fill soil	<4	<0.4	**18**	**15**	**11**	**0.3**	**19**	**34**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUPD-1	NA	Fill soil	<4	<0.4	**18**	**14**	**21**	**0.1**	**17**	**42**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUPC-1	NA	Fill soil	<4	<0.4	**27**	**19**	**17**	**0.6**	**27**	**39**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUPC-1 (lab duplicate)	NA	Fill soil	<4	<0.4	**23**	**17**	**14**	**0.5**	**24**	**36**	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUPF-1	NA	Fill soil	<4	<0.4	**15**	**22**	**31**	**0.1**	**14**	**54**	**0.4**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
Total Number of Samples			43	43	43	43	43	43	43	43	42	42	33	32	32	32	32	42	42	42	42	42	42	42	42	42	5
Maximum Value			<PQL	<PQL	46	68	54	0.6	54	69	0.85	0.1	<PQL	<PQL	<PQL	24.3	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	Not Detected

Concentration above the CT1 — **VALUE**
Concentration above SCC1 — **VALUE**
Concentration above the SCC2 — **VALUE**
Concentration above PQL — **Bold**

TABLE S8

SOIL LABORATORY TCLP RESULTS

All data in mg/L unless stated otherwise

			Nickel
PQL - Envirolab Services			0.02
TCLP1 - General Solid Waste			2
TCLP2 - Restricted Solid Waste			8
TCLP3 - Hazardous Waste			>8
Sample Reference	**Sample Depth**	**Sample Description**	
BH201	0.5-0.8	Fill: silty sandy clay	<0.02
BH205	0-0.1	Fill: silty sand	0.02
Total Number of samples			
Maximum Value			

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

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

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

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

	PQL Envirolab Services	ANZG 2018 Fresh Waters	SAMPLES						
			MW205	MW205 (lab replicate)	MW206	MW206 (lab replicate)	MW219	GWDUPA-1	GWDUPB-1
Inorganic Compounds and Parameters									
pH		6.5 - 8.5	7.5	NA	7.8	NA	8	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**4000**	NA	**1500**	NA	**6700**	NA	NA
Turbidity (NTU)		NSL	NA	NA	NA	NA	NA	NA	NA
Metals and Metalloids									
Arsenic (As lll)	1	24	<1	<1	**1**	NA	**3**	<1	<1
Cadmium	0.1	0.2	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Chromium (SAC for Cr III adopted)	1	3.3	<1	<1	<1	NA	**42**	<1	<1
Copper	1	1.4	**3**	**3**	<1	NA	**2**	<1	**3**
Lead	1	3.4	<1	<1	<1	NA	<1	<1	<1
Total Mercury (inorganic)	0.05	0.06	<0.05	<0.05	<0.05	NA	<0.05	<0.05	**3**
Nickel	1	11	**2**	**2**	**4**	NA	**2**	**4**	**4**
Zinc	1	8	**4**	**4**	**1**	NA	**9**	**7**	<0.05
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)									
Benzene	1	950	<1	NA	<1	<1	<1	<1	<10
Toluene	1	180	<1	NA	<1	<1	<1	<1	<10
Ethylbenzene	1	80	<1	NA	<1	<1	<1	<1	<10
m+p-xylene	2	75	<2	NA	<2	<2	<2	<2	<10
o-xylene	1	350	<1	NA	<1	<1	<1	<1	<10
Total xylenes	2	NSL	<2	NA	<2	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	0.2	16	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.1
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Anthracene	0.1	0.01	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Fluoranthene	0.1	1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1

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

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

	PQL Envirolab Services	Recreational (10 x NHMRC ADWG)	SAMPLES						
			MW205	MW205 (lab replicate)	MW206	MW206 (lab replicate)	MW219	GWDUPA-1	GWDUPB-1
Inorganic Compounds and Parameters									
pH		6.5 - 8.5	7.5	NA	7.8	NA	8	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**4000**	NA	**1500**	NA	**6700**	NA	NA
Turbidity (NTU)		NSL	NA	NA	NA	NA	NA	NA	NA
Metals and Metalloids									
Arsenic (As lll)	1	100	<1	<1	**1**	NA	**3**	<1	<1
Cadmium	0.1	20	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Chromium (total)	1	500	<1	<1	<1	NA	**42**	<1	<1
Copper	1	20000	**3**	**3**	<1	NA	**2**	<1	**3**
Lead	1	100	<1	<1	<1	NA	<1	<1	<1
Total Mercury (inorganic)	0.05	10	<0.05	<0.05	<0.05	NA	<0.05	<0.05	**3**
Nickel	1	200	**2**	**2**	**4**	NA	**2**	**4**	**4**
Zinc	1	30000	**4**	**4**	**1**	NA	**9**	**7**	<0.05
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)									
Benzene	1	10	<1	NA	<1	<1	<1	<1	<10
Toluene	1	8000	<1	NA	<1	<1	<1	<1	<10
Ethylbenzene	1	3000	<1	NA	<1	<1	<1	<1	<10
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	<2	<10
o-xylene	1	NSL	<1	NA	<1	<1	<1	<1	<10
Total xylenes	2	6000	<2	NA	<2	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.1
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	NA	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1

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

TABLE G3
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	
PQL - Envirolab Services				10	50	1	1	1	2	1	PID
NEPM 2013 - Land Use Category				HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW205	1.84	0m to <2m	Sand	<10	<50	<1	<1	<1	<2	<1	0.6
MW205 (lab replicate)	1.84	0m to <2m	Sand	NA	<50	NA	NA	NA	NA	NA	NA
MW206	1.1	0m to <2m	Sand	<10	<50	<1	<1	<1	<2	<1	1.1
MW206 (lab replicate)	1.1	0m to <2m	Sand	<10	NA	<1	<1	<1	<2	<1	NA
MW219	7.34	4m to <8m	Sand	<10	**160**	<1	<1	<1	<2	<1	>500
GWDUPA-1	1.1	0m to <2m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
GWDUPB-1	1.84	0m to <2m	Sand	<10	<50	<10	<10	<10	<2	<10	NA
Total Number of Samples				6	6	6	6	6	6	6	3
Maximum Value				<PQL	160	<PQL	<PQL	<PQL	<PQL	<PQL	7500

Concentration above the SAC **VALUE**
Site specific assesment (SSA) required **VALUE**
Concentration above the PQL **Bold**
The guideline corresponding to the elevated value is highlighted in grey in the Groundwater Assessment Criteria Table below

HSL GROUNDWATER ASSESSMENT CRITERIA

Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
MW205	1.84	0m to <2m	Sand	SSA	SSA	SSA	SSA	SSA	SSA	SSA
MW205 (lab replicate)	1.84	0m to <2m	Sand	NA	SSA	NA	NA	NA	NA	NA
MW206	1.1	0m to <2m	Sand	SSA	SSA	SSA	SSA	SSA	SSA	SSA
MW206 (lab replicate)	1.1	0m to <2m	Sand	SSA	NA	SSA	SSA	SSA	SSA	SSA
MW219	7.34	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
GWDUPA-1	1.1	0m to <2m	Sand	SSA	SSA	SSA	SSA	SSA	SSA	SSA
GWDUPB-1	1.84	0m to <2m	Sand	SSA	SSA	SSA	SSA	SSA	SSA	SSA

TABLE G4
GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	SAMPLES					
					MW205	MW205 (lab replicate)	MW206	MW206 (lab replicate)	GWDUPA-1	GWDUPB-1
Total Recoverable Hydrocarbons (TRH)										
C_6-C_9 Aliphatics (assessed using F1)	10	-	-	-	<10	NA	<10	<10	<10	<10
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	90-300	-	<50	<50	<50	NA	<50	<50
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)										
Benzene	1	1	-	-	<1	NA	<1	<1	<1	<10
Toluene	1	800	-	-	<1	NA	<1	<1	<1	<10
Ethylbenzene	1	300	-	-	<1	NA	<1	<1	<1	<10
Total xylenes	2	600	-	-	<2	NA	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	1	-	-	6.1	<1	NA	<1	<1	<1	<10

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

JKEnvironments

TABLE Q1
SOIL QA/QC SUMMARY

			TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene
	PQL Envirolab SYD		*25*	*50*	*100*	*100*	*0.2*	*0.5*	*1*	*2*	*1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.05*	*0.1*	*0.1*	*0.1*
	PQL Envirolab VIC		*25*	*50*	*100*	*100*	*0.2*	*0.5*	*1*	*2*	*1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*
Intra	BH206	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.2	0.06	<0.1	<0.1	<0.1
laboratory	SDUPB-1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.075	nc	nc	nc	0.043	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	67%	nc	nc	nc	82%	nc	nc	nc
Intra	TP218	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUPD-1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH207	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUPC-1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	TP213	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUPF-1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1	<0.2	0.07	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.125	0.125	nc	nc	nc	0.048	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	120%	120%	nc	nc	nc	95%	nc	nc	nc
Trip	TSS-A1		-	-	-	-	115%	117%	112%	110%	113%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	15/12/22																									
Field	TBS-A1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
Blank	13 - 15/12/2022																									
Field	FRS-A1	µg/L	<10	<50	<100	<100	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1
Rinsate	13/12/22																									
Field	FRS-B1	µg/L	<10	<50	<100	<100	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1
Rinsate	14/12/22																									

			HCB	alpha- BHC	gamma- BHC	beta- BHC	Heptachlor	delta- BHC	Aldrin	Heptachlor Epoxide	Gamma- Chlordane	alpha- chlordane	Endosulfan I	pp- DDE	Dieldrin	Endrin	pp- DDD	Endosulfan II	pp- DDT	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor
	PQL Envirolab SYD		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
	PQL Envirolab VIC		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
Intra	BH206	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUPB-1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	TP218	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUPD-1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH207	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUPC-1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	TP213	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUPF-1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Trip	TSS-A1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	15/12/22																					
Field	TBS-A1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	13 - 15/12/2022																					
Field	FRS-A1	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	13/12/22																					
Field	FRS-B1	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	14/12/22																					

			Azinphos-methyl (Guthion	Bromophos-ethyl	Chlorpyriphos	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Total PCBS
	PQL Envirolab SYD		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
	PQL Envirolab VIC		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
Intra	BH206	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUPB-1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	TP218	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUPD-1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH207	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUPC-1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	TP213	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUPF-1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Trip	TSS-A1		-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	15/12/22														
Field	TBS-A1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	13 - 15/12/2022														
Field	FRS-A1	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	13/12/22														
Field	FRS-B1	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	14/12/22														

			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD		*4*	*0.4*	*1*	*1*	*1*	*0.1*	*1*	*1*
	PQL Envirolab VIC		*4*	*0.4*	*1*	*1*	*1*	*0.1*	*1*	*1*
Intra	BH206	0-0.1	<4	<0.4	21	17	17	0.3	19	34
laboratory	SDUPB-1	NA	<4	<0.4	18	15	11	0.3	19	34
duplicate	MEAN		nc	nc	19.5	16	14	0.3	19	34
	RPD %		nc	nc	15%	13%	43%	0%	0%	0%
Intra	TP218	0-0.1	<4	<0.4	20	16	18	0.1	21	38
laboratory	SDUPD-1	NA	<4	<0.4	18	14	21	0.1	17	42
duplicate	MEAN		nc	nc	19	15	19.5	0.1	19	40
	RPD %		nc	nc	11%	13%	15%	0%	21%	10%
Inter	BH207	0-0.1	<4	<0.4	22	17	30	0.5	25	35
laboratory	SDUPC-1	NA	<4	<0.4	27	19	17	0.6	27	39
duplicate	MEAN		nc	nc	24.5	18	23.5	0.55	26	37
	RPD %		nc	nc	20%	11%	55%	18%	8%	11%
Inter	TP213	0-0.1	<4	<0.4	15	22	28	0.2	14	51
laboratory	SDUPF-1	NA	<4	<0.4	15	22	31	0.1	14	54
duplicate	MEAN		nc	nc	15	22	29.5	0.15	14	52.5
	RPD %		nc	nc	0%	0%	10%	67%	0%	6%
Trip	TSS-A1		-	-	-	-	-	-	-	-
Spike	15/12/22									
Field	TBS-A1	NA	<4	<0.4	3	<1	2	<0.1	<1	1
Blank	13 - 15/12/2022									
Field	FRS-A1	µg/L	<1	<0.1	<1	260	<1	<0.05	<1	20
Rinsate	13/12/22									
Field	FRS-B1	µg/L	<1	<0.1	<1	150	1	<0.05	<1	54
Rinsate	14/12/22									

Result outside of QA/QC acceptance criteria

TABLE Q2
GROUNDWATER QA/QC SUMMARY

		TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene	Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD	*10*	*50*	*100*	*100*	*1*	*1*	*1*	*2*	*1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
	PQL Envirolab VIC	*10*	*50*	*100*	*100*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
Inter	MW206	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	1	<0.1	<1	<1	<1	<0.05	4	1
laboratory	GWDUPA-1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	4	7
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.75	nc	nc	nc	nc	nc	4	4
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	67%	nc	nc	nc	nc	nc	0%	150%
Intra	MW205	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	3	<1	<0.05	2	4
laboratory	GWDUPB-1	<10	<50	<100	<100	<10	<10	<10	<10	<10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	3	<1	3	4	<0.05
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	3	nc	1.5125	3	2.25
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	nc	197%	67%	156%
Field	GW-TB1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	150	1	<0.05	<1	52
Blank	15/12/2022																																
Trip	TSW-A1	-	-	-	-	92%	90%	85%	96%	81%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Spike	15/12/2022																																

Result outside of QA/QC acceptance criteria Value

PSI Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC:	Ambient Background Concentration
ACM:	Asbestos Containing Material
ADWG:	AustralianDrinking Water Guidelines
AF:	Asbestos Fines
ANZG	Australian and New Zealand Guidelines
B(a)P:	Benzo(a)pyrene
CEC:	Cation Exchange Capacity
CRC:	Cooperative Research Centre
CT:	Contaminant Threshold
EILs:	Ecological Investigation Levels
ESLs:	Ecological Screening Levels
FA:	Fibrous Asbestos
GIL:	Groundwater Investigation Levels
GSW:	General Solid Waste
HILs:	Health Investigation Levels
HSLs:	Health Screening Levels
HSL-SSA:	Health Screening Level-SiteSpecific Assessment
kg/L	kilograms per litre
NA:	Not Analysed
NC:	Not Calculated
NEPM:	National Environmental Protection Measure
NHMRC:	National Health and Medical Research Council
NL:	Not Limiting
NSL:	No Set Limit
OCP:	Organochlorine Pesticides
OPP:	Organophosphorus Pesticides
PAHs:	Polycyclic Aromatic Hydrocarbons
%w/w:	weight per weight
ppm:	Parts per million
PCBs:	Polychlorinated Biphenyls
PCE:	Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
pH_{KCL} :	pH of filtered 1:20, 1M KCL extract, shaken overnight
pH_{ox} :	pH of filtered 1:20 1M KCl after peroxide digestion
PQL:	Practical Quantitation Limit
RS:	Rinsate Sample
RSL:	Regional Screening Levels
RSW:	Restricted Solid Waste
SAC:	Site Assessment Criteria
SCC:	Specific Contaminant Concentration
S_{Cr}:	Chromium reducible sulfur
S_{POS}:	Peroxide oxidisable Sulfur
SSA:	Site Specific Assessment
SSHSLs:	Site Specific Health Screening Levels
TAA:	Total Actual Acidity in 1M KCL extract titrated to pH6.5
TB:	Trip Blank
TCA:	1,1,1 Trichloroethane (methyl chloroform)
TCE:	Trichloroethylene (Trichloroethene)
TCLP:	Toxicity Characteristics Leaching Procedure
TPA:	Total Potential Acidity, 1M KCL peroxide digest
TS:	Trip Spike
TRH:	Total Recoverable Hydrocarbons
TSA:	Total Sulfide Acidity (TPA-TAA)
UCL:	Upper Level Confidence Limit on Mean Value
USEPA	United States Environmental Protection Agency
VOCC:	Volatile Organic Chlorinated Compounds
WHO:	World Health Organisation

Table Specific Explanations:

HIL Tables:

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

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with low traffic have been quoted).

Waste Classification and TCLP Table:

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

QA/QC Table:

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

TABLE S1
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-C: 'Public open space; secondary schools; and footpaths'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			300	90	300	17000	600	80	1200	30000	300	3	10	340	400	10	70	400	10	250	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0-0.1	Fill: Silty Clay	<4	<0.4	**25**	**25**	**22**	<0.1	**29**	**78**	<0.05	<0.5	<0.1	<0.1	<0.1	**1.1**	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH1 (lab duplicate)	0-0.1	Fill: Silty Clay	<4	<0.4	**23**	**20**	**20**	<0.1	**26**	**66**	<0.05	<0.5	<0.1	<0.1	<0.1	**1.1**	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH2	0-0.1	Fill: Sandy Clay	<4	<0.4	**24**	**13**	**10**	<0.1	**23**	**34**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH3	0-0.1	Fill: Sandy Clay	<4	<0.4	**28**	**25**	**37**	**0.1**	**33**	**80**	**5.5**	**0.8**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH4	0-0.1	Fill: Silty Sand	<4	<0.4	**22**	**18**	**29**	<0.1	**28**	**57**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH5	0-0.1	Fill: Silty Sand	<4	<0.4	**30**	**20**	**19**	**8.4**	**31**	**44**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH6	0-0.1	Fill: Silty Sand	<4	<0.4	**32**	**20**	**29**	**0.3**	**30**	**50**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH7	0.15-0.3	Fill: Sandy Gravel	<4	<0.4	**56**	**38**	**5**	<0.1	**90**	**45**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH8	0-0.1	Fill: Sandy Clay	<4	<0.4	**27**	**19**	**11**	<0.1	**32**	**38**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP1	0-0.1	Fill: Silty Clay	<4	<0.4	**25**	**19**	**11**	<0.1	**24**	**74**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP2	0-0.1	Fill: Gravelly Clay	<4	<0.4	**27**	**31**	**35**	**0.1**	**32**	**71**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP2 (lab duplicate)	0-0.1	Fill: Gravelly Clay	<4	<0.4	**28**	**32**	**35**	**0.2**	**35**	**75**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
TP3	0-0.1	Fill: Gravelly Clay	<4	<0.4	**30**	**23**	**12**	<0.1	**33**	**44**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP4	0-0.1	Fill: Sandy Clay	<4	<0.4	**31**	**22**	**14**	**0.3**	**36**	**44**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP5	0-0.1	Fill: Gravelly Clay	<4	<0.4	**25**	**20**	**20**	**0.2**	**29**	**51**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
TP6	0-0.1	Fill: Gravelly Clay	<4	<0.4	**61**	**16**	**11**	<0.1	**19**	**48**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP1	-	Fill: Silty Clay	<4	<0.4	**28**	**25**	**22**	<0.1	**35**	**81**	<0.05	<0.5	<0.1	<0.1	<0.1	**1.2**	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP2	-	Fill: Gravelly Clay	<4	<0.4	**23**	**18**	**11**	<0.1	**22**	**69**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
FCF1-TP2	0.1-0.3	Fibre Cement Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Detected**
Total Number of Samples			18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	13
Maximum Value			<PQL	<PQL	61	38	37	8.4	90	81	5.5	0.8	<PQL	<PQL	<PQL	1.2	<PQL	<PQL	<PQL	<PQL	<PQL	Detected

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

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

					C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1 (lab duplicate)	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1	1.0-1.45	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	3.9
BH2	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH4	0-0.1	Fill: Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH5	0-0.1	Fill: Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH6	0-0.1	Fill: Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH7	0.15-0.3	Fill: Sandy Gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH8	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
TP1	0-0.1	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
TP2	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP2 (lab duplicate)	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP3	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP4	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP5	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
TP6	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUP1	-	Fill: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUP2	-	Fill: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples					19	19	19	19	19	19	19	19
Maximum Value					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

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

HSL SOIL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
BH1	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1 (lab duplicate)	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1	1.0-1.45	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH2	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH3	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH4	0-0.1	Fill: Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH5	0-0.1	Fill: Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH6	0-0.1	Fill: Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH7	0.15-0.3	Fill: Sandy Gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH8	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP1	0-0.1	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP2	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP2 (lab duplicate)	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP3	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP4	0-0.1	Fill: Sandy Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP5	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
TP6	0-0.1	Fill: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP1	-	Fill: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2	-	Fill: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3

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

			C_6-C_{10} (F1) plus BTEX	$>C_{10}$-C_{16} (F2) plus napthalene	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH1	0-0.1	Coarse	<25	<50	**100**	<100
BH1 (lab replicate)	0-0.1	Coarse	<25	<50	**130**	<100
BH1	1.0-1.45	Coarse	<25	<50	<100	<100
BH2	0-0.1	Coarse	<25	<50	<100	<100
BH3	0-0.1	Coarse	<25	<50	**100**	<100
BH4	0-0.1	Coarse	<25	<50	<100	<100
BH5	0-0.1	Coarse	<25	<50	<100	<100
BH6	0-0.1	Coarse	<25	<50	<100	<100
BH7	0.15-0.3	Coarse	<25	<50	<100	<100
BH8	0-0.1	Coarse	<25	<50	<100	<100
TP1	0-0.1	Coarse	<25	<50	**140**	<100
TP2	0-0.1	Coarse	<25	<50	<100	<100
TP2 (lab replicate)	0-0.1	Coarse	<25	<50	<100	<100
TP3	0-0.1	Coarse	<25	<50	<100	<100
TP4	0-0.1	Coarse	<25	<50	<100	<100
TP5	0-0.1	Coarse	<25	<50	<100	<100
TP6	0-0.1	Coarse	<25	<50	<100	<100
SDUP1	-	Coarse	<25	<50	**100**	**110**
SDUP2	-	Coarse	<25	<50	**170**	<100
Total Number of Samples			19	19	19	19
Maximum Value			<PQL	<PQL	170	110

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

MANAGEMENT LIMIT ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Soil Texture**	C_6-C_{10} (F1) plus BTEX	$>C_{10}$-C_{16} (F2) plus napthalene	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)
BH1	0-0.1	Coarse	700	1000	2500	10000
BH1 (lab replicate)	0-0.1	Coarse	700	1000	2500	10000
BH1	1.0-1.45	Coarse	700	1000	2500	10000
BH2	0-0.1	Coarse	700	1000	2500	10000
BH3	0-0.1	Coarse	700	1000	2500	10000
BH4	0-0.1	Coarse	700	1000	2500	10000
BH5	0-0.1	Coarse	700	1000	2500	10000
BH6	0-0.1	Coarse	700	1000	2500	10000
BH7	0.15-0.3	Coarse	700	1000	2500	10000
BH8	0-0.1	Coarse	700	1000	2500	10000
TP1	0-0.1	Coarse	700	1000	2500	10000
TP2	0-0.1	Coarse	700	1000	2500	10000
TP2 (lab replicate)	0-0.1	Coarse	700	1000	2500	10000
TP3	0-0.1	Coarse	700	1000	2500	10000
TP4	0-0.1	Coarse	700	1000	2500	10000
TP5	0-0.1	Coarse	700	1000	2500	10000
TP6	0-0.1	Coarse	700	1000	2500	10000
SDUP1	-	Coarse	700	1000	2500	10000
SDUP2	-	Coarse	700	1000	2500	10000

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

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		5,100	3,800	5,300	7,400	120	18,000	5,300	15,000	1,900	
Site Use		**RECREATIONAL - DIRECT SOIL CONTACT**									
Sample Reference	**Sample Depth**										
BH1	0-0.1	<25	<50	**100**	<100	<0.2	<0.5	<1	<1	<1	0
BH1 (lab duplicate)	0-0.1	<25	<50	**130**	<100	<0.2	<0.5	<1	<1	<1	0
BH1	1.0-1.45	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	3.9
BH2	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH3	0-0.1	<25	<50	**100**	<100	<0.2	<0.5	<1	<1	<1	0
BH4	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH5	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH7	0.15-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH8	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.1
TP1	0-0.1	<25	<50	**140**	<100	<0.2	<0.5	<1	<1	<1	0.1
TP2	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP2 (lab duplicate)	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP3	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP4	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP5	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
TP6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDUP1	-	<25	<50	**100**	**110**	<0.2	<0.5	<1	<1	<1	0
SDUP2	-	<25	<50	**170**	<100	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples		19	19	19	19	19	19	19	19	19	19
Maximum Value		<PQL	<PQL	170	110	<PQL	<PQL	<PQL	<PQL	<PQL	NA

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

TABLE S5
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HSL-C:Public open space; secondary schools; and footpaths

FIELD DATA															LABORATORY DATA											
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.02**			**0.001**			**0.001**											**0.02**	**0.001**
1/06/2022	BH1	0-0.1	No	10	10,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	BH1	0-0.1	630.91	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
1/06/2022	BH1	0.1-0.6	NA	10	10,650	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	BH2	0-0.1	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	BH2	0-0.1	691.17	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
1/06/2022	BH2	0.1-0.8	NA	NA	4,180	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	BH3	0-0.1	No	10	10,070	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	BH3	0-0.1	642.9	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
1/06/2022	BH3	0.1-0.8	NA	NA	4,750	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/06/2022	BH4	0-0.1	No	10	10,690	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	BH4	0-0.1	749.46	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
2/06/2022	BH4	0.1-1.0	NA	NA	NA	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/06/2022	BH4	1.0-1.6	NA	NA	4,070	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/06/2022	BH5	0-0.1	No	NA	9,870	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	BH5	0-0.1	702.75	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
2/06/2022	BH5	0.1-0.8	NA	NA	2,020	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2/06/2022	BH6	0-0.1	No	10	11,020	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	BH6	0-0.1	544.19	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
3/06/2022	BH7	0.15-0.3	NA	NA	2,770	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	BH7	0.15-0.3	831.26	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
3/06/2022	BH7	0.3-0.7	NA	NA	9,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3/06/2022	BH8	0-0.1	No	10	10,850	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	BH8	0-0.1	744.64	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
3/06/2022	BH8	0.1-0.9	NA	NA	8,630	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP1	0-0.1	No	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	TP1	0-0.1	616.78	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
1/06/2022	TP1	0.1-0.2	NA	10	10,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP1	0.2-0.6	NA	10	10,910	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP1	0.6-1.0	NA	10	10,710	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP2	0-0.1	No	10	11,710	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP2	0.1-0.3	NA	10	10,050	12.3	1.8465	0.0184	No ACM <7mm observed	--	--	No FA observed	--	--	297823	TP2	0.1-0.3	745.43	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
1/06/2022	TP3	0-0.1	No	10	11,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	TP3	0-0.1	709.63	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
1/06/2022	TP3	0.1-0.2m	NA	10	11,110	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP3	0.2-1.0	NA	10	10,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP4	0-0.1	No	10	10,410	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	TP4	0-0.1	673.26	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
1/06/2022	TP4	0.1-0.7	NA	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP5	0-0.1	No	10	10,190	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	TP5	0-0.1	795.56	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected			<0.01	<0.001
1/06/2022	TP5	0.25-0.5	NA	10	11,030	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP5	0.5-0.9	NA	10	10,010	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP6	0-0.1	No	10	10,760	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	297823	TP6	0-0.1	40	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	NA	NA	NA	NA
1/06/2022	TP6	0.1-0.3	NA	10	10,570	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1/06/2022	TP6	0.3-0.5	NA	10	10,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Concentration above the SAC **VALUE**

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

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																		
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																			
BH1	0-0.1	Fill: Silty Clay	Coarse	NA	NA	NA	<4	**25**	**25**	**22**	**29**	**78**	<1	<0.1	<25	<50	**100**	<100	<0.2	<0.5	<1	<1	<0.05
BH1 (lab duplicate)	0-0.1	Fill: Silty Clay	Coarse	NA	NA	NA	<4	**23**	**20**	**20**	**26**	**66**	<1	<0.1	<25	<50	**130**	<100	<0.2	<0.5	<1	<1	<0.05
BH1	1.0-1.45	Silty Clay	Coarse	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	NA
BH2	0-0.1	Fill: Sandy Clay	Coarse	NA	NA	NA	<4	**24**	**13**	**10**	**23**	**34**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0-0.1	Fill: Sandy Clay	Coarse	NA	NA	NA	<4	**28**	**25**	**37**	**33**	**80**	<1	<0.1	<25	<50	**100**	<100	<0.2	<0.5	<1	<1	**0.55**
BH4	0-0.1	Fill: Silty Sand	Coarse	NA	NA	NA	<4	**22**	**18**	**29**	**28**	**57**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH5	0-0.1	Fill: Silty Sand	Coarse	NA	NA	NA	<4	**30**	**20**	**19**	**31**	**44**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH6	0-0.1	Fill: Silty Sand	Coarse	NA	NA	NA	<4	**32**	**20**	**29**	**30**	**50**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH7	0.15-0.3	Fill: Sandy Gravel	Coarse	**8.6**	**18**	**10**	<4	**56**	**38**	**5**	**90**	**45**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH8	0-0.1	Fill: Sandy Clay	Coarse	NA	NA	NA	<4	**27**	**19**	**11**	**32**	**38**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP1	0-0.1	Fill: Silty Clay	Coarse	NA	NA	NA	<4	**25**	**19**	**11**	**24**	**74**	<1	<0.1	<25	<50	**140**	<100	<0.2	<0.5	<1	<1	<0.05
TP2	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	<4	**27**	**31**	**35**	**32**	**71**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP2 (lab duplicate)	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	<4	**28**	**32**	**35**	**35**	**75**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP3	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	<4	**30**	**23**	**12**	**33**	**44**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP4	0-0.1	Fill: Sandy Clay	Coarse	NA	NA	NA	<4	**31**	**22**	**14**	**36**	**44**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP5	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	<4	**25**	**20**	**20**	**29**	**51**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
TP6	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	<4	**61**	**16**	**11**	**19**	**48**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP1	-	Fill: Silty Clay	Coarse	NA	NA	NA	<4	**28**	**25**	**22**	**35**	**81**	<1	<0.1	<25	<50	**100**	**110**	<0.2	<0.5	<1	<1	<0.05
SDUP2	-	Fill: Gravelly Clay	Coarse	NA	NA	NA	<4	**23**	**18**	**11**	**22**	**69**	<1	<0.1	<25	<50	**170**	<100	<0.2	<0.5	<1	<1	<0.05
Total Number of Samples				1	1	1	18	18	18	18	18	18	19	18	19	19	19	19	19	19	19	19	18
Maximum Value				8.6	18	10	<PQL	61	38	37	90	81	<PQL	<PQL	<PQL	<PQL	170	110	<PQL	<PQL	<PQL	<PQL	0.55

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

EIL AND ESL ASSESSMENT CRITERIA

Sample Reference	Sample Depth	Sample Description	Soil Texture	pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
BH1	0-0.1	Fill: Silty Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH1 (lab duplicate)	0-0.1	Fill: Silty Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH1	1.0-1.45	Silty Clay	Coarse	NA	NA	NA	--	--	--	--	--	--	170	--	180	120	300	2800	50	85	70	105	--
BH2	0-0.1	Fill: Sandy Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH3	0-0.1	Fill: Sandy Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH4	0-0.1	Fill: Silty Sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH5	0-0.1	Fill: Silty Sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH6	0-0.1	Fill: Silty Sand	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
BH7	0.15-0.3	Fill: Sandy Gravel	Coarse	**8.6**	**18**	**10**	100	410	230	1200	280	780	170	180	180	120	300	2800	50	85	70	105	20
BH8	0-0.1	Fill: Sandy Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP1	0-0.1	Fill: Silty Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP2	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP2 (lab duplicate)	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP3	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP4	0-0.1	Fill: Sandy Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP5	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
TP6	0-0.1	Fill: Gravelly Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
SDUP1	-	Fill: Silty Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20
SDUP2	-	Fill: Gravelly Clay	Coarse	NA	NA	NA	100	200	80	1200	35	150	170	180	180	120	300	2800	50	85	70	105	20

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

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0-0.1	Fill: Silty Clay	<4	<0.4	**25**	**25**	**22**	<0.1	**29**	**78**	<0.05	<0.05	<0.1	<0.1	<0.1	**1.1**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH1 (lab duplicate	0-0.1	Fill: Silty Clay	<4	<0.4	**23**	**20**	**20**	<0.1	**26**	**66**	<0.05	<0.05	<0.1	<0.1	<0.1	**1.1**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH1	1.0-1.45	Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH2	0-0.1	Fill: Sandy Clay	<4	<0.4	**24**	**13**	**10**	<0.1	**23**	**34**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH3	0-0.1	Fill: Sandy Clay	<4	<0.4	**28**	**25**	**37**	**0.1**	**33**	**80**	**5.5**	**0.55**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH4	0-0.1	Fill: Silty Sand	<4	<0.4	**22**	**18**	**29**	<0.1	**28**	**57**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH5	0-0.1	Fill: Silty Sand	<4	<0.4	**30**	**20**	**19**	**8.4**	**31**	**44**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH6	0-0.1	Fill: Silty Sand	<4	<0.4	**32**	**20**	**29**	**0.3**	**30**	**50**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH7	0.15-0.3	Fill: Sandy Gravel	<4	<0.4	**56**	**38**	**5**	<0.1	**90**	**45**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH8	0-0.1	Fill: Sandy Clay	<4	<0.4	**27**	**19**	**11**	<0.1	**32**	**38**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP1	0-0.1	Fill: Silty Clay	<4	<0.4	**25**	**19**	**11**	<0.1	**24**	**74**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**120**	**120**	<0.2	<0.5	<1	<1	Not Detected
TP2	0-0.1	Fill: Gravelly Clay	<4	<0.4	**27**	**31**	**35**	**0.1**	**32**	**71**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP2 (lab duplicate)	0-0.1	Fill: Gravelly Clay	<4	<0.4	**28**	**32**	**35**	**0.2**	**35**	**75**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
TP3	0-0.1	Fill: Gravelly Clay	<4	<0.4	**30**	**23**	**12**	<0.1	**33**	**44**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP4	0-0.1	Fill: Sandy Clay	<4	<0.4	**31**	**22**	**14**	**0.3**	**36**	**44**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP5	0-0.1	Fill: Gravelly Clay	<4	<0.4	**25**	**20**	**20**	**0.2**	**29**	**51**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
TP6	0-0.1	Fill: Gravelly Clay	<4	<0.4	**61**	**16**	**11**	<0.1	**19**	**48**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP1	-	Fill: Silty Clay	<4	<0.4	**28**	**25**	**22**	<0.1	**35**	**81**	<0.05	<0.05	<0.1	<0.1	<0.1	**1.2**	<0.1	<25	<50	<100	**130**	**130**	<0.2	<0.5	<1	<1	NA
SDUP2	-	Fill: Gravelly Clay	<4	<0.4	**23**	**18**	**11**	<0.1	**22**	**69**	<0.05	<0.05	<0.1	<0.1	<0.1	**<0.1**	<0.1	<25	<50	<100	**190**	**190**	<0.2	<0.5	<1	<1	NA
FCF1-TP2	0.1-0.3	Fibre Cement Fragment	NA	NA	**NA**	**NA**	**NA**	NA	**NA**	**NA**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Detected**
Total Number of Samples			18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	19	19	19	19	19	19	19	19	19	13
Maximum Value			<PQL	<PQL	61	38	37	8.4	90	81	5.5	0.55	<PQL	<PQL	<PQL	1.2	<PQL	<PQL	<PQL	<PQL	190	190	<PQL	<PQL	<PQL	<PQL	Not Detected

Concentration above the CT1 — **VALUE**
Concentration above SCC1 — **VALUE**
Concentration above the SCC2 — **VALUE**
Concentration above PQL — **Bold**

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

			Mercury	Nickel
PQL - Envirolab Services			0.01	0.02
TCLP1 - General Solid Waste			0.2	2
TCLP2 - Restricted Solid Waste			0.8	8
TCLP3 - Hazardous Waste			>0.8	>8
Sample Reference	**Sample Depth**	**Sample Description**		
BH5	0-0.1	Fill: Silty Sand	<0.0005	NA
BH7	0.15-0.3	Fill: Sandy Gravel	NA	**0.1**
Total Number of samples			1	1
Maximum Value			<PQL	0.1

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

TABLE 9
SOIL QA/QC SUMMARY

			TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene
	PQL Envirolab SYD		*25*	*50*	*100*	*100*	*0.2*	*0.5*	*1*	*2*	*1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.05*	*0.1*	*0.1*	*0.1*
	PQL Envirolab VIC		*25*	*50*	*100*	*100*	*0.2*	*0.5*	*1*	*2*	*1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*
Intra	BH1	0-0.1	<25	<50	100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP1	-	<25	<50	100	110	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	100	80	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	0%	75%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	TP2	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP2	-	<25	<50	170	<100	<0.2	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	110	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	109%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field	TB-S1	mg/kg	NA	NA	NA	NA	<0.2	<0.5	<1	<2	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	1/06/22																									
Field	FR-S1-SPT	µg/L	NA	NA	NA	NA	<1	<1	<1	<2	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	3/06/22																									
Trip	TS-S1		-	-	-	-	89%	96%	100%	98%	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	1/06/22																									

			HCB	alpha- BHC	gamma- BHC	beta- BHC	Heptachlor	delta- BHC	Aldrin	Heptachlor Epoxide	Gamma- Chlordane	alpha- chlordane	Endosulfan I	pp- DDE	Dieldrin	Endrin	pp- DDD	Endosulfan II	pp- DDT	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor
	PQL Envirolab SYD		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
	PQL Envirolab VIC		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
Intra	BH1	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1.15	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	9%	nc	nc	nc	nc	nc	nc	nc
Inter	TP2	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field	TB-S1	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	1/06/22																					
Field	FR-S1-SPT	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	3/06/22																					
Trip	TS-S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	1/06/22																					

			Azinphos-methyl (Guthion)	Bromophos-ethyl	Chlorpyriphos	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Total PCBS	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*4*	*0.4*	*1*	*1*	*1*	*0.1*	*1*	*1*
	PQL Envirolab VIC		*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*4.0*	*0.4*	*1.0*	*1.0*	*1.0*	*0.1*	*1.0*	*1.0*
Intra	BH1	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	25	25	22	<0.1	29	78
laboratory	SDUP1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	28	25	22	<0.1	35	81
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	26.5	25	22	nc	32	79.5
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	11%	0%	0%	nc	19%	4%
Inter	TP2	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	27	31	35	0.1	32	71
laboratory	SDUP2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	23	18	11	<0.1	22	69
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	25	24.5	23	0.075	27	70
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	16%	53%	104%	67%	37%	3%
Field	TB-S1	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	1/06/22																						
Field	FR-S1-SPT	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	3/06/22																						
Trip	TS-S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	1/06/22																						

Result outside of QA/QC acceptance criteria (highlighted)

Appendix D: Waste/Materials Tracking Template

Imported Materials Register

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

Exported (Waste) Materials Register

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

Appendix E: Guidelines and Reference Documents

Contaminated Land Management Act 1997 (NSW)

Environmental Planning and Assessment Act 1979 (NSW)

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

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

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

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

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy (Resilience and Hazards) 2021

Work Health and Safety Regulation 2017 (NSW)

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