Statement of Environmental Effects

Residential Subdivision
2 and 2A Bullecourt Avenue
Milperra

Client
Mirvac Residential (NSW) Developments Pty Ltd

Issued
4/10/2024



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Issued:	4/10/2024
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Surveying
Asset Recording
Civil Engineering
Infrastructure Engineering
Traffic & Transport Engineering
Environmental Consulting
Water Resource Engineering
Strata Certification (NSW)
Town Planning
Urban Design
Landscape Architecture
Project Management

Revision Table

REV	DESCRIPTION	DATE	AUTHORISED
A	Draft for Coordination	3/04/2024	IC
B	Draft for Pre-DA	29/08/2024	SG
C	Final for Pre-DA	30/08/2024	IC
D	Final for DA Lodgement	4/10/2024	IC

Acknowledgment

Beveridge Williams acknowledges the Traditional Custodians of the land on which we live/work and recognise their continuing connection to Country. We pay our respect to Elders past, present and emerging and extend that respect to all Aboriginal and Torres Strait Islander peoples.

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- **Appendix C** – Acoustic Assessment prepared by Renzo Tonin & Associates, dated 20/09/2022 Ver 6
- **Appendix D** –Arboricultural Impact Assessment by Temporal Tree Management, dated 01/10/2024
- **Appendix E**– Bushfire Hazard Assessment prepared by Blackash Bushfire Consulting, dated 18/09/2024
- **Appendix F** – Cost Estimate Report by Beveridge Williams
- **Appendix G** – Heritage Impact Assessment by Extent Heritage, dated 16/09/2024, Final 0.2
- **Appendix H** – Heritage Interpretation Approach by Urbis, dated 3/10/2024
- **Appendix I** – Traffic Impact Assessment prepared by The Transport Planning Partnership dated 20/09/2024 Ver 03.
- **Appendix J** – Waste Management Plan by Mirvac Residential (NSW) Developments, dated 24.05.2024
- **Appendix K** – Detailed Site Investigation prepared by Alliance Geotechnical, dated 30.01.2020, Ver 1
- **Appendix L** – Supplementary Stage 2 Detailed Site Investigation prepared by Sydney Environmental Group, dated 22.02.2024 Ver 1
- **Appendix M** – Remedial Action Plan prepared by Alliance Geotechnical, dated 15.09.2022 Ver 03
- **Appendix N** – Remedial Action Plan prepared by Sydney Environmental Group, dated 30/09/2024
- **Appendix O** – Landscape Concept Design by Urbris
- **Appendix P** – Water Cycle Management Plan prepared by Beveridge Williams, dated 26/09/2024
- **Appendix Q** – Civil/Engineering Plans prepared by Beveridge Williams, dated 3/10/2024, Ver. D
- **Appendix R** – Detailed Survey Plan by Beveridge Williams, dated 4/09/2024, Ver A
- **Appendix S** – Subdivision Plan prepared by Beveridge Williams, dated 1/10/2024, Ver. E
- **Appendix T** – Staging Plan prepared by Beveridge Williams, dated 13/06/2024, Ver. E



Figure 1: Aerial Photograph showing site and locality
Source: Nearmap

1 INTRODUCTION

1.1 Overview

Beveridge Williams has been engaged by Mirvac Residential (NSW) Developments Pty Ltd (Mirvac) to prepare a Development Application (DA) for an eighteen (18) Lot Torrens Title Subdivision at 2 & 2A Bullecourt Avenue Milperra (Lot 2 in DP1291984 and Lot 1 in DP101147).

The site has until recently been used as the Milperra Campus of Western Sydney University (WSU). The existing campus is spread out, consisting of a range of buildings used for learning, student housing and office administration. In addition, the Campus also possesses ancillary parking, footpaths, open space and vegetation.

Over the past 24 months, students and staff have gradually transitioned to the WSU Liverpool CBD Campus with remaining faculties having moved to the recently completed Bankstown CBD campus developed as a key component of WSU's Western Growth Strategy, an ambitious program that is reshaping the University's campus network with hi-tech state of the art campuses and city centre placemaking.

The proposed redevelopment of the Milperra campus will build organisational capacity for the University, and develop funding streams for its teaching, learning and research to serve the needs of the western Sydney community.

To facilitate a redevelopment of the site, Mirvac and WSU have entered into an agreement to redevelop the site for residential, business, recreation and conservation uses. As a result, the existing Milperra campus

(except for the childcare centre) was fully vacated on 31 December 2023. The childcare centre will remain operational during the 2024 calendar year and refurbished and re-opened thereafter.

The site has been rezoned under Planning Proposal PP-2021-5837 to enable the proposed master planned community, which is designed to provide optimum amenity for the existing and future residents within the neighbourhood. The Planning Proposal was gazetted on 14 June 2024 with the Voluntary Planning Agreement being executed by all parties.

This Statement of Environmental Effects (SEE) details the necessary information for the proposed Eighteen (18) Lot Torrens Title Subdivision to be assessed by the consent authority, being Canterbury-Bankstown Council, including a description of the site, its surrounds, and in accordance with Section 4.15 of the *Environmental Planning and Assessment Act 1979* (The Act), an assessment of the proposal against the relevant matters for consideration and planning controls. It has been prepared in accordance with Section 24 of the *Environmental Planning & Assessment Regulation 2021* (EP&A Reg) for the purposes of:

- demonstrating the development ultimately promotes maintaining site biodiversity by designing and siting the development to avoid significant adverse environmental outcomes through the retention of significant trees where viable; and
- outlining the appropriate measures the development has undertaken to demonstrate the approach to avoid, minimize or mitigate adverse environmental outcomes; and
- ensuring the development continues the above philosophy throughout the ongoing management and subsequent stages of the project.

The enclosed documentation identifies the extent of works proposed to be undertaken in order to facilitate this Torrens Title Subdivision. The DA is accompanied by a Subdivision Plan which details the proposed allotments, sizes and dimensions, relevant engineering plans detailing the physical works that are required to be constructed and fundamental environmental investigations and supporting technical reports and plans.

1.2 Background

The Milperra College of Advanced Education occupied the site between 1975 and 1983 followed by the Macarthur Institute of Higher Education in 1989. In 1989 the Hawkesbury Agricultural College and the Nepean College of Advanced Education were amalgamated to form the University of Western Sydney. The WSU Milperra Campus is one of 11 WSU campus sites throughout western Sydney. In recent years all campuses have changed their name to Western Sydney University (WSU). The campus previously supported students, staff, and faculty by providing learning facilities, student accommodation, staff offices, childcare centre, recreational amenities, and car parking. In 2016 the campus supported approximately 8,166 students, 195 academic staff and 128 professional staff.

The site has been rezoned to allow for reinvestment into the University's objects and functions under the *Western Sydney University Act 1997*. The Milperra Campus has relocated to the Bankstown CBD where increased access to public transport and other services are available. Approximately 3.7ha of land in the southeast portion of the site has recently been subdivided and transferred to the adjoining Mount St Joseph Catholic College to allow for expansion opportunities. This parcel of land being Lot 102 DP 874035 does not form part of the masterplan to redevelop the campus.

Mirvac and the WSU have entered into an agreement to redevelop the land for residential purposes. Mirvac are industry leaders in providing residential developments that focus on high quality open space and community centric facilities which not only creates an all-inclusive neighbourhood but will integrate seamlessly with the existing residential community.



Figure 2: Indicative Master Plan with Houses
Source: Mirvac

The demolition of all structures has been approved under DA-1512/2023(PAN-381273), which was approved by Canterbury Bankstown Council (Council) on 31/05/2024. Demolition of the structures haven't commenced yet but is imminent.

Included in Appendix R is a copy of the indicative Staging Plan for the development. This documents the proposed delivery of the roads and services infrastructure. Mirvac aim to deliver all dwellings within this development.

1.3 Supporting documentation

The following documents accompany, and should be read in conjunction with, this SEE:

- **Appendix A**: – Deposited Plan 1291984
- **Appendix B** – Voluntary Planning Agreement between Canterbury-Bankstown Council, Western Sydney University and Mirvac
- **Appendix C** – Acoustic Assessment prepared by Renzo Tonin & Associates, dated 20/09/2022 Ver 6
- **Appendix D** –Arboricultural Impact Assessment by Temporal Tree Management, dated 01/10/2024
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- **Appendix R** – Detailed Survey Plan by Beveridge Williams, dated 4/09/2024, Ver A
- **Appendix S** – Subdivision Plan prepared by Beveridge Williams, dated 1/10/2024, Ver. E
- **Appendix T** – Staging Plan prepared by Beveridge Williams, dated 13/06/2024, Ver. E

2 SITE & DEVELOPMENT CONTEXT

2.1 Locality

The site is in Milperra which is a suburb located 24km southwest of the Sydney Central Business District and is in the local government area (LGA) of Canterbury Bankstown. Milperra is bordered by the Georges River and features several parks and reserves including Bankstown Golf Course. The local area consists of a mix of residential, commercial, educational, recreation and industrial land uses.

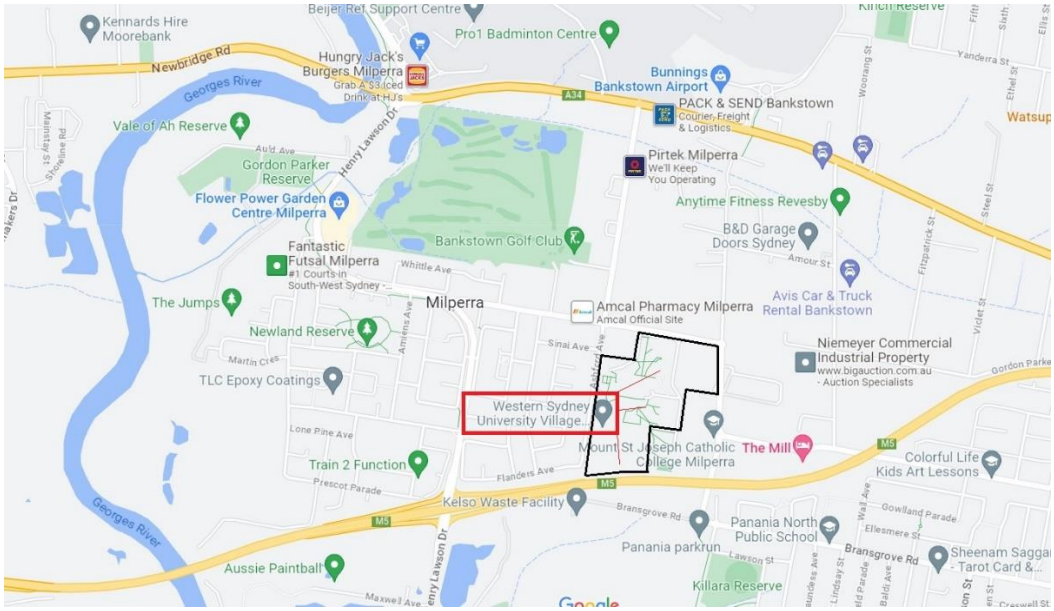


Figure 3: Locality Map
Source: Google Maps

2.2 Site Description

The site is identified as Lot 1 in DP101147 and Lot 2 in DP1291984 with a street address of 2 & 2A Bullecourt Avenue Milperra.

The site has an area of 19.62 ha and is bounded by Bullecourt Avenue to the north, Horsley Road to the east, M5 Motorway to the south and Ashford Avenue to the west. Adjoining the northwestern corner of the site is a council owned hockey/soccer field named 'Milperra Reserve' and the Mount St Joseph's Catholic School occupies a large area adjoining the eastern boundaries with frontage to Horsely Road. The northeastern corner of the site contains a large area of protected remnant Cumberland Plain Woodland (excluded from the development area). The majority of the site falls from the northeastern corner down to the southwestern corner.

The Milperra Campus currently has a total of 43 buildings ranging from single storey administration buildings and structures to three storey student housing buildings. Most buildings are constructed from bricks with aluminium windows and metal roofs. All existing buildings have been approved for demolition via DA-1512/2023.

The site was formally Lot 103 in DP 874035 and originally contained buildings 17, 18 and 19. A two lot subdivision of Lot 103 under DA 350-2020 created Lot 104 DP1268911 and Lot 105 DP1268911. Lot 105 DP1268911 was then converted to Lot 2 DP 1291984 following a comprehensive redefinition of the survey boundary. Mount St Joseph's Catholic School has since purchased Lot 104 (approximately 3.7Ha) to be part of the school.

The northern side of Bullecourt Avenue is occupied by light industrial buildings and warehouses, the southern side is mostly lined with trees, swales, and an acoustic fence providing a buffer to the M5 Motorway. The western side of Ashford Avenue is primarily residential development with some commercial opposite Milperra Reserve, while the eastern side of Horsley Road is mostly industrial units. The northwestern corner of the site adjoins the council owned hockey fields.

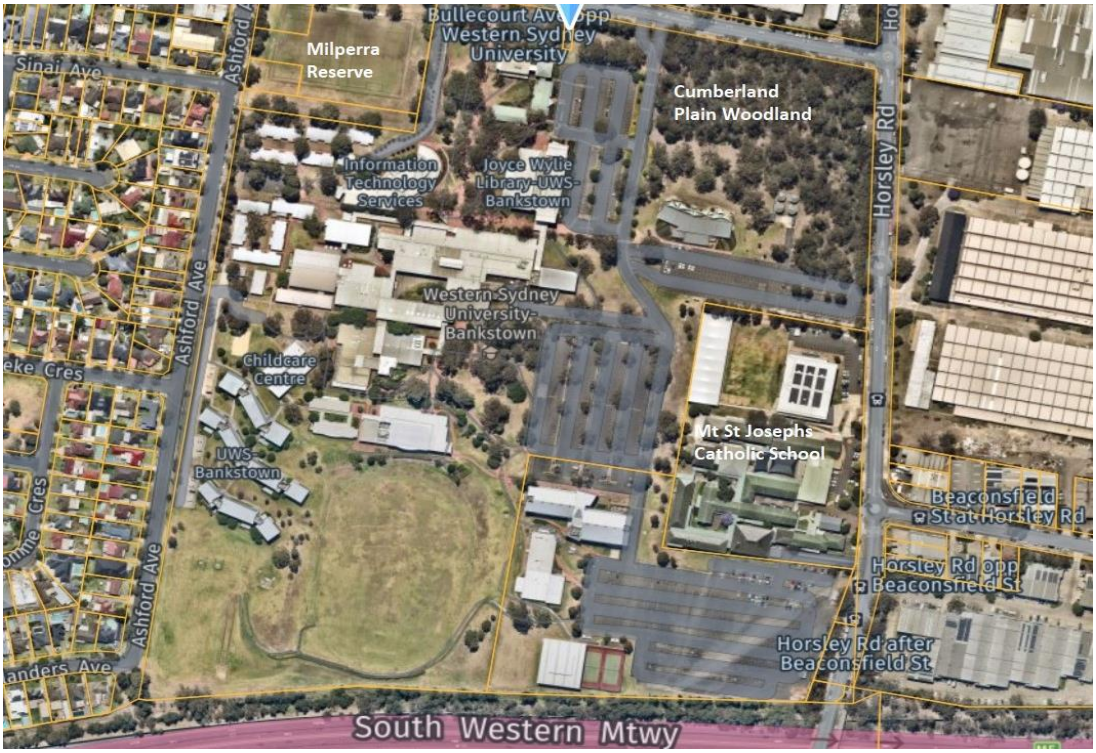


Figure 4: University Campus and Adjoining Sites
Source: Nearmap (24/10/2023)

3 THE PROPOSAL

This DA seeks consent for the subdivision of the site to create Eighteen (18) Torrens Titled Lots. 16 of these lots are proposed as final residential lots, with two (2) residue lots also proposed, which will be subject to future Development Applications. All the final residential lots proposed under this DA will have a frontage to Ashford Avenue with an east-west alignment.

For clarity, this development application is not intended to be staged. Where this report and other documentation refers to future staging, i.e. Stages 2 to 6, this staging refers to the sequencing of the site as a whole, and how this application precedes these future stages/Development Applications.

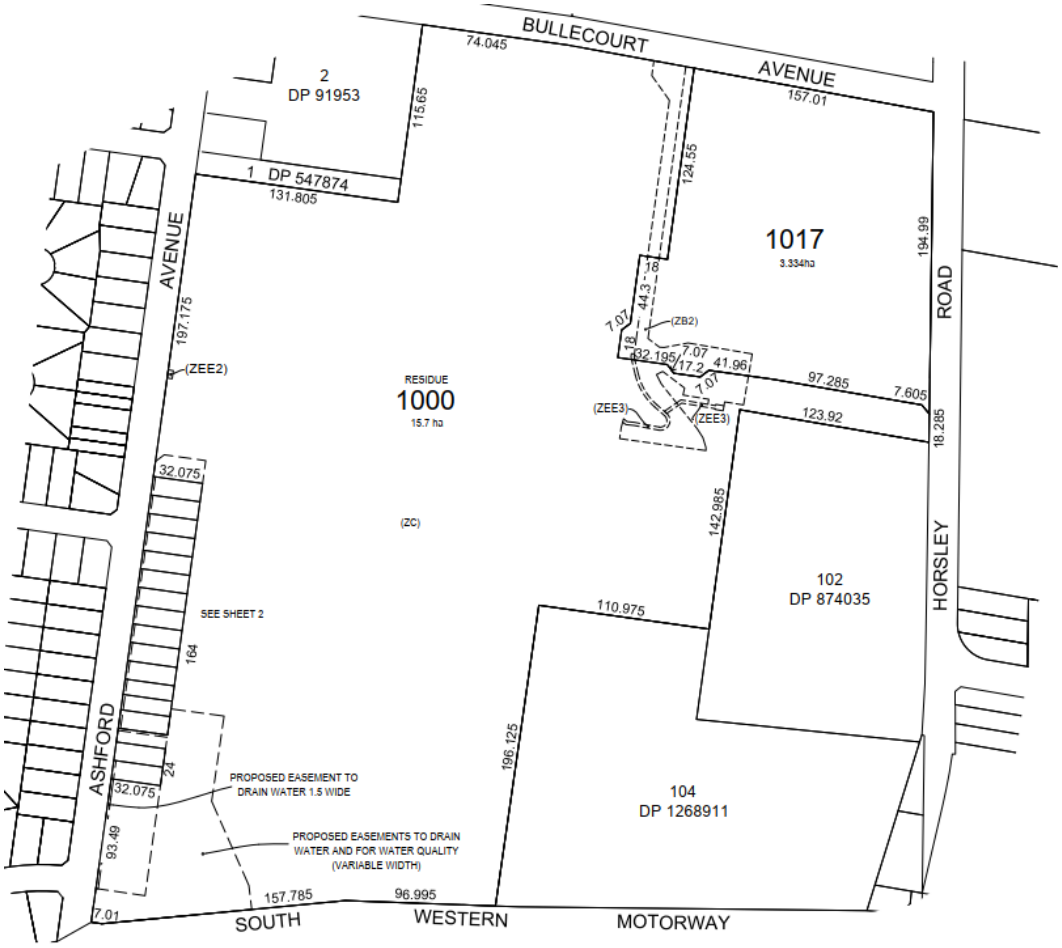


Figure 5: Subdivision Plan, Lot 1000 and 1017

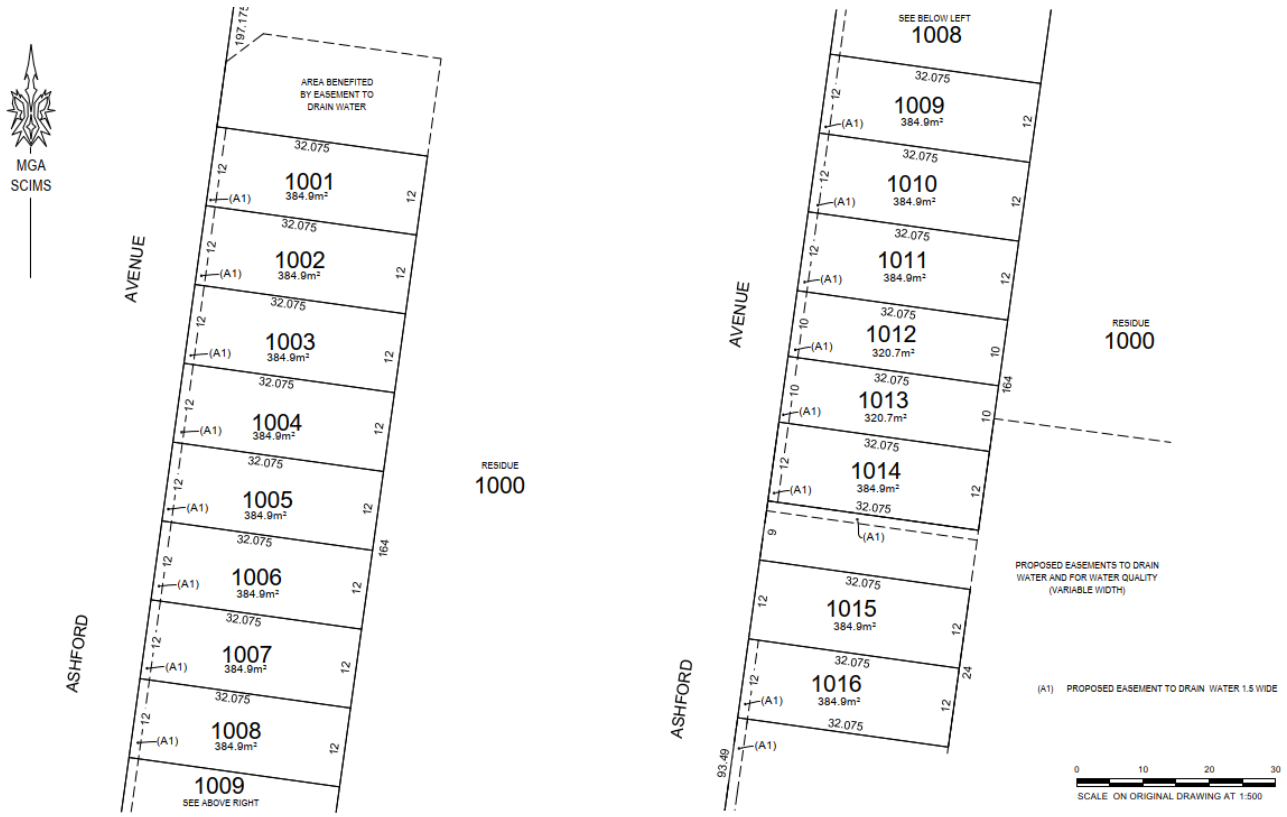


Figure 6: Lots 1001 to 1016

The development lots will all have a consistent size of 320.7m² and 384.9m², with all lots having a width of 10m or 12m and a depth of 32.075m. These lots are considered appropriate for their intended purpose, which is to accommodate future residential dwellings (subject to future applications) in a residential setting.

Table 1: Lot Information

Lot Number	Lot Classification	Width	Depth	Total Size
1000	Residue Lot	Variable	Variable	15.69 Ha
1001-1011 & 1014-1016	Development Lot	12m	32.075m	384.9m²
1012 & 1013	Development Lot	10m	32.075m	320.7m²
1017	Residue Lot	Variable	Variable	3.344 Ha

Lot 1000 is intended to be created as a residue lot, which will be subject to future Development Applications. Despite the irregular nature of Lot 1000 it is able to be further subdivided in an orderly fashion as per the Master Plan for the site and ensuring all new lots are regular in arrangement and able to accommodate future development.

Lot 1017 is also intended to be created as a residue lot, which will be subject to further Development Applications. Despite the irregular nature of Lot 1017, it is able to be further subdivided in an orderly fashion as per the Master Plan for the site, ensuring new roads are in the correct alignment and all the C2 and B1 land are in a single lot. This will assist in realising VPA requirements as the C2 land will be on a separate lot and be the subject of stand alone DAs.

It is noted that the existing Childcare Centre is wholly located within proposed Lot 1017, while the current car park is located on Proposed Lot 1000. It is noted that the Childcare centre will temporarily cease operations at the end of 2024 as a future DA will be lodged for road construction, new carpark, services and alterations / additions to the existing Childcare building on Proposed Lot 1017. This future DA will provide road access as per the Structure Plan including the intersection on Horsley Road and also service/parking wholly on the Child Care lot. Further, an easement will be placed over the existing car park located on Lot 1000 to the benefit of Lot 1017 to provide a temporary easement for access, parking and services.

Between Lot 1014 and Lot 1015 is a portion of Residue Lot 1000, which has a width of 9m. This land is intended to form part of a future pedestrian link (will ultimately be dedicated as public road under Stage 3)). This pedestrian link is detailed in the Master Plan for this site, with this development not prejudicing the future construction/dedication to Council. For simplicity, it has been retained in the residue lot, as there is no benefit dedicating this land to Council at this stage of the development process as part of this DA. Any future dwelling construction on Lots 1014 and 1015 will be developed to permit casual surveillance of the future pedestrian link.

It is noted that the demolition of the existing structures within the footprint of this proposed development has been approved as part of DA-1512/2023. This DA is reliant upon the preceding demolition DA.

Other incidental works associated with the subdivision that form part of the application include;

Earthworks

Earthworks are proposed to regrade the Ashford Avenue verge to ensure it has a grade which meets Council's requirement of 2.5%. Further, benching of the proposed lots will occur to ensure that the future dwellings have a level building pad. Minor retaining wall structures are proposed at the rear of the proposed lots from Lot 1004 through to Lot 1016 and also to the sides of the portion of Lot 1000 intended for the future pedestrian link.

Sediment and Erosion Controls

Sediment and erosion controls measures will be installed and progressively adjusted to suit site conditions as site gradients change throughout the course of the earthworks scope. This will include a mixture of silt fencing installation; temporary swale drains to ensure suitable water flow across catchments in to a sediment basin. Depending on the level of flow and permeability of the soils, the temporary basin may need to be adjusted in size to suit the flow to ensure that during the course of a rain event, the basin does not overflow. All works will be undertaken in compliance with the *Blue Book*.

Contamination/Remediation

The detailed site investigation *Appendix J – Detailed Site Investigation 2 Bullecourt Avenue Milperra* identified numerous locations across the proposed built form areas where contamination has been identified in the borehole logs. Remediation works will be undertaken in accordance with *Appendix L – Remediation Action plan 2 Bullecourt Avenue Milperra*. This will ensure the site is suitable for residential accommodation.

Stormwater and Temporary Basin Works

A 1.5m wide drainage easement (with associated pits, pipes and connection points for future dwellings) will be placed within the western boundary of the proposed lots, along the Ashford Avenue frontage. This easement will collect stormwater from each lot and convey it to the southwestern corner of Residue Lot 1000, where a temporary stormwater basin will be located. This basin will already exist prior to the Stage 1 works beginning. This is because it will be constructed as a temporary sediment basin to address sediment control under the Demolition DA. It will be maintained initially as a sediment basin during the Stage 1 works. Following stabilisation of the site the temporary sediment basin will be converted to a temporary bioretention basin (raingarden) and improve water quality of stormwater discharging from the Stage 1 development (including future houses. It is noted that this basin does not provide an OSD function. This is because OSD is not required for Stage 1. Stage 1 occurs after the demolition of the existing buildings and hardstand areas on the site. As such, the impervious area of the site (even following the house construction in Stage 1) is less than what it is under current conditions. This results in lesser peak flows than under existing conditions which means that OSD is not required for the Stage 1 development (including future houses). This is detailed in the Water Cycle Management Plan for Stage 1 appended to this report.

Temporarily, this basin will be retained by the landowner, with a restriction on title placed on Residue lot 1000 to ensure its maintenance and upkeep. Ultimately, this basin will be removed and filled to allow for future residential development in Stage 3. When this occurs, the stormwater from Stage 1 will be directed to permanent Basin No. 2 located in the southwestern corner (detailed in the Masterplan). Permanent Basin No. 2 requires adjustments to the sewer, retaining walls and removal of trees in the M5, it will be constructed under the future Development Application for Stage 3.

Utilities

The subdivision works include the augmentation of the existing services, including;

- **Electricity:** New connection points will be provided for each lot, currently this is an overhead system along Ashford Avenue. It will be relocated underground on the eastern side of Ashford Avenue as part of this application, in accordance with the VPA. It is noted existing trees along Ashford Avenue, of primarily poor structure and low-moderate retention value per the arborist report, are within the standard allocation of electrical infrastructure from both a plan and depth perspective. Design alternatives have been investigated to propose the alignment on the opposite side of Ashford Avenue and also outside of standard allocation – however these alternatives impact vegetation of higher significant and maturity or result in no change to potential impacts to structural root zones.

- **Potable Water and Sewer:** The existing infrastructure within Ashford Avenue, will be extended and provide a new connection point for each new lot.
- **Telecommunications:** The existing systems in Ashford Avenue, will be extended and provide a new connection point for each new lot.

Landscaping Embellishment and Tree Removal Works

Trees and shrubs located within the extent of Lots 1000 to 1016 will need to be removed to facilitate the subdivision, ancillary earthworks and future building pads. New street trees will be installed following the construction of the houses (subject to a future DA). It is proposed to use trees that are native to the area. As such, it is proposed that trees propagated from the C2 Environmental Conservation zone in the northeastern corner of the site be utilised. These trees are currently being propagated and are expected to be planted in May 2026 following the house construction by Mirvac on all 16 lots, with an expected capacity of 45L at that point in time. Using local Cumberland plain woodland species increases the opportunity for the community to flourish.

4 STATUTORY CONSIDERATIONS

4.1 Legislative Framework and Permissibility

Proposed developments are assessed in accordance with various legislative requirements which includes Acts, regulations state polices and local environmental plans. The following legislation and policies apply to the proposed development.

4.2 Environmental Planning and Assessment Act 1979

The proposed development requires consent under Part 4 of the EP&A Act. The EP&A Act is the governing legislation for development assessment in New South Wales. It governs matters such as planning administration, planning instruments, development assessments, building certification, developer contributions and appeals. It outlines the development process and details different types of development applications.

The EP&A Act requires consideration of a proposal in relation to its impacts on the environment. Section 4.15 of the EP&A Act outlines matters for consideration that are to be addressed. This includes consideration of the relevant environmental planning instruments, development control plans, any planning agreements, regulations as well as the likely impacts of the development, suitability of the site, submissions, and the public interest. These have been summarised in the table below, along with consideration in relation to the proposed development.

Table 2: Section 4.15(1) Matters for Consideration

Section 4.15 (1) matter	Consideration
(a) The provisions of:	
i. any environmental planning instrument, and	Relevant environmental planning instruments (EPIs), include the SEPP Biodiversity and Conservation 2021, SEPP Resilience and Hazards 2021 and the Canterbury Bankstown LEP 2023. Details in **Section 4.3.1**, below. As a Planning Proposal which will alter the planning controls is imminent and likely to occur, minimal weight should be given to the current LEP that is subject to change.
ii. any draft environmental planning instrument that is or has been placed on public exhibition and	No draft EPIs apply to the site.

details of which have been notified to the consent authority (unless the Director General has notified the consent authority that the making of the draft instrument has been deferred indefinitely or has not been approved), and	
iii. any development control plan, and	The Canterbury Bankstown Development Control Plan 2023 (CBDCP) has been considered in detail in **Section 4.3.2, below.**
iiia. any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and	A VPA has been executed between Council, the land owner and Mirvac. The consent authority is to have regard to this VPA when assessing the application. This has been considered further in **Section 4.6** below.
iv. the regulations (to the extent that they prescribe matters for the purposes of this paragraph),	The regulations have been considered in relation to their respective Acts, as relevant to the proposal.
(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,	Potential impacts arising from the development have been considered in detail in **Section 4.7**, below.
(c) the suitability of the site for the development,	The site is considered to be suitable for this development, being the subdivision of the site in 16 residential lots. The recent LEP amendments reinforces the site's suitability for use as residential accommodation, with this subdivision a vital step in facilitating this by creating appropriately sized and serviced lots to enable future residential accommodation.
(d) any submissions made in accordance with this Act or the regulations,	To be considered by the consent authority following exhibition of the DA.
(e) the public interest.	The proposal is in the public interest as the subdivision will facilitate future residential accommodation in a residential context. Any adverse environmental impacts that may arise from this development have been addressed through the technical reports and documents submitted with this application.

4.3 Provisions of Environmental Planning Instruments (EPIs)

The following EPIs are applicable to the site and have been considered in the preparation of this development application.

4.3.1 State Environmental Planning Policy (Resilience and Hazards) 2021

Chapter 4 Remediation of Land

This chapter provides a statewide framework for the remediation of contaminated land throughout the state. The remediation of land is promoted where required to reduce risk to human health.

Clause 4.6(1)(a) of the SEPP requires the consent authority to consider whether the land is contaminated before they consent to the carrying out of any development on land. If the land is contaminated the consent authority is to be satisfied that the site is fit for the intended purpose in its contaminated state, or if it can become fit for its intended purpose after remediation.

Multiple detailed site investigations have been undertaken which assessed the potential for contamination to be present on the site in accessible areas because of past and current land uses. The assessment by Alliance Geotechnical (AG) found that a supplementary contamination assessment was required to determine the nature and extent of contamination on the site and address the data gaps made by the building footprints on the site. A remedial action plan (RAP) has been prepared to validate the areas of concern.

A Site Audit Report has been prepared to determine the extent of contamination and appropriateness of remediation in order to ensure the land can be made suitable for the proposed residential land use. The report concluded that the site does contain Friable Asbestos Containing Materials on site, with data gaps existing due to hard stand areas and existing buildings.

Furthermore, additional detailed investigations have been completed by Sydney Environmental Group (SEG) to help determine the limits of the contamination prior to building and hardstand demolition.

A Remedial Action Plan was prepared by AG (2022) and concludes that "*the remedial strategies and goals can be achieved and the site made suitable in informing future land use planning and rendering the suit suitable for proposed land use.*" Therefore, despite the existing contamination, the consent authority can be satisfied that the site can be made suitable for its intended purpose, being residential accommodation, satisfying the requirements of the SEPP.

Sydney Environmental Group prepared a Remedial Action Plan, which refines the previous RAP prepared by Alliance Geotechnical. This RAP concludes that "*the remedial goal can be achieved, and the site made suitable for the proposed land use setting*".

4.3.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

Chapter 2 Infrastructure

This chapter provides a statewide framework for the effective delivery of infrastructure across the state, by providing a consistent planning regime statewide and ensuring development does not have an adverse impact upon infrastructure.

As the site has frontage/is adjacent to a classified road (M5 – South Western Motorway), Section 2.119 *Development with frontage to classified road* is applicable to this development. The requirements of this clause have been satisfied as;

a) Safe, vehicular access to the land has been provided by an alternate road and not the classified road.
b) No vehicular access from the site is proposed to the Classified Road. No smoke will be emitted from the site, with construction measures proposed to mitigate the impact of dust. Direct access to the Classified Road is not proposed and the increase in traffic volume arising from this development is not anticipated to impact the ongoing efficiency of the classified road.

Section 2.120 *Impact of Road Noise or vibration on non-road development* is also applicable to this development as the proposal is to be used for residential accommodation and the site is adjacent to a freeway that has an average daily vehicle trip that exceeds 20,000. Please refer to the submitted Acoustic Report, which confirms that the dwellings will be able to limit the impacts of road noise through suitable mitigation measures.

4.3.3 State Environmental Planning Policy (Biodiversity and Conservation) 2021

The *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (BC SEPP) consolidates many former State Environmental Planning Policies (SEPPs) and Regional Environmental Plans (REPs) related to the environment. The chapter relevant to this development is Chapter 6;

Chapter 6 – Water Catchments

The subject site is located within the catchment draining to the Georges River system and as such the provisions of the deemed SEPP apply. The broad aim of the deemed SEPP is to ensure the impact of urban development on the Georges River is minimised by considering catchment management, water quality and quantity, and protection and management of environmentally sensitive areas, flora and fauna and wetland habitats. This DA seeks approval for subdivision and civil works. Appropriate sediment control and erosion measures will be implemented during the construction phase to ensure there is no adverse impacts on the Georges River system.

Operationally, the proposed lots will drain to a temporary stormwater basin, which will provide water quality improvement in accordance with Council's specifications. Quantity control is not required for Stage 1 due to the reduction in impervious area on the site. Future development of the proposed residue lot will require permanent OSD basins to be installed. Under Stage 1 the quantity and quality of water discharged into Councils stormwater system will result in no ongoing adverse impacts upon the Georges River System.

4.3.4 Canterbury Bankstown Local Environmental Plan 2023 (CBLEP)

Under the provisions of the CBLEP, the site has multiple zonings, being;

- R1 General Residential
- RE1 Public Recreation
- B1 Neighbourhood Centre
- C2 Environmental Conservation
- SP2 Infrastructure – Drainage

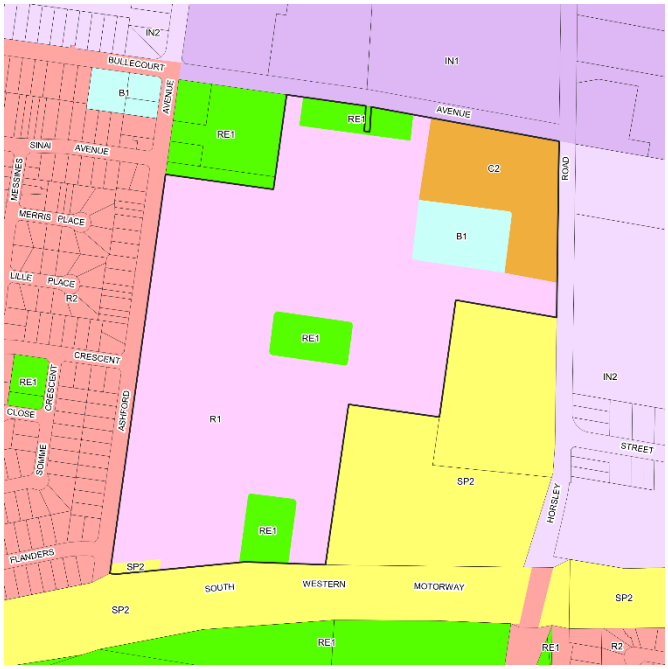


Figure 7: Land Zoning

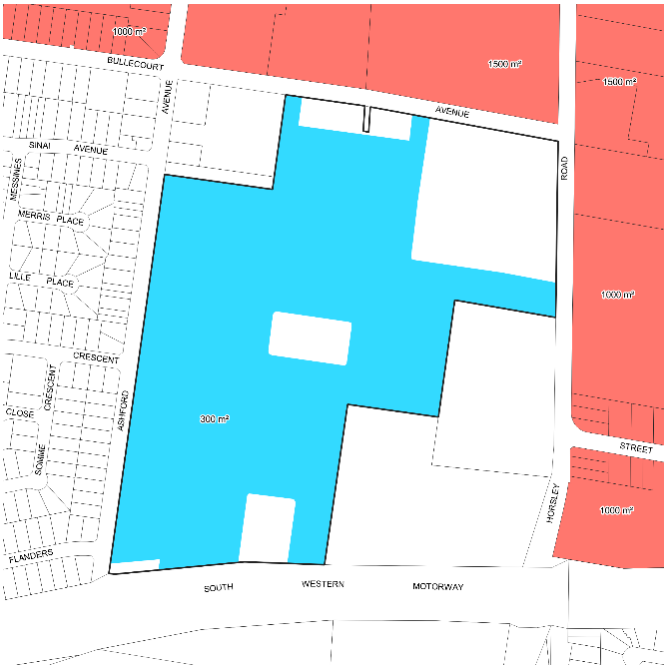


Figure 8: Minimum Lot Size

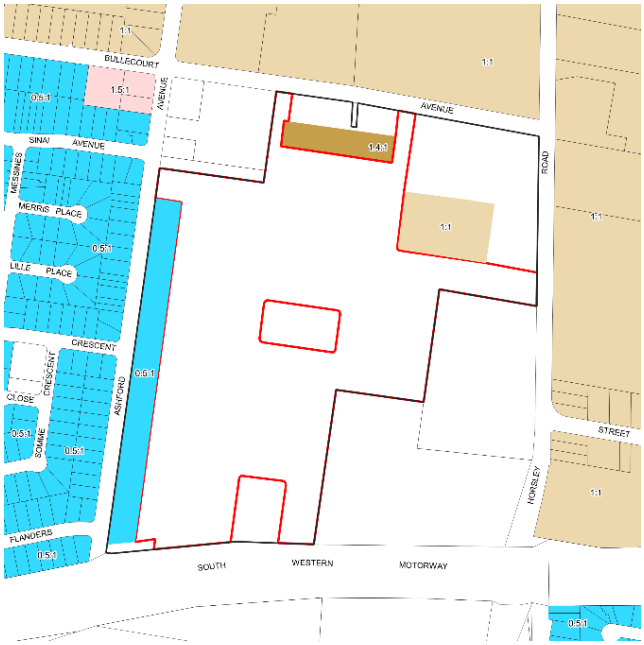


Figure 9: Floor Space Ratio



Figure 10: Height of Building



Figure 11: Heritage Items



Figure 12: Land Reservation Acquisition



Figure 13: Terrestrial Biodiversity

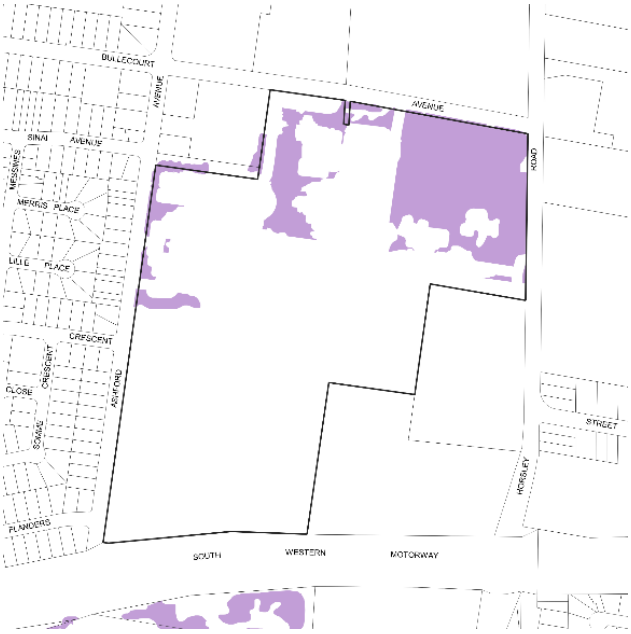


Figure 14: Biodiversity Values

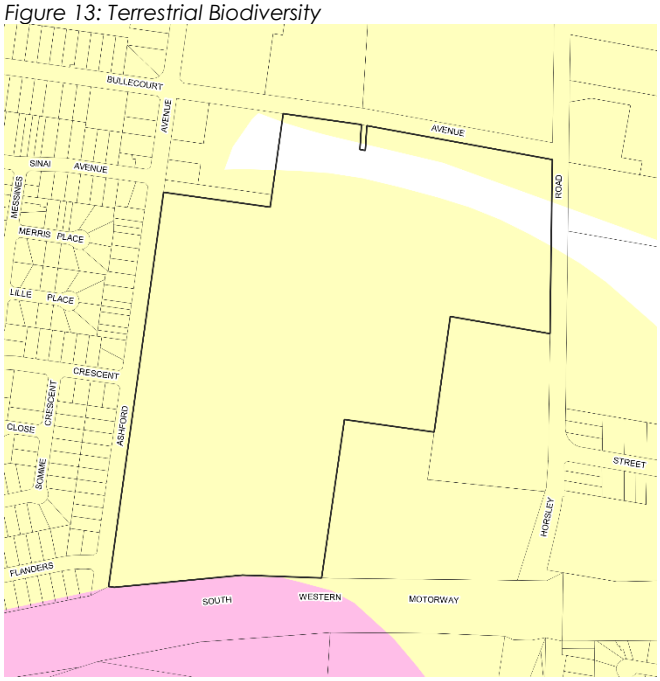


Figure 15: Acid Sulfate Soils

The following clauses of the CBLEP are relevant to the proposed subdivision.

Clause 2.3 Zone objectives and Land Use Table requires that a land use be permissible under a zone in order to be carried out on the site. It is noted that the portion of the site subject to this development application is zoned R1 General Residential, with the subdivision to facilitate future residential development.

Clause 2.6 Subdivision – Consent Requirements allows land subject to this Plan to be subdivided, but only with development consent. As the proposal is seeking Development Consent for subdivision, this clause has been met.

Clause 4.1 Minimum Subdivision Lot Size requires that each new lot, must meet the required lot size, as per the relevant Minimum Lot Size Map. The minimum lot size for the site is 300sqm. All the residential lots (Lot

1001 to Lot 1016) meet this minimum lot size. The two residue lots exceed this and can facilitate future development.

Clause 4.1B Minimum lot sizes and special provisions for certain dwellings requires that development consent can not be granted for dwelling houses in Special Area 8 (being the Former WSU site) that adjoin Ashford Avenue, unless they have a lot size of 300m^2. Despite this application not including the dwelling houses, all lots exceed 300m^2 and can accommodate future dwelling houses.

Clause 5.10 Heritage conservation is required to be considered due to the proximity of nearby heritage listed items.

Subclause (5) states that the consent authority may require a heritage assessment before granting consent to any development on land that is in the vicinity of land where a heritage item is located or on land within a heritage conservation area.

The site is not heritage listed or contain an item of heritage significance; however, the site is bounded by a locally listed heritage item: *Milperra Soldier Settlement (former) Item No.218* which relates to the street alignment of the former Milperra Soldiers Settlement.

The proposed subdivision does not intend to realign Ashford Avenue, or Bullecourt Avenue, with these roads proposed to remain within their current reserve. No new roads or intersection stubs are required to be constructed under this proposal. However, it is proposed that vehicle crossings be provided in the existing kerb to accommodate the future residential dwelling driveways. In addition, the existing eastern verge of Ashford Avenue will be regraded to 2.5% in accordance with accessibility guidelines for crossfall and a concrete pedestrian path will be provided.

The SoHI also states that there is a low risk of Aboriginal objects being uncovered due to the site being highly disturbed in the past. However, if by chance an Aboriginal artefact is found, an Aboriginal Heritage Impact Permit (AHIP) may be required.

Clause 5.21 Flood Planning is required to be considered as the site is partially flood affected. Council can be satisfied that Development consent can be granted to the proposed subdivision as;
(2)(a) the development is compatible with the flood function and behaviour of the land, noting that the site is flood affected by way of flood storage, meaning the minor filling required would not impact upon the flood behaviour, especially as compensatory storage has been provided.
(2)(b) as compensatory storage is being provided on site, with the site being affected by flood storage, there will be no impacts upon adjoining properties, by way of increased flooding or additional risk.
(2)(c) all future lots are located above the 1% AEP plus 500mm freeboard and associated accessways, which will provide a suitable evacuation route if required.
(2)(d) All future lots have sufficient alternate access from the proposed lots to a public road system which is capable of safe and efficient evacuation if required.
(2)(e) Appropriate measures will be installed and maintained throughout the construction phase to ensure there is no erosion, siltation or destruction of riparian vegetation. Further, operationally these works will be stabilised through landscaping and would have no downstream impacts.

Clause 6.1 Acid sulphate soils applies as the site is identified as being Class 5 Acid Sulphate Soils. Class 5 refers to works within 500m of adjacent Class 1, 2, 3 or 4 land that is below 5m Australian Height Datum (AHD) and by which the water table is likely to be lowered below 1m AHD on adjacent Class 1, 2, 3 or 4 land.

The excavation/earthworks required under this subdivision will not lower the water table to under 1m AHD. Therefore, while the site is within 500m of Class 3 land there is no excavation expected to occur below 1m AHD.

Clause 6.2 Earthworks applies as the development involves earthworks and contouring of the site to facilitate future built form. The following items have been considered as;

a) There will be minimal disruption to the drainage patterns of the land, as the benching of the lots follows and steps down with the existing contours of the land.
b) The earthworks will assist in future development of the land and facilitate residential development.
c) The quality of the fill used on site as part of the filling works will be VENM or ENM as required, whether it be sourced from on site or offsite.
d) The adjoining neighbours across Ashford Avenue will have minimal impacts as the levels at the road are being maintained, with this development tying into the existing levels.
e) Excess excavated material will be stockpiled to be reused in future stages unless unsuitable in which case it will be disposed of at relevant waste disposal areas.
f) Given the sites history and previous uses, it is a large disturbed site with little chances of finding relics, however, if found works will stop and the relevant authorities contacted.
g) The site is not located near a waterway, drinking water catchment or an environmentally sensitive area, therefore it is unlikely to have adverse impacts on waterways.
h) Appropriate measures such as sediment fencing, temporary fencing and dust mitigation measures will be implemented during construction as required.

Clause 6.3 Stormwater management and water sensitive urban design applies as the development is located on land which is zoned as R1, RE1, B1, C2 and SP2- Drainage. This clause requires that the adverse impacts of urban stormwater on adjoining properties, native bushland, waterways and ground water systems be minimised through the development. Reference should be made to the concept engineering plans and the Water cycle Management Report prepared by Beveridge Williams that have been lodged with this application. They detail the stormwater strategy for this site and addresses the requirements under subclause (3) as a temporary stormwater basin has been proposed which will improve the quality of stormwater discharging from the Stage 1 development area prior to discharge from the site.

Clause 6.4 Biodiversity is required to be considered as the site is currently mapped as "Terrestrial Biodiversity" on the relevant map in the LEP, it is noted that the mapped extent is limited to the northern portion of the site. The subject subdivision and associated works do not propose the removal of significant species of vegetation and are wholly located outside of the mapped Terrestrial Biodiversity Area. The proposed subdivision works therefore does not impact biodiversity qualities of the site.

Clause 6.9 Essential Services requires that development consent must not be granted unless the consent authority has considered whether adequate arrangements for servicing have been made. This site has previously operated as a university, which had a capacity of 8,166 students, 195 academic staff and 128 professional staff (this use has now ceased). This subdivision is proposed for 16 residential lots and there are sufficient arrangements for utility services to be provided to this development. Relevant utility and service providers have been consulted in developing the servicing designs and strategies.

Clause 6.34 Development at 2 and 2A Bullecourt Avenue, Milperra applies as the development is located at the subject address, being 2 and 2A Bullecourt Avenue. The proposal is for a subdivision which will allow for 16 dwelling houses to be constructed, as this is the first application for subdivision on the site, the total yield of the site is 16, which is below 430.

4.4 Canterbury Bankstown Development Control Plan 2023

Canterbury Bankstown Development Control Plan 2023 (CBDCP) provides detailed guidelines for development on land in the Canterbury Bankstown Local Government Area. The following Parts of the CBDCP are relevant to the proposed development:

4.4.1 Chapter 2.3 Tree Management

The site contains many mature trees and vegetation in the form of plants and hedges etc. Development consent is required to remove any tree that is:

> (a) located on a site listed as a heritage item in Schedule 5 of the Canterbury Bankstown Local Environmental Plan 2023; or
> (b) located on land included on the Biodiversity Map under the Canterbury Bankstown Local Environmental Plan 2023.

Chapter 2.3 describes the prescribed trees are required to be considered when development is proposed. The following trees are to be considered:

> *(a) all trees that are 5m or more in height; and*
> *(b) all mangroves, regardless of size; and*
> *(c) all trees, regardless of size, listed as Vulnerable or Endangered or a component of an Endangered Ecological Community listed under the Biodiversity Conservation Act 2016; and*
> *(d) all trees, regardless of size, listed under the Environmental Protection and Biodiversity Conservation Act 1999; and*
> *(e) all trees, regardless of size, located on land included on the Biodiversity Map under the Canterbury-Bankstown Local Environmental Plan 2023; and*
> *(f) all trees, regardless of size, located on sites listed as a heritage item in Schedule 5 of the Canterbury-Bankstown Local Environmental Plan 2023; and*
> *(g) all trees, regardless of size, located in the foreshore area under the Canterbury Bankstown Local Environmental Plan 2023.*

The trees along the Ashford Avenue frontage are proposed to be removed to facilitate the undergrounding of the powerlines and the trees within proposed Lot 1000-1016 are proposed to be removed as the sites will be benched ready for future dwellings and other ancillary works. However, the development has been sensitively designed to allow the trees within Ashford Avenue to be retained if required. The undergrounding of the power line and ancillary tree removal is to address VPA item No. 12. However, the applicant may wish to include these works as part of this initial stage 1 application. Due to the uncertainty with timing, flexibility is requested with this application in this regard. For completeness, an arborist report that covers all these trees have been provided (Refer to **Appendix D**). A condition such as the below or to a similar effect is requested to provide this flexibility;

> *"VPA item 12 requires that the existing overhead powerlines within Ashford Ave are to be relocated underground and practical completion received prior to the issuance of the OC for the final residential lot along Ashford Avenue. As the creation of Lots 1001-1016 are not linked to the final OC for the final residential lot along Ashford Avenue this VPA item is not required to be completed under this Stage 1 DA.*
>
> *However, should the applicant wish to complete this VPA item as part of the Stage 1 works then permission is granted to remove trees 16-25 under this Stage 1 DA if they will be affected by the*

undergrounding electrical works being completed as Part of Stage 1. If the undergrounding works along this portion of Ashford Avenue is delayed, then trees 16-25 are to be retained."

Further, an arborist report has been prepared by Temporal Tree Management, this report outlines the rationale and justification for the proposed tree removal. The report found that the tree removal is justified due to the proposed subdivision works occurring on site as the trees will not survive the proposed subdivision works, with the majority of trees either being exempt or having a low retention value.

4.4.2 Chapter 3.3 Waste Management

The aims of the chapter are to ensure that waste is managed in an effective way to maximise waste reduction and increased recycling. A Waste Management Plan is to address construction waste with an objective to maximise resource recovery and manage waste in line with legislative requirements.

A Waste Management Plan must accompany the development application and must:

(a) Identify all waste likely to result from the demolition, and opportunities for reuse of materials.
(b) Reuse or recycle salvaged materials on-site where possible.
(c) Allocate an area for the storage of materials for use, recycling and disposal (giving consideration to slope, drainage, location of waterways, stormwater outlets, vegetation, and access and handling requirements).
(d) Provide separate collection bins or areas for the storage of residual waste.
(e) Clearly sign post the purpose and content of the bins and storage areas.
(f) Implement measures to prevent damage by the elements, odour and health risks, and windborne litter.
(g) Minimise site disturbance and limit unnecessary excavation.

The Waste Management Plan submitted with the DA addresses the relevant considerations under this part.

4.4.3 Chapter 3.5 Subdivision

The aims of this chapter are to ensure lots provide adequate space for buildings, setbacks, landscape, open space, driveways, vehicle manoeuvring areas and the like. The relevant controls applicable to subdivisions have been assessed below.

Table 3: Chapter 3.5 Controls

Section 3 – Housing Estates		
Control	**Proposal**	**Compliance**
Subdivision		
3.1 In assessing proposals for residential subdivisions, Council places emphasis on the ease with which future dwellings with good solar access can be erected on the proposed lots. In general, this condition is best fulfilled when the side boundaries of the majority of the lots are on or near a north-south axis; however, there may be other solutions. It is important to consider the subdivision beyond the subdivision stage and strive for a future residential area in which the great majority of dwellings can achieve good solar access.	The proposed lots have an east-west axis, with the future rear yards of the dwellings located in the eastern portion of the proposed lots. The future rear yards will be able to achieve good solar access given this solar orientation, with overshadowing minimised.	**Yes**

Section 3 – Housing Estates		
Control	**Proposal**	**Compliance**
Subdivision		
3.2 The minimum width for road reserves is 18m. This comprises an 11m wide carriageway and a 3.5m wide pathway on each side of the carriageway.	The proposal is utilising an existing road for this subdivision, being Ashford Avenue, this street has an existing road reserve that exceeds 18m and a carriageway that exceeds 11m.	**Yes**
3.3 The minimum width for lane reserves is 9m. This comprises a 6m wide carriageway and a 1.5m wide pathway on each side of the carriageway.	No laneway is proposed.	**N/A**
Security		
3.4 Where the site shares a boundary with a railway corridor or an open stormwater drain, any building, solid fence or car park on the site should, wherever practical, be setback a minimum 1.5m from that boundary. The setback distance must be: (a) treated with hedging or climbing vines to screen the building, solid fence, or car park when viewed from the railway corridor or open stormwater drain; and (b) the hedging or climbing vines must be planted prior to the completion of the development using a minimum 300mm pot size; and (c) the planter bed area must incorporate a commercial grade, sub-surface, automatic, self–timed irrigation system; and (d) the site must be fenced along the boundary using a minimum 2m high chain-wire fence; and (e) the fence provides an appropriate access point to maintain the landscaping within the setback area; and (f) where a car park adjoins the boundary, hedging or climbing vines must also be planted along the sides of any building or solid fence on the site that face the railway corridor or open stormwater drain. If a setback for landscaping under this clause is not practical, other means to avoid graffiti must be employed that satisfies Council's graffiti minimisation strategy.	The proposed subdivision does not share a boundary with a railway corridor or an open stormwater drain, as such this section is not applicable.	**N/A**

4.4.4 Chapter 4.4 Development in the Vicinity of Places of Heritage Significance

The objectives of this chapter are:

- *to ensure that adjacent development does not detrimentally impact upon heritage significance of places of heritage significance or their settings.*
- *To ensure that new development is compatible with the heritage values of adjacent places of heritage significance.*

The site is adjoined by roads that are identified as items of local heritage significance. As previously mentioned, Bullecourt Avenue and Ashford Avenue are heritage items. The streets form part of the locally listed heritage item *Milperra Soldier Settlement (former)* Item No 218 in *Canterbury Bankstown LEP 2023*.

A Statement of Heritage Impact (SOHI) which has considered the impacts of the future residential development of the former WSU site including the demolition of the existing buildings and structures.

The SOHI provides the following:

> *The northern edge of Bullecourt Avenue is occupied by large industrial warehouses, and its southern edge bordering the WSU campus is lined mostly by trees, and a Council owned hockey field. The western side of Ashford Avenue is occupied largely by residential development comprising of one and two storey dwellings and some commercial buildings. Given the recent and changing nature of development in the area, views along these roads' bare little resemblance to the roads that formed part of the Milperra Soldier Settlement. It is the alignment of these roads that is significant in terms of representing the establishment of the Milperra Soldier Settlement.*

Regarding the SOHI advised that the subdivision and residential development on the site will not impact the road alignments nor impact on the heritage significance of the item.[1] While there will be minor regrading works and vehicle crossings to accommodate future driveway construction, the alignment of the roads is not impacted upon by the proposal.

Council can be satisfied that the subdivision is suitable for the site and will not have an adverse impact on the nearby heritage items.

The SOHI by Extent Heritage Advisors is attached as **Appendix G** for reference.

4.4.5 Chapter 11.13 Former WSU Campus – Milperra

A critical aspect of the rezoning of this site, is the introduction of a site-specific Development Control Plan, which provides site specific controls for the site. The Chapter 11, Section 13 – Former WSU Campus - Milperra was exhibited and endorsed by the Gateway process. Therefore, the DCP is considered imminent, with critical elements of this DCP assessed below;

Section 3 Subdivision and Site Layout

Table 4: Chapter 11.13 Former WSU Campus – Milperra

3.1 Street and Block Layout		
Control	**Proposal**	**Compliance**
C1 Road network to be provided is consistent with the Concept Masterplan. (Refer to **Figure 2**)	No new roads are proposed as part of this subdivision. However, the residue lot proposed as part of this application will be able to accommodate the future roads as per the DCP Structure plan. The masterplan which has been provided details the development of the residue lot in detail.	**Yes**

[1] WSU Milperra Campus Redevelopment Statement of Heritage Significance by Extent Heritage Advisors, p.23.

3.1 Street and Block Layout		
Control	**Proposal**	**Compliance**
C2 Local roads are to measure a minimum of 18m in road reservation width and incorporate the following: a. 11m wide road carriageway b. 3.5m verge width on each side (including a 1.2m wide footpath on one side of the road & a 2m shared path on either side of the road) c. Provision is to be made for Vehicular Footway Crossing where required. d. The remainder of the verge is to be landscaped and include street trees in accordance with **Figure 3.**	As detailed in C1 above, no new roads are proposed as part of this application. However, Ashford Avenue already meets these standards.	**Yes**
C3 Minor Local roads are to measure a minimum of 17.2m in width and incorporate the following: a. 10.2m wide road carriageway. b. 3.5m verge width on each side (including 1.2m wide footpath on both sides of road). c. Provision is to be made for Vehicular Footway Crossing where required. d. the remainde of the verge is to be landscaped and include street trees in accordance with **Figure 4.**	As detailed in C1 above, no new roads are proposed as part of this application.	**N/A**
C4 Laneways are to measure 8.5m in width and incorporate the following: a. 6m wide road carriageway b. 1.25m verges with suitable provisions of 1.25m x 1.25m garage bin hardstand areas on each side for each dwelling c. The remainder of the verge on each side of the lane is to be landscaped in accordance with **Figure 5.**	No laneways are proposed to be constructed with this application.	**N/A**
C5. Based on traffic volumes, cross intersections of roads must be treated with roundabouts to modulate traffic flows where required.	No new roads/intersections are proposed with this application.	**N/A**
C6. Straight road sections longer than 200m must provided speed calming devices such as raised thresholds or chicanes to self enforce speed limits.	No new roads are proposed with this application.	**N/A**
C7. Pedestrian crossings must be installed at least 5m away from stop/give way lines to allow one car space.	No new intersections are proposed with this application.	**N/A**
C8. Street layouts should prioritise connectivity and avoid dead-ends. Where dead-ends are proposed, provisions must allow vehicles to enter and exit in a forward direction.	No new roads are proposed with this application.	**N/A**
C9. Where lots are proposed to be serviced by Council service vehicles provision should be made to allow for vehicles to enter and exit in a forward direction.	The lots are proposed to be serviced by Councils waste service vehicle. It is noted that waste collection will be a Kerb Side Pickup, with the waste trucks able to do the required manoeuvres on the local street network.	**Yes**

3.1 Street and Block Layout		
Control	**Proposal**	**Compliance**
C10. Where the above cannot be provided to Council's satisfaction, these roads and laneways shall remain in private ownership.	The above can be provided, despite this Ashford Avenue is already a Council owned road.	**Yes**
C11. Laneways are to be provided to facilitate waste collection from the rear of properties and to minimise driveway crossings and impediments to pedestrian and vehicle traffic flow along all roads.	No laneway is proposed to be constructed with this application.	**N/A**
C12. Where laneways are provided, vehicle access to sites is to be provided only via the laneway.	No laneway is proposed to be constructed with this application.	**N/A**
C13. The entrance from Bullecourt Avenue is to have a median for at least the first 50m into the site, measured from the Bullecourt boundary. The median is to be a minimum of 2.5m wide and must provide street tree plantings.	No entrance from Bullecourt Avenue is proposed with this application.	**N/A**
C14. A pedestrian crossing point with a pedestrian island is to be located near the existing vehicle entry point along Ashford Avenue.	No works near the existing vehicle entrance from Bullecourt Avenue is proposed with this application.	**N/A**
C15. Where a proposed residential property directly adjoins an open space (not separated by a road), fencing shall be a maximum 1.8m high with the part of the fence 1.5m above ground level to be a minimum 50% open construction and integrate with open space to ensure passive surveillance and a high-quality design.	Proposed Lot 1014 and 1015 adjoin a future pedestrian link and will be provided with open style fencing to allow passive surveillance of the walkway. The fencing details will accompany the housing which will be subject to future applications.	**Yes**
C16. All street parking spaces must be provided in accordance with Figure 2	No on street parking is nominated to be located on Ashford Avenue.	**Yes**
C17. Access to individual lots must consider and maximise opportunity for street parking and tree planting. Where a run of attached dwellings is proposed and there is insufficient space for street parking between driveways, a large canopy tree should be provided in the parking lane (refer to Figure 4 'landscape blisters').	No attached dwellings are proposed as part of this application.	**N/A**
C18 A Vegetation Management Plan is prepared and implemented by a suitably qualified bush regenerator for the rehabilitation, management and long-term maintenance of any retained Cumberland Plain Woodland. Prior to felling trees, a nest box management plan must be prepared which includes details on: a) the number, size, type and location of tree hollows to be removed.	The Cumberland Plain Woodland is located on the proposed Lot 1017. This is a residue lot which will be subject to future development where a VMP can be provided.	**Yes**

3.1 Street and Block Layout		
Control	**Proposal**	**Compliance**
C19. The size, type, number and location of where the replacement nest boxes and/or compensatory artificial hollows using a HollowHog tool (https://www.hollowhog.com.au/) are to be installed based on the results of the pre-clearing survey. Prior to felling the trees, a suitably qualified ecologist must endeavour to individually remove sections of a tree containing a hollow or other habitat features for relocation and reuse by the project a. trees with hollows should be lopped in such a way that the risk of injury or mortality to fauna is minimised, such as top-down lopping, with lopped sections gently lowered to the ground, or by lowering whole trees to the ground with the "grab" attachment of a machine b. where it is not possible to remove a tree hollow/habitat feature prior to felling the tree, native fauna should first be removed before tree felling and the hollow bearing trees may then be slowly pushed over to avoid damage to hollows.	No trees of significant value or with a high retention value are proposed for removal.	**N/A**
C20. Street tree planting and landscaping should be provided on both sides of the street at the site. The street setbacks shall be wide enough to: a. retain existing trees and allow for new planted street trees to grow to maturity without the need for lopping and trimming. b. accommodate any proposed footpaths plus allow for the street trees to grow to maturity.	The trees in Ashford Avenue are proposed for removal due to the undergrounding of the overhead powerlines which requires excavation, meaning the retention of the trees is not feasible. The proposal allows for new street trees to be planted within Ashford Avenue, which are considerate of the new services and which can grow to maturity with no encumbrances.	**Yes**
C21. Lots and Vehicular Footway Crossings fronting Ashford Ave should be designed to retain existing street trees.	The driveways have been sited to allow tree retention, despite this, the undergrounding of the overhead power lines warrants the tree removal within Ashford Avenue.	**Yes**
C22. A maximum block length of 180m applies, before providing a pedestrian through site link connection. These connections should line up with adjacent streets to allow for long views through the site.	The block depth would exceed 180m as the subdivision is consistent with the Masterplan. A pedestrian link provision has been provided between Lot 1014 and Lot 1017.	**Yes**
C23. Pedestrian through site links are to be: a. 9m wide, including a 5m shared path and a 2m wide vegetated verge either side of the shared path. b. Open to the sky. c. Be accessible to pedestrians 24 hours a day and designed to be accessible for people of all abilities. d. Be designed to ensure pedestrian safety through the limiting of vehicular access (other than temporary maintenance or emergency vehicles).	A provision for a pedestrian site link provision has been provided between Lot 1014 and 1015. It is noted that this is only a provision under this DA and forms part of the residue lot. Under a future stage(later separate DA), this portion of the site would be made a pedestrian site link in accordance with the relevant requirements and dedicated to Council. As the pedestrian site link would not join two public roads under this stage, it will be constructed and dedicated under a future DA. Further, as the width of the site link is under 10m, it can not be used for a dwelling house site.	**Yes**

3.1 Street and Block Layout		
Control	**Proposal**	**Compliance**
c. Provide a safe environment, including appropriate lighting and clear straight sightlines. f. Lighting shall be designed and installed in accordance with Australian Standards AS/NZS 1158 Lighting for roads and public spaces and AS/NZS 4282 Control of the obtrusive effects of outdoor lighting and to the satisfaction of Council. g. Tree species used within the pedestrian links are to be selected from the list below: h. Understory planting to use low maintenance turf species (e.g. kikuyu or couch). i. The through site link path should be constructed to Canterbury Bankstown Council Standard Drawing S-029. j. Vehicle barriers are to be installed at path ends to comply with Canterbury Bankstown Council Standard Drawing S-033		
C24. Through site links are to be provided as an easement on title for public right of way. The land owner and/or developer may seek to enter into a Planning Agreement with Council for dedication of the land for pedestrian through site links to be dedicated as public roadways, as part of a Development Application. Such a planning agreement would need to be subject to acceptable terms for Council, including but not limited to, a monetary contribution for the ongoing maintenance of the pedestrian through site link.	As per Control 23 above, this site link will be provided under a future DA.	**Yes**
C25. Consideration must be given for the inclusion of a future pedestrian link along the southern boundary (north of the M5) to Horsley Road as part of any subdivision layout submitted to ensure this link is futureproofed as part of any subdivision DAs issued.	This will be considered under a future DA which encompasses this portion of the site.	**N/A**

3.2 Residential Lots		
Control	**Proposal**	**Compliance**
C1. Lots are to comply with the following minimum areas and dimensions for the specified dwelling type as listed in Table 2.	All development lots proposed under this application have a Lot size that exceeds 300m^2 with widths of 10m and 12m, meeting the minimum requirements under Table 2 for lots fronting Ashford Avenue.	**Yes**
C2. Lot sizes are to be generally consistent with the minimum lot sizes shown on *Table 2* and be reflective of the intended dwelling type as shown in *Figure 6*.	The proposed lot sizes are consistent with the sizes shown in Table 2. Figure 6 is not applicable to this application.	**Yes**
C3 The width of the parent lot must not be less than the following when measured from the building line: a. 15m when front loaded	This control is only applicable to attached / semi-detached housing and not dwelling houses.	**N/A**

3.2 Residential Lots		
Control	**Proposal**	**Compliance**
b. 11.2m where the car parking is provided at the rear of the lot and accessed only from a secondary road, parallel road or lane.		
C4 A maximum of six (6) attached dwellings (2 storey) (or a street wall length of 45 are permitted to be attached in a row before a break in the built form is required and a 0.9m side setback is applied.	No attached dwellings proposed.	**N/A**
C5. For attached dwellings, lots with a width less than 6m must be located opposite open space.	No attached dwellings proposed	**N/A**
C6. The maximum width of all garage door openings facing a primary, secondary, or parallel road is to be in accordance with the following: a. For lot widths at the building line ranging from 8m to 12m, the maximum permissible width for garage door(s) is 3.2m. b. For lot widths at the building line that are equal to or greater than 12m, the maximum permissible width for garage door(s) is 6m. c. For any sized lots that have a boundary to a laneway, there is no maximum garage door opening size. Note, this will permit lots with a lot width of less than 10m to have a double garage to a rear lane.	This is a built form control, applicable to the future dwellings. However, the 12m wide lots would be permitted to have a garage with a width of 6m.	**N/A**
C7. On all lots where a zero-lot line is permitted, the side of the allotment that may have a zero-lot alignment must be shown on the proposed - subdivision plan.	No zero lot lines are proposed.	**N/A**
C8. Where a zero-lot line is nominated on an allotment on the subdivision plan, the adjoining {burdened) allotment is to include a 900mm easement for zero lot walls to enable servicing, construction and maintenance of the adjoining dwelling. No overhanging eaves, gutters or services (including rainwater tanks, hot water units, air-conditioning units or the like) of the dwelling on the benefited lot will be permitted within the easement. Any services and projections permitted under Clause 4.4 (6) within the easement to the burdened lot dwelling should not impede the ability for maintenance to be undertaken to the benefitted lot.	No zero lot lines are proposed.	**N/A**
C9. Subdivision of land creating residential lots equal to or less than 245m2 or lots equal to or less than 9m wide shall include an indicative dwelling design as part of the subdivision development application. The dwelling design is to be included on the S88B instrument attached to the lot. The indicative dwelling design is to include: a. Proposed site plan	No lots proposed are under 245m^2.	**N/A**

3.2 Residential Lots		
Control	**Proposal**	**Compliance**
b. Proposed floor plans c. Proposed roof plan		

3.3 Dwelling Yield		
Control	**Proposal**	**Compliance**
C1. The subject site has a total maximum dwelling cap of 430 dwellings. Refer to clause 6.34 in the Canterbury-Bankstown Local Environmental Plan 2023.	This application intends to release 16 development lots, with a capacity for 16 dwelling houses. This is below the total of 430.	**Yes**
C2. A summary of the running total of dwellings proposed and constructed must be included in the Statement of Environmental Effects submitted with each Development Application that proposes the construction of residential accommodation.	This is the first application creating development lots over the former WSU site. As all the lots are too small for secondary dwellings or dual occupancies, with dwelling houses the only permitted form of development. This application brings the running total dwelling yield for the larger former WSU site to 16 dwellings/potential dwellings.	**Yes**
C3. The minimum site area for a Secondary Dwelling shall not be less than the minimum prescribed in Section 53 of the State Environmental Planning Policy (Housing) 2021.	Noted.	**N/A**

3.4 Canopy Cover		
Control	**Proposal**	**Compliance**
C1. Where there is no impedance on any newly proposed structures or dwellings, existing trees must be retained, particularly where they are adjacent to the public domain.	Existing trees on Ashford Avenue, where they conflict with the underground power lines are an impediment and have been proposed for removal.	**Yes**
C2. Any trees requiring consent for removal (as determined in Canterbury Bankstown DCP 2023 Chapter 2.3 Tree Management) must be replaced at a 3:1 ratio (three trees planted for every tree removed) with a mix of local provenance large trees that conform with the Cumberland Plain Woodland Community within the development site.	The application proposes the removal of 8 street trees in Ashford Avenue due to the undergrounding of the powerlines. The trees will be replanted at a ratio of 3:1, however this replanting will partially rely on future stages to meet this obligation, due to the limited footprint of this Stage 1 Development. The trees which are to be replanted will be from the Cumberland Plain Woodland Community with the seed/seedlings sourced from on site(from the remnant patch in the north east of the site) or from sites with a similar community. This will ensure the trees planted are sourced locally and are indigenous to the area.	**Yes**
C3. Any development/subdivision is to provide trees to enable a tree canopy cover of 35% of the site. This should be achieved across site through retention of existing trees, street tree planting and required planting on individual lots. For the purpose of canopy cover, the site area excludes the C2 Environmental Conservation Zoned Land.	Trees have been provided as part of this subdivision, please refer to the Street Tree Plan by Urbis (**Appendix M).** While 35% canopy cover is not provided through this application, trees will be provided as part of the dwelling applications which will be lodged in future. Given the dwelling designs are not finalised, tree locations haven't been recommended.	**Yes**

3.4 Canopy Cover		
Control	**Proposal**	**Compliance**
C4. Street trees must be provided along all local roads and minor local roads. Species must be of local provenance and be consistent with Table 4 below;	The tree species selected are considered appropriate.	**Yes**
C6. Where street tree planting is proposed along Primary and Secondary streets, at least three different species must be used across each Primary or Secondary Street. Refer to Table 4 above for species selection.	The tree species selected are considered appropriate.	**Yes**
C7. To ensure continuous canopy coverage street trees should be provided at least 10-l5m intervals either on the landscaped verge or in the parking lane.	Street Trees have been provided at a rate of one tree per lot, this is equivalent to a tree every 12m.	**Yes**
C8. Trees in the public domain (streets and parks) are to be installed with a minimum pot size of 75L.	Trees planted in the public domain may not achieve this pot size, this is due to the seeds/seedlings being sourced from on site and needing time to achieve the required size. It is noted that the trees will not be planted till after the construction of the dwellings, this is to ensure that the trees are in the nursery for longer and achieve the biggest size possible prior to their planting in the street.	**Yes**
C9. The selection of tree species for planting should consider species diversity and site suitability, including soil conditions, heat tolerance, water requirements and thermal comfort.	The chosen tree species are considered appropriate for this site.	**Yes**
C10. Development must be designed to retain existing high value canopy trees on the site where possible.	The trees proposed for removal are due to the requirement to underground the existing powerlines.	**Yes**
C11. Development must conserve, rehabilitate and enhance terrestrial connectivity between Cumberland Plain Woodland vegetation on site by planting local provenance species consistent with the Cumberland Plain Woodland community to enhance habitat for flora and fauna species.	Species proposed are consistent with the Cumberland Plain Woodland Community.	**Yes**
C12. Prior to clearing of any trees on the site, a tree survey report must be prepared to provide details on: a. The total number of trees approved to be removed and retained b. The tree species and whether the trees are native to the site, non-local natives or exotic c. The type and size of tree.	An Arborist Report has been provided with this application, which details the species of trees and quantifies all impacts to trees.	**Yes**
C13. Street trees should be positioned so that they do not unduly interrupt the sight lines to oncoming traffic and impact on public safety in accordance with the Australian Standards AS2980.	The proposed street trees will not block sight lines for vehicles entering or exiting the driveways.	**Yes**
C14. Prior to clearing of native vegetation from the site, native seed from the plants approved for removal is collected and propagated and used in revegetating the site including the	Seed collection from native vegetation within the site is currently being undertaken(at the time of writing of this report, it was early spring when seed collection begins).	**N/A**

3.4 Canopy Cover		
Control	**Proposal**	**Compliance**
rehabilitation of terrestrial linkages, REI open space areas, street planting. The seed collection programme should commence as early as possible so that local native provenance plant species are available to be planted, and the trees are advanced and established in size to improve the urban tree canopy and local biodiversity.	These seeds will be harvested and planted, once grown to a certain size, they will be planted on site as part of this landscaping works.	
C15. Any planting on the site shall use a diversity of Cumberland Plain Woodland provenance native trees, shrubs and groundcover species (rather than exotic species or non-local native species).	Species proposed are consistent with the Cumberland Plain Woodland Community.	**Yes**
C16. Any juvenile native plants to be removed shall be salvaged and transplanted to areas that are to be conserved. The juvenile plants must be translocated prior to any earthworks and clearing of native vegetation commencing. The plants should be relocated when plant growth conditions are ideal to give the native plants the best possible opportunity to survive and should be maintained until established.	All juvenile native plants have been/will be transplanted/salvaged from the site and maintained till they can be replanted on site as part of the landscaping embellishment.	**N/A**
C17. A Landscape Plan by a qualified landscape architect is required for public domain works and parks. The Landscape Plan should be prepared with regard to the following urban greening guidelines: a. WSROC Cool Suburbs: User Guide and Science Rationale {2022} Home Page / Cool Suburbs by WSROC b. Department of Planning, Industry and Environment (DPIE) (2021) Greener Neighbourhoods Guide. NSW Government. Greener neighbourhoods guide (nsw.gov.au) c. Gallagher Studio & Studio Zanardo (2021} Urban Tree Canopy Targets & Development Controls Report. Prepared for DPIE. Urban Tree Canopy Targets and Development Controls Report (nsw.gov.au) d. Low Carbon Living CRC (2017) Guide to Urban Cooling Strategies rp2024_guide_ to_ urban_cooling_strategies_2017_web.pdf (lowcarbon livingcrc.com .au) e. Office of Environment & Heritage (2015) Urban Green Cover in NSW. NSW Government. Urban Green Cover Technical Guidelines.pdf (nsw.gov.au) f. DPIE (2021) Street Tree Planting Design Manual, Rosemeadow Demonstration Project, NSW Government in collaboration with Campbelltown City Council https://www.dpie.nsw.gov.au/premiers-	Landscape Plans have been prepared for the works within Ashford Avenue and lodged with this application, these were prepared by Urbis.	**Yes**

3.4 Canopy Cover		
Control	**Proposal**	**Compliance**
priorities/greening-our-city/greening-our-city-grant/rosemeadow		
C18. For all land within the C2 Environmental Conservation Zone, a Vegetation Management Plan is to be prepared and implemented by an appropriately qualified bush regenerator for remnant Cumberland Plain Woodland that is to be conserved on the site. The Vegetation Management Plan is to include details on: a. seed collection - the location of all native seed sources should be within 1 km of the site and should be identified b. the type, species, size, quantity and location of replacement trees c. the plan demonstrates the plant species are of local native provenance d. the species, quantity and location of shrubs and groundcover plantings the pot size of the trees to be planted f. the area/space required to allow the planted trees to grow to maturity. g. maintenance requirements - planted vegetation should be regularly maintained and watered for 12 months following planting. Should any plant loss occur during the maintenance period the plants should be replaced by the same plant species. h. Address all matters in Appendix A: Matters to be addressed in Cumberland Plain Woodland Management (C2 Environmental Conservation zoned land) to this section of the DCP.	While the C2 land will be subdivided into its own residue lot, no development is occurring in this area through this application. Therefore, the requirements within this area will be provided under a future development application.	**N/A**

3.5 Public Open Space and Public Domain		
Control	**Proposal**	**Compliance**
C1. Provide the following public open space parks zoned as RE1 Public Recreation consistent with Figure 2 and the following sizes and locations: a. 4,600m2 (approx.) open space on the northern boundary fronting Bullecourt Avenue b. 5,380m2 (approx.) central park in the centre of the site. This park is to be co-located with existing mature trees as well as providing a playground. c. 4,860m2 {approx.) open space bordering the site's southern boundary to the M5 Motorway.	The temporary stormwater basin is located on land marked as R1. This is a temporary basin only which utilises the existing temporary sediment basin that is being constructed under the demolition DA 1512/2023. This temporary basin (and raingarden) will be removed when the permanent Basin No.2 (located in the SP2-Drainage zone) comes online in a future Stage. Relevant restrictions will be imposed on title to reflect this.	**Yes**
C2. Development in the public domain is to be consistent with any adopted Plan of Management or policy of Council. Design of parks must be undertaken in accordance with the agreed contribution stipulated in the	Construction of the parks will form part of a future DA.	**Yes**

3.5 Public Open Space and Public Domain		
Control	**Proposal**	**Compliance**
Planning Agreement for this site in connection with the Planning Proposal (PP- 2021-5837).		
C3. Any building/installation constructed within the public domain must consider impacts on the amenity of surrounding buildings and the public domain including: a. Solar amenity b. Impacts on the function of a place c. Obstacles to pedestrian movements and visual connections d. Noise on adjoining residential sites	Construction of the parks will form part of a future DA.	**Yes**
C4. All utilities services, other than street lighting and substation kiosks, located along Ashford Avenue are to be located underground, subject to service provider approval.	The overhead power lines are proposed to be relocated underground for the portion of the Ashford Avenue frontage that these lots occupy. Ausgrid applications have already been made. The remaining portion can occur with later stages.	**Yes**
C5. All utilities services within the proposed internal roads and laneways should be located underground, subject to service provider approval.	No internal roads are proposed as part of this DA.	**N/A**
C6. The design of the public domain is to integrate stormwater and floodwater management and may provide well integrated interpretive water elements that do not detract from the amenity of the public domain.	Only minor works within the public domain are proposed through this application, with no stormwater works required within Ashford Avenue.	**Yes**
C7. Detention basing/drainage swale(s) located on the south-western corner of the site are to be vegetated with local indigenous vegetation to control and filter stormwater runoff within a coastal wetland proximity area.	Refer stormwater plans, the temporary sediment basin will be converted to a temporary bioretention basin for Stage 1 which will include raingarden planting to help remove contaminants. However, it is noted that this will be removed once the permanent basins come online. Full embellishment of the final basins will occur prior to dedication under a future DA.	**Yes**
C8. Details of information signage that explains to the public how the bioretention facilities function in the northern and southern parks is to be included as part of the Development Application that proposes the construction of the parks.	The detention basin proposed as part of this application will remain in private ownership till the future stages are constructed/registered, noting it is temporary in nature.	**N/A**
C9. The design of the northern and southern parks must consider maintenance requirements and provide a detailed maintenance management plan in consultation with Council's Asset Maintenance Team that includes information such as: A. Maintenance schedule. b. The type of equipment and number of personnel required to maintain the parks. c. Recommended maintenance to the bioretention facilities in the north and south parks. d. Locations for vehicle access to load and unload maintenance equipment such as ride on lawn mowers.	No works within the public domain/intended for dedication is proposed under this DA.	**N/A**

3.5 Public Open Space and Public Domain		
Control	**Proposal**	**Compliance**
e. Managing the public open spaces post-flood or heavy rainfall events. f. Plant species information and information on replacement replanting.		
C10. A landscape plan by a qualified landscape architect must be provided for public domain works. This includes parks and all open space and stormwater detention areas	A street tree plan prepared by Urbis for the Ashford Avenue verge is included. No other works within the public domain/intended for dedication is proposed under this DA.	**Yes**
C11. Landscaping of public open space is to use a diversity of Cumberland Plain Woodland plant species of local provenance (including tree, shrub and groundcover species) rather than non-local native species and exotics	No works within the public domain/intended for dedication is proposed under this DA.	**N/A**
C12. The design of open spaces is to incorporate features such as informal seating areas, public amenities, shade structures, indigenous tree species, well integrated public art and appropriately varied hard surface treatments.	No works within the public domain/intended for dedication is proposed under this DA.	**N/A**
C13. BBQ facilities are not to be provided in any park on the site.	No works within the public domain/intended for dedication is proposed under this DA.	**N/A**
C14. Play elements should be integrated within the public domain design to visually and physically address primary open space areas.	No works within the public domain/intended for dedication is proposed under this DA.	**N/A**
C15. Vehicle access to lots is to be designed and located to minimise conflicts with pedestrians and cyclists on footpaths.	Vehicular access to the proposed lots will not conflict with pedestrians or cyclists. Vehicle crossings for the future driveways of Lot 1014 and 1015 have been located away from the future pedestrian link that will eventually be extended between these two lots.	**Yes**
C16. Shared pedestrian/cycle links are to be clearly and frequently signposted to indicate their shared status.	No shared pedestrian/cycle links proposed as part of this DA.	**N/A**

3.7 Stormwater		
Control	**Proposal**	**Compliance**
C1. The following devices must be provided in accordance with Council's specifications and subject to Council approval: a. Bio Basin in Southern Open Space (Basin 1), with an area of approximately 650 sqm b. Bio Basin in Drainage Basin (Basin 2), with an area of approximately 210 sqm c. Bio Basin in Northern Open Space, with an area of approximately 350 sqm,	These basins are not required for this development, but will be provided under a future Development Application. The temporary measures proposed through this development are sufficient for the stage 1 development.	**Yes**
C2. All proposed dwellings must comply with Section 3.1 Development Engineering Standards of the Canterbury Bankstown Development Control Plan 2023.	No dwellings form part of this DA, compliance is subject to future DA.	**N/A**
C3. Drainage systems should be sized to consider increases in rainfall intensity, frequency and duration under future climate change.	The stormwater easement and proposed basin has been designed to the current site conditions	**Yes**

3.7 Stormwater		
Control	**Proposal**	**Compliance**
	with space to increase capacity for future increases in rainfall .	
C4. A local Stormwater Management Plan is to be provided with the first Development Application for proposing subdivision/construction of residential accommodation of the site that demonstrates how the intended development complies with BASIX requirements in relation to: A. Size of the stormwater tank installed in litres, being the volume available for water storage in addition to (i.e., excluding any requirement for stormwater detention or retention for your site). b. Area of the catchment (i.e., water collection area) to be connected to the stormwater tank. c. Uses the water from stormwater tank will be allocated to, depending on whether it is treated or untreated.	Please refer to the stormwater plan submitted with the development application.	**Yes**
C5. The local Stormwater Management Plan must also demonstrate: a. The hydrology of the locality and its relationship to the drainage system b. The distribution of soil types and the scope for on-site infiltration c. Any anticipated rises in ground water due to development	Please refer to the Water Cycle Management plan for Stage 1 submitted with the development application.	**Yes**
C6. Any major drainage system is to be designed to address any specific site conditions, and detail how it connects into downstream drainage system(s).	The stormwater plan details how the stormwater basin connects into downstream properties.	**Yes**
C7. Major drainage systems are to be designed in manner that does not compromise personal safety of maintenance personnel	The stormwater basin has been designed to ensure the safety of personnel when maintenance is required.	**Yes**
C8. Stormwater management should include biofiltration, such as vegetated swales overlaid with soil- based filter medium, to improve discharge water quality.	A swale has not been provided, however the temporary bioretention basin is proposed to be vegetated, which will improve water quality when discharged.	**Yes**
C9. Stormwater detention devices are to be designed to: a. Ensure that the overflow and flow paths have enough capacity to reduce the effects of stormwater runoff during all rainfall events; b. be collected and discharged by gravity fed or charged system; c. Discharge stormwater generated by the site into the public stormwater system without affecting adjoining properties and downstream waterways; and d. Be free of obstructions.	The stormwater basin has been designed taking all the required factors into consideration. The piped stormwater system will be designed to convey the 1% AEP storm event to the future basins.	**Yes**
C10. Where infiltration and bio-retention devices are proposed, they are to be designed for the temporary capture of stormwater only.	The stormwater basin is designed to control the flow of stormwater from the site and will not permanently hold water.	**Yes**

3.7 Stormwater		
Control	**Proposal**	**Compliance**
C11. Drainage Basins must provide a max batter of 1:6 to ensure the requirement for ongoing maintenance does not create a burdening legacy.	The temporary stormwater basin either has retaining walls or batters that meet/exceed 1:6.	**Yes**
C12. Hard edging must be provided where raingardens are proposed to Council's specification and approval.	No Rain Gardens are provided.	**N/A**
C13. Any proposed drainage lines emanating from outside of the subject site to bio-basins contained with the subject site must be provided in accordance with Council's requirements and subject to Council's approval.	No drainage lines from outside the site are directed to the stormwater basins.	**N/A**
C14. The provision of GPT instruments within a Council owned road reserve prior to the dedication of internal local and minor local roads must seek Council's written approval prior to the implementation of the instrument.	There are no GPT instruments proposed as part of this development.	**Yes**
C15. The use of GPT Instruments is to be determined in accordance with Council's requirements and subject to Council's approval.	Noted.	**Yes**
C16. "No parking" signage and access gates must be provided for all bioretention and drainage basins subject to Council's agreement and approval.	The stormwater basin currently proposed is temporary only. When the ultimate basins are constructed and dedication occurs, the relevant signage will be provided.	**Yes**

3.8 Acoustics		
Control	**Proposal**	**Compliance**
C1. Any subdivision DA is to provide an acoustic report prepared by a suitably qualified person to identify requirements for residential dwellings to mitigate noise from traffic, open space, the Mount St Joseph Catholic College Milperra or the MS Motorway. The report is to clearly identify any lots that will require noise mitigation	An Acoustic Report has been prepared and lodged with this application. This report details noise impacts from all possible sources, including the M5 Motorway, the Catholic College, childcare centre, the council hockey fields and also the proposed parks.	**Yes**
C2. Lots subject to noise mitigation requirements should be subject to positive covenants requiring acoustic treatments for any vacant lot subdivisions.	As the lots front Ashford Avenue, which has been found to be subject to road noise. Acoustic Treatment is required to the facades only, this detail will be complied with when the dwellings are designed and construction details are known.	**Yes**
C3. High solid walls for the purposes of reducing acoustic disturbances: a. Are permissible only where walls are being used to shield the dwelling from the noise of classified roads or other disturbances; b. High solid walls for the purposes of reducing acoustic disturbances are to be specified and sited with the advice of a specialised acoustic consultant and included in the DA for proposed dwelling construction.	The proposed lots are not adjacent to the M5, with no high solid walls required.	**N/A**

3.8 Acoustics		
Control	**Proposal**	**Compliance**
c. Any acoustic fencing/walls addressing primary or secondary street frontages are to be setback l.5m from the property boundary and are to be buffered by a continuous landscape planting strip between the acoustic fencing/wall and the boundary, with a mature height of at least l.5m. d. Are to provide plant selections that are appropriate for the local context and be commensurate with local provenance.		
C4. Development Applications for the construction of dwellings within the noise sensitive areas must include noise mitigation measures recommended by the acoustic report approved in the subdivision development application {Control C1 above)	As per Control C1 above.	**Yes**
C5. Where party walls are provided, they must be carried to the underside of the roof and be constructed in accordance with Part FS of the Building Code of Australia.	No dwellings are proposed as part of this application.	**N/A**
C6. The maximum height of any fence along the school boundary is to be 2.4m.	The proposed lots are not adjacent with the School Boundary, with no high solid walls proposed.	**N/A**
C7. Electrical, mechanical, hydraulic and air conditioning equipment is to be housed so that it does not create an 'offensive noise' as defend in the Protection of the Environment Operations Act 1997 either within or at the boundaries of any property at any time of the day.	No dwellings are proposed as part of this application.	**N/A**

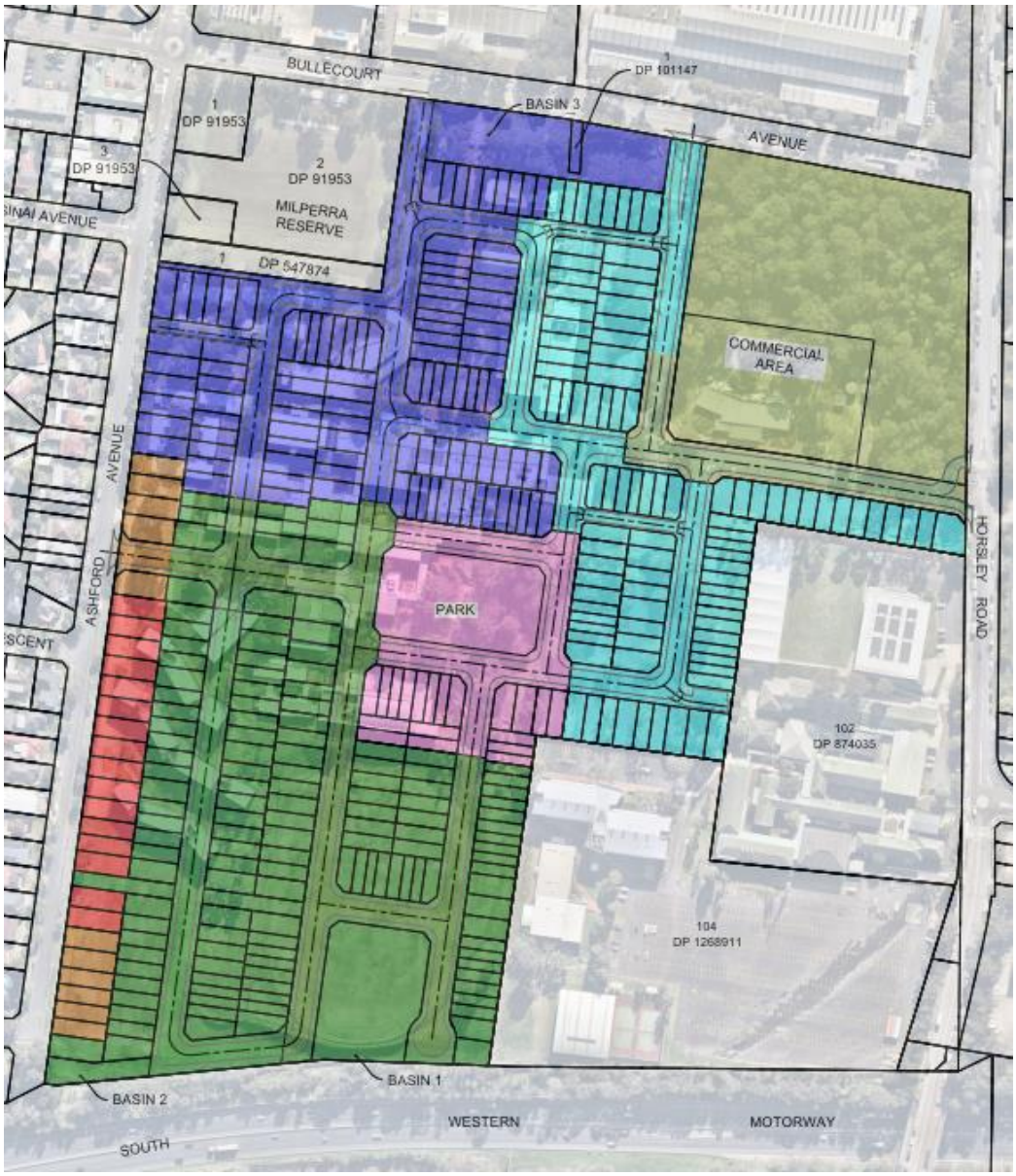


Figure 16: Extract from Acoustic Report Treatment Categories

4.5 Orderly Development

The proposed subdivision does not prohibit the orderly development of the site, rather it promotes orderly development. This application seeks to develop land along the Ashford Avenue frontage and will not disadvantage or preclude the development of the remainder of the site. As can be seen in the staging plan and overall site development plan below, the residue lot can still be developed in accordance with the LEP, the masterplan and other relevant controls, which will be subject to future development applications.

Due to the sites size, it is not beneficial to develop and subdivide it all at once, therefore the proposal will be subdivided in piecemeal through staging of the site. The lodgement of separate Development Applications for each stage, opposed to a large Development Application with 6 stages is beneficial as there is certainty in each stage being delivered and can be dealt with in isolation, reducing the extent of modifications required in future for ancillary changes.



Stage No.	No. of Superlots Lots	No. of Residential Lots	No. of Public/Drainage Reserve Lots	Stage Area (m²)
Stage 1	0	16	0	6030
Stage 2	0	11	0	4690
Stage 3	10	135	2	61674
Stage 4	2	19	1	15108
Stage 5	9	96	0	35176
Stage 6	9	105	1	40385
Commercial	1	0	0	33340

Figure 17: Staging and Overall Development Plan for the Site

4.6 Consideration of the Voluntary Planning Agreement

A Voluntary Planning Agreement between Canterbury-Bankstown Council, Western Sydney University and Mirvac has been executed. This document administers commitments from Mirvac Residential (NSW) Developments Pty Ltd and Western Sydney University towards the delivery of development contributions, works in kind and land dedication required in association with the development of the broader WSU site.

The VPA commitments that need to be addressed as part of this initial 18 lot subdivision are provided below.

- Local Roads (Item 5): No Local Roads are being dedicated under this subdivision, the subdivision is utilising an existing public road.
- Undergrounding of Powerlines (Item 12): The powerlines that are forward of the proposed allotments will be undergrounded prior to the Subdivision Certificate being issued. For clarity, this item does not need to be delivered till the final residential lot along Ashford Avenue is registered.
- Ashford Avenue – Footpath (Item 13): The footpaths that are forward of the proposed allotments will be constructed prior to the Occupation Certificates being released for these dwellings (i.e. will not be constructed prior to the Subdivision Certificate being issued). This is to reduce the likelihood of damage occurring during construction. In this regard, a bond is deemed to be an appropriate measure to secure these works.
- Affordable Housing Contribution (Item 15): 16 final residential lots are being created via this subdivision, therefore a contribution of $197,216 is anticipated.

Therefore, as the above requirements are provided as part of the subdivision works or can be conditioned in the consent, the VPA requirements for this subdivision have been met.

4.7 The Likely Impact of the Development

The area the subject of the development, only relates to a minor portion of the south-western portion of the site, for a part of the Ashford Avenue Frontage, as detailed in the subdivision plan. The residue portion of the site will be dealt with via future development applications.

The following matters are the likely impacts of the development:

4.7.1 Context and Setting

The proposed subdivision of the site is in preparation for the construction of residential accommodation to follow once development approval is granted and works undertaken.

4.7.2 Access and Traffic

The site is surrounded by a network of local streets and is bounded by roads to all four boundaries. Bullecourt Avenue is located to the sites northern boundary, Horsely Avenue is adjacent to the sites eastern boundary, the M5 Motorway is adjacent to the southern boundary and Ashford Avenue is located on the sites western boundary.

For the purpose of this development, access to the proposed lots will only be required from Ashford Avenue, as these lots all have frontage to Ashford Avenue and do not require alternate access.

All trucks will be covered prior to exiting the site. The construction site will not interfere with any pedestrian movement. Works will be carried out so that no impacts affect the surrounding buildings and roads.

4.7.3 Utilities

All utilities will be provided to the proposed lots(excluding the residue lots) to support future residential accommodation. The augmentation of utilities will be as per the relevant authorities requirements and designed/constructed in consultation with them.

4.7.4 Heritage

Council's mapping shows no known items of heritage significance on the site; however, the adjoining street network is identified as an item of local heritage significance. The item is the *Milperra Soldier Settlement (former)* which relates to the street alignment of the former Milperra Soldiers Settlement. As previously mentioned, a Statement of Heritage Significance was prepared to address the nearby heritage significance and to identify if there was anything for consideration on the site. The heritage consultant confirmed that the redevelopment of this site, would have minimal impact upon the heritage significance of the item.

The assessment further added that there was a low risk of Aboriginal artefacts being found on the site due to the site's highly disturbed history. The assessment does recommend that if in the event an artefact is uncovered works should cease and an Aboriginal Heritage Impact Permit (AHIP) may be required.

The Statement of Heritage Impact by Extent Heritage Advisors is attached for reference as **Appendix G.**

4.7.5 Water & Sewer

Water and sewer services will be provided to each new residential allotment to support the future residential development that will occur.

4.7.6 Flora and Fauna

Trees are proposed to be removed as part of this DA, these trees are recommended for removal through the submitted arborist report. The retention of these trees is not viable due to multiple factors, including the required undergrounding of the powerlines along Ashford Avenue(required via the VPA), the installation of footpaths and services and the required regrading of the verge to meet a 2.5% crossfall. The 2.37ha remanent patch of Cumberland Plain Woodland in the northeast corner is mapped on the Biodiversity Values Map due to its significant environmental value. However, the proposed subdivision works are clear of this area and will have no impact upon this vegetation.

4.7.7 Visual Amenity

The subdivision works by itself will have minimal impact upon the visual amenity in the local area or to adjacent properties. The future residential accommodation may cause impacts, but this will be assessed under future DAs.

4.7.8 Acoustic Amenity

The subdivision works will be limited to standard site working hours, being Monday-Friday 7am to 6pm and Saturday 7am to 4pm, with no work to be conducted on Sunday or Public Holidays. As such, the proposed works are not expected to have an impact upon adjoining properties. Once the subdivision is completed, there will be no ongoing impacts.

An acoustic report has been prepared to assess the impacts of road noise on the future residential dwellings, subject to the implementation of the recommendations of the report, the dwellings can successfully mitigate the impacts of road noise.

4.7.9 Site and Internal Design

The subdivision works are proposed to commence and progress on the site in an orderly manner. The site boundary will be demarcated utilising a combination of existing boundary fencing and temporary fencing.

There will be suitable signage displayed in a prominent position notifying of the works in progress and restricting access.

4.7.10 Erosion and Sediment Control

Appropriate erosion and sedimentation measures will be implemented during the construction works to ensure all materials are captured. Details are provided separately under an Erosion and Sediment Control Plan which has been submitted with the application and addresses erosion and sediment control. The erosion and sediment control has been designed in accordance with the Blue Book and Industry Best Practice to ensure no adverse impacts offsite.

4.7.11 Bushfire

The subject site is not mapped as bushfire prone land. Therefore the proposal is not integrated development and a referral to the NSW Rural Fire Service for General Terms of Approval is not required.

4.7.12 Biodiversity

The site has a remnant patch of Cumberland Plain Woodland in the northeastern corner of the site. No work is required to that portion of the site under this Development Application, with all works confined to the Ashford Avenue frontage. Further, no works are located over portions of the site that are mapped on the Biodiversity Values Map. Therefore, there will be no impact or clearing works to the Biodiversity Significant Land under this application and it will be retained.

4.8 The Suitability of the Site for the Development

The site is suitable for subdivision for the purposes of residential accommodation given the recent rezoning of the site and that the site is adjacent to existing residential development. There are no natural impediments or limitations that would hinder this development. All required services are available at the site, which can be extended to service this development, with suitable capacity available.

4.9 Any Submissions Made in Accordance with this Act or the Regulations

Public participation is addressed under Schedule 1 of the Act for advertised development and other notifiable development. The consent authority must ensure a development application is advertised/notified in accordance with this clause and any relevant development planning instrument and/or development control plan. Given the nature of the proposal it is considered that advertising will be required in this instance. If any submissions are received, they will be addressed by Council, alternatively they can be provided to the applicant for a response.

4.10 The Public Interest

The subdivision is in the public's interest as it is in accordance with the planning controls and will not detract from or diminish neighbouring properties. The residential development of the land is consistent with the State government's housing initiatives to boost supply and delivery of homes across the state. Providing housing solutions for all people is a key priority of the NSW Government to provide access to affordable and well-designed housing.

5 CONCLUSION

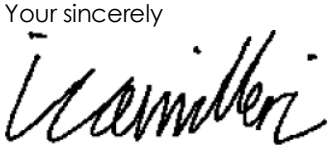
This SEE has been prepared to support a DA for an 18-lot residential subdivision at the former WSU Milperra campus site of the WSU. WSU and Mirvac have entered into an agreement to deliver a high quality, affordable residential community. The proposed subdivision is permissible in the zone.

The development ultimately promotes maintaining site biodiversity by designing and siting the development to avoid significant adverse environmental outcomes through the retention of significant trees and vegetation where viable.

The SEE concludes that the proposed subdivision of the site is consistent with the relevant panning controls including the Canterbury-Bankstown LEP 2023 and the Canterbury-Bankstown DCP 2023. It will be constructed in a way that reduces the environmental impacts to the site, including minimising vegetation removal where feasible, ensuring the site biodiversity is maintained. The subdivision will have a positive impact upon the immediately locality and is within the public's interest.

It is recommended that the 18 lot subdivision is supported by Council to facilitate future uses proposed for the site.

Your sincerely



Isaac Camilleri
Senior Town Planner
BEVERIDGE WILLIAMS

APPENDIX A: DEPOSITED PLAN

Req:R173519 /Doc:DP 1291984 P /Rev:07-Sep-2023 /NSW LRS /Prt:08-Sep-2023 04:00 /Seq:1 of 5
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MGA SCIMS

CONNECTION:
PM 25363 TO SSM 48748
8°34'37" MGA
8°34'35" (DP1096110, DP1093355 & SURVEY)
599.448 MGA/GROUND
599.455 (DP1096110, DP1093355 & SURVEY)

COORDINATE SCHEDULE						
MARK	MGA COORDINATES		CLASS	PU	METHOD	STATE
	EASTING	NORTHING				
PM 25361	314647.968	6242483.870	B	N/A	SCIMS	FOUND
PM 25363	314074.918	6242327.549	B	0.02	SCIMS	FOUND
SSM 17332	314632.395	6242496.251	B	0.02	SCIMS	FOUND
SSM 48748	314164.321	6242920.304	B	0.02	SCIMS	FOUND
SSM 137656	314637.870	6242906.046	B	0.02	SCIMS	FOUND
SSM 154456	314471.282	6242881.016	B	0.02	SCIMS	FOUND
SSM 154457	314447.148	6242662.458	B	0.02	SCIMS	FOUND
SSM 176715	314647.524	6242661.730	B	0.02	SCIMS	FOUND
SSM 181529	314106.338	6242558.401	B	0.02	SCIMS	FOUND
DATE OF SCIMS COORDINATES: 15-08-2022			MGA ZONE 56		MGA DATUM: GDA2020	
COMBINED SCALE FACTOR: 1.000018						

SP89012
6
DP 859718
1
DP 101147
10
DP 1034465
2
DP 91953
1 DP 547874
A
DP 327986
3
DP 734460
102
DP 874035
104
DP 1268911
2
19.62 ha

SSM 48748 FD
SSM 137656 FD
SSM 154456 FD
SSM 154457 FD
SSM 176715 FD
SSM 181529 FD
SSM 17332 FD
PM 25361 FD
PM 25363 FD
PEG FD

BULLECOURT AVENUE
SINAI AVENUE
ZONNEBEKE CRESCENT
FLANDERS AVENUE
ASHFORD AVENUE
HORSLEY ROAD
BEACONSFIELD STREET
SOUTH WESTERN MOTORWAY

SEE SHEET 2
SEE DIAGRAM 2A ON SHEET 2
SEE DIAGRAM 2B ON SHEET 2
SEE DIAGRAM 1A

97°17'37" MGA 97°17'30" OBS
309.459 MGA/GROUND & MEAS
81°27'19" MGA 81°27'20" OBS
168.455 MGA/GROUND 168.45 MEAS
97°54'45"
131.805
METAL FENCE (ABT 30 YEARS)
RM GIP FD 97°57'10" (C22783-3000)
RM DH&W 187°56'-2.42
115.65 7°56'35"
30.48 183°31'25"
100°22'05" 6.705
231.05 05"
189°06'09" MGA & OBS
366.512 MGA/GROUND & MEAS
487.665
3°28'55" 526.445 CONNECTION
90°12'29" MGA
200.373 MGA/GROUND 200.385 MEAS
177°44'14" MGA 177°44'00" OBS
244.502 MGA/GROUND & MEAS
213.29
123.92
279°46'30"
METAL FENCE (ABT 10 YEARS)
LOW CONCRETE BLOCK RET WALL
(0.08 CLEAR)
(0.19 CLEAR)
NAIL IN CONE RM DH&W FD 270°47'-2.70 (DP774309)
142.985 187°57'25"
154.555 180°
185°13'10" MGA 185°13'20" OBS
166.161 MGA/GROUND & MEAS
128°29'31" MGA & OBS
19.889 MGA/GROUND & OBS
SSM 17332 FD 187°37'-29.91 TO CNR (DP874035)
NO OCCUPATION 110.975 277°57'45"
48°01'16" MGA & OBS
500.709 MGA/GROUND & MEAS
187°45'02" MGA & OBS
232.976 MGA/GROUND & MEAS
74°44'29" MGA & OBS
593.983 MGA/GROUND & MEAS
NO OCCUPATION 196.125 188°12'55"
HIGH METAL POST & WIRE FENCE (ABT 20 YEARS)
96.995 272° 03'
15.005 40"
224.755 270°37'40"
157.785 264°34'00"
7.01 277°58'10"
137°32'55"-21.92 (DP732013)
RM STAR PICKET FD 93°52'-0.45 (DP1268911)
RM DH&W FD 29°01'-12.97 (DP1268911)
245.75 INT'N TO INT'N (DP732013) 245.78 (BY SURVEY)
187°56'35"
CH 267°26'35" 39.815 TO INT'N
32.305 TO INT'N 187°
RM DH&W FD 209°25'-4.885 (DP228751) (1ST REF GONE)
RM GONE (DP228751)
(17.07 WIDE)
7°56'35" 487.665
METAL FENCE (ABT 30 YEARS)
D P 2 2 9 8 8 8
72 71 70 2

(ZEE2) (ZEE3) (ZB2) (ZC) (X) (Y)

(ZB2) RIGHT OF CARRIAGE WAY VARIABLE WIDTH (DP1236774)
(ZC) EASEMENT FOR SERVICES VARIABLE WIDTH (WHOLE OF LOT) (DP1268911)
(ZEE2) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES (DP1144378)
(ZEE3) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 2 & 3.3 WIDE (DP1236774)

DIAGRAM 1A
RATIO 1:800

(X) - LAND EXCLUDES MINERALS (T447400)
(Y) - LAND EXCLUDES MINERALS - SEE CROWN GRANT(S)

SURVEYOR Name: BENJAMIN JOHN CUMMINS Date: 15-08-2022 Reference: 19164(105DEF)-DP	PLAN OF REDEFINITION OF LOT 105 IN DP1268911	L.G.A: CANTERBURY-BANKSTOWN Locality: MILPERRA Reduction Ratio: 1:2000 Lengths are in metres	07/09/2023	DP1291984

(ISSUE E)

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MGA SCIMS

1 DP 516522
71 DP 1096110
72
8 DP 230101
2 DP 1213775
1
11
DP 239008
12
12 DP 225714
10 DP 239008

AVENUE
ZONNEBEKE CRESCENT
ASHFORD
SINAI AVENUE
BULLECOURT
AVENUE
ROAD
HORSLEY

144.68 BY SURVEY 144.66 PO 35"
RM GONE (DP230101)
RM DH FD (NO WING) 97°57'~4.4 (DP1144378)
(ZEE2)
(5.3)
(127.69)
RM DH&W FD 278°20'~3.5 (DP1096110)
49°47'25" 30.145
15.24
RM DH&W FD 277°57'~3.6 (DP1096110)
56'
487.665
NAIL IN CONC FD RM DH&W FD 254°46'~3.825 (DP1213775)
NAIL IN CONC FD RM GIP FD 277°56'35"~0.455 (DP230101) RM DH&W FD 278°02'~3.485 (DP1213775)
37.82 TO INT'N
5°23'45"~54.825 (DP1213775)
(20.115 WIDE)
RM DH&Ws FD 7°56'50"~3.885 (DP239008) 8°57'~4.165 (BY SURVEY) 7°56'50"~13.26 (BY DP239008 & SURVEY)
3.66
277° 56' 50'
SSM 181529 FD
245.75 INT'N TO INT'N (DP732013) 245.78 (BY SURVEY)
187°
RM GONE (DP225714)
7°

RM DH&W FD 31°31'10"~8.89 (DP859718)
7°55'20" 149.38
1 DP 703922
SP89012
4.705 -18.385 (DP859718)
5.0
322°58' 1.015
METAL FENCE (LESS THAN 10 YEARS)
100.94
277°
5.0
232°41'45" 13.93 TO CNR SSM48748 FD (DP1022835) 232°51'~13.95 BY SURVEY
97°
8°06'15" 20.115
20.115
RM GONE (DP1022835)
30.47 TO INT'N
35"
RM DH&W FD 255°59'~3.81 (DP1022835) 255°59'~3.84 BY SURVEY
44.94 (DP1022835)
RM DH&W FD 28°05'~3.605 (DP1093355)
RM DH&W FD 278°07'~3.58 (DP1093355)
11.58
2 1 DP 1093355
24.39
RM GONE (DP 230101)
RM GIP FD 97°57'~1.0 (C22783-3000)
1 DP 547874
METAL FENCE (ABT 30 YEARS)
97°54'45" 131.805
(0.1)
POST & WIRE MESH FENCE (ABT 30 YEARS)
115.825
3
1
2
RM GONE (DP230101)
RM DH&W FD 278°20'~3.5 (DP1096110)
187°
7°
(ZEE2)
487.665 (127.69)
56'
(20.115 WIDE)
144.68 BY SURVEY 144.66 PO
RM GONE (DP230101)
METAL FENCE (ABOUT 30 YEARS)

6 DP 859718
RM DH&W FD 55°47'~5.30 (DP 859718)
59'
NO OCCUPATION
121.08
25"
(20.115 WIDE)
131.805
POST & WIRE MESH FENCE (ABT 30 YEARS)
RM DH&W 187°56'~2.42
(1.5)
METAL FENCE (ABT 30 YEARS)
115.65
7°56'35"
25"
94.835
NO OCCUPATION
STEEL POST & WIRE MESH FENCE (ABT 10 YEARS)
(0.9)
(0.1)
(ABT 14)
RM GONE (DP 624503)
RM DH&W 183°48'~2.36
RM DH&W 183°47'~3.88
31'
20.26
100°
1.995
6.705
DH IN CONC
30.48
183°
3°31'25"
30.48
100°22'05"
6.705
1 DP 101147 (NO OCCUPATIONS)
2
10 DP 1034465
236.635 (DP1034465)
280°22'05"
22'
(68.745)
05"
RM DH&W FD 124°16'20"~9.49 (DP1236474)
231.05
(ZB2)
CONTINUED ON DIAGRAM 2B

10 DP 1034465
RM DH&W FD 132°25'~4.69 (DP774808)
20.115
270°45'15"
15"
26.36
22
METAL POST AND WIRE MESH FENCE (ABT 20 YEARS)
SSM137656 FD 93°10'35" 16.50 TO CNR (DP1092293)
76.915 (CONNECTION)
0°45'15"
45'
DP 1092293
21
180°
METAL POST AND WIRE MESH FENCE (ABOUT 20 YEARS)
81°27'20"~168.45 (DP1283423)
(0.15)
236.635 (DP1034465) 280°22'05"
BULLECOURT SSM154456 FD
100°
NO OCCUPATION
(ZB2)
(20.115 WIDE)
22'
231.05
METAL FENCE (ABOUT 10 YEARS)
05"
0°22'55"
20.175
RM GONE (DP269237) RM DH&W 181°14'~0.525
(0.4)
RM GONE (DP269237)
RM GONE (DP774808)
METAL FENCE (ABT 10 YEARS)
(0.1)
30"
46'
213.29
180°
2

(ZB2) RIGHT OF CARRIAGE WAY VARIABLE WIDTH (DP1236474)
(ZEE2) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES (DP1144378)

DIAGRAM 2A
RATIO 1:500

DIAGRAM 2B
RATIO 1:1000

CONTINUED FROM DIAGRAM 2A

SURVEYOR Name: BENJAMIN JOHN CUMMINS Date: 15-08-2022 Reference: 19164(105DEF)-DP	PLAN OF REDEFINITION OF LOT 105 IN DP1268911	L.G.A: CANTERBURY-BANKSTOWN Locality: MILPERRA Reduction Ratio: 1:1000 Lengths are in metres	07/09/2023	DP1291984

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PLAN FORM 6_E (2020)	**DEPOSITED PLAN ADMINISTRATION SHEET**	Sheet 1 of 3 sheet(s)

Office Use Only

Registered: 07/09/2023

Title System: TORRENS

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DP1291984

PLAN OF REDEFINITION

OF LOT 105 IN DP1268911

LGA: CANTERBURY-BANKSTOWN

Locality: MILPERRA

Parish: BANKSTOWN

County: CUMBERLAND

Survey Certificate

I, BENJAMIN JOHN CUMMINS

of BEVERIDGE WILLIAMS & CO PTY LTD
32 IOLANTHE STREET, CAMPBELLTOWN NSW 2560

a surveyor registered under the *Surveying and Spatial Information Act 2002*, certify that:

(a) The land shown in the plan was surveyed in accordance with the Surveying and Spatial Information Regulation 2017, is accurate and the survey was completed on 15-Aug-2022

(b) ~~Partial Survey~~

(c) ~~Compilation~~

Datum Line: 'X' - 'Y'

Type: Urban ☑ Rural ☐

Signature: Dated: 07-Nov-2022

Surveyor Identification No: 3301

Surveyor registered under the *Surveying and Spatial Information Act 2002*

~~Crown Lands NSW/Western Lands Office Approval~~

~~I,----------(Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown herein have been given.~~

~~Signature:----------~~

~~Date:----------~~

~~File Number:----------~~

~~Office:----------~~

~~Subdivision Certificate~~

~~I,----------~~

~~----------certify that the provisions of section 6.15 of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.~~

~~Signature:----------~~

~~Registration number:----------~~

~~Consent Authority:----------~~

~~Date of endorsement:----------~~

~~Subdivision Certificate number:----------~~

~~File number:----------~~

Plans used in the preparation of survey.

DP91953	DP269237	DP874035	DP1213775
DP101147	DP547874	DP1018354	DP1236474
DP201198	DP624503	DP1022835	DP1268911
DP228751	DP732013	DP1092293	DP1283423
DP229888	DP774309	DP1093355	C22783-3000
DP230101	DP832619	DP1096110	
DP239008	DP859718	DP1144378	

Statements of intention to dedicate public roads, create public reserves and drainage reserves, acquire/resume land.

Surveyor's Reference: 19164(105DEF)-DP ISSUE A

Signatures, Seals and Section 88B Statements should appear on the following sheet(s)

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PLAN FORM 6_E (2020) **DEPOSITED PLAN ADMINISTRATION SHEET** Sheet 2 of 3 sheet(s)

Registered: 07/09/2023 Office Use Only

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DP1291984

PLAN OF REDEFINITION

OF LOT 105 IN DP1268911

Subdivision Certificate number:

Date of Endorsement:

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2017*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Lot Number	Sub-Address Number	Address Number	Road Name	Road Type	Locality Name
2	N/A	2	Bullecourt	Avenue	Milperra

If space is insufficient use additional annexure sheet

Surveyor's Reference: 19164(105DEF)-DP ISSUE A

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PLAN FORM 6_E (2020) **DEPOSITED PLAN ADMINISTRATION SHEET** Sheet 3 of 3 sheet(s)

Registered: 07/09/2023 Office Use Only

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DP1291984

PLAN OF REDEFINITION

OF LOT 105 IN DP1268911

Subdivision Certificate number:

Date of Endorsement:

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2017*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Execution by Western Sydney University Pursuant to Section 50(3) of the Interpretation Act 1987 (NSW) in the presence of:

.....

Signature of Authorised Officer

Bill Parasiris

.....

Name of Authorised Officer

I certify that the person signing above, with whom I am personally acquainted or as to whose identity I am otherwise satisfied signed this in my presence.

.....

Signature of Witness

Katherine Stanton

.....

Name of Witness

Building R1, Yarramundi Road, Richmond NSW 2753

.....

Address of Witness

If space is insufficient use additional annexure sheet

Surveyor's Reference: 19164(105DEF)-DP ISSUE A

APPENDIX B: VOLUNTARY PLANNING AGREEMENT

DocuSign Envelope ID: CCDA23A4-50B6-434C-90B3-D6F5ADE93EE9

Canterbury-Bankstown Council

Mirvac Residential (NSW) Developments Pty Ltd

Western Sydney University

Voluntary Planning Agreement

2 and 2a Bullecourt Avenue, Milperra

WSU Bankstown Campus

© Corrs Chambers Westgarth

DocuSign Envelope ID: CCDA23A4-50B6-434C-90B3-D6F5ADE93EE9

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DocuSign Envelope ID: CCDA23A4-50B6-434C-90B3-D6F5ADE93EE9

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Date

Parties

Canterbury-Bankstown Council ABN 45 985 891 846 of 66-72 Rickard Road, Bankstown NSW 2200 **(Council)**

Mirvac Residential (NSW) Developments Pty Ltd ABN 29 609 513 135 of Level 28, 200 George Street, Sydney NSW 2000 **(Developer)**

Western Sydney University ABN 53 014 069 881 of Locked Bag 1797, Penrith NSW 2651 **(Landowner)**

Background

A The Landowner owns the Land.

B The Developer and the Landowner prepared the Planning Proposal seeking the Instrument Change, which includes a rezoning of the Land.

C The Developer intends to carry out the Development following the Instrument Change.

D The Developer has made an offer to enter into this Agreement with Council for the provision of Development Contributions in connection with the Planning Proposal and the Development.

E The combined agreed value of the Development Contributions offset is $3,462,458.54.

F Council has accepted the offer to enter into this Agreement. The Parties wish to formalise that arrangement by entering into this Agreement in accordance with section 7.4 of the Act.

Agreed terms

1 Definitions and interpretation

1.1 Definitions

Terms used in this Agreement have the following meanings:

Act	the *Environmental Planning and Assessment Act 1979* (NSW).

Affordable Housing Contribution	means the payment of a Monetary Contribution to Council for affordable housing purposes, as described in **Part C** of **Schedule 2**.
Agreed Contribution Value	means the estimated value for each Development Contribution as identified in **Column 3** of **Schedule 2**, and to be indexed quarterly as follows: (a) in respect of a Development Contribution comprising the Dedication Land, the Milperra Community Contribution and the Affordable Housing Contribution – indexed in accordance with the Consumer Price Index (All Groups Sydney) published by the Australian Bureau of Statistics on and from the date of this Agreement, (b) in respect of a Development Contribution comprising a Works in Kind or a payment of Monetary Contribution in lieu – indexed in accordance with the Producer Price Index (Output of Construction Industry) published by the Australian Bureau of Statistics on and from the date of this Agreement.
Agreement	this voluntary planning agreement, including any schedules and annexures.
Approval	includes an approval, consent, licence, permission or the like.
Approved Deferred Works	means those Works in Kind that Council approves to defer under **clause 7.9**.
Authority	means, in respect of a particular context or circumstance, each Federal, State or Local Government, semi-Government, quasi-Government or other body or authority, statutory or otherwise, including but not limited to any court or tribunal, having jurisdiction and responsibility in respect of that context or circumstance.

Bank Guarantee	means an irrevocable and unconditional undertaking without any expiry or end date in favour of Council to pay an amount or amounts of money to Council on demand issued by: (a) one of the following trading banks: (i) Australia and New Zealand Banking Group Limited; (ii) Commonwealth Bank of Australia; (iii) Macquarie Bank Limited; (iv) National Australia Bank Limited; (v) St George Bank Limited; (vi) HSBC Bank Australia Limited; (vii) Westpac Banking Corporation, or (b) any other financial institution approved by Council in its absolute discretion.
Business Day	a day on which banks are open for business generally in Sydney, and which is not a Saturday, Sunday or bank or public holiday in Sydney and specifically excluding 27, 28, 29, 30 and 31 December.
Certificate of Final Completion	means a certificate in writing issued by Council to the Developer to effect that, in the reasonable opinion of Council, the Works in Kind to which the certificate relates have been completed by the Developer in accordance with this Agreement.
Certificate of Practical Completion	means a certificate in writing issued by Council to the Developer to the effect that, in the reasonable opinion of Council, construction of a Works in Kind is complete, except for minor omissions and defects: (a) which do not prevent the Works in Kind from being reasonably capable of being used for their intended purpose; and (b) the rectification of which will not prejudice the convenient use of the Works in Kind.
Claim	includes a claim, demand, remedy, suit, injury, damage, loss, cost, liability, action, proceeding or right of action.
CLM Act	means the *Contaminated Land Management Act 1997* (NSW).
Contamination	has the same meaning as in the CLM Act.

Construction Certificate	has the same meaning given to that expression in the Act.
Dedication	means transfer to Council for no cost in accordance with this Agreement. **Dedicate** has the same meaning.
Dedication Land	means the Local Roads Land, SP2 Infrastructure (Drainage) Land and RE1 Public Recreation Zoned Land.
Defect	has the meaning given to that expression in **clause 8.1(a)**.
Defects Liability Period	with respect to: (a) an item of the Works in Kind other than one referred to in paragraph (b) below, means 12 months from the date the particular Works in Kind is subject to a Certificate of Practical Completion issued in accordance with **clause 7.6(c)(i)**; and (b) items 4, 5, 6, 10 and 11 in **Schedule 2**, means the period beginning on the date the particular Works in Kind is subject to a Certificate of Practical Completion issued in accordance with **clause 7.6(c)(i)** and ending on the date the Occupation Certificate for the Dwelling on the 401st Residential Lot in the Development is issued, or if less than 401 Residential Lots are approved in the Development, the date the Occupation Certificate for the last Residential Lot in the Development is issued.
Defects Liability Security	means Security in the amount of $144,654.03, which is equal to 2.5% of the Agreed Contributions Value of the Works in Kind, indexed quarterly in accordance with the Consumer Price Index (All Groups Sydney) published by the Australian Bureau of Statistics on and from the date of this Agreement.
Defects Notice	has the meaning given to that expression in **clause 8.1(a)**.
Deferred Works	has the meaning given to that expression in **clause 7.9(a)**.
Deferred Works Security	has the meaning given to that expression in **clause 14.4(a)**.

Development	the development (within the meaning of the Act) of the Land authorised by a Development Consent and permitted as a consequence of the Instrument Change, which, at the date of this Agreement, is proposed to involve the construction of up to 430 residential dwellings and provision of local open space, a neighbourhood centre and drainage facilities.
Development Consent	has the same meaning given to that expression in the Act and includes any development consents granted by Council in respect of the Development.
Development Contributions	the contributions to be provided by the Landowner and Developer in accordance with **clause 5** and **Schedule 2**.
Dwelling	has the same meaning as in the LEP.
Explanatory Note	The explanatory note prepared pursuant to section 205 of the Regulation and attached at **Annexure D**.
General Security	means Security in the amount of $581,968.53, which is equal to 2.5% of the Agreed Contributions Value of the Development Contributions, indexed quarterly in accordance with the Consumer Price Index (All Groups Sydney) published by the Australian Bureau of Statistics on and from the date of this Agreement.
Instrument Change	means an amendment to the LEP as a consequence of the Planning Proposal, which is given effect by the publication of a new LEP in the NSW Government Gazette.
Insurance Bond	means an irrevocable and unconditional undertaking: (a) by an Insurance Company which is an eligible financial institution for the purposes of Treasury Circular NSW TC14/01 dated 24 January 2014 as amended, supplemented or substituted from time to time; and (b) on terms acceptable to Council, in Council's absolute discretion, to pay the face value of that undertaking (being such amount as is required under this Agreement) on demand.
Land	means Lot 105 DP1268911 and Lot 1 DP101147, situated at 2 and 2a Bullecourt Avenue, Milperra and currently known as the Western Sydney University Bankstown Campus, including any land created as a result of the subdivision or consolidation of that land.

LEP	means the Canterbury-Bankstown Local Environmental Plan 2023 (NSW).
Local Roads Land	that part of the Land that is proposed to be Dedicated as public road, as indicatively shown marked 'Local Road' on the plan at **Annexure A.**
Maintain	in relation to a Works in Kind, means keep in a good state of repair and working order to Council's satisfaction, and includes repair of any damage and removal of any graffiti to the works.
Maintenance Period	(a) in relation to a Works in Kind not referred to in (b), means the period commencing on the date the Council issues a Certificate of Practical Completion in respect of the work and ending on the date the Occupation Certificate for the Dwelling on the 401st Residential Lot in the Development is issued or if less than 401 Residential Lots are approved in the Development, the date the Occupation Certificate for the last Residential Lot in the Development is issued, and (b) in relation to a Works in Kind comprising a drainage or bioretention work means a period of 5 years commencing on the date the Council issues a Certificate of Practical Completion in respect of the work.
Milperra Community Contribution	the payment of a Monetary Contribution to Council for the purpose of the Milperra Community Centre or other community facilities in the Milperra region as described in **Part C** of **Schedule 2.**
Monetary Contribution	means the payment of an amount to Council, including an amount paid in lieu of carrying out an item of Works in Kind that is equivalent to the Agreed Contribution Amount for that item.
Occupation Certificate	has the same meaning given to that expression in the Act.
RE1 Public Recreation Zoned Land	that part of the Land that is proposed to be Dedicated to Council for public open space, that is proposed to be or that is zoned RE1 Public Recreation under the LEP and as shown marked 'Proposed Public Open Space' on the plan at **Annexure A**.
Part 6 Certificate	means a certificate under Part 6 of the Act.

Party	a party to this Agreement, including their successors and assigns.
Planning Proposal	means the planning proposal made pursuant to section 3.33 of the Act submitted by the Sydney South Planning Panel to the Department of Planning and Environment on 17 February 2022 and given reference number PP-2021-5837.
Practical Completion	in respect of a Works in Kind, occurs when the Council has issued a Certificate of Practical Completion for the Works in Kind.
Public Domain Work Permit	means an approval issued by Council under the *Roads Act 1993* and/or *Local Government Act 1993* pursuant to which a developer is authorised to carry out works within, on, under or above any land owned by Council (including roads).
Register	the Torrens title register maintained under the *Real Property Act 1900* (NSW).
Regulation	the *Environmental Planning and Assessment Regulation 2021* (NSW).
Release Land	has the meaning given to that expression in **clause 13.2(a)**.
Residential Accommodation	has the meaning given to that expression in the *Standard Instrument—Principal Local Environmental Plan*.
Residential Lot	means a lot that forms part of the Land to be created by registration of a plan of subdivision, strata plan or strata plan of subdivision, and is intended to be developed or used for Residential Accommodation, excluding any Service Lots or Super Lots.
Security	means (a) a Bank Guarantee; or (b) a bond agreed to by Council, including an Insurance Bond.

Service Lot	means a Lot that is created for one or more of the following purposes: (a) to be dedicated or otherwise transferred to an Authority (including to Council); (b) any public utility undertaking within the meaning of the *Standard Instrument—Principal Local Environmental Plan*; (c) open space, recreation, environmental conservation, drainage or riparian land management; or (d) a road, but does not include a Super Lot.
Site Audit Report	has the same meaning as in the CLM Act.
Site Audit Statement	has the same meaning as in the CLM Act.
SP2 Infrastructure (Drainage) Land	that part of the Land that is proposed to be Dedicated as drainage reserve, as indicatively shown on the plan at **Annexure C**.
Strata Certificate	has the same meaning given to that expression in the *Strata Schemes Development Act 2015*.
Subdivision Certificate	has the same meaning given to that expression in the Act.
Subdivision Works Certificate	has the same meaning given to that expression in the Act.
Super Lot	means a Lot which, following the registration of a plan of subdivision, is intended for further subdivision (including strata and community title subdivision) for Residential Accommodation, but does not include a Service Lot.
Works in Kind	each of the works to be carried out as specified in **Column 2** of **Part B** of **Schedule 2**.

1.2 Interpretation

In this Agreement, unless the context clearly indicates otherwise:

(a) a reference to a statute, ordinance, code or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them;

(b) the singular includes the plural and vice versa;

(c) the word "person" includes a firm, a body corporate, an unincorporated association or an authority;

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(d) a reference to a person includes a reference to the person's executors, administrators, successors, substitutes (including, without limitation, persons taking by novation) and assigns;

(e) a reference to anything (including, without limitation, any amount) is a reference to the whole and each part of it and a reference to a group of persons is a reference to all of them collectively, to any two or more of them collectively and to each of them individually;

(f) "include" or "including" when introducing a list of items does not limit the meaning of the words to which the list relates to those items or to items of a similar kind;

(g) a reference to a body, whether statutory or not which ceases to exist or whose powers or functions are transferred to another body is a reference to the body which replaces it or which substantially succeeds to its powers or functions;

(h) no rule of construction applies to the disadvantage of a Party because that Party was responsible for the preparation of this Agreement;

(i) any capitalised term used, but not defined in this Agreement, will have the meaning ascribed to it under, and by virtue of, the Act;

(j) headings are inserted for convenience only and do not affect the interpretation of this Agreement;

(k) if the day on which any act, matter or thing is to be done under this Agreement is not a Business Day, the act, matter or thing must be done on the next Business Day;

(l) a reference in this Agreement to dollars or $ means Australian dollars and all amounts payable under this Agreement are payable in Australian dollars;

(m) a reference in this Agreement to any agreement, deed or document is to that agreement, deed or document as amended, novated, supplemented or replaced; and

(n) a reference to a clause, part schedule or attachment is a reference to a clause, part, schedule or attachment of or to this Agreement.

2 Planning agreement under the Act

(a) The Parties agree that this Agreement is a planning agreement within the meaning of section 7.4 of the Act.

(b) **Schedule 1** of this Agreement summarises the requirements for planning agreements under section 7.4 of the Act and the ways in which this Agreement addresses those requirements.

3 Application of this Agreement

This Agreement applies to the:

(a) Land;

(b) Instrument Change; and

(c) Development.

4 Operation of this Agreement

(a) **Clauses 1, 2, 3, 4, 13, 16, 17, 18, 19** and **21.1** operate and are effective and binding on the Parties on and from the date of this Agreement.

(b) The Parties agree that the balance of the terms of this Agreement operate and are effective and binding on the Parties on and from the date the Instrument Change is made.

(c) Notwithstanding **clause 4(b)**, the Parties agree that the Landowner and Developer are not bound by this Agreement to deliver the Development Contributions unless:

(i) the Instrument Change is made;

(ii) a Development Consent or Development Consents (as necessary) is or are granted for the Development; and

(iii) the Development is physically commenced in accordance with section 4.53 of the Act.

5 Contributions to be made under this Agreement

(a) Subject to this Agreement and in accordance with **Schedule 2**, the Developer and the Landowner (as applicable) are to deliver the Development Contributions, comprising the:

(i) Dedication of the Dedication Land;

(ii) carrying out, completion and maintenance of the Works in Kind or, in respect of Works in Kind items 7, 12 and 14, the provision of a Monetary Contribution in lieu in accordance with **clause 7.8** and subject to agreement from the Council; and

(iii) provision of the Milperra Community Contribution and the Affordable Housing Contribution.

(b) The Parties acknowledge and agree that the Agreed Contribution Value in respect of a Works in Kind or Dedication Land:

(i) constitutes the agreed value of the public benefit of a Development Contribution required to be made under this Deed irrespective of the cost to the Developer of making the Development Contribution, and

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(ii) does not serve to define the monetary extent of the Developer's obligation to make the Development Contribution to which the Agreed Contribution Value relates.

6 Dedication of Dedication Land

6.1 Delivery of the Dedication Land

The Landowner is to Dedicate the Dedication Land specified in **Part A** of **Schedule 2**, by the time specified in **Column 4** of **Part A** of **Schedule 2**, in accordance with **clause 6.2, clause 6.3** and **clause 6.4**.

6.2 Dedication process

(a) The Landowner must take all steps necessary, and may be assisted by the Developer in the taking of such steps, to give effect to the Dedication of the Dedication Land to Council in accordance with the timing specified in **clause 6.1** by:

(i) in the case of the RE1 Public Recreation Zoned Land and SP2 Infrastructure (Drainage) Land, either:

(A) preparing and registering a deposited plan (or more than one deposited plan) which has the effect of Dedicating the RE1 Public Recreation Zoned Land and SP2 Infrastructure (Drainage) Land to Council as a public reserve or a drainage reserve (as applicable) in accordance with section 49 of the *Local Government Act 1993* (NSW); or

(B) arranging the electronic conveyance of the RE1 Public Recreation Zoned Land and SP2 Infrastructure (Drainage) Land to Council for $1.00, including:

(1) preparing and registering a deposited plan (or more than one deposited plan) to create the RE1 Public Recreation Zoned Land and SP2 Infrastructure (Drainage) Land as separate parcels;

(2) procuring all necessary consents to facilitate the transfer of the RE1 Public Recreation Zoned Land and SP2 Infrastructure (Drainage) Land to Council; and

(3) coordinating the electronic conveyance of the RE1 Public Recreation Zoned Land and SP2 Infrastructure (Drainage) Land to Council via Property Exchange Australia Ltd (PEXA) or another applicable electronic lodgement network operator;

(ii) in the case of the Local Roads Land, preparing and registering a deposited plan (or more than one deposited plan) which has the effect of Dedicating the Local Roads Land to Council as public road in accordance with section 9 of the *Roads Act 1993*; and

(iii) taking any other necessary action to give effect to the transfer of the title of the Dedication Land to Council.

(b) The Dedication Land is taken to be Dedicated to Council for the purposes of this Agreement when the relevant deposited plan or electronic conveyance has been registered.

(c) To the extent permitted by law, Council must promptly do all things reasonably required by the Landowner to facilitate the registration of a deposited plan or plans to create the Dedication Land, including but not limited to issuing a Subdivision Certificate.

(d) Subject to the requirements under this **clause 6.2**, Council agrees that it will accept the Dedication Land free of all encumbrances and interests other than any easements or interests approved in writing by Council required by any authority or utility service provider or required under any Development Consent.

(e) To assist in Council's consideration of any easements or interests referred to in **clause 6.2(d)**, the Developer is provide to Council on request a plan or other document showing the location and terms of any easements and interests.

(f) The Developer is responsible for paying any costs and expenses, including those incurred by Council, associated with the Dedication of the Dedication Land to Council.

6.3 Site Audit Report and Site Audit Statement

Before Dedicating the Dedication Land to Council, the Developer, at its cost, is to obtain and provide to Council a Site Audit Report and Site Audit Statement stating that the Dedication Land is suitable for the purpose for which the Dedication Land is required to be dedicated under this Agreement without being subject to compliance with an environmental management plan.

6.4 Completion of SP2 Infrastructure (Drainage) prior to Dedication

Before Dedicating the Dedication Land comprising item 3 of **Schedule 2** to Council, the Developer is to have obtained a Certificate of Practical Completion in respect of Works in Kind item 10 of **Schedule 2**.

6.5 Indemnity

The Developer indemnifies and agrees to keep indemnified Council against all Claims made against Council as a result of any Contamination on or emanating from the Dedication Land but only in relation to Contamination that existed on or before the date that the Dedication Land is transferred or dedicated to Council or compulsorily acquired by Council pursuant to this Agreement, but only in circumstances where the Council is of the view, acting reasonably, that the Site Audit Report and Site Audit Statement has not been properly prepared in accordance with the applicable industry standards.

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7 Carrying out and delivery of Works in Kind

7.1 Design of Works in Kind

(a) The Developer may not commence construction of a Works in Kind unless the Works in Kind is designed and approved in accordance with this clause.

(b) The Developer must, promptly after the date of the Development Consent applicable to the relevant Works in Kind, prepare plans and specifications for the Works in Kind having regard to:

(i) the relevant Development Consent;

(ii) applicable Council standards (except to the extent such standards are varied by the relevant Development Consent); and

(iii) applicable Australian standards.

(c) Before commencing the design of the Works in Kind contribution items 4, 6, 7, 10 and 14, the Developer is to request Council to provide the Developer with Council's design requirements for the works.

(d) Upon receipt of the Developer's request, Council may:

(i) initially request the Developer to provide a written proposal concerning the design of the Works in Kind, including preliminary concept designs, to assist Council in determining and notifying the Developer of its requirements, and subsequently request the Developer to submit the plans and drawings of the Works in Kind to Council for approval; or

(ii) request the Developer to submit the plans and drawings of the works to Council for approval.

(e) The Developer is to prepare:

(i) plans and drawings of the Works in Kind in accordance with the Council's design requirements provided to the Developer under **clause 7.1(d)**, and

(ii) in respect of Works in Kind items 7 and 14, an estimate of the costs of construction of those items to those plans and drawings prepared and certified by an independent and suitably qualified and registered quantity surveyor, showing that the estimated costs of construction is not less than the Agreed Contribution Value,

and submit the plans and drawings and cost estimate to the Council for approval.

(f) Subject to **clause 7.1(g)**, Council may reasonably require the Developer to make any change to the plans and drawings of the Works in Kind that it reasonably considers necessary or desirable as a precondition to approving the plans and drawings, and the Developer is to make any such change.

(g) In respect of Works in Kind items 7 and 14, the Developer is not required to make any change requested under **clause 7.1(f)** if such change will result in an increase in the estimated cost of the relevant Works in Kind exceeding the Agreed Contribution Value for that item, as certified by an independent and suitably qualified and registered quantity surveyor.

(h) Council is to inform the Developer in writing when it approves the plans and drawings of the Works in Kind.

(i) The Developer is not to make any application for any Approval relating to the Works in Kind contribution items 4, 6, 7, 10 and 14 unless Council has approved the plans and drawings of the Works in Kind under this clause.

(j) For the basin design components relating to the Works in Kind contribution items 4 and 10, the Developer agrees to:

(i) install gross pollutant traps at the end of each drainage line shown on the plan at **Annexure C**, and ensure that vehicular access to the gross pollutant traps is available in all weather conditions;

(ii) when it lodges an application for a Subdivision Works Certificate for those items, provide to Council for Council's approval a maintenance plan for the maintenance of the drainage and bioretention basins shown on the plan at **Annexure C** which includes (without limitation) details of the following matters:

(A) requirements for works-as-executed plans,

(B) life cycle plans and maintenance plans for individual assets including the following details:

(1) device model and brand (if applicable),

(2) characteristics of the 'upstream' area (e.g. pollution, volume of water) and how the device meets these,

(3) simplified diagram of the device functions,

(4) useful life,

(5) preventative maintenance and frequency,

(6) in respect of gross pollutant traps, adherence to the 'Guidelines for the Maintenance of Stormwater Treatment Measures' published by Water NSW,

(7) reactive maintenance,

(8) data sheets for gross pollutant traps,

(9) warranties;

(iii) maintain the drainage and bioretention basins shown on the plan at **Annexure C** for a period of 5 years from the Practical Completion of those Works in Kind in accordance with the maintenance plan approved by Council under **clause 7.1(j)(ii)**; and

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(iv) at the completion of the maintenance period referred to in **clause 7.1(j)(iii)**, undertake testing to determine whether there has been an unacceptable reduction in the infiltration capacity of the drainage and bioretention basins.

(k) The Developer acknowledges and agrees that if an unacceptable reduction in the infiltration capacity of the drainage and bioretention basins is identified under **clause 7.1(j)(iv)**, the Developer must either:

(i) undertake work to restore the infiltration capacity of the drainage and bioretention basins, within the approved footprint, to the capacity level at Practical Completion of those Works in Kind; or

(ii) subject to Council's agreement, pay to Council an amount agreed in lieu of carrying out the work identified in **clause 7.1(k)(i)**, to allow Council to carry out the work.

(l) Prior to the issue of an Occupation Certificate in respect of a Residential Lot, the Developer is to ensure that the Residential Lot is supplied with an appropriate rainwater tank fitted in accordance with the *BASIX Interim Rainwater Harvesting System Guidelines*.

7.2 Carrying out of Works in Kind

(a) The Developer must:

(i) carry out the Works in Kind:

(A) in a good and workmanlike manner; and

(B) in accordance with the plans and drawings prepared and approved by Council under **clause 7.1**; and

(ii) bring the Works in Kind to Practical Completion by the time specified in **Column 4 of Part B of Schedule 2**.

(b) The Developer is to ensure that anything necessary for the proper performance of its obligations under this Agreement relating to the provision of the Works in Kind is supplied or made available for that purpose.

(c) The Developer is to use all reasonable endeavours to ensure that, in providing the Works in Kind:

(i) all necessary measures are taken to protect people and property;

(ii) unnecessary interference with the passage of people and vehicles is avoided; and

(iii) nuisances and unreasonable noise and disturbances are prevented.

(d) The Developer is not to obstruct, interfere with, impair or damage any public road, public footpath, public cycleway or other public thoroughfare, or any pipe, conduit, drain, watercourse or other public utility or service on any land in connection with the Works in Kind unless authorised in writing by Council or any relevant Authority.

(e) The Developer warrants to Council that:

(i) it has obtained all Approvals and has complied with all laws and applicable industry standards in relation to the Works in Kind;

(ii) it accepts that, if any aspect of the Works in Kind do not comply with this Agreement, Council is entitled to require the Developer to cease the Works in Kind and to pursue its rights and remedies relating to the non-compliance under this Agreement and, subject to this Agreement, at law or in equity; and

(iii) the Works in Kind, when completed, are to be fit for purpose.

(f) The Developer is to procure in favour of Council from the appropriate person engaged in relation to the Works in Kind, any warranty reasonably required by Council relating to the design, construction, supervision, inspection, testing or certification of the Works in Kind.

7.3 Damage to assets & property

(a) The Developer must immediately notify Council in writing of any loss or damage that occurs in respect of a Council asset of which it becomes aware while carrying out the Works in Kind.

(b) The Developer must replace or fix any Council asset the Developer loses or damages while carrying out the Works in Kind in accordance with any requirements of Council.

(c) If an audit, inspection or test of the Works in Kind shows that:

(i) the Works in Kind do not conform to the location, design, specifications, materials or finishes approved by Council under this Agreement; or

(ii) damage has occurred to a Council asset or the property of another person in connection with the Works in Kind,

Council may give the Developer a notice in writing requiring it to take corrective action to bring the Works in Kind into conformity or repair the damage, as the case requires.

(d) Without limiting any other remedies available to Council under this Agreement, if the Developer does not comply with Council's requirements under subclause (c), Council may take the action required of the Developer and recover Council's costs of so doing from the Developer.

7.4 Entry onto land

(a) The Developer is responsible for obtaining all necessary rights to lawfully enter and occupy land, and provide the Works in Kind.

(b) Upon receiving not less than 15 Business Days prior written notice from the Developer, and subject to the requirements of any laws including the *Crown Land Management Act 2016*, Council is to allow the Developer, to enter, occupy, and use Council owned or controlled land specified in the

notice at any reasonable time if the occupation or use of the land by the Developer is reasonably necessary for the Works in Kind.

(c) Council is not required to allow the Developer to enter, occupy and use any Council owned land that is used for public purposes unless and until the Developer has paid any applicable fee or rent, as approved by Council, for that purpose.

(d) Upon receiving not less than 15 Business Days prior notice from Council, the Developer is to provide Council with safe and unhindered access at any reasonable time to any land on which the Works in Kind are being, or have been, provided.

(e) Council must comply with the Developer's reasonable safety requirements while on any land on which the Works in Kind are being provided.

7.5 Audit, inspection and testing of Works in Kind

(a) Council may undertake an audit, inspection or test of the Works in Kind at any reasonable time for any purpose related to this Agreement upon giving not less than 15 Business Days prior notice to the Developer.

(b) The Developer is to provide Council with any assistance that is reasonably required by Council to enable Council to undertake any audit, inspection or test of the Works in Kind.

(c) If an audit, inspection or test reasonably shows that particular action must be taken in relation to the Works in Kind, the Developer is to:

(i) take the action in the manner, and within the time, the Council reasonably requires, and

(ii) provide evidence to the Council that the action has been taken.

(d) If an audit, inspection or test shows that the Works in Kind have not been provided in accordance with this Agreement, the Developer is to pay any costs incurred by the Council in connection with the audit, inspection or test.

(e) If the Council reasonably decides that a further and more detailed audit, inspection or test of the Works in Kind is required, the Council may determine an approved fee in that regard and the Developer is to pay to the Council the fee so approved.

7.6 Completion of Works in Kind

(a) When the Developer is of the reasonable opinion that any item of the Works in Kind is substantially complete, the Developer must notify Council in writing requesting Council to inspect the Works in Kind.

(b) Council must inspect the relevant Works in Kind promptly following, and within 15 Business Days of Council receiving, the notice under **clause 7.6(a)**.

(c) Council must, within 15 Business Days of completing its inspection of the Works in Kind (and in any event, no later than 20 Business Days after receipt of the notice under **clause 7.6(a)**), provide the Developer with:

(i) a Certificate of Practical Completion; or

(ii) a written notice specifying that it is of the opinion that the Works in Kind has not been completed to the extent to enable the issuing of a Certificate of Practical Completion, in which case it must set out all the matters that Council reasonably considers must be completed in order for a Certificate of Practical Completion to be issued.

(d) If the Council does not provide the Developer with a notice under **clause 7.6(c)** within the specified timeframe, the Developer can send a further notice to the Council and if the Council does not respond within a further 5 Business Days, then the Works in Kind the subject of the Developer's notice under **clause 7.6(a)** will be deemed to have been the subject of a Certificate of Practical Completion on the date nominated in the Developer's notice.

(e) The Developer:

(i) must correct any defects or finalise any incomplete work specified by Council under **clause 7.6(c)(ii)**, within the agreed time as reasonably nominated by the Developer, or if no time is nominated and agreed, within 10 Business Days after the Developer receives the notice issued under **clause 7.6(c)(ii)** from Council. Once complete, the provisions of **clauses 7.6(a)–7.6(c)** will apply; or

(ii) if it does not agree with the matters set out in Council's notice issued under **clause 7.6(c)(ii)**, must notify Council that a dispute has arisen and **clause 16** of this Agreement will apply.

(f) Within 21 days after the issuing of a Certificate of Practical Completion, the Developer is to rectify any minor omissions or defects in the Works in Kind which did not prevent the issuing of the Certificate of Practical Completion and thereby complete the Works in Kind.

7.7 Works-As-Executed Plan

(a) No later than 21 days after Practical Completion of all of a Works in Kind, the Developer is to submit to Council a full Works-As-Executed-Plan for the Works in Kind in a format agreed to by Council.

(b) The Developer, being the copyright owner in the Works-As-Executed Plan, assigns the copyright in the Works-As-Executed Plan to Council free of Cost to Council.

(c) If the Developer is not the copyright owner of the Work-As-Executed Plan, the Developer is to promptly procure the assignment of the copyright of the Works-As-Executed Plan to Council free of cost to Council.

7.8 Alternative method of delivering Works in Kind

(a) In respect of items 7 and 14 in **Schedule 2**, subject to obtaining Council's prior written agreement to accept Monetary Contributions in lieu of those items, the Developer may decide, at any time prior to the issue of a Construction Certificate and/or Public Domain Work Permit (whichever is applicable) to pay to Council a Monetary Contribution in the amount of the Agreed Contribution Value of the item, in lieu of carrying out that item.

(b) In respect of item 12 in **Schedule 2**, if, after having consulted with the Council and Ausgrid, the Council is satisfied that the Developer is unable to obtain Ausgrid approval for the undergrounding of the powerlines, then in lieu of carrying out that item the Developer is to pay to Council a Monetary Contribution in the amount of the Agreed Contribution Value of the item and the Council may apply that Monetary Contribution towards undergrounding of power lines in Milperra.

(c) If the Developer decides to pay a Monetary Contribution in lieu of carrying out Works in Kind in accordance with **clause 7.8(a)**, or is required to pay a Monetary Contribution in accordance with **clause 7.8(b)**, the Developer must:

(i) give Council not less than 15 Business Days written notice of its intention to pay a Monetary Contribution; and

(ii) transfer funds in the amount of the Monetary Contribution to Council by the time that the relevant item of Works in Kind was required to have been completed under this Agreement, provided Council has provided the Developer with sufficient details necessary to arrange the transfer of funds.

(d) A Monetary Contribution is made for the purposes of this Agreement when cleared funds are deposited and credited by means of electronic funds transfer into a bank account nominated by Council.

(e) If a tax invoice is required by law to be provided to the Developer by Council, the Developer is not required to pay the Monetary Contribution identified in its notice issued in accordance with **clause 7.8(c)(i)** until Council has given the Developer a tax invoice for the amount of the relevant Monetary Contribution.

(f) If the Developer decides or is required to pay, and pays, a Monetary Contribution in lieu of carrying out Works in Kind in accordance with this clause, the Developer will not be considered to be in breach of this Agreement as a result of a failure to achieve Practical Completion of the Works in Kind by the time for Practical Completion of those Works in Kind as specified in **Column 4** of **Part B** of **Schedule 2**.

7.9 Deferral of Works in Kind

(a) Notwithstanding any other provision of this Agreement, if the Developer forms the view at any time that it is unable to deliver an item or items of Works in Kind (**Deferred Works**) by the time specified in **Column 4** of

Part B of **Schedule 2**, then the Developer may seek Council's approval to defer the relevant Works in Kind by providing written notice to Council:

(i) identifying the relevant Works in Kind that the Developer proposes to defer;

(ii) identifying the anticipated time for completion of the relevant Works in Kind; and

(iii) if the Developer seeks to reduce the Deferred Works Security from the default amount equal to the Agreed Contribution Value of the relevant Works in Kind, the Developer must provide reasons for that request including any evidence of the cost of achieving completion of the Deferred Works to support the reduction in the Deferred Works Security.

(b) Within 15 Business Days of the Developer providing the notice under **clause 7.9(a)**, Council must give the Developer a written notice stating whether or not it consents to the deferral of the Deferred Works, the revised date for completion and any reduction in the Deferred Works Security. In determining whether it consents to the deferral of the Deferred Works, the revised date for completion and any reduction in the Deferred Works Security, Council must act reasonably however **clause 16** does not apply to any such determination.

(c) If Council consents to the deferral of the Deferred Works and receives from the Developer the Deferred Works Security in the amount identified in Council's notice provided under **clause 7.9(b)**, then:

(i) the time for completion of the Approved Deferred Works under this Agreement will be taken to be the revised date for completion approved by Council;

(ii) the Developer will not be considered to be in breach of this Agreement as a result of a failure to achieve Practical Completion of the Approved Deferred Works by the time for Practical Completion of those Works in Kind as specified in **Column 4** of **Part B** of **Schedule 2**; and

(iii) if applicable, any relevant Subdivision Certificate or Strata Certificate may be issued notwithstanding that the time for Practical Completion of the Approved Deferred Works was required prior to the issue of a Subdivision Certificate or Strata Certificate in **Column 4** of **Part B** of **Schedule 2**.

(d) If the Approved Deferred Works do not achieve Practical Completion by the revised completion date, then:

(i) Council may call on the Deferred Works Security in accordance with **clause 11.2**; and

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(ii) no further Part 6 Certificates or Strata Certificates may be issued for the Development until the Approved Deferred Works achieve Practical Completion.

(e) The Developer may request a further deferral of Approved Deferred Works by following the procedures in this **clause 7.9**.

7.10 Maintenance of Works in Kind after Practical Completion

In respect of the following items of Works in Kind:

(a) Open Space Embellishment (item 4 in **Schedule 2**),

(b) Local Roads (item 5 in **Schedule 2**),

(c) Shared Cycleway (item 6 in **Schedule 2**),

(d) SP2 Infrastructure (Drainage) (item 10 in **Schedule 2**),

(e) Local Road Footpaths (item 11 in **Schedule 2**)

the Developer is to Maintain the works during the Maintenance Period to the Council's satisfaction and in accordance with any requirements notified by the Council to the Developer in a Certificate of Practical Completion, and in respect of a Works in Kind comprising a drainage or bioretention work, in accordance with the maintenance plan approved by Council under **clause 7.1(j)(ii)**.

8 Defects Liability

8.1 Defects Notice

(a) Where a Certificate of Practical Completion has been issued for all or any part of the Works in Kind pursuant to **clause 7.6(c)(i)**, but the relevant part of the Works in Kind is incomplete, has minor omissions or defects (which did not prevent the issuing of a Certificate of Practical Completion) or contains any other defect, being a defect which:

(i) adversely affects, or is likely to adversely affect, the appearance, structural integrity, functionality or the ordinary use and/or enjoyment of the relevant part of the Works in Kind; or

(ii) will require maintenance or rectification works to be performed on the Works in Kind as a result of the existence of the defect,

(Defect), Council may issue a defects notice **(Defects Notice)** to the Developer concerning that part of the Works in Kind, but only within the Defects Liability Period.

(b) A Defects Notice must contain the following information:

(i) the nature and extent of the Defect, omission or incomplete work;

(ii) the specific details of the work Council requires the Developer to carry out in order to rectify the Defect, omission or incomplete work; and

(iii) the time within which the Defect, omission or incomplete work must be rectified (which must be a reasonable time having regard to the nature of the Defect, omission or incomplete work).

8.2 Developer to rectify Defects

(a) The Developer must:

(i) procure the performance of the work required to rectify the Defects, omission or incomplete work contained within a Defects Notice after receipt of the Defects Notice; or

(ii) serve a notice on Council that it disputes the matters set out in the Defects Notice.

(b) The Developer must follow the procedure set out in **clauses 7.6(a)–7.6(d)** in respect of the satisfaction of the Defects Notice except that:

(i) all references to '*is substantially complete*' is to be a reference to '*has been rectified in accordance with the Defects Notice*'; and

(ii) all references to '*Certificate of Practical Completion*' is a reference to '*Certificate of Final Completion*'.

(c) Where the Developer serves notice on Council in accordance with **clause 8.2(a)(ii), clause 16** of this Agreement will apply.

(d) Council takes possession and ownership of the Works in Kind at 4:00pm on the later of:

(i) the end of the Defects Liability Period for the Works in Kind; or

(ii) the date Council issues a Certificate of Final Completion in accordance with this clause.

9 Affordable Housing Contribution

(a) The Developer is to pay to Council the Affordable Housing Contribution specified in **Column 3** of item 15 in **Schedule 2**, before the timing specified in **Column 4** of item 15 in **Schedule 2**.

(b) The amount of the Affordable Housing Contribution is to be indexed from the date of this Deed until the date of payment in accordance with the following formula:

A = B x C/D

where:

A = the indexed amount of the Affordable Housing Contribution, which shall not be less than the amount of Affordable Housing Contribution as at the date of this Agreement;

B = the amount of the Affordable Housing Contribution as at the date of this Agreement;

C = the Index most recently published before the date of payment; and

D = the Index most recently published before the commencement date of this Agreement.

In this **clause 9(b)**, Index means the Consumer Price Index (All Groups - Sydney) as published by the Australian Bureau of Statistics, or any replacement index published from time to time.

(c) The Affordable Housing Contribution is made for the purposes of this Agreement when Council receives the full amount of the contribution payable under this Agreement by unendorsed bank cheque or deposit by means of an electronic funds transfer of cleared funds into a bank account nominated by Council.

10 Milperra Community Centre Contribution

(a) The Developer is to pay to Council the Milperra Community Centre Contribution a specified in **Column 3** of item 16 in **Schedule 2**, before the timing specified in **Column 4** of item 16 in **Schedule 2**.

(b) The amount of the Milperra Community Contribution is to be indexed from the date of this Deed until the date of payment in accordance with the following formula:

A = B x C/D

where:

A = the indexed amount of the Milperra Community Contribution, which shall not be less than the amount of Milperra Community Contribution as at the date of this Agreement;

B = the amount of the Milperra Community Contribution as at the date of this Agreement;

C = the Index most recently published before the date of payment; and

D = the Index most recently published before the commencement date of this Agreement.

In this **clause 10(b)**, Index means the Consumer Price Index (All Groups - Sydney) as published by the Australian Bureau of Statistics, or any replacement index published from time to time.

(c) The Milperra Community Centre Contribution is made for the purposes of this Agreement when the Council receives the full amount of the contribution payable under this Agreement by unendorsed bank cheque or by deposit by means of an electronic funds transfer of cleared funds into a bank account nominated by the Council.

11 Breach of obligations

11.1 Notice of breach

If the Council reasonably considers that the Developer is in breach of any obligation under this Agreement, it may give a written notice to the Developer:

(a) specifying the nature and extent of the breach,

(b) requiring the Developer to:

(i) rectify the breach if it reasonably considers it is capable of rectification, or

(ii) pay compensation to the reasonable satisfaction of the Council in lieu of rectifying the breach if it reasonably considers the breach is not capable of rectification,

(c) specifying the period within which the breach is to be rectified or compensation paid, being a period that is reasonable in the circumstances.

11.2 Failure to comply with notice of breach

(a) If the Developer fails to fully comply with a notice referred to in **clause 11.1**, the Council may, without further notice to the Developer and notwithstanding any other remedy it may have under this Agreement, under any Act or otherwise at law or in equity, call-up the General Security, the Defects Liability Security or the Deferred Works Security, as appropriate, and apply it to remedy the Developer's breach.

(b) If the Developer fails to comply with a notice given under **clause 11.1** relating to the provision or rectification of Works in Kind under this Agreement, the Council may also step-in and remedy the breach and may enter, occupy and use any land owned or controlled by the Developer and any equipment on such land for that purpose.

11.3 Recovery of costs by Council

(a) Any costs incurred by the Council in remedying a breach in accordance with **clause 11.2** may be recovered by the Council by either or a combination of the following means:

(i) by calling-up and applying the General Security, the Defects Liability Security or the Deferred Works Security, as appropriate, provided by the Developer under this Agreement, or

(ii) as a debt due in a court of competent jurisdiction.

(b) For the purpose of **clause 11.3(a)**, the Council's costs of remedying a breach the subject of a notice given under **clause 11** include, but are not limited to:

(i) the costs of the Council's employees, agents and contractors reasonably incurred for that purpose,

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(ii) all fees and charges necessarily or reasonably incurred by the Council in remedying the breach, and

(iii) all legal costs and expenses reasonably incurred by the Council, by reason of the breach.

11.4 Exercise of Council's rights at law or in equity

(a) Nothing in this **clause 11** prevents the Council from exercising any rights it may have at law or in equity in relation to a breach of this Agreement by the Developer, including but not limited to seeking relief in an appropriate court.

11.5 Enforcement in a court of competent jurisdiction

(a) Without limiting any other provision of this Agreement and subject to complying with the procedures in **clause 16**, the Parties may enforce this Agreement in any court of competent jurisdiction.

(b) For the avoidance of doubt, nothing in this Agreement prevents:

(i) a Party from bringing proceedings in the Land and Environment Court to enforce any aspect of this Agreement or any matter to which this Agreement relates, or

(ii) a party exercising any function under the Act or any other Act or law relating to the enforcement of any aspect of this Agreement or any matter to which this Agreement relates.

12 Application of s7.11, s7.12 and s7.24 of the Act to the Development and benefits under this Agreement

(a) This Agreement does not exclude the application of sections 7.11, 7.12 and 7.24 of the Act to the Land and the Development.

(b) Certain benefits under this Agreement are to be taken into consideration under section 7.11(6) of the Act to the extent stated in **clause 12(c)**.

(c) Council accepts the provision of certain Dedication Land, Works in Kind and the Milperra Community Contribution identified **in Schedule 2** as a material public benefit and agrees that these will be offset against contributions required to be made under sections 7.11 of the Act in connection with the development of the Land but only up to the amounts and for the public purposes specified in **Column 5** of **Schedule 2**.

13 Registration of this Agreement

13.1 Registration

(a) The Landowner represents and warrants that it is the registered proprietor of the Land.

(b) The Landowner agrees that it will procure the registration of this Agreement in the relevant folios of the Register for the Land in accordance with section 7.6 of the Act.

(c) On the date of this Agreement, the Landowner must deliver to Council:

(i) the written irrevocable consent of each person who:

(A) has an estate or interest in the Land; or

(B) is seized or possessed of an estate or interest in the Land; and

(ii) an instrument in registrable form requesting registration of this Agreement on the title to the Land duly executed by the registered proprietor of the Land.

(d) The Developer is to do such things as are necessary to enable the lodgement and registration of this Agreement to occur electronically through PEXA or another applicable electronic lodgement network operator in accordance with **clause 13.1(b)**.

13.2 Release and discharge of Agreement

(a) Council agrees to provide the Landowner and Developer with a release and discharge of this Agreement with respect to a lot or lots forming part of the relevant Land or any lot created or to be created on subdivision of the Land (or part of the Land) (**Release Land**):

(i) on satisfaction by the Landowner or Developer (as applicable) of the obligation to provide the Dedication Land, Monetary Contributions, and Affordable Housing Contributions relevant to that Release Land; and

(ii) on:

(A) satisfaction by the Developer of the obligation to complete a Works in Kind relevant to that Release Land and provision of the Defects Liability Security for that Works in Kind; or

(B) where Council has consented to the deferral of a Works in Kind under **clause 7.9** relevant to that Release Land, the Developer has provided any Deferred Works Security required to be provided with respect to the Approved Deferred Works.

(b) Council agrees to do all things reasonably required by the Landowner or Developer to, following a request to release this Agreement from the Release Land:

(i) release and discharge this Agreement with respect to the Release Land; and

(ii) execute the relevant documents to enable the Landowner or Developer to remove the notation of this Agreement from the relevant folio(s) of the Register in respect of the Release Land, as soon as practicable after receiving a request from the Landowner or Developer to do so,

upon Council being satisfied that:

(iii) the Landowner and Developer have satisfied all of their obligations under this Agreement in respect of the Release Land; and

(iv) the Landowner and Developer are not otherwise in default of their obligations under this Agreement.

14 Security and enforcement

14.1 Compulsory Acquisition

(a) If the Landowner does not procure the Dedication of the Dedication Land in accordance with **clause 6**, the Landowner agrees that Council may compulsorily acquire all or part of the Dedication Land that has not been Dedicated in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW) for the amount of $1.00 without having to follow the pre-acquisition procedure under the Just Terms Act.

(b) The Parties acknowledge and agree that:

(i) **clause 14.1(a)** is an agreement between the Developer and Council for the purpose of section 30 of the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW); and

(ii) all relevant matters concerning the compulsory acquisition and the compensation to be paid for the acquisition are agreed.

(c) If, as a result of the acquisition referred to in **clause 14.1(a)**, Council is required to pay compensation to any person other than the Landowner or Developer, the Landowner and Developer are to reimburse Council that amount, upon a written request being made by Council, or Council can call on the General Security.

(d) The Landowner and Developer indemnify and keep indemnified Council against all Claims made against Council as a result of any acquisition by Council of the whole or any part of the Dedication Land except if, and to the extent that, the Claim arises because of Council's negligence or default.

(e) The Landowner and Developer are to promptly do all things necessary, and consents to Council doing all things necessary, to give effect to this **clause 14.1**, including without limitation:

(i) signing any documents or forms,

(ii) giving land owner's consent for lodgement of any Development Application, and

(iii) paying Council's costs arising under this **clause 14.1**.

14.2 General Security

(a) The Developer is to provide the General Security to Council:

(i) before the Developer obtains a Construction Certificate for any part of the Development or before the Developer commences any part of the Works in Kind, whichever occurs first; or

(ii) at such other time agreed in writing by Council.

(b) Council is to hold the General Security as security for the Developer performing its obligations under this Agreement other than an obligation to which the Defects Liability Security or the Deferred Works Security applies.

(c) Despite any other provision of this Agreement, Council, in its absolute discretion, may refuse to allow the Developer to enter, occupy or use any land owned or controlled by Council or refuse to provide the Developer with any plant, equipment, facilities or assistance relating to the carrying out of the Development if the Developer has not provided the General Security to Council in accordance with this Agreement.

(d) Council is to release and return the General Security or any unused part of it to the Developer within 14 days of all of the following having occurred:

(i) all Monetary Contributions including the Affordable Housing Contribution have been paid to Council;

(ii) all Dedication Land has been Dedicated to Council; and

(iii) all Works in Kind have reached Practical Completion and the Developer has provided the Defects Liability Security to Council for the Works in Kind.

(e) The Developer may provide Council with a replacement General Security at any time.

(f) On receipt of a replacement General Security, Council is to release and return the replaced General Security to the Developer.

(g) If Council calls-up the General Security or any portion of it, Council may give the Developer a written notice requiring the Developer to provide a further or replacement General Security to ensure that the amount of General Security held by Council equals the amount Council is entitled to hold under this Agreement.

(h) The Developer is to ensure that the General Security provided to Council is at all times maintained to the full current indexed value.

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14.3 Defects Liability Security

(a) The Developer is to deliver the Defects Liability Security to Council before the commencement of the Defects Liability Period to secure the Developer's obligations in relation to the Defects Liability Period for Works in Kind.

(b) Council is to release and return the Defects Liability Security, or any remaining part, to the Developer within 30 days after the end of the Defects Liability Period if, at that time, the Developer is not in breach of an obligation under this Agreement to which the Defects Liability Security relates.

14.4 Deferred Works Security

(a) In the event that the Developer and Council agree to defer any Works in Kind under **clause 7.9**, the Developer must deliver to Council a Bank Guarantee for the amount equivalent to the Agreed Contribution Value of the relevant Works in Kind, or any lesser amount specified in Council's notice provided under **clause 7.9(b) (Deferred Works Security)**.

(b) The Developer may replace the Deferred Works Security provided by it at any time, provided that the amount of that replacement is not less than that which is required to be provided under this Agreement. On receipt of a replacement Deferred Works Security, Council must immediately release the Deferred Works Security being replaced and return it to the Developer.

(c) Council must release the Deferred Works Security or the relevant part of the Deferred Works Security to the Developer within 20 Business Days of:

(i) it issuing, or being deemed to have issued, a Certificate of Practical Completion for the relevant part of the Approved Deferred Works in accordance with clause **7.6**; or

(ii) the Developer satisfying any of its obligations under this Agreement by paying a Monetary Contribution to Council in accordance with **clause 7.8** in respect of Approved Deferred Works.

15 Indemnities and Insurance

15.1 Risk

The Landowner and Developer performs this Agreement at their own risk and their own cost.

15.2 Release

The Landowner and Developer release Council from any Claim they may have against Council arising in connection with the performance of their obligations under this Agreement except if, and to the extent that, the Claim arises because of Council's negligence or default.

15.3 Indemnity

The Landowner and Developer indemnify Council from and against all Claims that may be sustained, suffered, recovered or made against Council arising in connection with the performance of their obligations under this Agreement except if, and to the extent that, the Claim arises because of Council's negligence or default.

15.4 Insurance

(a) The Developer is to take out and keep current to the satisfaction of Council the following insurances in relation to the Works in Kind until the Works in Kind are completed in accordance with this Agreement:

(i) contract works insurance for the full replacement value of the Works in Kind (including the cost of demolition and removal of debris, consultants' fees and authorities' fees), to cover the Developer's liability in respect of damage to or destruction of the Works in Kind;

(ii) public liability insurance for at least $20,000,000.00 for a single occurrence, which covers Council, the Developer, the Landowner and any subcontractor of the Developer, for liability to any third party; and

(iii) workers compensation insurance as required by law.

(b) If the Developer fails to comply with **clause 15.4(a)**, Council may effect and keep in force such insurances and pay such premiums as may be necessary for that purpose and the amount so paid shall be a debt due from the Developer to Council and may be recovered by Council as it deems appropriate including:

(i) by calling upon the General Security provided by the Developer to Council under this Agreement, but not before giving reasonable prior notice of Council's intention to do so; or

(ii) recovery as a debt due in a court of competent jurisdiction.

(c) The Developer is not to commence any Works in Kind unless it has first provided to Council satisfactory written evidence of all of the insurances specified in **clause 15.4(a)**.

16 Dispute Resolution

16.1 Dispute

If any dispute arises out of this Agreement, then the Parties must resolve that dispute in accordance with this **clause 16** and a Party to the Agreement must not commence any court or arbitration proceedings, except where a Party seeks urgent interlocutory relief. Any referral or undertaking of the dispute resolution process as set out in this **clause 16** does not suspend any other obligations of the Parties' under this Agreement.

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16.2 Expert determination

(a) This **clause 16.2** applies to a dispute between any of the Parties to this Agreement concerning a matter arising in connection with this Agreement that can be determined by an appropriately qualified expert if:

(i) the Parties to the dispute agree that it can be so determined; or

(ii) the Chief Executive Officer of the professional body that represents persons who appear to have the relevant expertise to determine the dispute gives a written opinion that the Dispute can be determined by a member of that body.

(b) A dispute to which this clause applies is taken to arise if one Party gives another Party a notice in writing specifying particulars of the dispute.

(c) If a notice is given under **clause 16.2(b)**, the Parties are to meet within 10 Business Days of the notice in an attempt to resolve the dispute.

(d) If the dispute is not resolved within a further 20 Business Days, the dispute is to be referred to the President of the NSW Law Society to appoint an expert for expert determination.

(e) The expert determination is binding on the Parties except in the case of fraud or misfeasance by the expert.

(f) Each Party is to bear its own costs arising from or in connection with the appointment of the expert and the expert determination.

(g) The Parties are to share equally the costs of the President, the expert, and the expert determination.

16.3 Mediation

(a) This **clause 16.3** applies to any dispute arising in connection with this Agreement other than a dispute to which **clause 16.2** applies.

(b) Such a dispute is taken to arise if one Party gives another Party a notice in writing specifying particulars of the dispute.

(c) If a notice is given under **clause 16.3(b)**, the Parties are to meet within 14 days of the notice in an attempt to resolve the dispute.

(d) If the dispute is not resolved within a further 20 Business Days, the Parties are to mediate the dispute in accordance with the Mediation Rules of the Law Society of New South Wales published from time to time and are to request the President of the Law Society to select a mediator.

(e) If the dispute is not resolved by mediation within a further 20 Business Days, or such longer period as may be necessary to allow any mediation process which has been commenced to be completed, then the Parties may exercise their legal rights in relation to the dispute, including by the commencement of legal proceedings in a court of competent jurisdiction in New South Wales.

(f) Each Party is to bear its own costs arising from or in connection with the appointment of a mediator and the mediation.

(g) The Parties are to share equally the costs of the President, the mediator, and the mediation.

16.4 Court proceedings

If the dispute is not resolved within 80 Business Days after notice is given under **clause 16.2(b)** or **16.3(b)** then any Party which has complied with the provisions of this **clause 16** may in writing terminate any dispute resolution process undertaken under this **clause 16** and may then commence court proceedings in relation to the dispute.

16.5 Not use information

The Parties acknowledge the purpose of any exchange of information or documents or the making of any offer of settlement under this **clause 16** is to attempt to settle the dispute. No Party may use information or documents obtained through any dispute resolution process undertaken under this **clause 16** for any purpose other than in an attempt to settle the dispute.

16.6 No prejudice

This **clause 16** does not prejudice the right of a Party to institute court proceedings for urgent injunctive or declaratory relief in relation to any matter arising out of or relating to this Agreement.

17 Notices

17.1 Delivery

Any notice, consent, information, application or request that must or may be given or made to a Party under this Agreement is only given or made if it is in writing and sent in one of the following ways:

(a) delivered or posted to that Party at its address set out below; or

(b) emailed to that Party at its email address set out below.

Council

Attention:	Matthew Stewart – Chief Executive Officer
Address:	Canterbury-Bankstown Council
	PO Box 8
	Bankstown NSW 1885
Phone Number:	9707 9524
Email Address:	matthew.stewart@cbcity.nsw.gov.au

Developer	
Attention:	Theo Zotos
Address:	Level 28, 200 George Street, Sydney,NSW 2000
Phone Number:	(02) 9080 8062
Email Address:	theo.zotos@mirvac.com
Landowner	
Attention:	Bill Parasiris
Address:	Western Sydney University Locked Bag 1797 Penrith NSW 2651
Phone Number:	(02) 4570 1859
Email Address:	B.Parasiris@westernsydney.edu.au

17.2 Change of Details

If a Party gives the other Party 10 Business Days' notice of a change of its address or email address, any notice, consent, information, application or request is only given or made by that other Party if it is delivered, posted or electronically sent to the latest address or email address.

17.3 Giving of Notice

Subject to **clause 17.4**, any notice, consent, invoice, information, application or request is to be treated as given or made at the following time:

(a) if it is delivered by process server, when it is served at the relevant address; or

(b) if it is sent by registered post, seven Business Days after it is posted; or

(c) if it is sent by email, as soon as the email has been sent to the correct email address and the recipient has received the email without error.

17.4 Delivery outside of business hours

If any notice, consent, information, application or request is delivered on a day that is not a Business Day, or if on a Business Day, after 5.00 pm on that day in the place of the Party to whom it is sent, it is to be treated as having been given or made at the beginning of the next Business Day.

18 Approvals and consent

Except as otherwise set out in this Agreement, and subject to any statutory obligations, a Party may give or withhold an approval or consent to be given under this Agreement in that Party's absolute discretion and subject to any

conditions determined by the Party. A Party is not obliged to give its reasons for giving or withholding consent or for giving consent subject to conditions.

19 Assignment and dealings

(a) The Landowner or Developer may not sell, transfer, assign or novate or similarly deal with its right, title or interest in the Land (if any) or rights or obligations under the terms of this Agreement, or allow any interest in them to arise or be varied, in each case, without Council's consent and unless, prior to any such sale, transfer, assignment, charge, encumbrance or novation, the Landowner or Developer (as applicable):

(i) at no cost to Council, first procures the execution by that person of a deed of novation or assignment with Council in favour of Council by which that person agrees to be bound by the Agreement as if they were a party to the original Agreement;

(ii) Council has given written notice to the Developer or the Landowner (as the case may be) stating that it reasonably considers that the purchaser, transferee, assignee or novatee, is reasonably capable of performing its obligations under this Agreement; and

(iii) satisfies Council that it is not in material breach of this Agreement.

(b) The Landowner and Developer acknowledge and agree that notwithstanding any breach by it of **clause 19(a)**, they remain liable to fully perform their obligations under this Agreement unless and until they have complied with their obligations under **clause 19(a)** or Council gives the Landowner or Developer (as the case may be) a written release from compliance with that clause in its absolute discretion.

20 Termination of this Agreement

This Agreement terminates when all obligations under the Agreement have been satisfied.

21 General

21.1 Legal Costs

(a) The Developer agrees to pay Council's costs associated with reviewing, preparing, negotiating, amending, executing, stamping, registration and removal of registration of this Agreement and any document related to this Agreement within 5 business days of a written demand by Council for such payment.

(b) The Developer is also to pay to Council Council's reasonable costs and disbursements arising from the ongoing administration and of enforcing

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this Agreement (including remedying any breach or default by the Developer or Landowner of their obligations under this Agreement) within 7 days of a written demand by Council for such payment.

21.2 Entire Agreement

This Agreement constitutes the entire agreement of the Parties about its subject matter and supersedes all previous agreements, understandings and negotiations on that subject matter.

21.3 Further Acts

Each Party must promptly execute all documents and do all things that another Party from time to time reasonably requests to affect, perfect or complete this Agreement and all transactions incidental to it.

21.4 Governing law and jurisdiction

This Agreement is governed by the law of New South Wales. The Parties submit to the non-exclusive jurisdiction of its Courts and Courts of appeal. The Parties will not object to the exercise of jurisdiction by those Courts on any basis.

21.5 No Fetter

Nothing in this Agreement shall be construed as requiring Council to do anything that would cause it to be in breach of any of its obligations at law, and without limitation, nothing shall be construed as limiting or fettering in any way the exercise of any statutory discretion or duty.

21.6 Representations and warranties

The Parties represent and warrant that they have power to enter into this Agreement and comply with their obligations under the Agreement and that entry into this Agreement will not result in the breach of any law.

21.7 Severability

(a) The Parties acknowledge that under and by virtue of section 7.4(4) of the Act, any provision of this Agreement is not invalid by reason only that there is no connection between the Development and the object of the expenditure of any money required to be paid by that provision.

(b) The Parties agree that to the extent permitted by law, this Agreement prevails to the extent of its inconsistency with any law.

(c) If a clause or part of a clause of this Agreement can be read in a way that makes it illegal, unenforceable or invalid, but can also be read in a way that makes it legal, enforceable and valid, it must be read in the latter way.

(d) If any clause or part of a clause is illegal, unenforceable or invalid, that clause or part is to be treated as removed from this Agreement, but the rest of this Agreement is not affected.

21.8 Modification

No modification of this Agreement will be of any force or effect unless it is in writing and signed by the Parties to this Agreement and is in accordance with the provisions of the Act.

21.9 Waiver

(a) The fact that a Party fails to do, or delays in doing, something the Party is entitled to do under this Agreement, does not amount to a waiver of any obligation or exercise of a right of, or breach of obligation by, another Party.

(b) A waiver by a Party is only effective if it is in writing.

(c) A written waiver by a Party is only effective in relation to the particular obligation, right or breach in respect of which it is given. It is not to be taken as an implied waiver of any other obligation, right or breach or as an implied waiver of that obligation, right or breach in relation to any other occasion.

(d) A single or partial exercise or waiver by a Party of a right relating to this Agreement does not prevent any other exercise of that right or the exercise of any other right.

(e) A Party is not liable for any loss, cost or expense of any other Party caused or contributed to by the waiver, exercise, attempted exercise, failure to exercise or delay in the exercise of a right.

21.10 Relationship of Parties

This Agreement is not intended to create a partnership, joint venture or agency relationship between Council and the Developer.

21.11 Further Steps

Each Party must promptly do whatever any other Party reasonably requires of it to give effect to this Agreement and to perform its obligations under it.

21.12 Explanatory Note

Pursuant to section 205(5) of the Regulation, the Parties agree that the Explanatory Note is not to be used to interpret this Agreement.

21.13 Counterparts

This Agreement may be executed in any number of counterparts. All counterparts taken together constitute one instrument.

21.14 Rights cumulative

Except as expressly stated otherwise in this Agreement, the rights of a Party under this Agreement are cumulative and are in addition to any other rights of that Party.

21.15 Electronic execution

(a) Each Party:

(i) consents to this Agreement being signed by electronic signature by the methods set out in **clause 21.15(c)**;

(ii) agrees that those methods validly identify the person signing and indicates that person's intention to sign this Agreement;

(iii) agrees that those methods are reliable as appropriate for the purpose of signing this Agreement; and

(iv) agrees that electronic signing of this Agreement by or on behalf of a Party by those methods indicates that Party's intention to be bound.

(b) If this Agreement is signed on behalf of a legal entity, the persons signing warrant that they have the authority to sign.

(c) For the purposes of **clause 21.15(a)**, the methods are:

(i) insertion of an image (including a scanned image) of the person's own unique signature onto the Agreement; or

(ii) insertion of the person's name onto the Agreement; or

(iii) use of a stylus or touch finger or a touch screen to sign the Agreement,

provided that in each of the above cases, words to the effect of '*Electronic signature of me, [insert full name], affixed by me, or at my direction, on [insert date]*' are also included on the Agreement; or

(iv) use of a reliable electronic signing platform (such as DocuSign or AdobeSign) to sign the Agreement; or

(v) as otherwise agreed in writing between the Parties.

Schedule 1

Section 7.4 Requirements

The parties acknowledge and agree that the table set out below provides for certain terms, conditions and procedures for the purpose of this Agreement complying with the Act.

Table 1 – Requirements under section 7.4 of the Act

Requirement under the Act	This Agreement
Planning instrument and/or development application – (section 7.4(1)) The Developer has:	
(a) sought a change to an environmental planning instrument.	(a) Yes
(b) made, or proposes to make, a Development Application.	(b) Yes
(c) entered into an agreement with, or is otherwise associated with, a person, to whom paragraph (a) or (b) applies.	(c) No
Description of land to which this Agreement applies – (section 7.4(3)(a))	The Land as defined in **clause 1.1**.
Description of development to which this Agreement applies – (section 7.4(3)(b))	The Development as defined in **clause 1.1**.
The scope, timing and manner of delivery of contributions required by this Agreement – (section 7.4(3)(c))	See **Schedule 2**.
Applicability of sections 7.11 and 7.12 of the Act – (section 7.4(3)(d))	The application of sections 7.11 and 7.12 of the Act are not excluded in respect of the Land and the Development.
Applicability of section 7.24 of the Act – (section 7.4(3)(d))	The application of section 7.24 of the Act is not excluded in respect of the Development.

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Requirement under the Act	This Agreement
Consideration of benefits under this Agreement if section 7.11 applies – (section 7.4(3)(e))	See **clause 12(b)**.
Mechanism for dispute resolution – (section 7.4(3)(f))	See **clause 16**.
Enforcement of this Agreement – (section 7.4(3)(g))	See **clauses 13** and **14**.
No obligation to grant consent or exercise functions – (section 7.4(10))	See **clauses 18** and **21.5**.

Schedule 2

Development Contributions

Part A – Dedication of the Dedication Land

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
1.	**RE1 Public Recreation Zoned Land** Dedication of approximately 14,441m^2 of the Land to Council for public open space, specifically: i. circa 4,643m^2 of land marked 'Northern Open Space' on the plan at **Annexure A**;	$3,700,000	Prior to the release of any Subdivision Certificate or Strata Certificate for a plan that when registered would create the 301st Residential Lot.	Nil
	ii. circa 5,076m^2 of land marked 'Central Open Space' on the plan at **Annexure A**; and	$4,570,000	Prior to the release of any Subdivision Certificate or Strata Certificate for a plan that when registered would create the 201st	$1,635,287.54 Open space and recreational facilities

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
			Residential Lot.	
	iii. circa 4,722m^2 of land marked 'Southern Open Space' on the plan at **Annexure A.**	$3,300,000	Prior to the release of a Subdivision Certificate or Strata Certificate for a plan that when registered would create the 401st Residential Lot, or if less than 401 Residential Lots are approved in the Development, prior to the release of the Subdivision Certificate or Strata Certificate for the plan that when registered would create the last Residential Lot in the Development.	Nil
2.	**Local Roads** i. Dedication of approximately 14,088m^2 of the Land to Council, being an area with a length of approximately 770m and width of 18m, as	Not applicable	Prior to the release of a Subdivision Certificate or Strata Certificate for a plan that when registered	Nil

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
	shown on the plan and noted as "Local Road" at **Annexure A.** ii. Dedication of approximately 33,110m^2 of the Land to Council, being an area with a length of approximately 1,925m and general width of 17.2m, as shown on the plan and noted as "Local Road-Minor" at **Annexure A.**	Not applicable	would create a Residential Lot that directly fronts that road. Prior to the release of a Subdivision Certificate or Strata Certificate for a plan that when registered would create a Residential Lot that directly fronts that road.	Nil
3.	**SP2 Infrastructure (Drainage)** Dedication of approximately 668m^2 of SP2 Infrastructure (Drainage) land to Council	$230,000	Prior to the release of the Subdivision Certificate or Strata Certificate for a plan that when registered would create the 401st Residential Lot for the Development, or if less than 401 Residential Lots are approved in the Development, prior to the release of the	Nil

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
			Subdivision Certificate or Strata Certificate for the plan that when registered would create the last Residential Lot in the Development.	

Part B – Works in Kind

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
4.	**Open Space Embellishment** Embellishment of the RE1 Public Recreation Zoned Land, comprising the following works: (a) pathways (in all); (b) children's playground equipment, in the	$1,542,495	Practical Completion of embellishment of the part of the RE1 Public Recreation Zoned Land shown as 'Northern Open Space' and 'Southern Open Space' in Annexure A must be reached prior to the Dedication of the relevant portion of the Dedication Land and issue of the first Occupation Certificate	Nil

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
	Central Open Space only; (c) outdoor fitness equipment, in the Central Open Space or Southern Open Space only; (d) sheltered picnic tables, in the Central Open Space only; (e) seating (in all); (f) landscaping and turf (in all); and (g) kick around play, in the Southern Open Space only. Where applicable, works shall be designed generally in accordance with the indicative bioretention and basin plans provided in		for the first dwelling fronting the relevant part of the RE1 Public Recreation Zoned Land. Practical Completion of embellishment of the part of the RE1 Public Recreation Zoned Land shown as the 'Central Open Space' in Annexure A must be reached prior to the earlier of the issue of an Occupation Certificate for the: a) 50th Dwelling in the Development; or b) the first Dwelling fronting the Central Open Space Land. Maintenance, testing and any restoration work of drainage and bioretention basins to be carried out in accordance with timing specified in **clauses 7.1(j)(iii), 7.1(j)(iv) and 7.1(k).**	

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
	Annexure C.			
5.	**Local Roads** Construction of all proposed "Local Roads" (collector roads) as shown on the plan at **Annexure A**, in accordance with all relevant Council and road engineering standards (unless otherwise agreed between Council and the Developer).	$1,963,100	Practical Completion must be reached prior to the Dedication of the relevant portion of the Dedication Land and in any event prior to the release of a Subdivision Certificate or Strata Certificate for a plan that when registered would create a Residential Lot that directly fronts that road.	Nil
6.	**Shared Cycleway** Construction of a shared cycleway along the roads marked "Local Roads" on the plan at **Annexure A.**	$235,350	Practical Completion must be reached prior to the release of an Occupation Certificate for any dwelling fronting the cycleway.	$235,350 Roads and traffic
7.	**Milperra Reserve Embellishment** Upgrades to Milperra Reserve (being 121-121A Ashford Avenue, Milperra (Lots 1 – 3 DP91953) of a standard that is consistent	$1,041,921	Prior to the release of a Subdivision Certificate or Strata Certificate for a plan that when registered would create the 401st Residential Lot, or if less than 401 Residential Lots are approved	$1,041,921 Open space and recreational facilities

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
	with the 'Neighbourhood Sportsground' category as outlined in Council's *Generic Plan of Management for Community Land and Crown Land*, specifically consisting of the following: (a) new lawn/turf and irrigation to expand the footprint of the existing playing area to allow for more sporting codes such as soccer/rugby etc (currently set up for hockey); (b) basic seating around the periphery of the playing area; (c) rubbish bins; (d) lighting; (e) shaded seating (under trees);		in the Development, prior to the release of the Subdivision Certificate or Strata Certificate for the plan that when registered would create the last Residential Lot in the Development.	

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
	(f) upgrade to amenities (toilets etc); (g) drinking fountains; (h) some areas of shade trees on the periphery of the playing fields; and (i) landscaping treatments, including paths to better integrate Milperra Reserve with the Land.			
8.	**Remnant Vegetation Works** Works as required under the ecological assessment to be undertaken by or on behalf of the Developer in respect of that part of the Land zoned C2 Environmental	N/A	Prior to the release of a Subdivision Certificate or Strata Certificate for a plan that when registered would create the 401st Residential Lot, or if less than 401 Residential Lots are approved in the Development, prior to the release of the Subdivision	Nil

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
	Conservation including, where appropriate, replanting and signage works. Full details of any works on the Land zoned C2 Environmental Conservation is to be included as part of a development application lodged in respect of the Development.		Certificate or Strata Certificate for the plan that when registered would create the last Residential Lot in the Development.	
9.	**Not used**	N/A	N/A	N/A
10.	**SP2 Infrastructure (Drainage)** Embellishment of the SP2 Infrastructure (Drainage) Land and carrying out of the works and maintenance specified in **clauses 7.1(j)** and **7.1(k)**.	$154,000	Practical Completion must be reached prior to the Dedication of the relevant portion of the Dedication Land and in any event prior to the release of the Subdivision Certificate or Strata Certificate for a plan that when registered would create the 401st Residential Lot for the Development, or if less than 401 Residential Lots are approved in the Development, prior to the release of the Subdivision Certificate or	Nil

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
			Strata Certificate for the plan that when registered would create the last Residential Lot in the Development. Maintenance, testing and any restoration work to be carried out in accordance with timing specified in **clauses 7.1(j)(iii), 7.1(j)(iv)** and **7.1(k)**.	
11.	**Local Roads – Footpaths** Provide new footpaths along bus routes, on one side of the road. Refer to Local Roads – Footpaths, as indicatively shown on the plan at **Annexure A**.	$94,140	Practical Completion must be reached prior to the release of an Occupation Certificate for any Dwelling fronting the relevant footpath.	Nil
12.	**Undergrounding of Powerlines** Undergrounding of approximately 545 metres of powerlines along Ashford Avenue subject to obtaining any required Ausgrid	$597,655	Practical Completion must be reached prior to the release of an Occupation Certificate for the final Dwelling along Ashford Avenue.	Nil

Column 1 Item No. (shown on Annexure A)	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
	approvals Refer to Undergrounding of Powerlines, as indicatively shown on the plan at **Annexure A.**			
13.	**Ashford Avenue – Footpath** Construction of a 1.2m wide footpath and landscaping along approximately 545 metres of the eastern side of Ashford Avenue. Refer to Footpath, as indicatively shown on the plan at **Annexure A.**	$98,100	Practical Completion must be reached prior to the release of an Occupation Certificate for any Dwelling fronting the footpath.	$98,100
14.	**Cycleway** Construction of circa 110m of cycleway connections to Panania Station to promote the use active and public transport for future residents and the broader Milperra community.	$59,400	Practical Completion must be reached prior to the release of the Subdivision Certificate or Strata Certificate for a plan that when registered would create the 201st Residential Lot for the Development.	$59,400 Roads and transport

Part C – Monetary Contributions

Column 1 Item No.	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
15.	**Affordable Housing Contribution** Payment of a monetary contribution for the provision of affordable housing in appropriate locations within the Canterbury-Bankstown Local Government Area.	$5,300,180	The amount of $12,326 per Dwelling is to be paid prior to the release of a Subdivision Certificate or Strata Certificate for a plan that when registered would create the relevant Residential Lot for that Dwelling. In the event less than 430 Dwellings are approved in the Development, the balance of the Affordable Housing Contribution is to be paid within 15 Business Days of the release of the Subdivision Certificate or Strata Certificate for the plan that when registered would create the Residential Lot for the last Dwelling in the Development and in any event, prior to the issuing of the Occupation Certificate for the last Dwelling in the Development.	Nil
16.	**Milperra Community Contribution**	$392,400	Prior to the release of any Subdivision Certificate or Strata Certificate for a plan	$392,400

Column 1 Item No.	Column 2 Development Contribution	Column 3 Agreed Contribution Value	Column 4 Timing	Column 5 Contribution Offset
	Payment of a monetary contribution for repair and renovation to the Milperra Community Centre (128 Ashford Ave, Milperra) or other community facilities in the Milperra region.		that when registered would create the 201st Residential Lot.	

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Execution

Executed as an agreement.

Executed by **Canterbury-Bankstown Council** by its duly appointed officer in the presence of:

Witness

PATRICK LEBON

Name of Witness (print)

Officer

Name of Officer (print)

Executed by **Mirvac Residential (NSW) Developments Pty Ltd** pursuant to section 127 of the *Corporations Act 2001*:

DocuSigned by:
Vicki Vordis
625728D3A0BC466...

Company Secretary/Director

Vicki Vordis

Name of Company Secretary/Director (print)

DocuSigned by:
Marina Rofe
301FDBB14CEE405...

Director

Marina Rofe

Name of Director (print)

Executed pursuant to section 23 of the *Western Sydney University Act 1997* by ..... as a delegate of **Western Sydney University** ABN 53 014 069 881 acting lawfully under delegated authority and in the presence of:

DocuSigned by: Katherine Stanton
A9551D7E65EE466...
Witness

Katherine Stanton
Name of Witness (print)

Building R1, Yarramundi Road, Richmond NSW 2753
Address of Witness

DocuSigned by: Bill Parasiris
265FB65284444A4...
Delegate

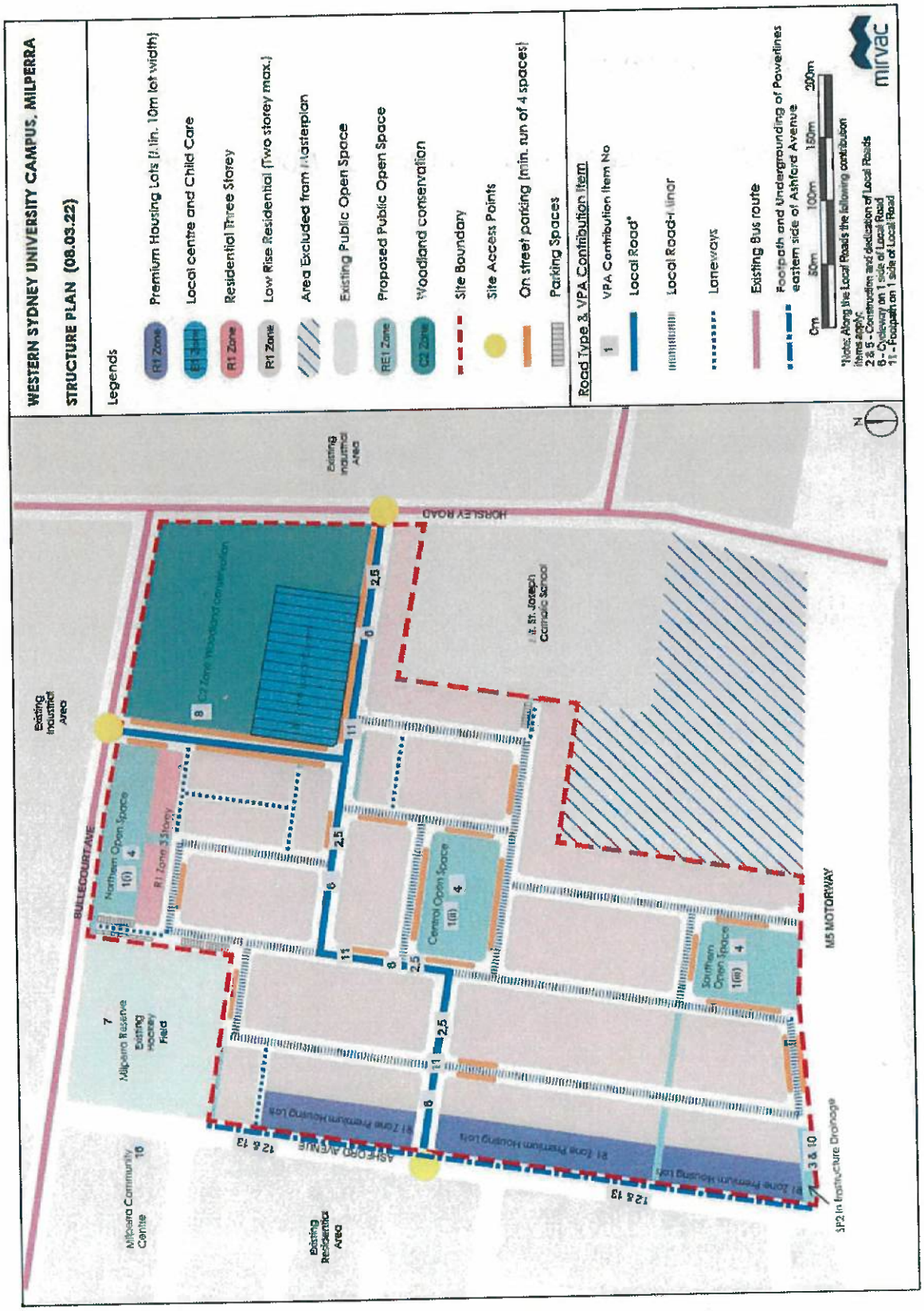
Bill Parasiris
Name of Delegate (print)

Vice-President Infrastructure and Commercial
Office held

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Annexure A

Dedication Land and locations of Works in Kind

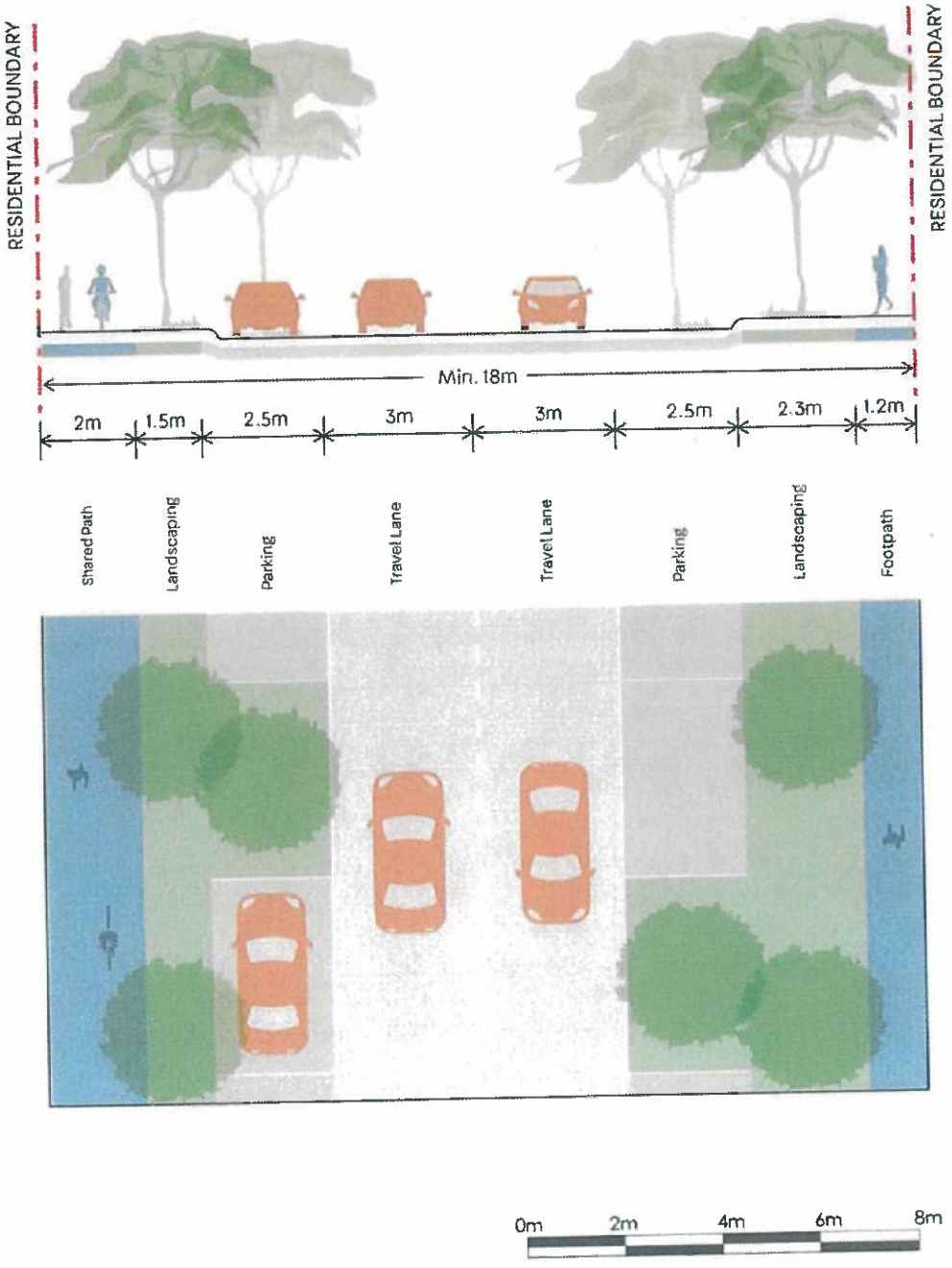

WESTERN SYDNEY UNIVERSITY CAMPUS, MILPERRA
STRUCTURE PLAN (08.03.22)
Legends
R1 Zone
Premium Housing Lots (Min. 10m lot width)
Local centre and Child Care
Residential Three Storey
Low Rise Residential (Two storey max.)
Area Excluded from Masterplan
Existing Public Open Space
Proposed Public Open Space
Woodland conservation
Site Boundary
Site Access Points
On street parking (min. run of 4 spaces)
Parking Spaces
Road Type & VPA Contribution Item
VPA Contribution Item No
Local Road*
Local Road-Minor
Laneways
Existing Bus route
Footpath and Undergrounding of Powerlines eastern side of Ashford Avenue
0m 50m 100m 150m 200m
*Notes: Along the Local Roads the following contribution items apply:
2 & 5 - Construction and dedication of Local Roads
8 - Cycleway on 1 side of Local Road
11 - Footpath on 1 side of Local Road
mirvac
N
HORSLEY ROAD
BULLECOURT AVE
ASHFORD AVENUE
M5 MOTORWAY
Existing Industrial Area
Existing Residential Area
Northern Open Space 1(i) 4
Central Open Space 1(ii) 4
Southern Open Space 1(iii) 4
R1 Zone 3 Storey
R1 Zone Premium Housing Lots
R2 Zone Woodland conservation
St. Joseph Catholic School
Milperra Reserve Existing Hockey Field 7
Milperra Community Centre 16
SP2 Infrastructure Drainage
12 & 13
3 & 10
2.5
6
11
8

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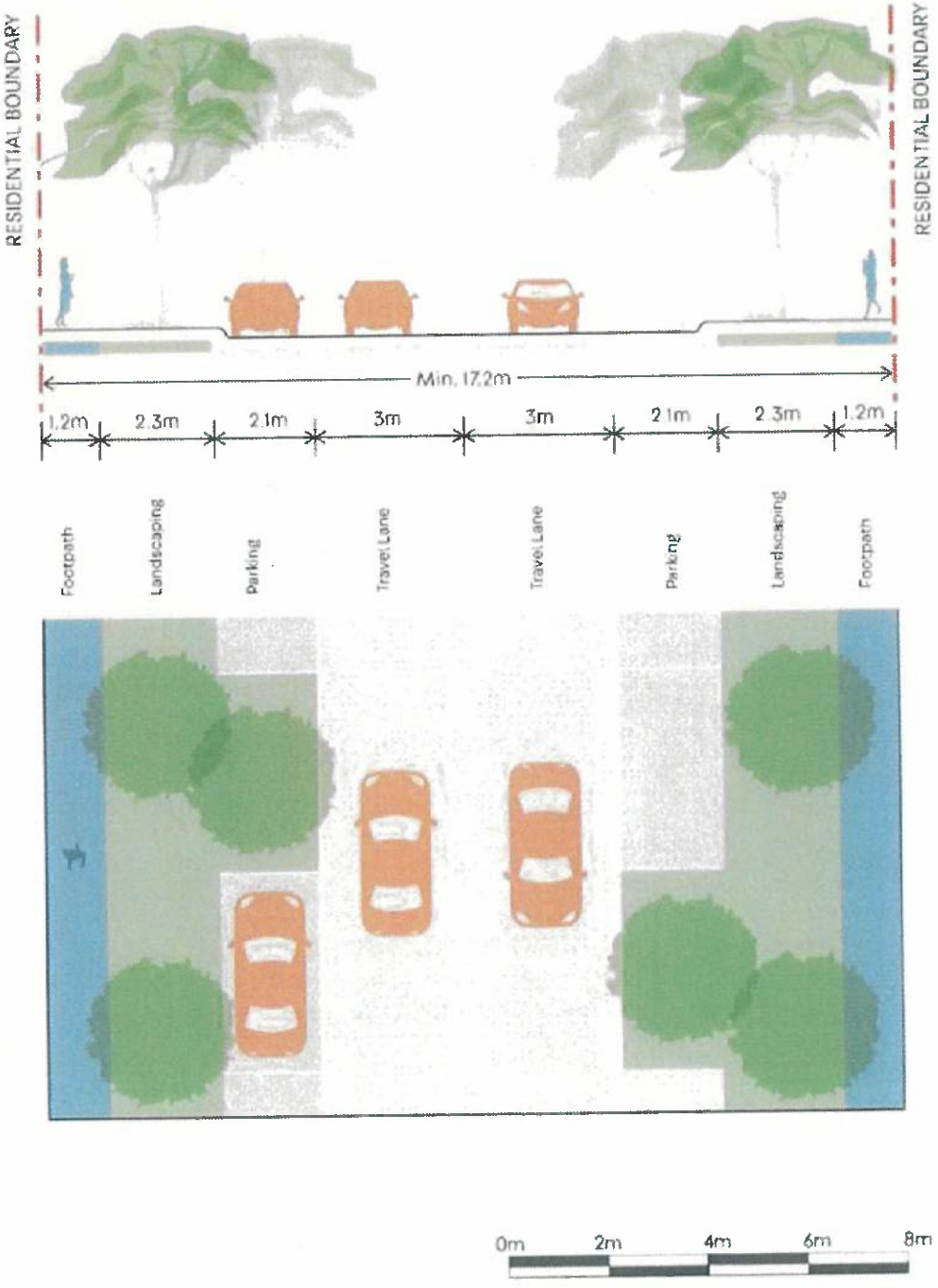
Annexure B

Road Reserve Design Requirements

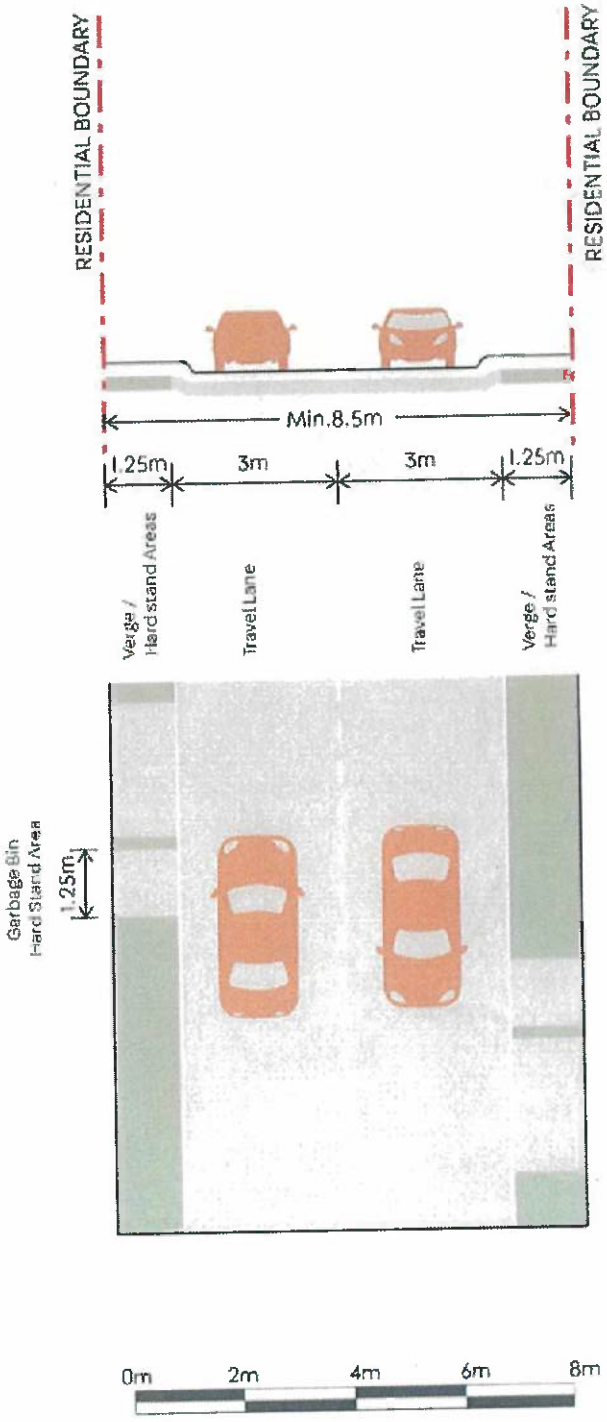
Local Road Cross-section



Minor Local Road Cross-section



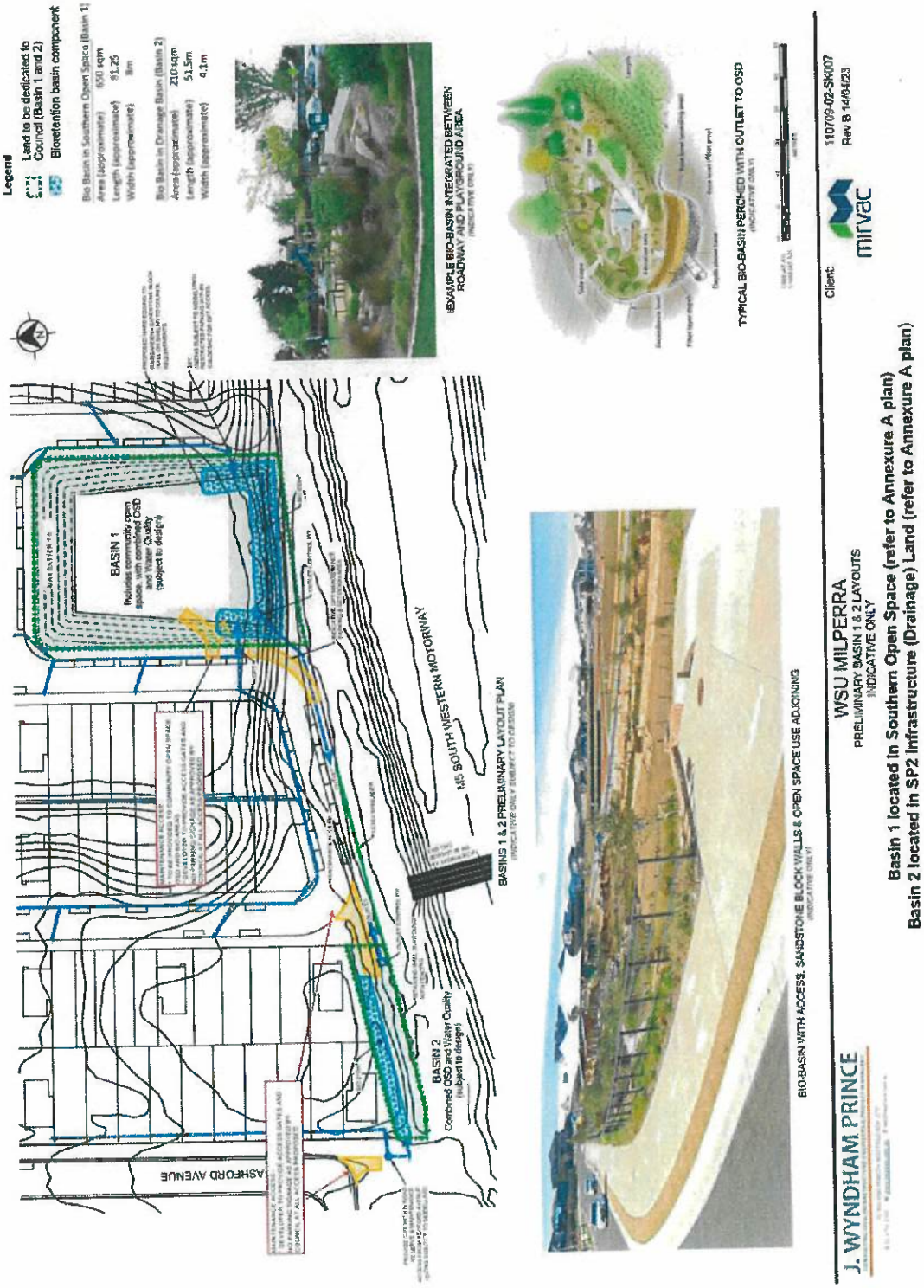
Laneway Cross-section



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Annexure C

Bioretention and Drainage Basins Plans


Legend
Land to be dedicated to Council (Basin 1 and 2)
Bioretention basin component
Bio Basin in Southern Open Space (Basin 1)
Area (approximate) 650 sqm
Length (approximate) 51.25
Width (approximate) 8m
Bio Basin in Drainage Basin (Basin 2)
Area (approximate) 210 sqm
Length (approximate) 51.5m
Width (approximate) 4.1m
EXAMPLE BIO-BASIN INTEGRATED BETWEEN ROADWAY AND PLAYGROUND AREA
TYPICAL BIO-BASIN PERCHED WITH OUTLET TO OSD
BASIN 1
Includes community open space, with combined OSD and Water Quality (subject to design)
BASIN 2
Combined OSD and Water Quality (subject to design)
M5 SOUTH WESTERN MOTORWAY
BASINS 1 & 2 PRELIMINARY LAYOUT PLAN
ASHFORD AVENUE
BIO-BASIN WITH ACCESS, SANDSTONE BLOCK WALLS & OPEN SPACE USE ADJOINING
J. WYNDHAM PRINCE
WSU MILPERRA
PRELIMINARY BASIN 1 & 2 LAYOUTS
INDICATIVE ONLY
Client:
mirvac
110709-02-SK007
Rev B 14/04/23
Basin 1 located in Southern Open Space (refer to Annexure A plan)
Basin 2 located in SP2 Infrastructure (Drainage) Land (refer to Annexure A plan)

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Basin 3 located in Northern Open Space (refer to Annexure A plan)

Basin 3 located in Northern Open Space (refer to Annexure A plan)

Annexure D

Explanatory Note

Section 205 of the *Environmental Planning and Assessment Regulation 2021*

Summary of Objectives, Nature and Effect of the Draft Planning Agreement

Objectives of the Planning Agreement

The objective of the Planning Agreement is to provide for the delivery of public benefits in connection with the Development by requiring the Developer and the Landowner (as applicable) to:

- dedicate the Dedication Land to the Council for public purposes including roads, drainage and public recreation;
- deliver infrastructure, facilities and services including roads, embellishment of open space and provision of cycleways as Works in Kind; and
- provide for the payment of Monetary Contributions of $5,300,180 and $392,400 (to be indexed in accordance with the CPI) by the Developer to be applied towards the provision of affordable housing in appropriate locations within the Canterbury-Bankstown local government area and the repair and renovation of the Milperra Community Centre (or other community facilities in the Milperra region), respectively.

Nature of the Planning Agreement

The Planning Agreement is a planning agreement under section 7.4(1) of the Act. The Planning Agreement is a voluntary agreement under which Development Contributions (as defined in clause 1.1 of the Planning Agreement) are made by the Developer for various public purposes (as defined in section 7.4(2) of the Act).

The details, staging and timing of these Development Contributions are set out in Schedule 2 of the Planning Agreement.

Effect of the Planning Agreement

The Planning Agreement:

- is in connection with an amendment to the LEP relating to the Planning Proposal prepared by the Developer and Landowner and submitted by the Sydney South Planning Panel to the Department of Planning and Environment on 17 February 2022 (Planning Portal Ref: PP-2021-5837);
- relates to the carrying out of the Development (as defined in clause 1.1 of the Planning Agreement) on the Land by the Developer;

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- does not exclude the application of sections 7.11, 7.12 and 7.24 of the Act to the Land and the Development;
- is to be registered on the title to the Land;
- imposes restrictions on the Parties transferring the Land or part of the Land or assigning, or novating an interest under the agreement; and
- provides for the delivery of Development Contributions by the Developer and the Landowner (as applicable) comprising the:
    - dedication of the Dedication Land;
    - carrying out, completion and maintenance of Works in Kind; and
    - provision of Monetary Contributions.

Assessment of the Merits of the Planning Agreement

The Planning Purposes Served by the Planning Agreement

The Planning Agreement:

- promotes and co-ordinates the orderly and economic use and development of the land to which it applies;
- provides increased opportunity for public involvement and participation in environmental planning and assessment of the Development; and
- provides for additional monetary contributions by the Developer to the Council to be used for public purposes, in addition to other development contributions under section 7.11 or section 7.12 and section 7.24 of the Act required for the proposed Development on the land to which it applies.

How the Planning Agreement Promotes the Public Interest

The Planning Agreement sets out arrangements for the delivery of infrastructure, facilities and services to meet the needs of the Development.

The Planning Agreement promotes the public interest by promoting the objects of the Act as set out in section 1.3 of the Act and through the provision of the public benefits outlined above.

For Planning Authorities

Development Corporations – How the Planning Agreement Promotes its Statutory Responsibilities

N/A

Other Public Authorities – How the Planning Agreement Promotes the Objects (if any) of the Act under which it is Constituted

N/A

Councils – How the Planning Agreement Promotes the Principles for Local Government Contained in Chapter 3 of the *Local Government Act 1993*

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The Planning Agreement promotes the principles for local government by:

- demonstrating that the Council is acting fairly, ethically and without bias in the interests of the local community;
- keeping the local and wider community informed about Council activities; and
- ensuring the provision of adequate, equitable and appropriate services and facilities for the community and ensuring that those services and facilities are managed efficiently and effectively.

All Planning Authorities – Whether the Planning Agreement Conforms with the Authority's Capital Works Program

Yes. The proposed contributions are consistent with the community infrastructure identified in the Council's Planning Agreements Policy and aligns with Council's Capital Works Program.

All Planning Authorities – Whether the Planning Agreement specifies that certain requirements must be complied with before a construction certificate, occupation certificate or subdivision certificate is issued

Yes. Certain Development Contributions are required to be delivered prior to the issuing of an Occupation Certificate for a relevant stage of the Development.

APPENDIX C: ACOUSTIC REPORT

RENZO TONIN & ASSOCIATES
inspired to achieve

Acoustics
Vibration
Structural Dynamics

MILPERRA WSU PLANNING PROPOSAL

Acoustic Assessment

Mirvac Residential Developments (NSW)

TL127-01F04 Acoustic Report (r6)

35 1982-2017 ACOUSTIC ENGINEERING EXCELLENCE

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Document details

Detail	Reference
Doc reference:	TL127-01F04 Acoustic Report (r6)
Prepared for:	Mirvac Residential Developments (NSW)
Address:	Level 28, 200 George Street Sydney NSW 2000
Attention:	Theo Zotos

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Authorised
23.01.2020	Report draft issued to client for review	-	0	N. Aziz	N. Tselios	D. Suwandi
24.01.2020	Report issued to client for review	-	1	N. Aziz	N. Tselios	D. Suwandi
03.02.2020	Final report issued to client	-	2	N. Aziz	N. Tselios	D. Suwandi
06.02.2020	Final report issued with minor revision to the sports ground	-	3	N. Aziz	N. Tselios	D. Suwandi
11.08.2022	Updated report with industrial noise assessment	-	4	S. Khan	-	T. Taylor
15.09.2022	Updated report with additional comments	-	5	S. Khan	-	T. Taylor
20.09.2022	Updated report with additional comments	-	6	S. Khan	-	T. Taylor

Important Disclaimer:

The work presented in this document was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

This document is issued subject to review and authorisation by the Team Leader noted by the initials printed in the last column above. If no initials appear, this document shall be considered as preliminary or draft only and no reliance shall be placed upon it other than for information to be verified later.

This document is prepared for the requirements of our Client referred to above in the 'Document details' which are based on a specific brief with limitations as agreed to with the Client. It is not intended for and should not be relied upon by a third party and no responsibility is undertaken to any third party without prior consent provided by Renzo Tonin & Associates. The information herein should not be reproduced, presented, or reviewed except in full. Prior to passing on to a third party, the Client is to fully inform the third party of the specific brief and limitations associated with the commission.

In preparing this report, we have relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, we have not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate, or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

We have derived data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination and re-evaluation of the data, findings, observations, and conclusions expressed in this report.

We have prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures, and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

The information contained herein is for the purpose of acoustics only. No claims are made, and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability, and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

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1 Introduction

Renzo Tonin & Associates was engaged to conduct an environmental noise assessment of existing road traffic, and commercial and industrial premises to support the redevelopment of Western Sydney University (WSU) Milperra Campus.

The proposed development is approximately 430 low-rise residential houses, including an associated childcare, community facility and open spaces. The site adjoins the existing Mount St Joseph High School, and a section of the University site (south-eastern corner) is to be sold to the school.

This report quantifies the impact of external noise on the site (road traffic and industrial noise). In addition, operational noise from the proposed childcare centre, playground and sports ground are examined.

The noise impacts have been assessed in accordance with the requirements of the relevant guidelines as specified below and assessed in detail in the respective report sections.

Noise source	Guideline/Policy/Standard	Section
Road traffic and industrial noise impacts	State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) (Used for Road traffic noise impacts) Development in Rail Corridors and Busy Roads - Interim Guideline (December 2008) (Used for Road traffic noise impacts) Australian Standard AS2107:2016 Acoustics - Recommended design sound levels and reverberation times for building interiors (Used for industrial noise impacts)	Section 4 and 5
Childcare centre	Association of Australasian Acoustical Consultants (AAAC) Guideline for Child Care Centre Acoustic Assessment (AAAC Guideline)	Section 6
Playground and sports ground • Mount St Joseph School Playground • Milperra Reserve	NSW EPA Noise Guideline for Local Government (NGLG)	Section 7

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001. APPENDIX A contains a glossary of acoustic terms used in this report.

2 Project description

2.1 Site description and development overview

The site is bound by industrial premises to the east of the site on the opposite side of Horsley Road (Heatcraft Australia, etc.) and to the north on the opposite side of Bullecourt Avenue (Southern Steel Cash & Carry, etc.) with existing residential dwellings to the west on the opposite side of Ashford Avenue. There are also commercial/retail premises as well as existing sports ground (Milperra Reserve) to the north-west near the intersection of Ashford and Bullecourt Avenues. There is also an existing school and its proposed expansion on the south-eastern corner of the site (see Figure 1) and a childcare (Western Sydney University Early Learning) on the eastern part of the site. Regarding road traffic, the subdivision is subject to the road traffic along the M5 Motorway to the south.

Figure 1: Subject site



Figure 2: Milperra WSU Masterplan



2.2 Assessment methodology

In order to assess the potential noise impact on the subdivision site, the following methodology was used:

- Determine existing road traffic noise levels impacting on-site.
- Determine the extent of noise impacts at proposed residential lots using the results of the noise monitoring and predictive noise modelling.

- Identify where road traffic noise intrusion onto the site may exceed the relevant criteria.
- Identify industrial noise impacts on proposed residential lots using the results of the attended and unattended noise monitoring.
- Using the results of the noise monitoring and predictive noise modelling to determine the extent of noise impact at residential lots from playground, sports ground, and childcare.
- Identify where playground, sports ground or childcare noise intrusion onto the site may exceed the relevant criteria.
- Where external noise levels are predicted to exceed the noise criteria, in-principal recommendations are provided for building envelope design to achieve internal noise criteria.

2.3 Reference material

The following documentation was referenced for this report:

- Milperra WSU Masterplan package prepared by Mirvac [ref: Milperra WSU Masterplan-NewPark-Rev 4b2-28-07-2021-17.2m roads per CB dated 28 July 2021]
- Information on the children outdoor play area capacity provided in an email from WSU Early Learning [ref: RE WSU Early Learning Bankstown - Information Request for Acoustic Assessment.msg]

3 Existing noise environment

Long-term noise monitoring was conducted at the subject site between Wednesdays 27 November and Monday, 13 December 2019 in order to determine existing ambient noise levels from road traffic, industrial activity, and school playground. The long-term noise monitoring methodology is detailed in APPENDIX B., and noise level-vs-time graphs of the data are included in APPENDIX C.

The section below details the results of traffic and ambient noise conditions. In addition, a survey of the impact of existing industrial noise in the vicinity of the site was undertaken. This is detailed in section 5.

3.1 Noise measurement location

The long-term measurement locations are outlined in Table 1 and shown in Figure 3.

Table 1: Noise monitoring locations

ID	Location	Description
Long-term noise monitoring		
L1	WSU Oval South	The noise monitor was located on the southern boundary of the Masterplan and approximately 27m to the north of the closest lane of the M5 Motorway. The noise environment was dominated by road traffic from the M5 Motorway to the south. It is advised that the noise monitor was located behind the existing noise barrier in the free field.
L2	WSU East Parking - Horsley Road	The noise monitor was located on the eastern boundary of the Masterplan and approximately 9m to the west of Horsley Road. The noise environment was dominated by road traffic from the Horsley Road to the east. It is advised that the noise monitor was located in the free field.
L3	WSU Entrance - Bullecourt Avenue	The noise monitor was located on the northern boundary of the Masterplan and approximately 9m to the south of Bullecourt Avenue. The noise environment was dominated by road traffic and industrial premises from the Bullecourt Avenue to the north. It is advised that the noise monitor was located in the free field.
L4	Mount St Joseph School Sports Field	The noise monitor was located on the north boundary of the existing school adjacent to the Masterplan. It was located approximately 11m to the north of the school's sports field. The noise environment was dominated by school activities and distant road traffic from the Horsley Road to the east. It is advised that the noise monitor was located in the free field.
L5	WSU Village Entrance - Ashford Avenue	The noise monitor was located on the western boundary of the Masterplan and approximately 11m to the east of Ashford Avenue. The noise environment was dominated by road traffic from the Ashford Avenue to the west. It is advised that the noise monitor was located in the free field.

Figure 3: Long-term noise monitoring locations



3.2 Long-term noise measurement results and discussion

Results from long-term noise monitoring are presented in Table 2 below.

Table 2: Long-term noise monitoring results

Monitoring location	L_{A90} background noise levels			L_{Aeq} ambient noise levels	
	Day[1]	Evening[1]	Night[1]	Day[2]	Night[2]
L1 - WSU Oval South	52	50	43	60	57
L2 - WSU East Parking - Horsley Road	49	45	41	64	59
L3 - WSU Entrance - Bullecourt Avenue	53	47	39	70	65
L4 - Mount St Joseph School Sports Field	43	44	39	57	50
L5 - WSU Village Entrance - Ashford Avenue	52	50	43	59	57

Notes: 1. Day: 07:00-18:00, Evening: 18:00-22:00, Night: 22:00-07:00
2. Day: 7:00am to 10:00pm; Night: 10:00pm to 7:00am

The noise environment at logger locations L2 and L3 were dominated by road traffic and subjectively the noise emission from the industrial facilities from across the roads are deemed not to contribute to the existing measured L_{Aeq}. Therefore, further assessment against the NSW EPA NPfI is not deemed necessary.

4 Road traffic noise assessment noise impact study

4.1 State Environmental Planning Policy (Infrastructure) 2007 noise limits

In NSW, the SEPP (Infrastructure) 2007, also known as the ISEPP, commenced on 1 January 2008 to facilitate the effective delivery of infrastructure across the state. The aim of the policy includes identifying the environmental assessment category into which different types of infrastructure and services development fall and identifying matters to be considered in the assessment of development adjacent to particular types of infrastructure.

Clause 102 of the ISEPP states as follows:

102 Impact of road noise or vibration on non-road development

1. *This clause applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 40,000 vehicles (based on the traffic volume data published on the website of the RTA) and that the consent authority considers is likely to be adversely affected by road noise or vibration:*
   - *a building for residential use,*
   - *a place of public worship,*
   - *a hospital,*
   - *an educational establishment or childcare centre.*
2. *Before determining a development application for development to which this clause applies, the consent authority must take into consideration any guidelines that are issued by the Director-General for the purposes of this clause and published in the Gazette.*
3. *If the development is for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:*
   - *in any bedroom in the building--35 dB(A) at any time between 10 pm and 7am,*
   - *anywhere else in the building (other than a garage, kitchen, bathroom, or hallway) -- 40 dB(A) at any time.*
4. *In this clause, "freeway", "tollway" and "transitway" have the same meanings as they have in the Roads Act 1993.*

4.1.1 ISEPP Guideline

To support the ISEPP, the NSW Department of Planning released the *Development in Rail Corridors and Busy Roads – Interim Guideline* (December 2008). The Guideline assists in the planning, design, and assessment of developments in, or adjacent to, major transport corridors in terms of noise, vibration and air quality.

The Guideline clarifies the time period of measurement and assessment. As stated in the Guideline in Section 3.4 'What Noise and Vibration Concepts are Relevant' and Table 3.1 of Section 3.6.1, noise measurements are determined over the following relevant time periods:

- Daytime 7am - 10pm $L_{Aeq(15hr)}$
- Night-time 10pm - 7am $L_{Aeq(9hr)}$

L_{Aeq} is the Equivalent Continuous Noise Level and accounts for both the level of fluctuating noise and the number of noise events over the time period. The noise criteria nominated in the ISEPP are internal noise levels with windows and doors closed and the requirements are stated in the following table.

Table 3: ISEPP internal road traffic noise criteria

Internal space	Time period	Noise metric	Internal criteria^
Bedrooms	7am - 10pm	$L_{Aeq(15hrs)}$	40*
	10pm - 7am	$L_{Aeq(9hrs)}$	35
Other Habitable Rooms	Any Time	$L_{Aeq(15hrs)}$ and $L_{Aeq(9hrs)}$	40

Notes: ^ With windows and doors closed.

* Whilst not specified in the ISEPP, daytime criteria for bedrooms are set to 40dB(A), as per the other habitable rooms.

The Guideline in Section 3.6.1 'Airborne Noise' states as follows:

> *"If internal noise levels with windows or doors open exceed the criteria by more than 10dBA, the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."*

As noise modelling is undertaken for external locations, the above criteria and guidelines have been used to establish equivalent external noise criteria. This external noise criterion is used to determine which building facades may require specific acoustic treatment to meet the requirements of the ISEPP. External goals have been calculated based on nominal 10dB(A) reduction through an open window to a free-field position. Windows open to 5% of floor area in accordance with the NCC 2019 requirements.

Table 4: ISEPP road and rail traffic noise criteria for new residential development

Room	Location	$L_{Aeq,\ 15hr}$ Day 7am - 10pm	$L_{Aeq\ 9hr}$ Night 10pm - 7am
Living rooms*	Internal, windows closed	40	40
	Internal, windows open	50	50
	External free field (allowing windows to remain open) ^	60	60

Room	Location	$L_{Aeq,\ 15hr}$ Day 7am - 10pm	$L_{Aeq\ 9hr}$ Night 10pm - 7am
Bedrooms*	Internal, windows closed	40	35
	Internal, windows open	50	45
	External free field (allowing windows to remain open) ^	60	55

Notes: * Requisite for 40,000AADT Roads only under ISEPP 2007.

^ ISEPP Guideline states that where internal noise criteria are exceeded by more than 10dB(A) with windows open mechanical ventilation is required. External goals have been calculated based on nominal 10dB(A) reduction through an open window to a free-field position. Windows open to 5% of floor area in accordance with the National Construction Code (NCC) 2019 requirements.

4.2 Noise sources

Road traffic noise sound power levels were determined from the noise monitoring results. The following $L_{Aeq(9hrs)}$ sound power levels were used, which were validated to both logger locations in the noise modelling.

Table 5: Road traffic noise 9-hour equivalent sound power levels PWL/metre (re 1 Picowatt)

Noise source	Overall dB(A)	Octave band centre frequency - Hz								
		31.5	63	125	250	500	1k	2k	4k	8k
M5 Motorway	91	94	98	93	84	87	88	83	71	63
Horsley Road	73	73	77	73	64	67	68	62	51	43
Ashford Avenue	71	72	76	71	62	65	66	61	50	41
Bullecourt Avenue	78	78	82	78	69	72	73	67	56	48

4.3 Prediction methodology

The noise propagation calculations were carried out in accordance with ISO9613 as implemented by CadnaA computer modelling program (version 2020). The software considers sound radiation patterns, acoustic shielding and potential reflections from intervening building elements, and noise attenuation due to distance.

The noise prediction model was run for two (2) different receiver heights, 1.5m above ground level for ground floor and 4.5m above ground level for 1st floor.

The measured night-time road traffic noise levels indicate a greater impact and therefore, noise predictions were assessed to night-time criteria as compliance with the more stringent night-time criteria will results in compliance during the day.

4.4 Road traffic noise prediction results

The noise prediction results are set out in a graphical format in APPENDIX D of this report. The contour maps in APPENDIX D show that noise levels at some facades on the boundary of the Masterplan do not comply with the ISEPP noise limits. Noise control treatments to mitigate road traffic noise are discussed in Section 8.

5 Industrial noise impact study

In order to ensure that noise from pre-existing industrial development is considered in the design of new dwellings a survey of industrial noise at the site was undertaken.

5.1 Condition from the Department of Planning

Department of Planning's has made the following comment with respect to acoustics:

> *f. Address potential noise impacts from nearby industrial uses, and if there are significant impacts outline how these impacts will be mitigated by the future residential development.*

5.2 Internal noise level goals

AS2107:2016 internal noise goals will be adopted in setting noise targets for new residential development in areas impacted by industrial noise.

In Section 5 and Table 1 of the Australian Standard 2107 states the recommended A-weighted sound pressure level ranges for the design of the spaces in buildings.

The noise criteria nominated in the Australian Standard 2107 are internal noise levels with windows and doors closed and the requirements are stated in the following table. The table below presents target internal noise levels within dwellings based on AS2107 because of external industrial noise intrusion.

Table 6: AS2107 internal noise criteria

Type of occupancy	Internal space	Internal criteria (L_{Aeq})
Houses and apartments in suburban areas	Sleeping Areas	35
	Living Areas	40
	Apartment Common Areas	50

5.2.1 Equipment Used for Noise Assessment

Sound level measurements were undertaken in general accordance with AS1055.1-1997 "Acoustics – Description and Measurement of Environmental Noise" using an NTi Audio Type XL2 precision sound level analyser which is a class 1 instrument having accuracy suitable for field and laboratory use. Statistical noise levels were acquired in both overall and octave band frequencies. The instrument was calibrated prior and after measurements using a Bruel & Kjaer Type 4231 calibrator. No significant drift in calibration was observed. All instrumentation complies with IEC 61672 (parts 1-3) '*Electroacoustics - Sound Level Meters*' and IEC 60942 '*Electroacoustics - Sound calibrators*' and carries current NATA certification (or if less than 2 years old, manufacturers certification).

5.2.2 Noise Measurement results

As part of this noise assessment, short term attended noise measurements were undertaken during the early morning of Wednesday, 27 July 2022, in order to determine the industrial noise contribution on the future residential development. The measurement locations were 1.5m above the ground level on 6 different locations around Western Sydney University (WSU) Milperra Campus.

A summary of measured L_{Aeq} noise levels is presented in below Table 7 and Table 8 for specified locations shown in Figure 4.

To assist, the L_{Aeq} noise levels presented in below Table 7 compares industrial noise contribution measured on Wednesday, 27 July 2022 and Night-time traffic noise levels as documented in Table 2.

Figure 4: Short-term noise monitoring locations



Table 7: Industrial noise levels (L_{Aeq}) compared to traffic noise levels (L_{Aeq})

Measurement Location number	Measurement Location description	Date/time	Industrial noise levels (L_{Aeq})	Traffic noise levels at Night (L_{Aeq})	Comment
S1	South-east corner of WSU Oval (Approximately 30m from South-Western Motor Way)	27/07/2022 01:11-01:26	N/A	57	L_{Aeq} was driven by traffic noise from South-Western Motorway. No industrial activity from 260-270 Horsley Road, Milperra was seen/heard. These industrial sites are approximately within 150m of location S2.
S2	In WSU carpark 2 near Mount St Joseph School, 273 Horsley Road (Approximately 8m away from Horsley Road)	27/07/2022 01:37-01:52	N/A	59	L_{Aeq} was driven by distinct traffic noise from South-Western Motorway. No industrial activity from 260-270 Horsley Road, Milperra was seen/heard. These industrial sites are approximately within 150m of location S2.
S3	On WSU footpath facing Southern Steel Cash and Carry, 319 Horsley Rd, Milperra (Approximately 5m away from Bullecourt Avenue and 54m away from the Southern Steel Cash and Carry, building roller door)	27/07/2022 01:59-02:14	48	65	L_{Aeq} was mostly driven by distinct traffic noise from South-Western Motorway and Bullecourt Avenue. Activities associated within the Southern Steel Cash and Carry, 319 Horsley Road building such as lifting long and heavy structural steel pipes and unloading them on the truck(53L_{Amax}) and truck moving(53L_{Amax}) can be faintly heard at locations S3 and S4.
S4	In WSU carpark 1 (Approximately 35m from Bullecourt Avenue and 75m away from the Southern Steel Cash and Carry, building roller door)	27/07/2022 02:17-02:32	48	65	L_{Aeq} was mostly driven by distinct traffic noise from South-Western Motor Way and Bullecourt Avenue. Activities associated within the Southern Steel Cash and Carry, 319 Horsley Road building such as lifting long and heavy structural steel pipes and unloading them on the truck(53L_{Amax}) and truck moving(53L_{Amax}) can be faintly heard at locations S3 and S4.
S5	In WSU carpark 1 (Approximately 35m from Bullecourt Avenue and 86m away from the Southern Steel Cash and Carry, building roller door)	27/07/2022 02:34-02:49	47	65	L_{Aeq} was mostly driven by distinct traffic noise from South-Western Motorway and Bullecourt Avenue. Some of the traffic noise from South-Western Motorway was masked by
S6	On WSU west footpath facing 150 Ashford Ave, Milperra (Approximately 5m from Ashford Avenue)	27/07/2022 02:55-03:10	N/A	57	L_{Aeq} was driven by distinct traffic noise from South-Western Motorway and Ashford Avenue. This measurement was taken to determine noise from industrial sites located to the north of WSU Milperra campus.

Table 8 represents an additional measurement that was recorded to determine the noise from the mechanical plant associated with the Southern Steel Cash and Carry, 319 Horsley Road building breaking out from the roller door which is located on the opposite side of Bullecourt Avenue.

Table 8: L_{Aeq} noise measurement result for mechanical plant associated with the Southern Steel Cash and Carry, 319 Horsley Road

Measurement Location number	Measurement Location description	Date/time	Measured L_{Aeq}	Comment
S7	Standing 5m from the industrial building roller door on opposite side of Bullecourt Avenue	27/07/2022 03:11-03:26	46	L_{Aeq} was driven by mechanical plant associated with the Southern Steel Cash and Carry, 319 Horsley Road building.

5.2.3 Discussion

Based on the above, road traffic noise levels are higher than industrial noise levels at the site.

- In above mentioned Table 7, measured noise levels at locations S1(south of WSU Milperra Campus) S2(east of WSU Milperra Campus) and S6(west of WSU Milperra Campus) demonstrates no activity from the industrial sites that are in proximity.

- Noise levels at locations S3(i.e., 48L_{Aeq}), S4(i.e., 48L_{Aeq}) and S5(i.e., 47L_{Aeq}), demonstrates noise levels that are well below the measured traffic noise level (i.e., 65L_{Aeq}). Noting that there were activities associated within the Southern Steel Cash and Carry, 319 Horsley Road building such as lifting long and heavy structural steel pipes and unloading them on the truck(53L_{Amax}) and truck moving(53L_{Amax}) were recorded.

- Noise from 319 Horsley Road building roller door (which is located on the opposite side of Bullecourt Avenue to WSU Campus) is lower than the road traffic noise levels on Bullecourt Road.

Overall, the industrial noise levels are much lower with respect to road traffic noise levels and hence, façade systems detailed in Section 8 are sufficient to address road noise and industrial noise intrusion.

Provided that the recommendations in section 8 are adopted, by road traffic noise and industrial noise will be attenuated such that suitable internal noise levels within dwellings will be achieved.

6 Childcare noise emission study

6.1 AAAC Guideline

The AAAC has issued a 'Guideline for Child Care Acoustic Assessment (2010)' (AAAC Guideline). The guideline contains the following suggested levels when assessing noise from a childcare centre.

Residential Receptors

Outdoor play area

> *For outdoor play of more than 2 hours per day, the Leq,15min noise level emitted from the outdoor play area shall not exceed the background noise level by more than 5dB.*
>
> *It is reasonable to allow a higher level of noise impact for a shorter duration of outdoor play. For outdoor play of up to 2 hours total per day, noise shall not exceed the background noise level by more than 10dB.*

The background noise level used for the noise criteria of this assessment is based on noise monitoring location L2 at Horsley Road on daytime.

6.2 Noise sources

Noise measurements of outdoor play were attempted but due to the bushfire situation at the time, the time when the children is allowed to be outside was restricted and therefore, this created a timing issue; and hence, the noise emission from the childcare centre is predicted as below.

The sound power levels recommended in the AAAC Guideline have been used in the noise calculations for the outdoor play areas. The AAAC Guideline gives a range of noise levels for different age groups of children playing as shown in Table 9.

Table 9: AAAC Sound power levels for groups of 10 children playing (dB re 10^{-12} watts)

Number of children	Sound Power Level dB(A)
10 children ages 0 to 2 years	77 to 80
10 children aged 2 to 3 years	83 to 87
10 children aged 3 to 6 years	84 to 90

By way of explanation the "sound power level" is not the same as the "sound pressure level". The "sound power level" is the source emission strength analogous to the wattage of a light bulb (a higher wattage producing a higher light intensity at any distance). Having established the sound power level of children at play, the sound pressure level then decreases with distance and is further reduced by interposed acoustic barriers.

Experience with other childcare centres shows that if one were to adopt the highest values in Table 9 for calculations, this predicts noise levels that are too high compared with the measured noise levels. Instead, if the logarithmic average of the highest and lowest values is used, this results in a realistic assessment for children engaged in active play. Taking the logarithmic average is skewed towards the higher values as shown in the following table:

Table 10: Adopted sound power levels for groups of 10 children in active play (dB re 10^{-12} watts)

Number of children	Sound Power Level dB(A)
10 children ages 0 to 2 years	78.8
10 children aged 2 to 3 years	85.4
10 children aged 3 to 6 years	88.0

In respect of groups of children engaging in passive play (ie. sandpit, seated activities, etc.) the lower range in Table 9 above are applicable.

The sound power levels are then scaled to take into consideration the actual number of children at the subject development in each age group to enable prediction of noise levels to receiver locations. The following assumptions are made:

1. There are 8 children 0-2yo, 8 children 2-3yo, and 18 children 3-6yo in the outdoor active play area. There are 8 children 0-2yo, 8 children 2-3yo, and 17 children 3-6yo in the outdoor passive play area. The plan of management must ensure that these numbers are not exceeded.

2. In the outdoor passive play area the lower range of sound power levels in Table 9 are adopted, and in the active play area the higher range in Table 11 are adopted. The plan of management must ensure that the type of play in the outside play area is controlled by staff supervision and by ensuring that there is no active play equipment in the outside passive play area.

Table 11 shows the sound power levels used in the calculations, when converted for the appropriate number of children in each age group.

Table 11: Sound power levels of children (dB re 10^{-12} watt)

Number of children	Sound Power Level dB(A)
8 children 0-2yo in the active play area and 8 children 0-2yo in the passive play area	81
8 children 2-3yo in the active play area and 8 children 2-3yo in the passive play area	88
18 children 3-6yo in the active play area and 17 children 3-6yo in the passive play area	94

Children between the aged of 0 to 3 years are modelled at a height of 1.0m and older children are modelled at a height of 1.2m.

6.3 Prediction methodology

The noise propagation calculations were carried out in accordance with ISO9613 as implemented by CadnaA computer modelling program (version 2020). The software considers sound radiation patterns, acoustic shielding and potential reflections from intervening building elements, and noise attenuation due to distance.

The noise prediction model was run for two (2) different receiver heights, 1.5m above ground level for ground floor and 4.5m above ground level for 1st floor at the nearest residential boundary on the western and eastern side of the childcare external area. The following figure shows the receiver locations closest to the childcare based on the subdivision masterplan.

Figure 5: Childcare receiver locations



6.4 Childcare noise prediction results

Based on the childcare capacity, noise source levels, and the above prediction methodology, the predicted noise impacts at the receiver locations are presented in the following table.

Table 12: Predicted $L_{Aeq,\ 15min}$ noise levels, dB(A)

Receiver locations	Predicted $L_{Aeq,\ 15min}$ noise level dB(A)	Noise criteria (dBA)
R1 - Western lots		
Ground Floor	47	54

Receiver locations	Predicted $L_{Aeq, 15min}$ noise level dB(A)	Noise criteria (dBA)
First Floor	50	54
R2 - Eastern lots		
Ground Floor	26	54
First Floor	29	54

The noise prediction results indicate that the childcare noise demonstrates compliance at all receivers and no noise mitigation measures are necessary.

7 School playground and sports ground noise emission study

7.1 NSW EPA Noise Guideline for Local Government (NGLG) intrusiveness criterion

In the absence of specific noise criteria stipulated by the consent authority, reference is made to the NSW *Noise Guide for Local Government* (NGLG). According to the NGLG, the intrusiveness of a noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the L_{Aeq} descriptor) does not exceed the background noise level measured in the absence of the source by more than 5dB(A). The intrusiveness criterion is summarised as follows:

- $L_{Aeq,15minute} \leq$ Rating background level (RBL) plus 5dB(A)

The allowable $L_{Aeq\ 15minute}$ noise emission from a development is therefore dependant on the background noise level in an area without the subject development in operation. The background noise levels at time which the development is to operate therefore need to be quantified.

7.2 Noise sources

The noise levels obtained from the noise logger at logger location L4 have been used to calculate the sound power levels of Mount St Joseph school's playground. It is assumed that the same power levels are generated at Milperra Reserve sports ground. The following table presents the resulting sound power levels.

Table 13: Sound power level of typical activity at playground and sports ground (dB re 10^{-12} watts)

Noise source	Overall dB(A)	Octave band centre frequency - Hz								
		31.5	63	125	250	500	1k	2k	4k	8k
Milperra Reserve (L_W per sq. metre)	57	64	65	61	58	55	52	48	43	38
Mt St Joseph playground (L_W per sq. metre)	61	68	69	65	62	59	55	51	46	42

7.3 Prediction methodology

The noise propagation calculations were carried out in accordance with ISO9613 as implemented by CadnaA computer modelling program (version 2020). The software considers sound radiation patterns, acoustic shielding and potential reflections from intervening building elements, and noise attenuation due to distance.

The noise prediction model was run for two (2) different receiver heights, 1.5m above ground level for ground floor and 4.5m above ground level for 1st floor. The following figure shows the receiver locations closest to the school playground and sports ground based on the subdivision masterplan. The

background noise level used for the noise criteria of this assessment is based on noise monitoring location L4 at Mount St Joseph school for receiver locations R3 and R4 and noise monitoring location L3 at Bullecourt Avenue for receiver locations R5 and R6. It is assumed that the playground operates until 6:00pm and the sports ground operate until 10:00pm.

See Appendix E.

Figure 6: School playground and sports ground receiver locations



7.4 Playground and sports ground noise prediction results and recommendations

Based on the playground and sports ground noise levels and the above prediction methodology, the predicted noise impacts at the receiver locations are presented in the following table.

Table 14: Predicted $L_{Aeq,\ 15min}$ Noise Levels, dB(A)

Receiver Locations	Predicted $L_{Aeq,\ 15min}$ noise level dB(A)	Noise criteria (dBA)
R3 - North side of school playground		
Ground Floor	**54**	48
First Floor	**56**	48
R4 - West side of school playground		
Ground Floor	**61**	48

Receiver Locations	Predicted $L_{Aeq, 15min}$ noise level dB(A)	Noise criteria (dBA)
First Floor	**60**	48
R5 - South side of Milperra Reserve sports ground		
Ground Floor	**51**	45
First Floor	**52**	45
R6 - East side of Milperra Reserve sports ground		
Ground Floor	**48**	45
First Floor	**54**	45

Notes: **Bold** indicates exceedance.

The noise prediction results indicate that there are exceedances at all receiver locations and noise mitigation measures are deemed necessary.

Recommended noise controls are:

- For dwellings adjacent to the School playground:
    - Build 2.1m fences at the boundary between the residential lots and Mount St Joseph school and
    - Glazing treatments as per Appendix E.
- For dwellings adjacent to the sports field:
    - Glazing treatments as per Appendix E.

8 Noise control treatment recommendations

The noise modelling identified areas where the external noise goals were not met. Therefore, the affected areas of residential dwellings are to be designed to meet the relevant internal noise criteria.

The following provides in-principal noise control recommendations to reduce noise intrusion for residential premises. The recommendations are based on several assumptions relating to the built form. The advice provided here is in respect of acoustics only. Supplementary professional advice should be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

8.1 Building setbacks and layout

Dwellings constructed in road traffic noise affected areas can be designed so that their layouts minimise noise in living and sleeping areas. Less sensitive rooms (such as kitchens, laundries, and bathrooms) are recommended to be placed on the side of the building fronting the nearest noise source (being the road).

8.2 Indicative building construction

Based on the noise modelling, and in accordance with internal noise criteria set out in Section 4.1, recommendations for building element constructions are presented for the following room types. It is assumed that non-habitable rooms are separated from habitable spaces by doors (i.e., doors to studies, laundries, and ensuites/bathrooms etc.).

Table 15: Room parameters

Room	Item	Description
Bedroom	Dimensions (L x W x H)	Indicatively 3m x 3m x 2.7m or larger.
	Surface finishes	Carpeted floors with underlay, plasterboard walls and ceiling, and bed
Living room	Dimensions (L x W x H)	7m x 5m x 2.7m
	Surface finishes	Timber or tiled floors, plasterboard walls and ceiling
Lounge	Dimensions (L x W x H)	6m x 4m x 2.7m
	Surface finishes	Carpeted floors with underlay, plasterboard, and ceiling

The required acoustic treatment categories are presented graphically in APPENDIX F. The acoustic treatment corresponding to each category is specified in Table 16.

Table 16: Acoustic constructions for treatment categories (ISEPP)

Category	Room	Construction element	Indicative treatment	
Category 1 (Alternative ventilation not required)	Bedrooms and adjoining ensuites	Windows/glazed doors*	Less than $4m^2$ = R_W 24	No specific glass thickness required
			$4m^2$ – $8m^2$ = R_W 27	6mm float glass with acoustic seals
		Walls/roof/ceiling	Standard constructions	
	Lounge/living rooms	Windows/glazed doors*	Less than $8m^2$ = R_W 29	6mm float glass with acoustic seals
			$8m^2$ – $16m^2$ = R_W 32	6.38mm laminated glass with acoustic seals
		Timber doors	35mm solid core timber - acoustic seals	
		Walls/roof/ceiling	Standard constructions	
Category 2 (Alternative ventilation required)	Bedrooms and adjoining ensuites	Windows/glazed doors*	Less than $2m^2$ = R_W 24	No specific glass thickness required
			$2m^2$ – $4m^2$ = R_W 27	6mm float glass with acoustic seals
			$4m^2$ – $8m^2$ = R_W 30	6.38mm laminated glass with acoustic seals
		Walls/roof/ceiling	Standard constructions	
	Lounge/living rooms	Windows/glazed doors*	Less than $4m^2$ = R_W 29	6mm float glass with acoustic seals
			$4m^2$ – $8m^2$ = R_W 32	6.38mm laminated glass with acoustic seals
			$8m^2$ – $16m^2$ = R_W 35	10.38mm laminated glass with acoustic seals
		Timber doors	40mm solid core timber - acoustic seals	
		Walls/roof/ceiling	Standard constructions	
Category 3 (Alternative ventilation required)	Bedrooms and adjoining ensuites	Windows/glazed doors*	Less than $2m^2$ = R_W 27	6mm float glass with acoustic seals
			$2m^2$ – $4m^2$ = R_W 30	6.38mm laminated glass with acoustic seals
			$4m^2$ – $8m^2$ = R_W 33	10.38mm laminated glass with acoustic seals
		Roof/ceiling	Standard constructions	
		Walls	R_W 46	Brick veneer construction, standard internal plasterboard with R1.5 wall batts Or Reverse brick veneer construction, external metal or FC cladding with R1.5 wall batts Or Metal studs with 1 layer of 16mm fire-rated plasterboard inside, metal or FC external cladding, R1.5 wall batts
	Lounge/living rooms	Windows/glazed doors*	Less than $4m^2$ = R_W 32	6.38mm laminated glass with acoustic seals
			$4m^2$ – $8m^2$ = R_W 35	10.38mm laminated glass with acoustic seals
			$8m^2$ – $16m^2$ = R_W 38	Heavy laminated glass or double glazing with acoustic seals
		Timber doors	45mm solid core timber - acoustic seals	

Category	Room	Construction element	Indicative treatment	
		Roof/ceiling	Standard constructions	
		Walls	R_W 46	Brick veneer construction, standard internal plasterboard with R1.5 wall batts Or Reverse brick veneer construction, external metal or FC cladding with R1.5 wall batts Or Metal studs with 1 layer of 16mm fire-rated plasterboard inside, metal or FC external cladding, R1.5 wall batts
Category 4 (Alternative ventilation required)	Bedrooms and adjoining ensuites	Windows/glazed doors*	Less than $2m^2$ = R_W 30	6.38mm laminated glass with acoustic seals
			$2m^2 – 4m^2$ = R_W 33	10.38mm laminated glass with acoustic seals
			$4m^2 – 8m^2$ = R_W 36	12.38mm laminated glass with acoustic seals
		Roof/ceiling	Tiled or metal pitched roof / 2 x 13mm plasterboard ceiling / bulk insulation in cavity	
		Walls	R_W 49	Brick veneer construction, standard internal plasterboard with R1.5 wall batts Or Reverse brick veneer construction, external metal or FC cladding with R1.5 wall batts Or Metal studs with 2 layers of 16mm fire-rated plasterboard inside, metal or FC external cladding, R1.5 wall batts
	Lounge/living rooms	Windows/glazed doors*	Less than $4m^2$ = R_W 35	10.38mm laminated glass with acoustic seals
			$4m^2 – 8m^2$ = R_W 38	Heavy laminated glass or double glazing with acoustic seals
			$8m^2 – 16m^2$ = R_W 41	Double glazed with acoustic seals
		Timber doors	45mm solid core timber - acoustic seals	
		Roof/ceiling	Tiled or metal pitched roof / 2 x 13mm plasterboard ceiling / bulk insulation in cavity	
		Walls	R_W 49	Brick veneer construction, standard internal plasterboard with R1.5 wall batts Or Reverse brick veneer construction, external metal or FC cladding with R1.5 wall batts Or Metal studs with 2 layers of 16mm fire-rated plasterboard inside, metal or FC external cladding, R1.5 wall batts

Notes: * Area of windows and doors shall be the total of all glazing for the given room.

The acoustic requirements for windows and doors have been provided on an R_W basis to allow flexibility with the developer and variations in design due to other design requirements such as thermal performance. The R_W rating sets the basis of the recommended acoustic performance, and the constructions are provided for guidance only. The acoustic performance of specific building components should be confirmed by manufactures or suitably qualified professional prior to installation.

Unless otherwise specified, the base building envelope of dwellings is of standard constructions which are assumed to consist of the following:

- Walls of brick veneer construction, double brick, or light weight clad construction which could consist of fibre-cement cladding on the outside of timber stud walls and internal plasterboard lining. All walls are assumed to have minimum R1.5 insulation in the cavity. It is noted that both brick veneer and cavity double brick construction are of significantly higher acoustic performance than light weight cladding systems. In higher road traffic noise areas, there may be a requirement to upgrade light weight systems. These instances will be noted in the acoustic recommendations.
- Roof to be pitched, with concrete or terracotta tile or sheet metal roof with sarking, R3.0 insulation in the roof space (combination of below roof and above ceiling), and one layer of 10mm thick standard plasterboard fixed to ceiling joists.
- External doors to be solid core timber or glazed, fitted with acoustic seals around the perimeter. Pivot style doors are not recommended as full perimeter acoustic seals are not readily incorporated. The performance of any external doors should have the same acoustic performance as that required for general glazing.

8.3 Alternative ventilation

Where facades have been identified for acoustic treatment in Section 8.2, windows are to be kept closed to meet the internal noise goals. It is noted that windows are not required to be sealed shut/fixed and can be operable.

It is recommended that a mechanical engineer is consulted to ensure the ventilation requirements of the Building Code of Australia and Australian Standard 1668 "*The use of ventilation and air-conditioning in buildings*" are achieved. The internal noise goals are to be met with mechanical ventilation systems not operating.

Where alternative forms of ventilation are to be provided, it must be ensured that the solution does not provide a new noise leakage path into the dwelling and does not create a noise nuisance to neighbouring premises.

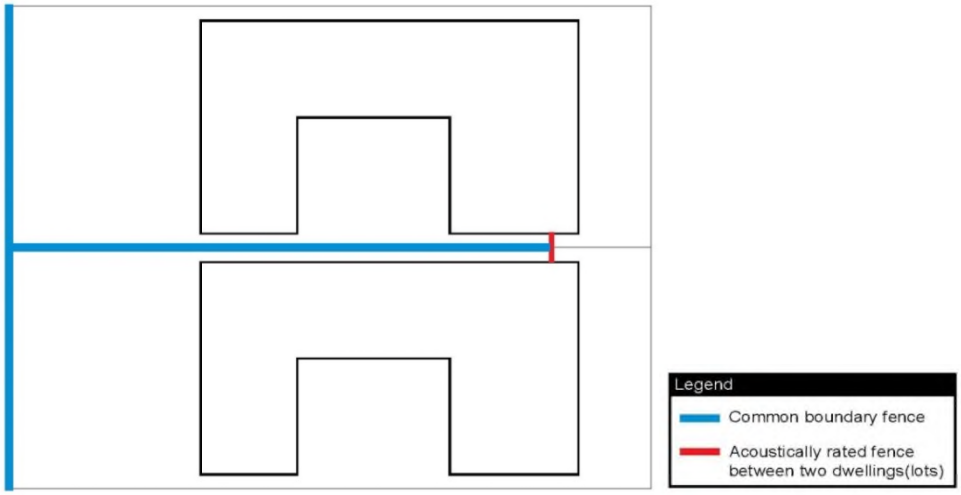
8.4 Scope of acoustic recommendations

The recommended mitigation measures for road traffic noise cannot consider the specific design of each dwelling as those details are not available at this stage of development. The recommendations have been developed for the approvals process and cost planning, and to provide the indicative measures required for each dwelling. Whilst it is the intent for the recommendations and this report to minimise the need for detailed acoustic assessment of each dwelling, it is recommended that an individual acoustic review of the 'Construction' drawings be carried out for each noise affected lot to ensure correct interpretation and application of the recommendations.

8.5 Boundary fences

Acoustically rated fences on the boundary of the lots should be considered if appropriate. Acoustically rated boundary fences are also recommended 'between' dwellings, as illustrated in Figure 7.

Figure 7: Fence locations



The provision of solid boundary fences between residential lots can be beneficial to the ground floor of properties that are directly exposed to the roads. Acoustically rated fences are not specifically required along common boundaries between individual dwellings, unless specified above.

An acoustically rated fence can be constructed of common building materials but needs to be from a durable material with sufficient mass (min. 10kg/m^2) to prevent direct noise transmission e.g., masonry, fibrous cement, lapped and capped timber fence, polycarbonate, or any combination of such materials, provided they withstand the weather elements. A natural barrier of trees or shrubs is not an effective noise screen. The boundary fence should be continuous with no gaps between panels or underneath panels (other than that required for gates). It is recommended that rebates be incorporated into any gates.

8.5.1 Playground and sports ground

The provision of solid boundary fences or earth mounds (berm) between residential lots and playground and sports ground are recommended as specified in Section 7.4 to minimise the noise impact from the sports ground's playground and sports ground. Figure 8 below shows the extent of the acoustic boundary fences.

Figure 8: Extent of acoustic boundary fences at residential lots adjacent to playground and sports ground



9 Conclusion

Renzo Tonin & Associates has completed an environmental noise assessment for the DA of the Milperra WSU Masterplan. The report has quantified the noise impact from existing noise sources around the project site. The report has been prepared in accordance with the relevant objectives as detailed in Section 1.

The results of the noise modelling indicate that:

- Exceedances of the ISEPP criteria are predicted at the residential lots along the southern portion of the Masterplan.
- For facades that are exposed to noise levels above the ISEPP, acoustic constructions for treatment are required to achieve the internal noise level criteria.
- As the industrial noise levels are much lower with respect to road traffic noise levels, façade systems detailed in Section 8 above are sufficient to address road noise and industrial noise intrusion.
- Where the internal criteria can only be achieved with windows closed, then mechanical ventilation or air conditioning that meets the requirements of the Building Code of Australia must also be provided to ensure fresh airflow inside the dwelling. It is important to ensure that mechanical ventilation does not provide a new noise leakage path into the dwelling and does not create a noise nuisance to neighbouring residential premises. It is noted that windows are not required to be sealed shut/fixed and can be operable.
- There is no exceedance predicted at the boundary of the residential lots with respect to operations of the childcare centre (especially noise associated with childcare outdoor play area); and therefore, it is deemed to comply with no additional acoustic mitigation measure.
- Exceedances of the NGLG criteria are predicted at the residential lots along the boundaries between the lots and Mount St Joseph School playground at the eastern part of the masterplan and between the lots and Milperra Reserve sports ground at the north-western part of the masterplan. Noise mitigation measures are specified in Sections 7.4 and 8.5.1.

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of everyday sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz) but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch, and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.

L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

APPENDIX B Long-term noise monitoring methodology

B.1 Noise monitoring equipment

A long-term unattended noise monitor consists of a sound level meter housed inside a weather resistant enclosure. Noise levels are monitored continuously with statistical data stored in memory for every 15-minute period.

Long term noise monitoring was conducted using the following instrumentation:

Description	Type	Octave band data	Logger location
RTA06 & RTA07 (NTi Audio XL2, with low noise microphone)	Type 1	1/1	L1, L2, L3, L4, and L5

Note: All meters comply with AS IEC 61672.1 2004 "Electroacoustics - Sound Level Meters" and designated either Type 1 or Type 2 as per table and are suitable for field use.

The equipment was calibrated prior and after the measurement period using a Brüel & Kjær Type 4230 calibrator. No significant drift in calibration was observed.

B.2 Meteorology during monitoring

Measurements affected by extraneous noise, wind (greater than 5m/s) or rain were excluded from the recorded data in accordance with the NSW INP. Determination of extraneous meteorological conditions was based on data provided by the Bureau of Meteorology (BOM), for a location considered representative of the noise monitoring location(s). However, the data was adjusted to account for the height difference between the BOM weather station, where wind speed and direction is recorded at a height of 10m above ground level, and the microphone location, which is typically 1.5m above ground level (and less than 3m). The correction factor applied to the data is based on Table C.1 of ISO 4354:2009 '*Wind actions on structures*'.

B.3 Noise vs time graphs

Noise almost always varies with time. Noise environments can be described using various descriptors to show how a noise ranges about a level. In this report, noise values measured or referred to include the L_{10}, L_{90}, and L_{eq} levels. The statistical descriptors L_{10} and L_{90} measure the noise level exceeded for 10% and 90% of the sample measurement time. The L_{eq} level is the equivalent continuous noise level, or the level averaged on an equal energy basis. Measurement sample periods are usually ten to fifteen minutes. The Noise -vs- Time graphs representing measured noise levels, as presented in this report, illustrate these concepts for the broadband dB(A) results.

APPENDIX C Long-term noise monitoring results

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inspired to achieve

Acoustics
Vibration
Structural Dynamics

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WSU Oval South, Milperra

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Wednesday-27-November-2019	-	50	44	-	57	55
Thursday-28-November-2019	53	51	43	58	56	54
Friday-29-November-2019	53	51	43	58	56	53
Saturday-30-November-2019	52	48	40	58	53	51
Sunday-01-December-2019	50	49	41	56	54	55
Monday-02-December-2019	54	51	43	59	56	55
Tuesday-03-December-2019	52	50	42	59	55	55
Wednesday-04-December-2019	52	-	-	57	-	-
Representative Weekday[5]	**53**	**51**	**43**	**58**	**56**	**54**
Representative Weekend[5]	**51**	**49**	**41**	**57**	**54**	**53**
Representative Week[5]	**52**	**50**	**43**	**58**	**56**	**54**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

WSU Oval South, Milperra

Road / Rail Noise Monitoring Results (at one metre from façade)

	L_{Aeq} Noise Levels		$L_{Aeq\ 1hr}$ Noise Levels			
Date	**Day[1]**	**Night[2]**	**Day - Up[4]**	**Day - Low[5]**	**Night - Up[4]**	**Night - Low[5]**
Wednesday-27-November-2019	61	57	64	57	61	54
Thursday-28-November-2019	61	57	62	59	59	53
Friday-29-November-2019	60	55	61	58	57	52
Saturday-30-November-2019	60	54	62	55	56	50
Sunday-01-December-2019	58	57	59	56	60	53
Monday-02-December-2019	60	57	62	59	61	53
Tuesday-03-December-2019	61	57	61	57	61	53
Wednesday-04-December-2019	59	-	60	58	-	-
Representative Weekday[3]	**61**	**57**	**61**	**58**	**61**	**53**
Representative Weekend[3]	**59**	**55**	**60**	**56**	**58**	**51**
Representative Week[3]	**60**	**57**	**61**	**58**	**60**	**53**

Notes:

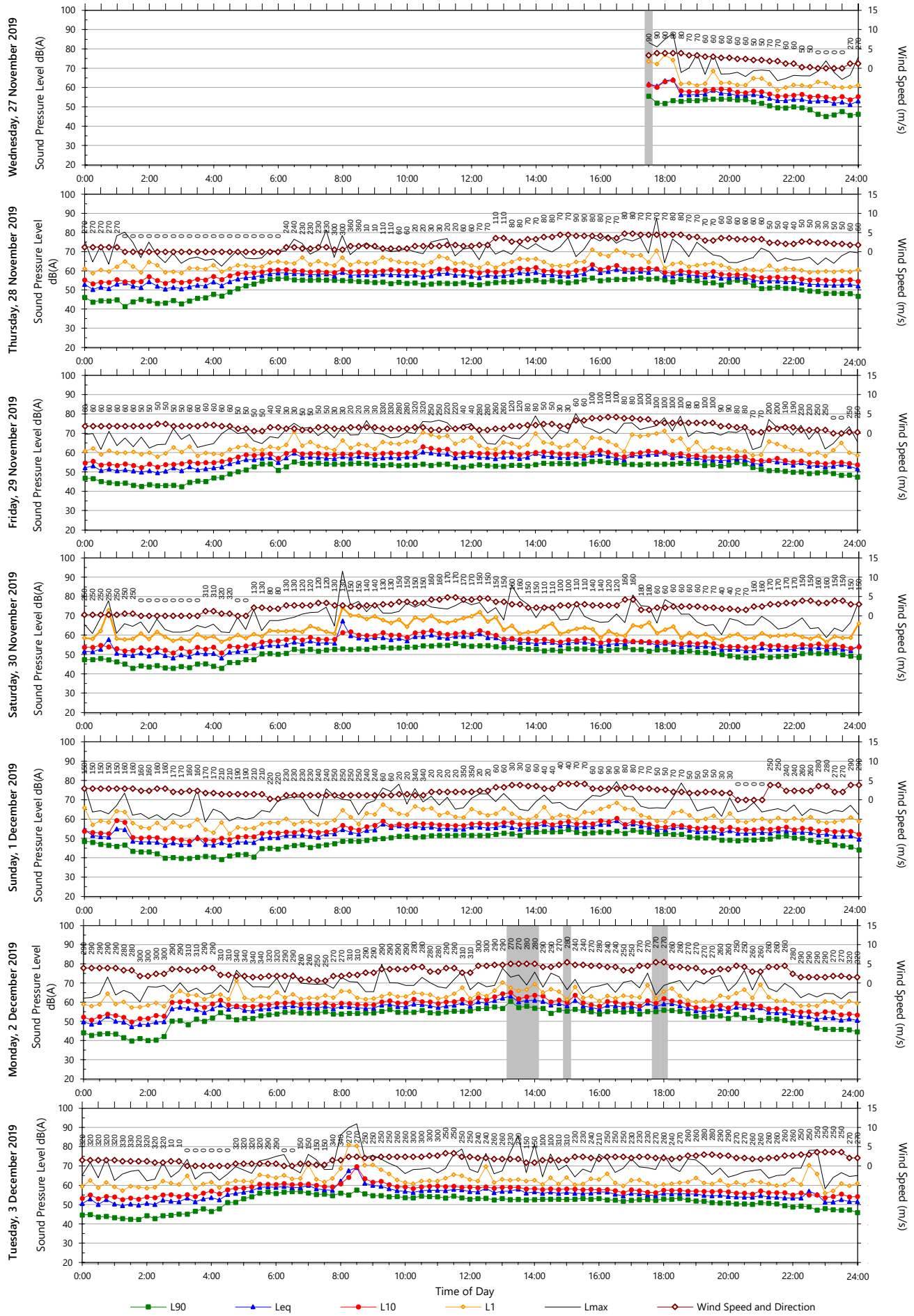
1. Day is 7:00am to 10:00pm 2. Night is 10:00pm to 7:00am 3. Median of daily L_{Aeq}

4. Upper 10th percentile $L_{Aeq\ 1hr}$ 5. Lower 10th percentile $L_{Aeq\ 1hr}$

6. Values are calculated at the facade. 2.5dB is added to results if logger is placed in the free field

Unattended Monitoring Results

Location: WSU Oval South, Milperra

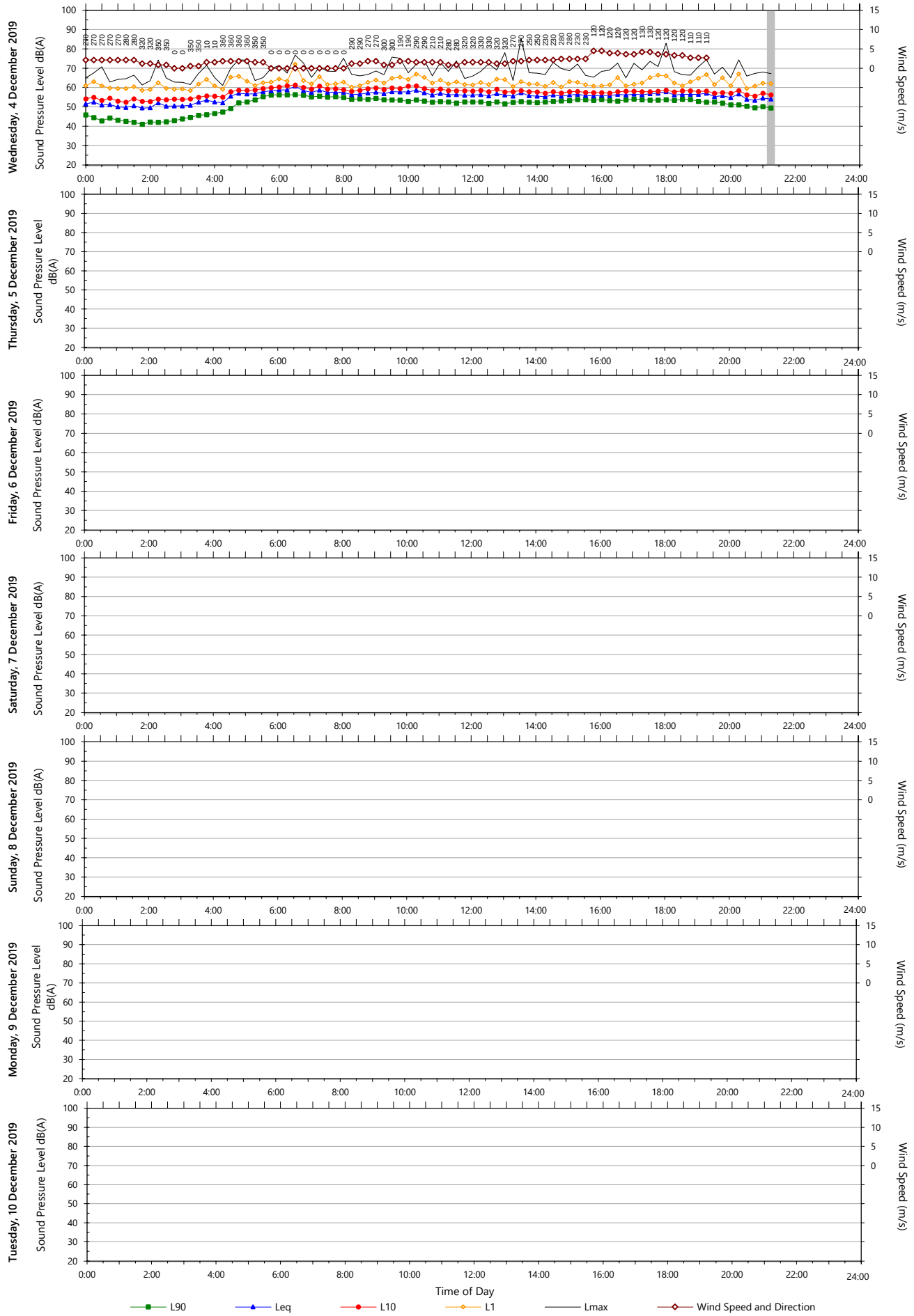


Data File: 2019-11-27_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r31)

Unattended Monitoring Results

Location: WSU Oval South, Milperra



Data File: 2019-11-27_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r31)

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www.renzotonin.com.au

Horsley Road, Milperra

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Wednesday-27-November-2019	-	45	42	-	62	58
Thursday-28-November-2019	49	46	41	62	61	57
Friday-29-November-2019	49	47	42	62	60	56
Saturday-30-November-2019	48	41	37	63	59	55
Sunday-01-December-2019	44	40	38	60	58	57
Monday-02-December-2019	51	47	-	62	60	-
Representative Weekday[5]	**49**	**46**	**42**	**62**	**61**	**57**
Representative Weekend[5]	**46**	**41**	**37**	**61**	**59**	**56**
Representative Week[5]	**49**	**45**	**41**	**62**	**60**	**57**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

Horsley Road, Milperra

Road / Rail Noise Monitoring Results (at one metre from façade)

	L_{Aeq} Noise Levels		$L_{Aeq\ 1hr}$ Noise Levels			
Date	**Day[1]**	**Night[2]**	**Day - Up[4]**	**Day - Low[5]**	**Night - Up[4]**	**Night - Low[5]**
Wednesday-27-November-2019	65	61	68	62	64	53
Thursday-28-November-2019	64	59	67	61	63	54
Friday-29-November-2019	64	58	66	62	61	54
Saturday-30-November-2019	64	58	66	61	60	53
Sunday-01-December-2019	62	60	63	59	63	51
Monday-02-December-2019	64	57	65	62	57	57
Representative Weekday[3]	**64**	**59**	**66**	**62**	**62**	**54**
Representative Weekend[3]	**63**	**59**	**65**	**60**	**62**	**52**
Representative Week[3]	**64**	**59**	**66**	**62**	**62**	**54**

Notes:

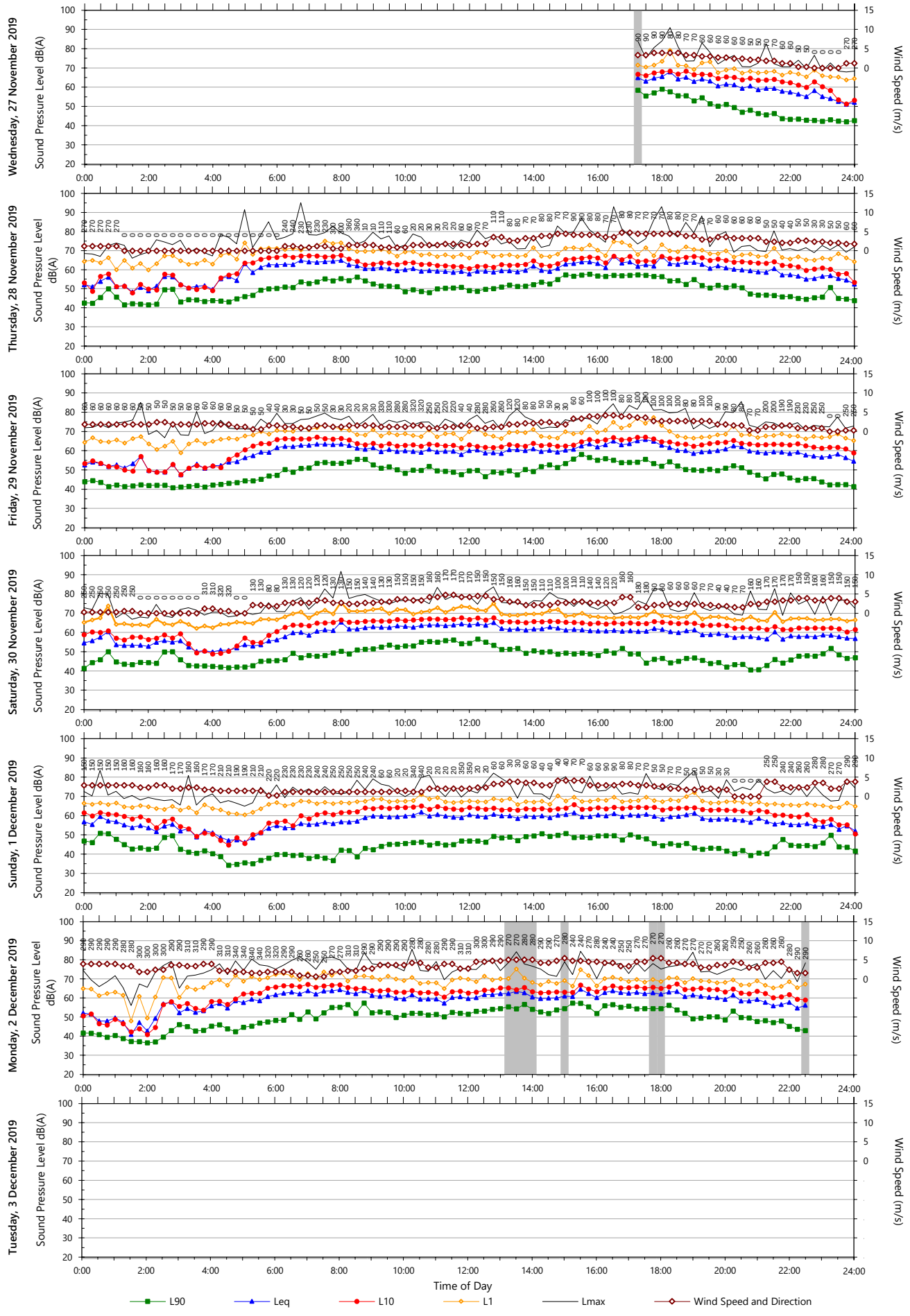
1. Day is 7:00am to 10:00pm 2. Night is 10:00pm to 7:00am 3. Median of daily L_{Aeq}

4. Upper 10th percentile $L_{Aeq\ 1hr}$ 5. Lower 10th percentile $L_{Aeq\ 1hr}$

6. Values are calculated at the facade. 2.5dB is added to results if logger is placed in the free field

Unattended Monitoring Results

Location: Horsley Road, Milperra



Data File: 2019-11-27_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r31)

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Vibration
Structural Dynamics

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Bullecourt Avenue, Milperra

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Wednesday-27-November-2019	-	47	40	-	66	63
Thursday-28-November-2019	53	48	39	68	67	63
Friday-29-November-2019	54	45	38	68	66	60
Saturday-30-November-2019	48	41	35	66	63	59
Sunday-01-December-2019	43	40	38	65	63	62
Monday-02-December-2019	54	50	40	68	65	63
Tuesday-03-December-2019	52	47	39	68	65	63
Wednesday-04-December-2019	-	-	-	-	-	-
Representative Weekday[5]	**53**	**47**	**39**	**68**	**66**	**62**
Representative Weekend[5]	**46**	**40**	**36**	**66**	**63**	**61**
Representative Week[5]	**53**	**47**	**39**	**67**	**65**	**62**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

Bullecourt Avenue, Milperra

Road / Rail Noise Monitoring Results (at one metre from façade)

	L_{Aeq} Noise Levels		$L_{Aeq\ 1hr}$ Noise Levels			
Date	**Day[1]**	**Night[2]**	**Day - Up[4]**	**Day - Low[5]**	**Night - Up[4]**	**Night - Low[5]**
Wednesday-27-November-2019	69	66	70	67	70	59
Thursday-28-November-2019	70	65	71	69	69	59
Friday-29-November-2019	70	63	71	69	65	60
Saturday-30-November-2019	68	61	70	65	64	58
Sunday-01-December-2019	67	65	68	64	69	56
Monday-02-December-2019	70	65	71	67	70	58
Tuesday-03-December-2019	70	66	71	67	70	59
Wednesday-04-December-2019	71	-	72	71	-	-
Representative Weekday[3]	**70**	**65**	**71**	**68**	**70**	**59**
Representative Weekend[3]	**67**	**63**	**69**	**65**	**66**	**57**
Representative Week[3]	**70**	**65**	**71**	**67**	**69**	**59**

Notes:

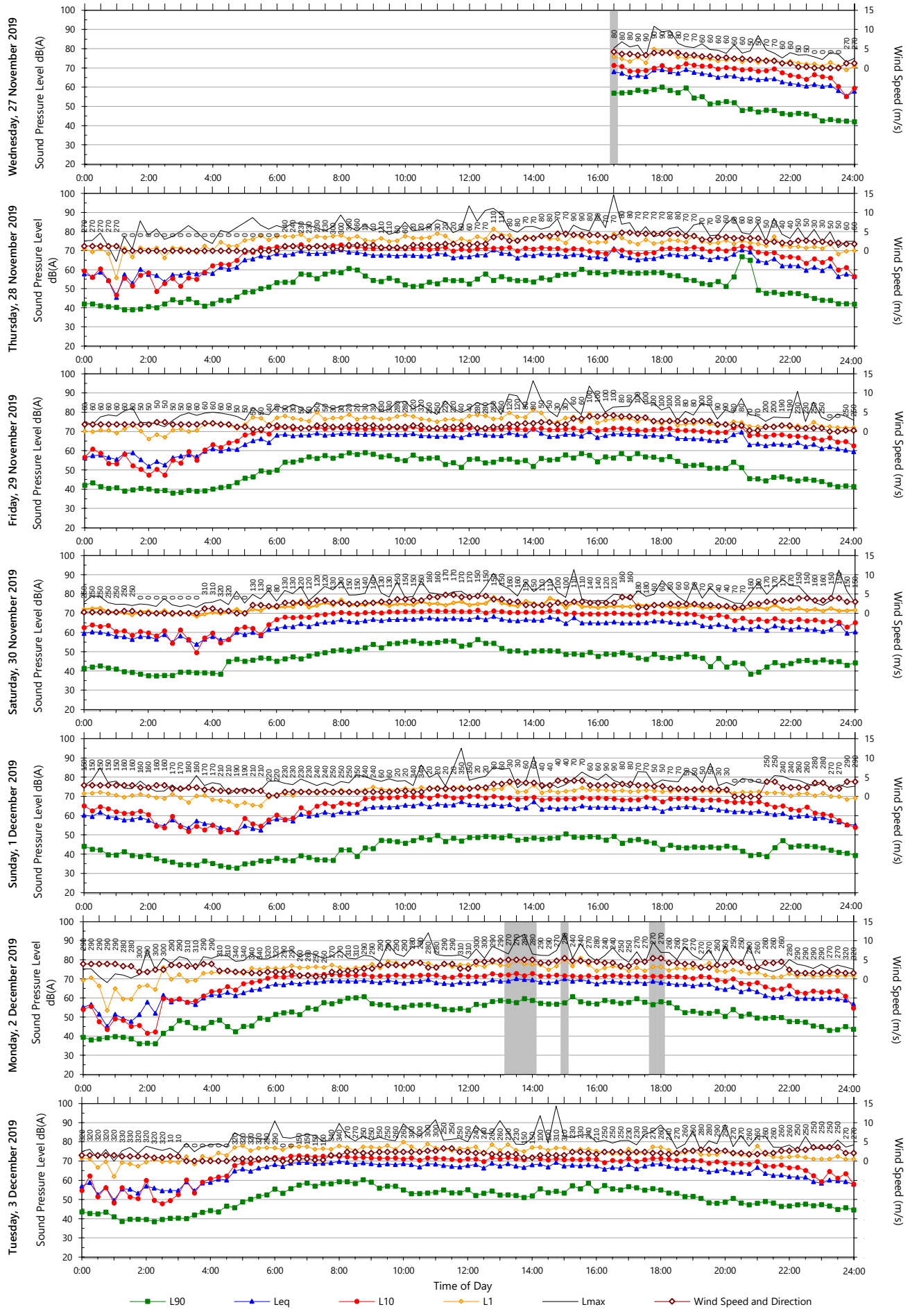
1. Day is 7:00am to 10:00pm 2. Night is 10:00pm to 7:00am 3. Median of daily L_{Aeq}

4. Upper 10th percentile $L_{Aeq\ 1hr}$ 5. Lower 10th percentile $L_{Aeq\ 1hr}$

6. Values are calculated at the facade. 2.5dB is added to results if logger is placed in the free field

Unattended Monitoring Results

Location: Bullecourt Avenue, Milperra

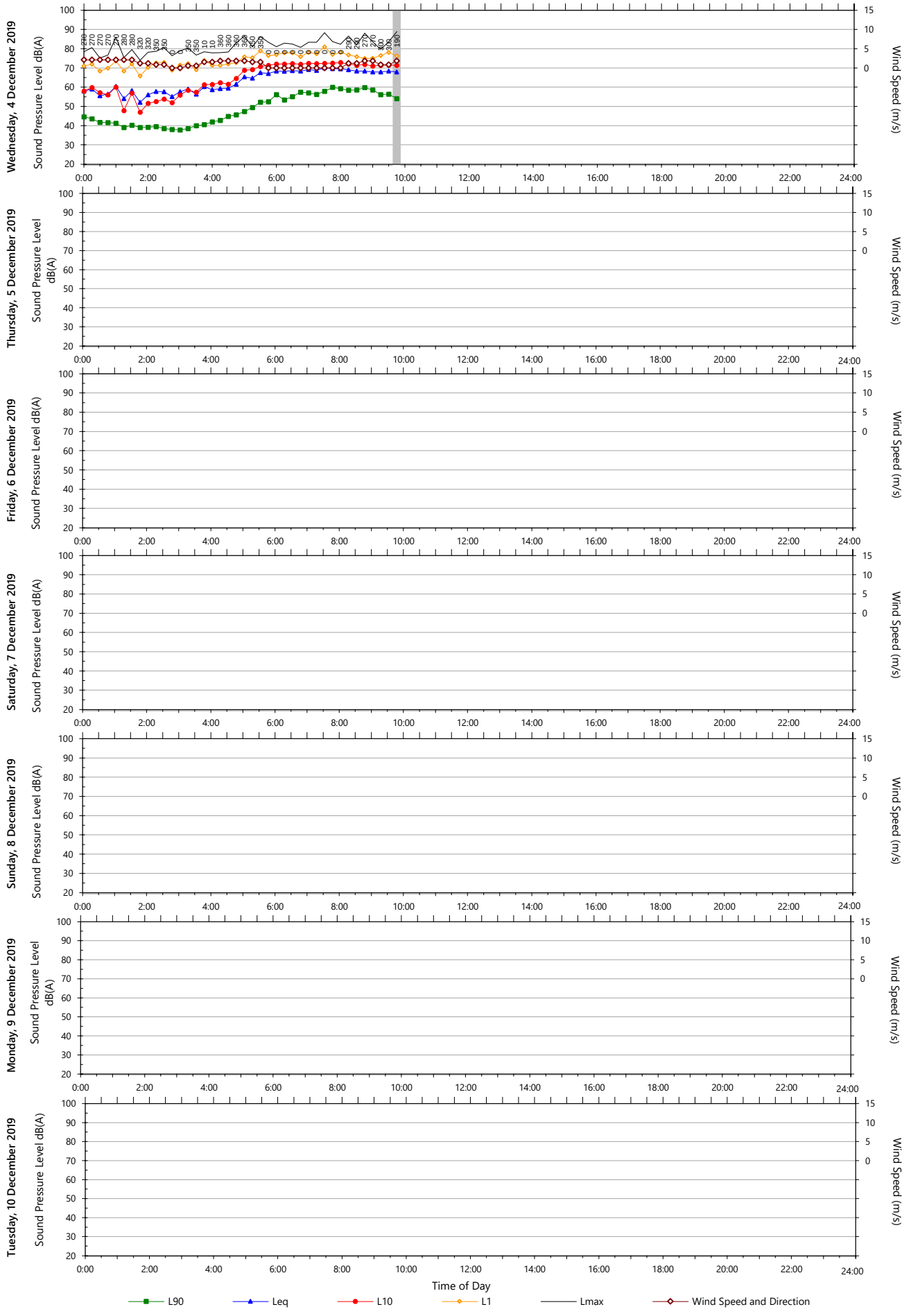


Data File: 2019-11-27_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r31)

Unattended Monitoring Results

Location: Bullecourt Avenue, Milperra



Data File: 2019-11-27_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r31)

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Mount St Joseph Sports Field, Milperra

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Friday-06-December-2019	-	-	39	-	-	47
Saturday-07-December-2019	43	45	38	54	51	47
Sunday-08-December-2019	44	43	39	52	51	47
Monday-09-December-2019	47	43	40	55	50	49
Tuesday-10-December-2019	-	47	40	-	53	48
Wednesday-11-December-2019	47	44	38	56	53	48
Thursday-12-December-2019	-	-	-	-	-	-
Representative Weekday[5]	**47**	**44**	**40**	**55**	**52**	**48**
Representative Weekend[5]	**43**	**44**	**39**	**53**	**51**	**47**
Representative Week[5]	**45**	**44**	**39**	**54**	**52**	**48**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

Mount St Joseph Sports Field, Milperra

Road / Rail Noise Monitoring Results (at one metre from façade)

	L_{Aeq} Noise Levels		$L_{Aeq\ 1hr}$ Noise Levels			
Date	**Day[1]**	**Night[2]**	**Day - Up[4]**	**Day - Low[5]**	**Night - Up[4]**	**Night - Low[5]**
Friday-06-December-2019	57	49	59	53	53	45
Saturday-07-December-2019	56	49	59	51	53	44
Sunday-08-December-2019	54	50	56	51	54	44
Monday-09-December-2019	57	51	59	53	56	45
Tuesday-10-December-2019	55	51	57	52	53	46
Wednesday-11-December-2019	58	50	59	54	53	44
Thursday-12-December-2019	61	-	63	56	-	-
Representative Weekday[3]	**57**	**50**	**59**	**53**	**53**	**45**
Representative Weekend[3]	**55**	**50**	**57**	**51**	**53**	**44**
Representative Week[3]	**57**	**50**	**59**	**53**	**53**	**45**

Notes:

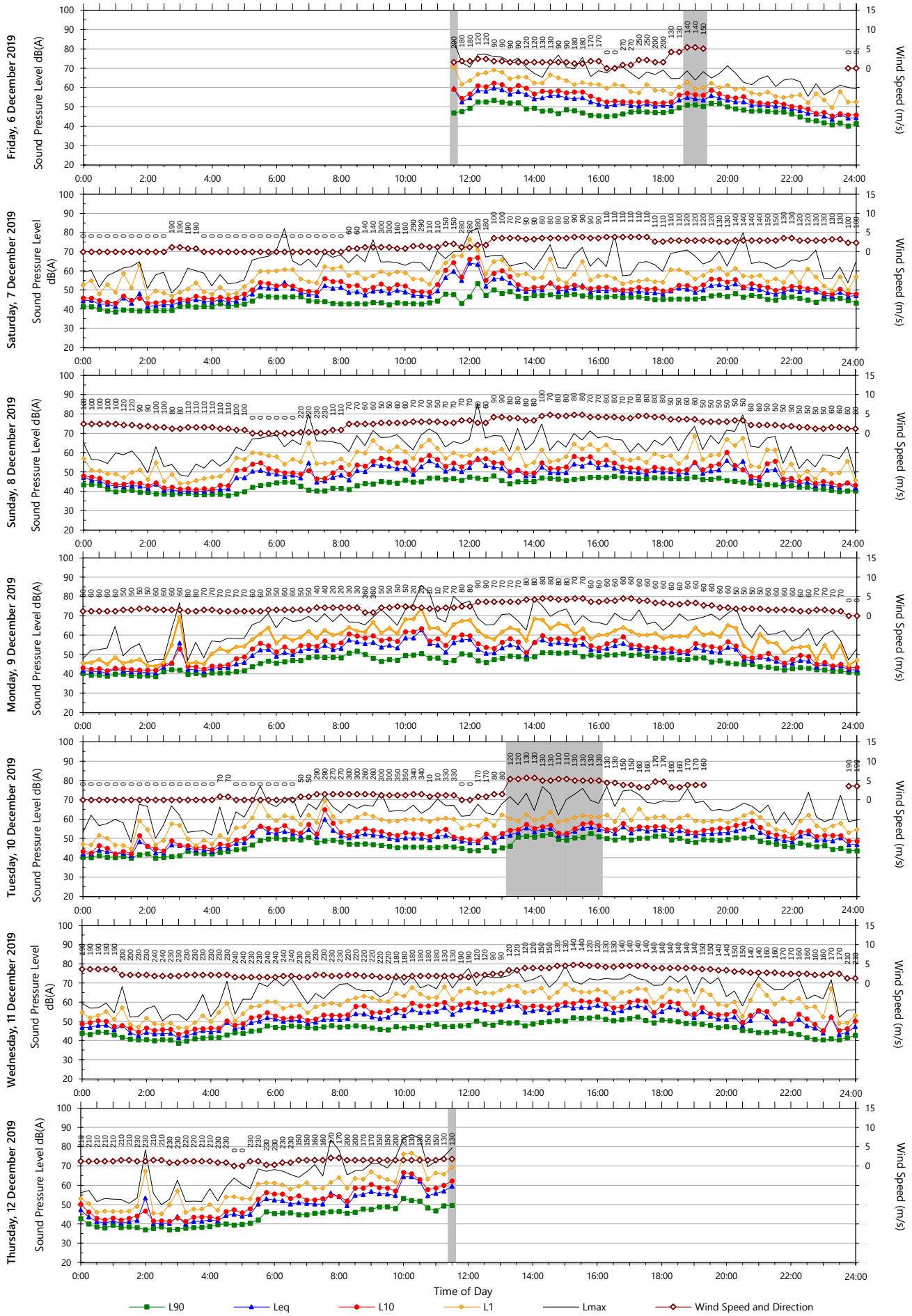
1. Day is 7:00am to 10:00pm 2. Night is 10:00pm to 7:00am 3. Median of daily L_{Aeq}

4. Upper 10th percentile $L_{Aeq\ 1hr}$ 5. Lower 10th percentile $L_{Aeq\ 1hr}$

6. Values are calculated at the facade. 2.5dB is added to results if logger is placed in the free field

Unattended Monitoring Results

Location: Mount St Joseph Sports Field, Milperra



Data File: 2019-12-06_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r31)

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Ashford Avenue, Milperra

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Wednesday-27-November-2019	-	52	41	-	57	54
Thursday-28-November-2019	53	49	45	57	55	54
Friday-29-November-2019	52	49	44	56	55	55
Saturday-30-November-2019	54	50	40	58	56	52
Sunday-01-December-2019	52	50	43	56	55	51
Monday-02-December-2019	-	48	39	-	54	53
Tuesday-03-December-2019	52	53	46	56	63	56
Wednesday-04-December-2019	-	-	-	-	-	-
Representative Weekday[5]	**52**	**49**	**44**	**57**	**58**	**55**
Representative Weekend[5]	**53**	**50**	**41**	**57**	**56**	**52**
Representative Week[5]	**52**	**50**	**43**	**57**	**57**	**54**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

Ashford Avenue, Milperra

Road / Rail Noise Monitoring Results (at one metre from façade)

	L_{Aeq} Noise Levels		$L_{Aeq\ 1hr}$ Noise Levels			
Date	**Day[1]**	**Night[2]**	**Day - Up[4]**	**Day - Low[5]**	**Night - Up[4]**	**Night - Low[5]**
Wednesday-27-November-2019	59	57	60	58	60	52
Thursday-28-November-2019	59	57	60	57	60	53
Friday-29-November-2019	59	57	60	56	61	52
Saturday-30-November-2019	60	55	62	58	58	50
Sunday-01-December-2019	59	53	60	57	55	50
Monday-02-December-2019	58	56	58	56	60	50
Tuesday-03-December-2019	62	59	62	58	61	54
Wednesday-04-December-2019	61	-	61	60	-	-
Representative Weekday[3]	**59**	**57**	**60**	**57**	**60**	**52**
Representative Weekend[3]	**59**	**54**	**61**	**57**	**56**	**50**
Representative Week[3]	**59**	**57**	**60**	**57**	**60**	**52**

Notes:

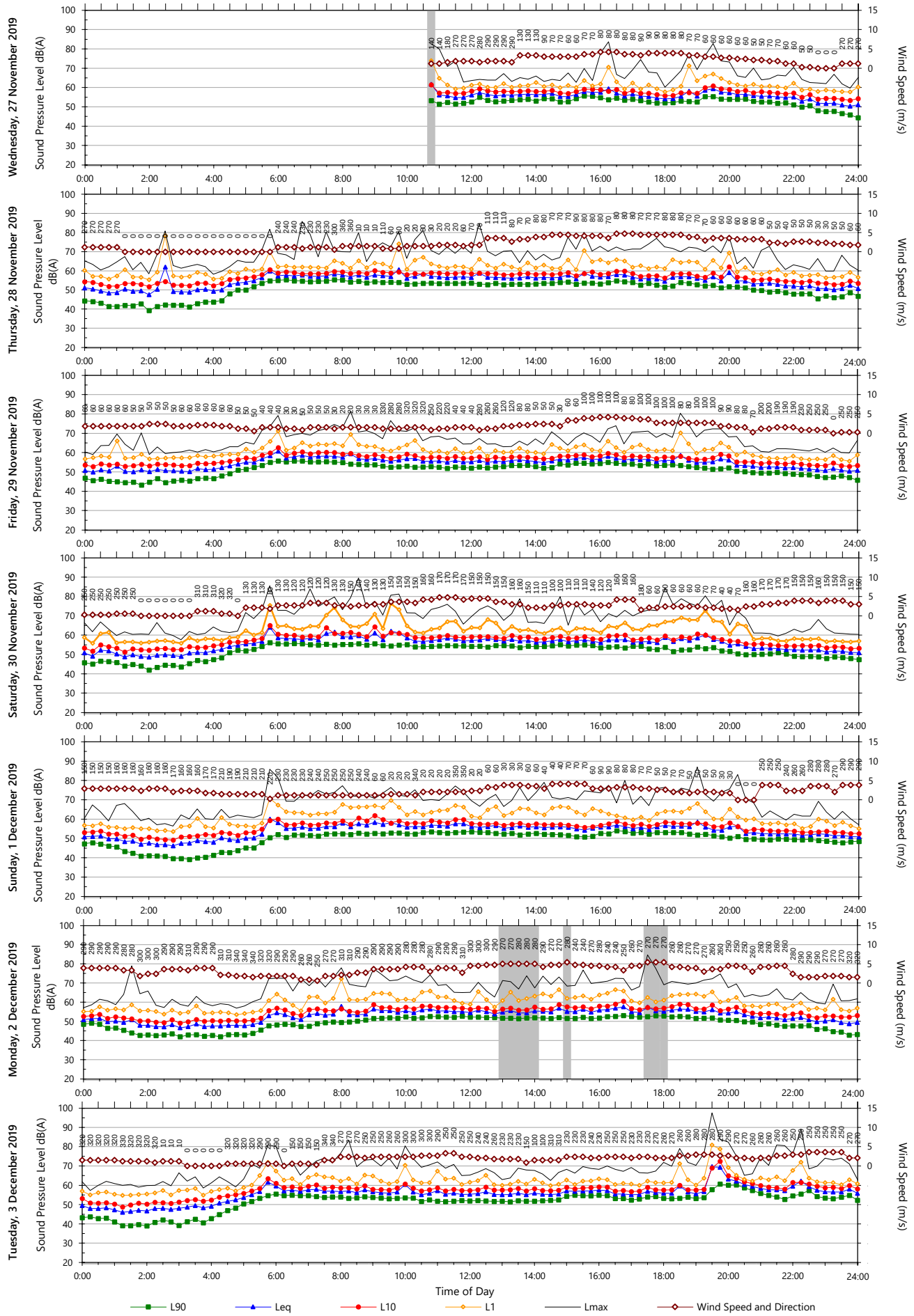
1. Day is 7:00am to 10:00pm 2. Night is 10:00pm to 7:00am 3. Median of daily L_{Aeq}

4. Upper 10th percentile $L_{Aeq\ 1hr}$ 5. Lower 10th percentile $L_{Aeq\ 1hr}$

6. Values are calculated at the facade. 2.5dB is added to results if logger is placed in the free field

Unattended Monitoring Results

Location: Ashford Avenue, Milperra

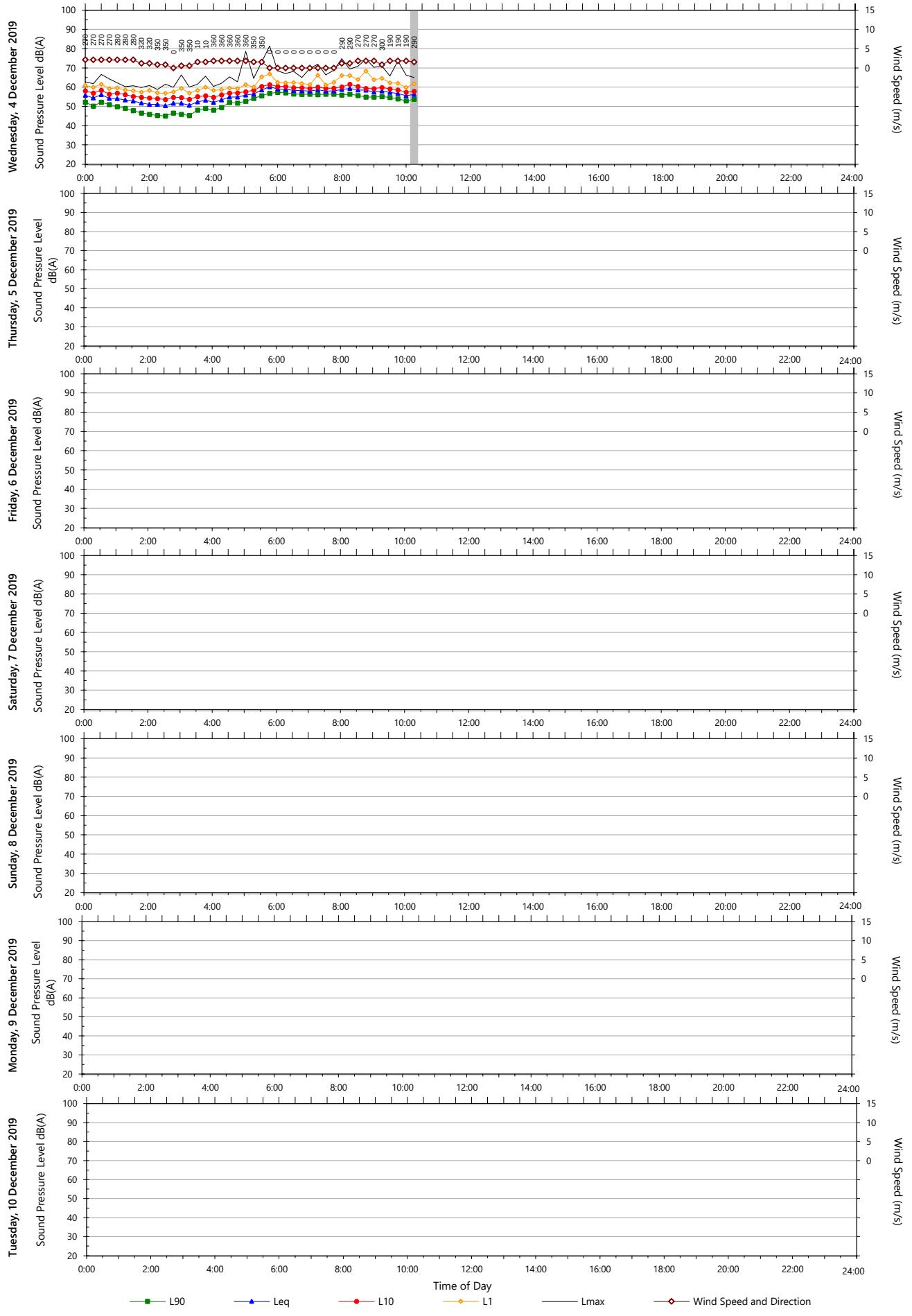


Data File: 2019-11-19_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r31)

Unattended Monitoring Results

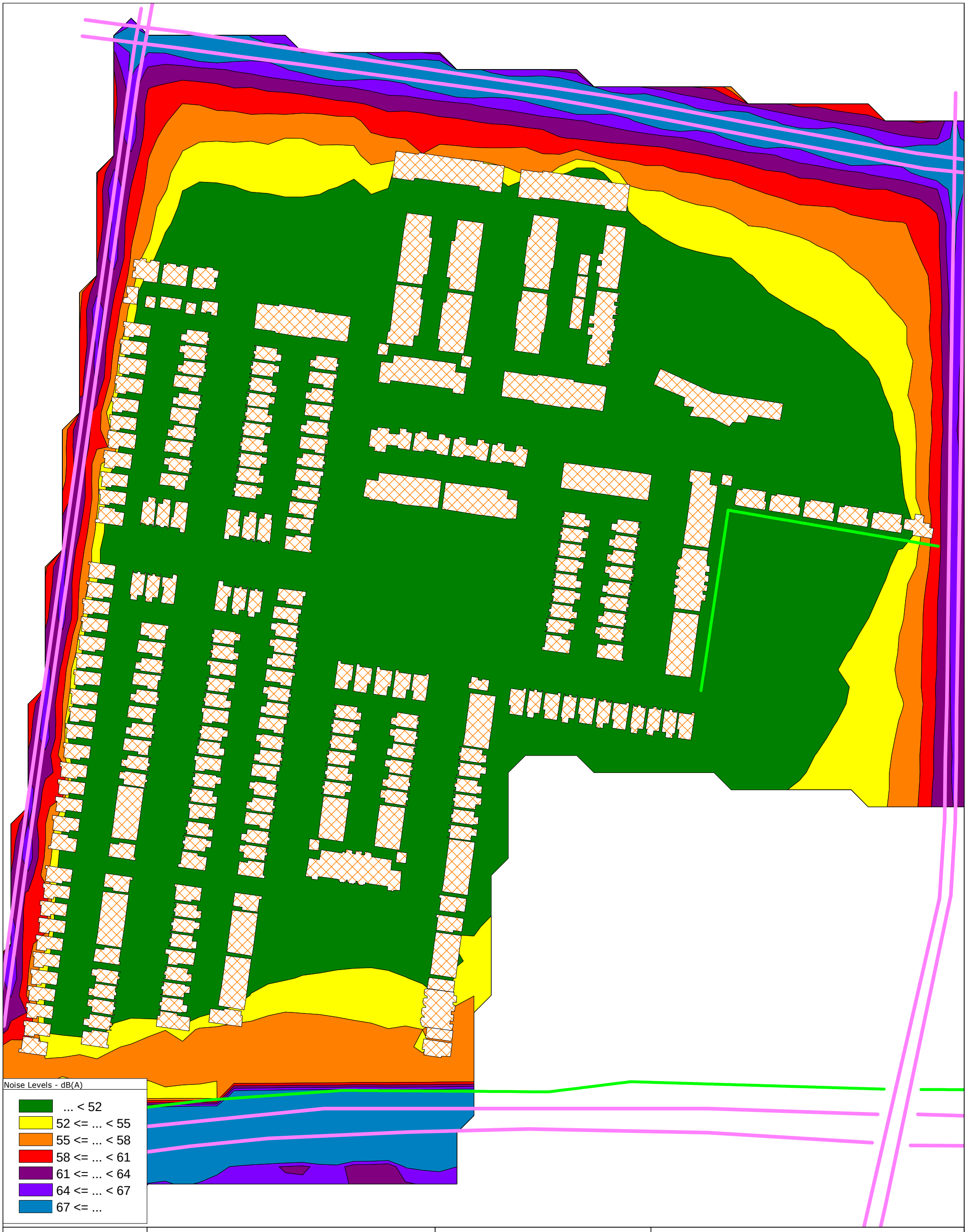
Location: Ashford Avenue, Milperra



Data File: 2019-11-19_SLM_000_123_Rpt_Report.txt

Template: QTE-26 Logger Graphs Program (r31)

APPENDIX D Noise modelling results - Road Traffic Noise



legend:

- Building
- Existing Road
- Barrier

Client: mirvac

Consultant: RENZO TONIN & ASSOCIATES inspired to achieve

1/418A Elizabeth Street, SURRY HILLS NSW 2010
P: 02 8218 0500 F: 02 8218 0501

Project:
WESTERN SYDNEY UNIVERSITY
MILPERRA SUBDIVISION

Description:
GROUND FLOOR FACADE TREATMENT

Noise levels are approximate due to interpolation of contours and should be used for reference only.

For information only and not for construction.

This information is protected by copyright.

Project No.:	Produced by:
TL127-01	MSK
Figure Ref:	Grid:
TL127-02 (r0)	TL127-02 NC01
Date:	Scale:
13.09.2022	1: 2100 A3

Noise Levels - dB(A)

- ... < 52
- 52 <= ... < 55
- 55 <= ... < 58
- 58 <= ... < 61
- 61 <= ... < 64
- 64 <= ... < 67
- 67 <= ...

legend:

- Building
- Existing Road
- Barrier

Client: mirvac

Consultant:

RENZO TONIN & ASSOCIATES
inspired to achieve

1/418A Elizabeth Street, SURRY HILLS NSW 2010
P: 02 8218 0500 F: 02 8218 0501

Project:
WESTERN SYDNEY UNIVERSITY
MILPERRA SUBDIVISION

Description:
FIRST FLOOR FACADE TREATMENT

Noise levels are approximate due to interpolation of contours and should be used for reference only.

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Project No.:	Produced by:
TL127-01	MSK
Figure Ref:	Grid:
TL127-02 (r0)	TL127-01NC01
Date:	Scale:
13.09.2022	1: 2100 A3

APPENDIX E Noise modelling results - Playground and Sports Field Noise

Noise Levels - dB(A)

- ... < 52
- 52 <= ... < 55
- 55 <= ... < 58
- 58 <= ... < 61
- 61 <= ... < 64
- 64 <= ... < 67
- 67 <= ...

legend:

- Building
- Existing Road
- Barrier

Client: mirvac

Consultant:

RENZO TONIN & ASSOCIATES
inspired to achieve

1/418A Elizabeth Street, SURRY HILLS NSW 2010
P: 02 8218 0500 F: 02 8218 0501

Project:
WESTERN SYDNEY UNIVERSITY
MILPERRA SUBDIVISION

Description:
GROUND FLOOR FACADE TREATMENT FOR PLAYGROUND N

Noise levels are approximate due to interpolation of contours and should be used for reference only.

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Project No.:	Produced by:
TL127-01	MSK
Figure Ref:	Grid:
TL127-01P03 (r0)	TL127-01NC01
Date:	Scale:
13.09.2022	1: 2100 A3

Noise Levels - dB(A)

- ... < 52
- 52 <= ... < 55
- 55 <= ... < 58
- 58 <= ... < 61
- 61 <= ... < 64
- 64 <= ... < 67
- 67 <= ...

legend:

- Building
- Existing Road
- Barrier

Client:

mirvac

Consultant:

RENZO TONIN & ASSOCIATES
inspired to achieve

1/418A Elizabeth Street, SURRY HILLS NSW 2010
P: 02 8218 0500 F: 02 8218 0501

Project:
WESTERN SYDNEY UNIVERSITY
MILPERRA SUBDIVISION

Description:
FIRST FLOOR FACADE TREATMENT FOR PLAYGROUND NOIS

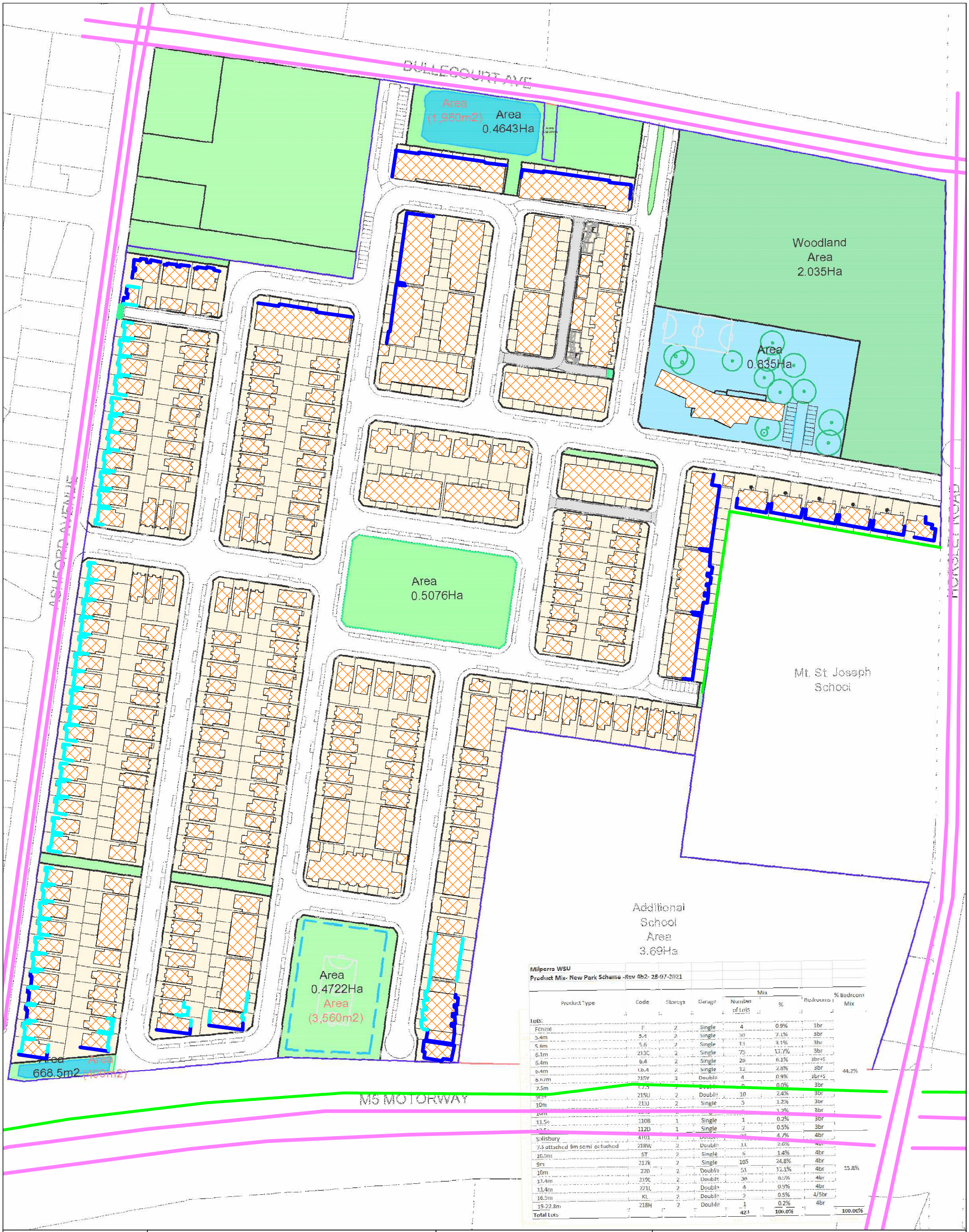
Noise levels are approximate due to interpolation of contours and should be used for reference only.

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Project No.:	Produced by:
TL127-01	MSK
Figure Ref:	Grid:
TL127-01P03 (r0)	TL127-01NC01
Date:	Scale:
13.09.2022	1: 2100 A3

APPENDIX F Acoustic treatment categories



Milperra WSU
Product Mix- New Park Scheme -Rev 4b2- 28-07-2021

Product Type	Code	Storeys	Garage	Mix: Number of Lots	Mix: %	Bedrooms	% Bedroom Mix
Lots:							
Fenzie	F	2	Single	4	0.9%	1br	
5.4m	5.4	2	Single	30	7.1%	3br	
5.6m	5.6	2	Single	11	2.1%	3br	
6.1m	215C	2	Single	75	17.7%	3br	
6.4m	6.4	2	Single	26	6.1%	3br+S	
6.4m	06.4	2	Single	12	2.8%	3br	44.2%
6.6m	215V	2	Double	4	0.9%	3br+S	
7.5m	17J	2	Double	0	0.0%	3br	
9m	215U	2	Double	10	2.4%	3br	
10m	213J	2	Single	5	1.2%	3br	
10m					1.2%	3br	
11.5m	110B	1	Single	1	0.2%	3br	
11.5m	112D	1	Single	2	0.5%	3br	
Salisbury	410J	1	Double	20	4.7%	4br	
7.5 attached 9m semi detached	218W	2	Double	11	2.6%	4br	
10.5m	ST	2	Single	6	1.4%	4br	
9m	217K	2	Single	105	24.8%	4br	
10m	220	2	Double	53	12.1%	4br	55.8%
11.4m	219L	2	Double	36	8.5%	4br	
11.4m	221L	2	Double	4	0.9%	4br	
16.5m	KL	2	Double	2	0.5%	4/5br	
19-22.8m	218H	2	Double	1	0.2%	4br	
Total Lots				421	100.0%		100.00%

legend:
- Building
- Existing Road
- Barrier

planners interior des

Client:

mirvac

Consultant:

RENZO TONIN & ASSOCIATES
inspired to achieve

1/418A Elizabeth Street, SURRY HILLS NSW 2010
P: 02 8218 0500 F: 02 8218 0501

Project:
WESTERN SYDNEY UNIVERSITY
MILPERRA SUBDIVISION

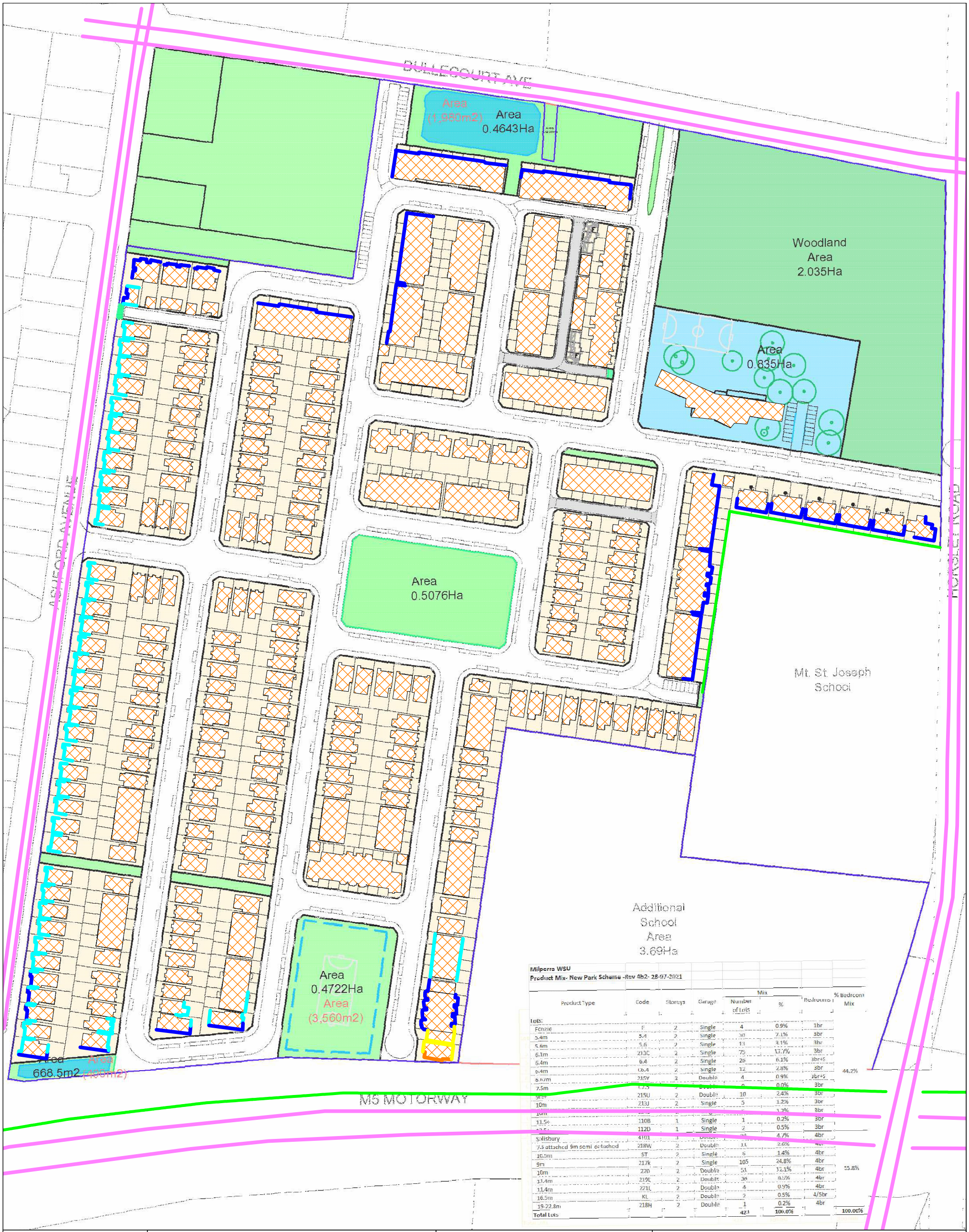
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GROUND FLOOR FACADE TREATMENT CATAGORIES

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TL127-01P03 (r0)	TL127-01NC01
Date:	Scale:
13.09.2022	1: 2100 A3



Milperra WSU
Product Mix- New Park Scheme -Rev 4b2- 28-07-2021

Product Type	Code	Storeys	Garage	Mix Number of Lots	Mix %	Bedrooms	% Bedroom Mix
Lots:							
Fenzie	F	2	Single	4	0.9%	1br	
5.4m	5.4	2	Single	30	7.1%	3br	
5.6m	5.6	2	Single	11	2.1%	3br	
6.1m	215C	2	Single	75	17.7%	3br	
6.4m	6.4	2	Single	26	6.1%	3br+S	
6.4m	06.4	2	Single	12	2.8%	3br	44.2%
6.6m	215Y	2	Double	4	0.9%	3br+S	
7.5m	17.5	2	Double	0	0.0%	3br	
9m	215U	2	Double	10	2.4%	3br	
10m	213J	2	Single	5	1.2%	3br	
10m					1.2%	3br	
11.5m	110B	1	Single	1	0.2%	3br	
11.5m	112D	1	Single	2	0.5%	3br	
Salisbury	410J	1	Double	20	4.7%	4br	
7.5 attached 9m semi detached	218W	2	Double	11	2.6%	4br	
10.5m	ST	2	Single	6	1.4%	4br	
9m	217K	2	Single	105	24.8%	4br	
10m	220	2	Double	53	12.1%	4br	55.8%
11.4m	219L	2	Double	36	8.5%	4br	
11.4m	221L	2	Double	4	0.9%	4br	
16.5m	KL	2	Double	2	0.5%	4/5br	
19-22.8m	218H	2	Double	1	0.2%	4br	
Total Lots				421	100.0%		100.00%

legend:
- Building
- Existing Road
- Barrier

Client: mirvac

Consultant:
RENZO TONIN & ASSOCIATES
inspired to achieve
1/418A Elizabeth Street, SURRY HILLS NSW 2010
P: 02 8218 0500 F: 02 8218 0501

Project:
WESTERN SYDNEY UNIVERSITY
MILPERRA SUBDIVISION

Description:
FIRST FLOOR FACADE TREATMENT CATAGORIES

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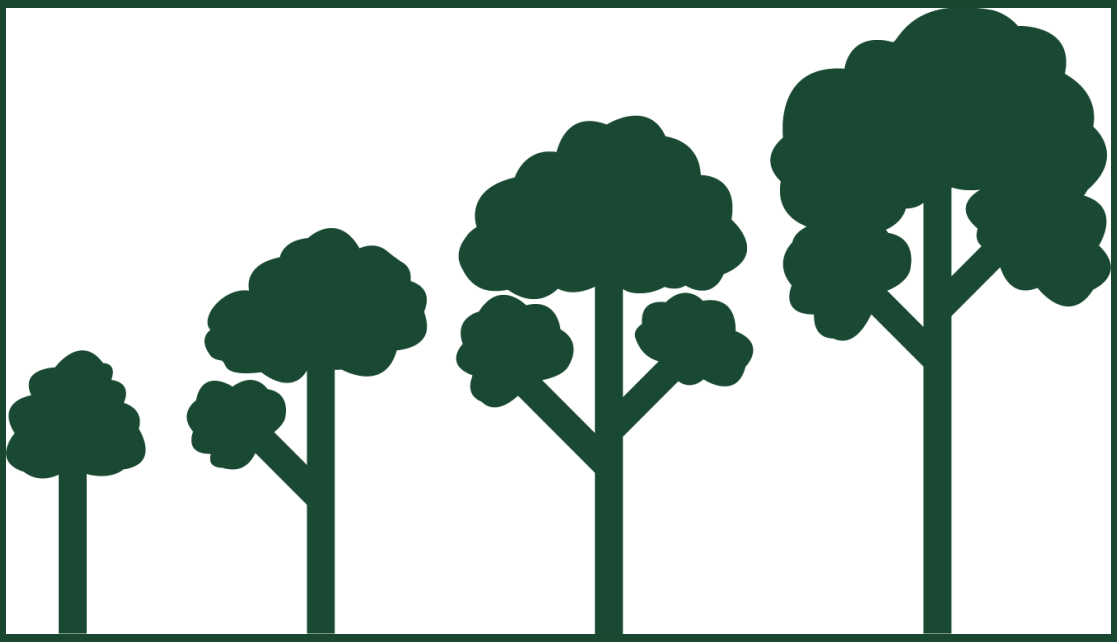
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APPENDIX D: ARBORICULTURAL IMPACT ASSESSMENT

Arboricultural Impact Assessment



Western Sydney University, Milperra Campus
NSW, 2214
2/-/DP1291984
Job No. 2400116
01/10/2024

PREPARED BY:

Temporal Tree Management Pty Ltd.

William Dunlop: Consulting Arborist
(M. UrbHort, Grad. Dip(Arb), B.Sc).

ISA Member: 290269

TRAQ Qualified

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PREPARED FOR:

Mirvac Homes (NSW) Pty Ltd.

Level 28, 200 George Street

Sydney, NSW, 2000

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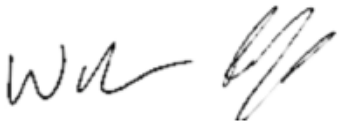
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DISCLAIMER and LIMITATIONS

This report has been prepared for *Mirvac Homes (NSW) Pty. Ltd.* This report has been prepared as a supporting document of the proposed development of the Western Sydney University Milperra campus at 2 Bullecourt Avene, Milperra. The purpose of this report is to assess the condition of 600 trees positioned inside and within 5 metres of the property boundaries of this site, and identify potential impacts the proposed development may have on those trees.

The author of this report is *Temporal Tree Management Pty Ltd.* This report is not designed for any other purpose. The author accepts no responsibility for the use of this report for purposes other than as an Arboricultural Impact Assessment or if used by any other person / party. The collection of tree data and the preparation of this report have been undertaken without prejudice.

All observations, recommendations and advice expressed within this report are based on *the Australian Standard for the Protection of Trees on Development Sites (AS 4970 2009),* the professional experience of the author, information gathered during the site assessments and information provided by the client. Trees are dynamically growing organisms that change over time. Recommendations provided in this report reflect the information within the supporting documentation and the condition of the assessed trees on the day of assessment. No guarantee is implied with respect to future tree condition or safety beyond the advice and recommendations within the report.



William Dunlop

Director of *Temporal Tree Management Pty Ltd.*

B. Sc (Adv.), Grad. Dip (Arb) (AQF Level 8), M. UrbHort.

1st October 2024

1. Executive Summary

The purpose of this report is to provide an Arboricultural Impact Assessment for the trees located inside and within 5 metres of the boundaries of the Western Sydney University Milperra Campus. Six hundred trees are included in this assessment. Twenty-four groups of closely positioned specimens of the same size and species.

An assessment of the trees within and adjacent to the subject site was undertaken by William Dunlop of *Temporal Tree Management Pty Ltd* on 4 and 5/06/2024. Re-assessment of these trees and an initial assessment of one-hundred and seventy-seven trees was undertaken on 25/09/2024. Tree location plans are provided in **Appendix G.** Tree data tables are provided in **Appendix I.** Tree retention values were determined using the Tree Retention Values Assessment Methodology (Morton 2011). Determination of development impacts and recommended tree protection measures are drawn from the *Australian Standard for the Protection of Trees on Development Sites* (AS4970 2009).

Tree Retention Values

Retention Values Determined for Six-hundred Assessed Trees			
Very Low	Low	Moderate	High
Trees 39, 121, 169, 333, 402 and 424	Trees 28, 80, 86-94, 96-100, 103, 104, 106, 107, 109, 110, 152, 157-159, 165, 166, 185, 218-227, 246, 247, 255, 259, 263, 273, 274, 277, 279, 287, 289, 293, 302-309, 311, 313-316, 327, 331, 332, 334-339, 341, 342, 389, 434-445, 447-449, 465, 473, 483-532, 536, 543-550, 552, 557-566, 573-575, 578, 584, 599 and 600	Trees 6, 11, 21-24, 26, 27, 31-34, 36, 37, 40, 41, 44, 45, 52, 55, 57-61, 79, 84, 95, 101, 102, 105, 111, 116-120, 128, 143, 144, 151, 160, 161, 163, 168, 176, 182, 186-188, 195, 206, 209, 213, 262, 265, 269, 271, 276, 284, 290, 291, 300, 310, 312, 325, 330, 344, 345, 348, 349, 352, 353, 356, 358-363, 367, 370-372, 374-384, 390, 391, 396, 415, 417-420, 446, 450, 451, 457, 459, 461, 462, 467, 468, 535, 537-542, 551, 553-556, 568, 569, 571, 581-583 and 585-598	Trees 1-5, 7-10, 12-20, 25, 29, 30, 35, 38, 42, 43, 46-51, 53, 54, 56, 62-78, 81-83, 85, 108, 112-115, 122-127, 129-142, 145-150, 153-156, 162, 164, 167, 170-175, 177-181, 183, 184, 189-194, 196-205, 207, 208, 210-212, 214-217, 228-245, 248-254, 256-258, 260, 261, 264, 266-268, 270, 272, 275, 278, 280-283, 285, 286, 288, 292, 294-299, 301, 317-324, 326, 328, 329, 340, 343, 346, 347, 350, 351, 354, 355, 357, 364-366, 368, 369, 373, 385, 388, 392-395, 397-401, 403-414, 416, 421-423, 425-433, 452-456, 458, 460, 463, 464, 466, 469, 470-472, 474-482, 533, 534, 567, 570, 572, 576, 577, 579 and 580

The retention value of the assessed trees was determined using the Tree Retention Values Assessment Methodology (Morton 2011). Two-hundred and eighty assessed trees were determined to be of High retention value. One-hundred and forty-four trees were determined to be of Moderate retention value. One-hundred and seventy trees were determined to be of Low retention value within the surrounding landscape while six trees were determined to be of Very Low retention value.

Impact of Proposed Development

Impact of TPZ Encroachments on One-hundred and Eighty-eight Assessed Trees				
N/A (0%)	Low (<10%)	Moderate (>10%<20%)	High (>20%<30%)	Severe (>30%)
Trees 1, 2, 4, 5-14, 21-24, 27, 32, 33, 39, 40, 41, 47, 49, 51, 57-76, 78, 79, 81-84, 156, 213, 239, 315-319, 335-348, 354, 364, 367, 404, 405, 406, 414, 428, 429, 431, 432, 478-482, 568-571 and 578-582	Trees 19, 26, 29, 31, 34, 45, 77, 143, 157, 207, 241, 353, 365 and 433	Trees 30, 37, 122-141, 145-148, 159, 211, 238, 241, 349, 355, 360, 361, 362, 363, 366, 411-413, 430 and 567	Trees 44, 46, 48, 50, 142, 158, 209, 210, 212, 237, 240, 309, 427 and 572	Trees 3, 20, 25, 35, 38, 42, 43, 56, 151, 152, 208, 320, 322, 356, 474, 475, 476, 477, 576 and 577

The stems of Four-hundred and twelve trees are within with the footprint of proposed bulk earthworks areas required for drainage, internal roads, footpaths and services. This includes eighteen street trees along the eastern verge of Ashford Avenue (Trees 583-600) are within the footprint of proposed excavation required for the installation of new underground electrical services.

Thirty-four trees will sustain TPZ encroachments of greater than 20%. The impact of the major encroachments sustained by Trees 3, 20, 56, 151, 152, 309, 320, 322, 356, 474, 475, 477 and 572 cannot be adequately mitigated. These thirteen trees will require removal under the proposed design plan. The twenty-one remaining trees with encroachments of greater than 20% along with forty-two trees that will sustain encroachments of less than 20% can be retained providing sensitive construction methods compliant with *Section 3.3.4 of AS4970 (2009)* are utilized.

Thirteen trees will sustain tolerable minor TPZ encroachments. One-hundred and three trees included in this assessment will not be directly impacted by the proposed works.

Tree Removal Schedule

Retention Values of Four-hundred and Seventeen Trees Proposed for Removal			
Very Low	Low	Moderate	High
Trees 121, 169, 333, 402 and 424	Trees 28, 80, 86-94, 96-100, 103, 104, 106, 107, 109, 110, 152, 165, 166, 185, 218-227, 246, 247, 255, 259, 263, 273, 274, 277, 279, 287, 289, 293, 302-309, 311, 313, 314, 327, 331, 332, 334, 389, 434-445, 447-449, 447-449, 464, 473, 486-532, 536, 543-550, 552, 557-566, 573-575 and 584	Trees 36, 52, 55, 95, 101, 102, 105, 111, 116-120, 151, 160, 161, 163, 168, 176, 182, 186-188, 195, 206, 262, 265, 269, 271, 276, 284, 290, 291, 300, 310, 312, 325, 330, 352, 356, 358, 370-372, 374-384, 390, 391, 396, 415, 417-420, 446, 450, 451, 457, 459, 461, 462, 467, 468, 535, 537-542, 551, 553-556, 583 and 585-596	Trees 3, 15-18, 20, 53, 54, 56, 85, 108, 112-115, 149, 150, 153-155, 162, 164, 167, 170-175, 177-181, 183, 184, 189-194, 196-205, 214-217, 228-236, 242-245, 248-254, 256-258, 260, 261, 264, 266-268, 270, 272, 278, 280-283, 285, 286, 288, 292, 294-299, 301, 320-324, 326, 328, 329, 350, 351, 357, 368, 369, 373, 385, 388, 392-395, 397-401, 403, 407-410, 416, 421-423, 425, 426, 452-456, 458, 460, 463, 464, 466, 469-472, 474, 475, 477, 533, 534 and 572

Four-hundred and seventeen trees / tree groups are proposed for removal. This includes the removal of one-hundred and sixty-two High retention value trees, ninety-eight trees of Moderate retention value, one-hundred and fifty-two Low retention value trees and five trees of Very Low retention value. Sixteen High Retention Value Trees (Trees 167, 256, 257, 258, 260, 261, 264, 266, 267, 268, 270, 272, 275, 466, 470 and 324) are positioned inside the subject site within areas of minimal proposed earthworks (maximum excavation or fill depth of 300mm). These sixteen trees are proposed for removal under the proposed design plans. If practicable, the proposed bulk earthworks plan should be amended to facilitate the retention and protection of these five trees

Trees 36, 80, 90, 91, 95, 100, 109, 161 246, 247, 255, 263, 273, 287, 332, 441, 442, 495, 502, 503, 504, 505, 506, 508, 531, 536, 537, 538, 539, 541, 543, 544, 547, 562, 563, 573, 574 and 575 are positioned within the subject site and were measured to be less than 5 metres in height. Trees 121, 169, 333, 402 and 424 have died and do not contain any observed hollows. Trees 117, 118, 119, 120, 121, 152, 206, 315, 316, 337, 338, 339, 341 and 370 are of species that are listed in *Chater 2.3.2.5 – Exemptions on all other land in the Canterbury Bankstown DCP (2023)* (Canterbury Bankstown Council 2024). These fifty-seven trees are not protected under *Chapter 2.3 of the City of Canterbury Bankstown DCP (2023).* These trees may therefore be removed without prior consent from the City of Canterbury Bankstown Council.

The remaining three-hundred and sixty trees proposed for removal are prescribed trees under *Chapter 3.2 of the City of Canterbury Bankstown DCP (2023).* Consent for the removal of these trees must be obtained as part of the Conditions of Consent for the proposed development.

One-hundred and eighty-three trees will sustain tolerable or negligible impacts under the proposed design plan (**Appendix I**). The retention of these trees as part of the development is supported providing the tree protection measures and sensitive construction methods outlined in Section 7.3 of this report are adhered to in accordance with *AS4970 (2009).*

2. Site Information

2.1. Site Location

The subject site for this Arboricultural Impact Assessment (AIA) is the Western Sydney University Milperra Campus at 2 Bullecourt Avenue, Milperra. This report is pursuant to all trees inside and within 5 metres of the property boundaries of this site (Appendix A). The area of the subject site is approximately 192 000 sq.m.

This report has relied upon the following plans and documents:

- *Functional Layout Plan,* prepared *by Beveridge and Williams,* Project No: 2301879, Drawing No: 910, Rev: P4, drawn: 23/09/24.
- *Bulk Earthworks Plan Overall,* prepared *by Beveridge and Williams,* Project No: 2301879, Drawing No: 500, Rev: P1, drawn: 23/09/2024.
- *Staging Plan,* as prepared *by Beveridge and Williams,* Project No: 2301879, Ref. 302, Drawing No. 010, Rev: G, drawn: 29/08/2024.
- *Addendum Arboricultural Impact Assessment* prepared by *Temporal Tree Management Pty Ltd.* (17/05/2024).
- *Preliminary Arboricultural Assessment* prepared by *Accurate Tree Assessment* (12/2023).

2.2. Relevant Policy Controls

The subject site is located within the City of Canterbury Bankstown local government area. All land inside the property boundaries of the Western Sydney University Milperra Council is within an SP2 Educational Establishment zone. Trees positioned outside the north-western boundary within the property of Milperra Reserve are within an RE1 Public Recreation zone. Trees positioned outside the

western boundary along the Ashford Avenue grassed verge are within an R2 Low-density Residential zone. Trees positioned outside the southern boundary adjacent to the South-western Motorway (M5) are within an SP2 Road and Infrastructure zone (**Appendix A**).

The environmental policy regulations relevant to the trees within and surrounding the subject site are drawn from *the NSW State Environmental Planning Policy (SEPP) (Biodiversity and Conservation) 2021.* Management of the trees within the subject site falls under the control of the City of Canterbury Bankstown. The policy controls governing the management of the trees within the City of Canterbury Bankstown are outlined in *Chapter 2 - Site Considerations, Part 3 - 'Tree Management' of the Canterbury Bankstown Development Control Plan (BDCP 2023).* This policy control supports the guidelines outlined in the *Canterbury Bankstown Local Environmental Plan (BLEP 2023).* These controls draw from *the Australian Standard for the Protection of Trees on Development Sites* (AS4970 2009) and *the Australian Standard for Pruning Amenity Trees* (AS4373 2007).

Patches of an identified Endangered Ecological community are positioned within the northern portion of the subject site (SEED 2024) (**Appendix A**). *Cumberland Plains Woodland* in the Sydney Basin Bioregion (as described in the final determination of the Scientific Committee to list the ecological community) is listed as an Endangered Ecological Community under *the Biodiversity Conservation Act 2016* and under *the Environment Protection and Biodiversity Conservation Act 1999* of the Commonwealth (NSW Dept. of Planning and Environment 2021). The EEC areas within the subject site are mapped as Biodiversity Values Mapped Area (**Appendix A**). The indigenous trees within and adjacent to the boundary of these identified patches of identified EEC areas were therefore determined to be of increased Landscape Significance.

The subject site is also bounded on the western and northern sides by the Ashford Avenue and Bullecourt Avenue Heritage Items (**Appendix A**). The contribution of the street trees included in this assessment to this heritage item was considered in determining their Landscape Significance.

2.3. Tree Locations and Diversity

As stipulated in the *Chapter 2.3 of the Canterbury Bankstown DCP (2023)*, woody vegetation was prescribed as a 'tree' if its height exceeded 5 metres (City of Canterbury Bankstown Council 2024). All trees within the Ashford Avenue grassed verge, regardless of size were included in this assessment

due to the position of the subject site within a Heritage Item or Biodiversity Values Mapped Area (City of Canterbury Bankstown Council 2024). All trees inside and within 5 metres of the property boundaries of the subject site were included in this assessment. Six hundred trees were included in this assessment (**Appendix G**) (**Appendix I**).

The ownership of the trees varied. Trees 21-27, 29-35, 37-51, 404-406 and 412-415 are positioned outside the eastern site boundary and are within the property of the adjacent school (Mount St Joseph, Milperra) (102/-/DP874035). Trees 1, 2, 4-14, 73, 84, 427-433 and 478-482 are positioned outside the north-eastern boundary of the site within a heavily vegetated conservation area. Trees 57-72, 74-79 and 81-83 are positioned outside north-eastern boundary surrounding the neighbouring childcare centre. Trees 156-159, 207, 212, 213 and 237-241 are positioned outside the north-western boundary within Milperra Reserve (3/-/DP91953). Trees 576-600 are street trees positioned outside the western boundary of the subject site along the Ashford Avenue grassed verge. These trees have been previously assessed in the *Addendum Arboricultural Impact Assessment* prepared by *Temporal Tree Management Pty Ltd.* (17/05/2024) (**Appendix J**). Trees 474, 476 and 567-572 are positioned outside the southern boundary within the vegetated corridor in between the subject site and the M5 (10/-/DP814579). These trees have been previously assessed in the *Preliminary Arboricultural Assessment* prepared by *Accurate Tree Assessment* (12/2023) (**Appendix K**). All other trees included in this assessment are positioned within the property boundaries of the subject site (2/-/DP1291984). The position of the trees within the proposed Staged areas of works is provided in Appendix I.

The species distribution of the assessed trees varied considerably (Table 4). Sixty-four species were observed in this assessment. Six indigenous species were observed during this assessment. The one-hundred and fifty-nine assessed trees / tree groups of these seven species are likely to be remnant or remnant progeny of the Cumberland Plains Woodland vegetation formation. Thirty-four native species that are non-indigenous to the subject site were observed. The three-hundred and forty-eight trees / tree groups of these thirty-four species are likely to be planted specimens or progeny of planted trees.

Twenty-four exotic species were observed. The ninety-four trees/tree groups from these nine species have been planted as ornamental trees within or adjacent to the subject site. Fourteen trees are of an identified noxious species (*Cinnamomum camphora* and *Triadica sebifera*) (NSW Department of Primary Industries 2023). These trees are likely to be planted specimens.

Table 4. Range of species and number of assessed trees within each.

Scientific Name	Common Name	Locally Indigenous	Native	Scheduled Weed	Number of Trees	*Scientific Name*	Common Name	Locally Indigenous	Native	Scheduled Weed	Number of Trees
Eucalyptus fibrosa	Broad-leaved Red Ironbark	Yes	Yes	No	8	***Fraxinus 'Raywood'***	Claret Ash	No	No	No	4
Eucalyptus tereticornis	Forest Red Gum	Yes	Yes	No	71	***Eucalyptus botryoides***	Southern Mahogany	No	Yes	No	1
Eucalyptus moluccana	Grey Box	Yes	Yes	No	40	***Lagerstroemia indica***	Crepe Myrtle	No	No	No	7
Angophora floribunda	Rough Barked Apple	Yes	Yes	No	18	***Waterhousea floribunda***	Weeping Lilly Pilly	No	Yes	No	3
Jacaranda mimosifolia	Jacaranda	No	No	No	2	***Melia azedarach***	White Cedar	No	No	No	1
Acacia salicina	Broughton Willow	No	Yes	No	5	***Prunus persica***	Peach	No	No	No	6
Eucalyptus spathulata	Gum	No	Yes	No	1	***Phoenix canariensis***	Canary Island Date Palm	No	No	No	1
Callistemon rugulosus	Scarlet Bottlebrush	No	Yes	No	5	***Flindersia australis***	Australian Teak	No	Yes	No	3
Callistemon viminalis	Weeping Bottle Brush	No	Yes	No	9	***Ulmus parvifolia***	Chinese Elm	No	No	No	2
Grevillea sp.	Grevillea	No	Yes	No	1	***Castanospermum australe***	Moreton Bay Chestnut	No	Yes	No	1
Eucalyptus saligna	Sydney Blue Gum	No	Yes	No	15	***Harpullia pendula***	Tulipwood	No	No	No	1
Acacia binervia	Coast Myall	No	Yes	No	1	***Eucalyptus nicholii***	Narrow-leaved Peppermint	No	Yes	No	1
Corymbia maculata	Spotted Gum	No	Yes	No	23	***Callistemon salignus***	Willow Bottle Brush	No	Yes	No	1
Corymbia citriodora	Lemon-scented Gum	No	Yes	No	68	***Eucalyptus alba***	White Gum	No	Yes	No	4
Eucalyptus crebra	Narrow-leaved Red Ironbark	Yes	Yes	No	21	***Corymbia eximia***	Yellow Bloodwood	No	Yes	No	1
Pyrus calleryana	Callery Pear	No	No	No	34	***Melaleuca decora***	White Feather Honeymyrtle	Yes	Yes	No	1
Corymbia ficifolia	Flowering Gum	No	Yes	No	1	***Yucca sp.***	Yucca	No	No	No	1
Eucalyptus microcorys	Tallow Wood	No	Yes	No	33	***Cupressus sempervirens***	Italian Cypress	No	No	No	1
Lophostemon confertus	Queensland Brush Box	No	Yes	No	3	***Ginkgo biloba***	Maiden Hair Tree	No	No	No	1
Cedrus deodara	Deodar Cedar	No	No	No	3	***Tibouchina granulosa***	Purple Glory Tree	No	No	No	1
Eucalyptus scoparia	Wallangarra Gum	No	Yes	No	6	***Thuja occidentalis***	Weeping Norway Spruce	No	No	No	1
Angophora costata	Smooth-barked Apple Myrtle	No	Yes	No	2	***Picea abies 'Pendula'***	Full Moon Maple	No	No	No	1
Stenocarpus sinuatus	Firewheel Tree	No	Yes	No	4	***Acer japonicum***	Japanese Maple	No	No	No	1
Cinnamomum camphora	Camphor Laurel	No	No	Yes	4	***Acacia implexa***	Lightwood	No	Yes	No	2
Melaleuca quinquenervia	Broad-leaved Paperbark	No	Yes	No	3	***Cupaniopsis anacardiodes***	Tuckeroo	No	Yes	No	1
Eucalyptus sideroxylon	Red Ironbark	No	Yes	No	10	***Prunus nigra***	Purple Cherry Plum	No	No	No	5
Eucalyptus racemosa	Narrow-leaved Scribbly Gum	No	Yes	No	3	***Viburnum tinus***	Vibernum	No	No	No	1
Syzygium australe	Brush Cherry	No	Yes	No	2	***Dracaena marginats***	Dracaena	No	No	No	1
Melaleuca linariifolia	Snow in Summer	No	Yes	No	1	***Casuarina glauca***	Grey She-oak	No	Yes	No	5
Triadica sebifera	Chinese Tallow Tree	No	No	No	10	***Gordonia axillaris***	Fried Egg Plant	No	No	No	2
Eucalyptus melliodora	Yellow Box	No	Yes	No	3	***Tristaniopsis laurina***	Water Gum	No	Yes	No	13
Eucalyptus robusta	Swamp Mahogany	No	Yes	No	2	***Acer negundo***	Box Elder	No	No	No	2

3. Site Development Plans

Proposed redevelopment of the Western Sydney University Milperra campus involves demolition of all buildings and ancillary structures for the construction of residential housing (Figure 1). Demolition works within the site have been approved under a separate Development Application (DA-1512/2023).

The proposed subdivision and residential construction work relevant to this report involve extensive bulk work excavation in preparation for the proposed housing, internal roads, footpaths and drainage pathways (Figure 2). A park is proposed to be built within the central and southern portion of the site and a commercial childcare / café is proposed to be completed within the north-eastern boundary.

The installation of new underground electrical services is proposed to be undertaken along the western boundary within the Ashford Avenue verge between Sinai Avenue and Flanders Avenue. The impact of these works on the Ashford Avenue street trees adjacent to the western boundary (Trees 576-600) is included in this assessment and is evaluated in detail in the Addendum Arboricultural Impact Assessment prepared by *Temporal Tree Management Pty Ltd.* (17/05/2024) (**Appendix J**).

The residential subdivision works are proposed to be undertaken in six stages (Figure 3). Stages 1 and 2 of the residential subdivision and construction works are proposed to be undertaken after completion of demolition works. Stages 3 and 4 are proposed to be undertaken together after completion of Stages 1 and 2. Stages 5 and 6 will be undertaken together as the final component of the development. The commercial childcare / café is proposed to be constructed in between Stages 2 and 3. The position of each assessed trees within the Staged areas is provided in **Appendix I.**

All vegetation within the footprint of the proposed residential subdivision area and drainage basins is proposed for clearing to facilitate the required bulk work excavation within these areas. See **Appendix A** for Site Maps and **Appendix G** for Detailed Tree Location Plans.



Figure 1. Proposed development plans. *Functional Layout Plan,* prepared *by Beveridge and Williams,* Project No: 2301879, Drawing No: 910, Rev: P4, drawn: 23/09/2024. Annotated by *Temporal Tree Management Pty Ltd.* (26/09/2024).

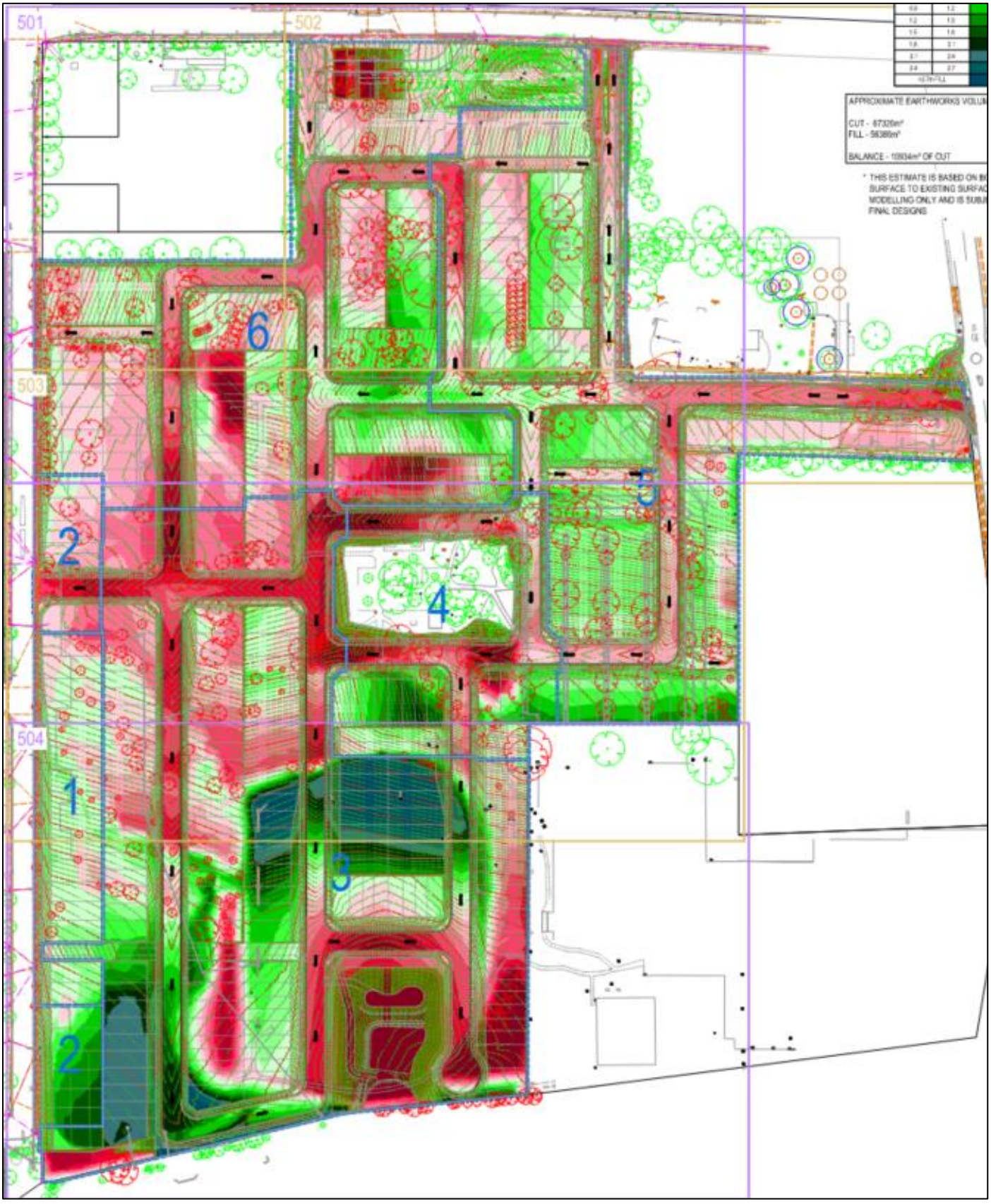
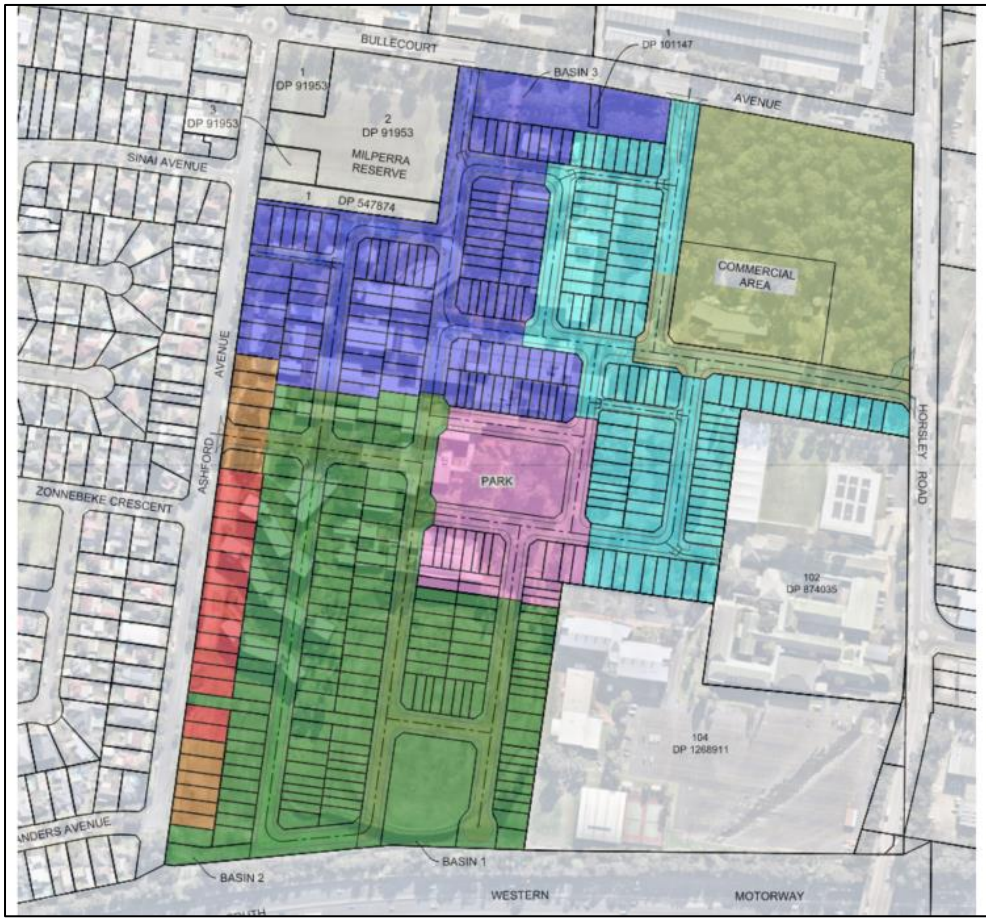


Figure 2. Proposed development plans. *Bulk Earthworks Plan Overall,* prepared *by Beveridge and Williams,* Project No: 2301879, Drawing No: 500, Rev: P1, drawn: 23/09/2024.



Stage No.	No. of Superlots Lots	No. of Residential Lots	No. of Public/Drainage Reserve Lots	Stage Area (m²)
Stage 1	0	16	0	6030
Stage 2	0	11	0	4690
Stage 3	10	135	2	61674
Stage 4	2	19	1	15108
Stage 5	9	96	0	35176
Stage 6	9	105	1	40385
Commercial	1	0	0	33340

Figure 3. Staging Plan, as prepared by *Beveridge and Williams*, Project No: 2301879, Ref. 302, Drawing No. 010, Rev: G, drawn: 29/08/2024.

4. Preliminary Assessment

4.1 Assessment Methodology

A ground-based visual assessment of the four-hundred and twenty trees within the Western Sydney University Milperra campus development area was undertaken by William Dunlop of *Temporal Tree Management Pty Ltd.* on 03 and 04/06/2024. Re-assessment of these trees and an initial assessment of one-hundred and seventy-seven trees was undertaken on 25/09/2024. Tree data tables are provided in **Appendix I.**

Ø Tree Number Schedule: Six hundred trees are included in this assessment. Twenty-four groups of closely positioned specimens of the same size and species were formed for closely positioned specimens of the same size and species that are suitable for collective management. Numbered tree tags were installed on assessed trees / tree groups when feasible. Tags were not installed on trees positioned outside the property boundaries of the subject site or in unreachable positions within the site.

Ø Genus and species Vegetation was identified and described using scientific names.

Ø Common Name: One common is provided.

Ø Maturity: **Juvenile, Semi – mature, Mature or Over Mature**. Judgement on these four categories was determined by professional knowledge and existing research on the species present.

Ø Position within Site: Surveyed position of tree within site relative to the *Staging Plan,* as prepared *by Beveridge and Williams,* Project No: 2301879, Ref. 302, Drawing No. 010, Rev: G, drawn: 29/08/2024 (Figure 3) (**Appendix A**).

Ø Height: Estimated in metres.

Ø Canopy Width: The diameter of each tree's canopy was estimated as an average in metres from two planes.

Ø Diameter at Breast Height (DBH): DBH was measured at 1.4 metres height and is described in centimetres. The DBH of the largest specimen in a group was applied to all trees in that group. DBH was estimated for Trees 21-27, 29-35, 37-51, 156-159, 207, 212, 213, 237-241, 404-406, 412-415, 427-433, 474, 476 and 567-572 due to their position outside the property boundaries of the subject site.

Ø Diameter at Root Flare (DRF): DRF was measured at the height of the trees' root flare and is described in centimetres. The DRF of the largest specimen in a group was applied to all trees in that group. DRF was estimated for Trees 21-27, 29-35, 37-51, 156-159, 207, 212, 213, 237-241, 404-406, 412-415, 427-433, 474, 476 and 567-572 due to their position outside the property boundaries of the subject site.

Ø Health: **Dead, Poor, Fair, Good or Excellent**. Professional experience along with the visual vitality index established by Johnston et al. (2012) was used to underpin this category **(Appendix B).**

Ø Structure: **Failed, Very Poor, Poor, Fair, Good or Excellent**. Professional experience along with Visual Tree Assessment methodology established by Mattheck and Breloar (1994) was used to underpin this category.

Ø Habitat Observed: **Stick Nest, Dray, Hollow or Possible Hollow**. Observation of potential bird or arboreal mammal habitat within the assessed trees was noted as part of the Visual Tree Assessment methodology.

Ø Useful Life Expectancy (ULE): This estimate provides an important estimate of a tree's remaining safe life span within a landscape (Barrell 1996). Estimates are based on species knowledge and an individual's structure, health and position within the landscape. ULE estimate categories used were: **Long** (>40 years), **Medium** (between 15 and 40 years), **Short** (between 5 and 15 years), **Negligible** (Less than 5 years) or **Dead** (less than 12 months). A framework for the ULE determination methodology is provided in **Appendix E** (Barrell 1996).

Ø Landscape Value: **Significant** (1), **Very High** (2), **High** (3), **Moderate** (4), **Low** (5), **Very Low** (6), **Insignificant** (7). These categories account for each tree's size, ecological significance as a food or habitat resource, structural integrity, visual prominence within the landscape and any additional

heritage or protection controls that may be relevant to it. A framework for the Landscape Significance determination methodology is provided in **Appendix D** (Morton 2011).

Ø Retention Value: **High, Moderate, Low and Very Low**. ULE and Landscape Significance categories were used for each tree to determine their retention value (Figure 3). The retention and protection of trees determined to be of **High** retention value should be prioritised for any

proposed development within the subject site. Trees determined to be of **Moderate** retention value should be retained and protected if feasible. The retention of trees determined to be of **Low** retention value should not obstruct any proposed development within the subject site. Tree determined to be of **Very Low** retention value should be removed as part of any development within the site. A framework for the Retention Value priorities is provided in **Appendix C** (Morton 2011).

	Landscape Significance Reading						
Tree Sustainability	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Greater than 40 years	**High Retention Value**						
15 to 40 years			**Moderate**				
5 to 15 years				**Low**			
Less than 5 years					**Very Low Retention Value**		
Dead or hazardous							

Figure 4. Tree retention values assessment methodology. Matrix modified by A. Morton (2011) Tree Retention Values Table Footprint Green Pty Ltd, Sydney Australian. Accessed from the Newcastle Urban Forest Technical Manual (2018). A framework for the Retention Value priorities is provided in **Appendix C** (Morton 2011).

Ø Tree Protection Zone Radius (R_{TPZ}): A Tree Protection Zone is a circular area surrounding a tree that provides the principal means of protecting trees on development sites. Tree Protection Zones aim to prevent soil compaction, contamination and physical damage to trees above and below ground through the exclusion of all development activity from within the specified radius (Matheny and Clark 1994). A Tree Protection Zone (TPZ) radius (R_{TPZ}) may be calculated using the equation from the Australian Standard for the Protection of Trees on Development Sites (AS 4970 2009):

$$\mathbf{R_{(TPZ)} = DBH \times 12.}$$

As per *Section 3.2 of AS4970 (2009),* a minimum R_{TPZ} measure of 2 metres and maximum measure of 15 metres were calculated for this assessment.

Ø Structural Root Zone Radius (R_{SRZ}): This measure provides an indication of the portion of a tree's root plate that is considered fundamentally important for the maintenance of basal anchorage. The volume of root plate estimated within an SRZ is not related to the physiological viability of a tree

(Mattheck and Breloer 1994). It is important to note that SRZ area is not an absolute figure. Rather, it is an estimate based on a line of best fit drawn from research relating to observation of tree failures within forested areas. The SRZ area must therefore be viewed as an approximation that may be smaller or greater in size depending on site conditions and the vitality of individual assessed trees.

No SRZ radius was calculated for assessed palm specimens as per *AS470 (2009).* An SRZ radius (R_{SRZ}) may be calculated using the equation from the *Australian Standard for the Protection of Trees on Development Sites* (AS 4970 2009):

$$R_{(SRZ)} = (DRF \times 50)^{0.42 \times} 0.64$$

The tree protection zone radius (R_{TPZs}) and structural root zone radius (R_{SRZs}) were calculated as *per Section 3 of AS4970 (2009)* (Figure 4).

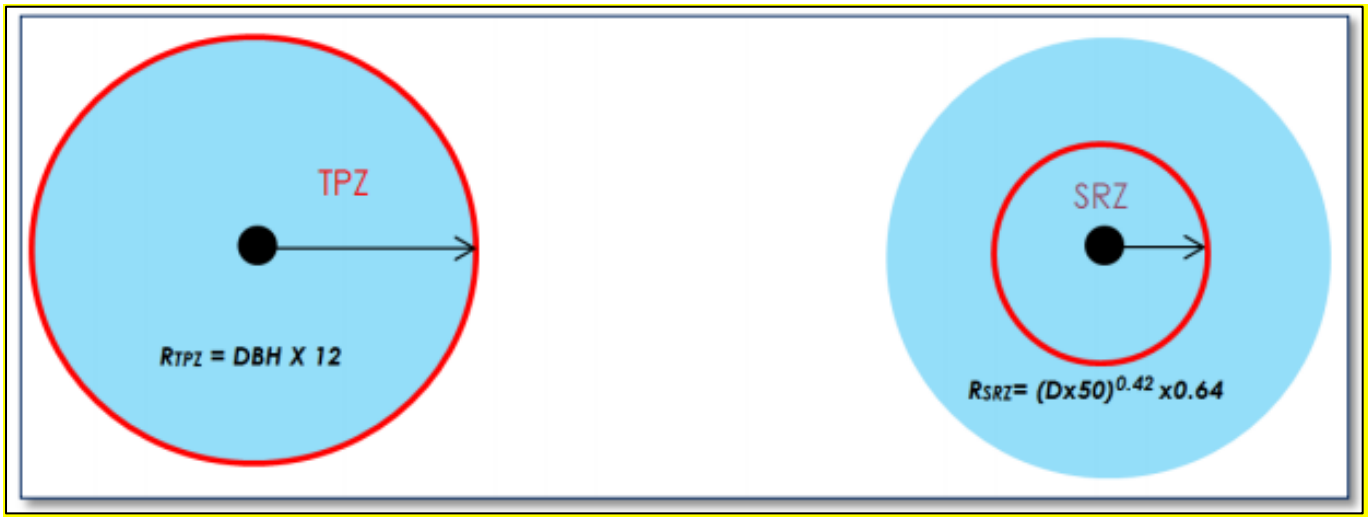


Figure 5. TPZ and SRZ radial measurement equations.

5. Tree Data Summary

Two-hundred and eighty trees were determined to be of High Retention Value within the surrounding landscape (**Table 1**). The indigenous species significance and larger size underpinned the Very High Landscape Value determined for the majority of the High Retention value trees. The large size, good condition and native species value underpinned the High Landscape Significance determined for the remaining High retention value trees.

The increased proportion of the two-hundred and eighty High retention value assessed trees reflects the density of indigenous vegetation within the site. The position of these indigenous trees within identified Cumberland Plains Woodland renders them of High or Very High landscape significance. Larger indigenous trees are positioned throughout the northern portion of the site. However, they are concentrated within the heavily forested area within and adjacent to the north-eastern site boundary (**Appendix I**).

One-hundred and forty-four trees were determined to be of Moderate retention value (Table 1). A reduction in landscape significance was determined for the majority of these trees due to the smaller size of the indigenous or native specimens or the reduced species significance of planted native or exotic specimens. Shortened ULE estimates for the majority of these trees were underpinned by observations of poor health or structural defects. These factors reduced retention rating determined for these trees.

One-hundred and seventy trees were determined to be of Low retention value within the surrounding landscape. The Low landscape significance determined for the majority of these trees was underpinned by their small size and / or reduced species value. A short or negligible ULE estimate determined for some Low retention value trees was also underpinned by signs of severe dieback and or observation of major structural defects. Six trees have died were determined to be on Very Low retention value (Table 1). The retention of the one-hundred and seventy Low retention value trees and six Very Low retention value trees should not obstruct or require alteration of the development.

6. Impact of Development

6.1. TPZ Encroachments

A TPZ encroachment is the proportional area of a tree's TPZ that will be absorbed, disturbed or exposed as part of a development. As defined in *Sections 3.3.2 and 3.3.3 of AS4970 (2009),* minor TPZ encroachments are less than 10% of a trees' TPZ area while major TPZ encroachments exceed 10%.

Minor encroachments of less than 10% of the total TPZ area may occur without the site presence of the Project Arborist providing there is an equal compensation of protected area elsewhere adjacent to the TPZ. The potential impact on the viability of tree with a TPZ encroachment that is less than 10% is defined as Low in this assessment.

Major encroachments of more than 10% of the total TPZ area may occur if it can be demonstrated that the impact of the encroachment is mitigated or won't impact the viability of the affected tree. The impact of a major TPZ encroachment that is between 10-20% is defined as Moderate in this assessment and is generally considered to be acceptable providing the tree's condition is shown to be Good/Fair, it can be shown that the affected tree will remain viable. The impact on the viability of tree with a major TPZ encroachment that is between 20-30% is defined as High in this assessment. The impact of a major encroachment within this range may compromise the viability of an impacted tree. Retention under a High impact major TPZ encroachment must demonstrate mitigation of impact from existing infrastructure and / or demonstrate it by through a Root Mapping Assessment to show that the affected tree will remain viable. Modification of the design plan may be required to mitigate the impact of the encroaching structure. There must also be an equal compensation of protected area elsewhere adjacent to the TPZ.

Major encroachments of greater than 30%, or any encroachment that breaches a tree's SRZ, are likely to impact a tree's health and the structural integrity of their root plate. Retention under such encroachments is unacceptable unless that trees viability can be shown through a Root Mapping Assessment and significant mitigation of the impact. The impact on the viability of tree with a major TPZ encroachment that is between greater than 30% is defined as Severe in this assessment. Instances where a tree's stem is positioned within the footprint of a proposed structure is in this assessment determined to be a 100% TPZ encroachment that will have a Severe impact.

6.2. Site Specific Encroachments

TPZ encroachments were calculated for all assessed trees. Four-hundred and eight trees positioned within the footprint of proposed earthworks areas will sustain a Total (100%) TPZ encroachment and are not included in Table 3. The encroachments sustained by all trees positioned outside the proposed bulk-earthworks areas are included in Table 3.

Table 3. TPZ encroachments associated with the proposed development calculated for one-hundred and eighty-eight assessed trees positioned outside or adjacent to the proposed bulk earthworks areas. TPZ Encroachment data for seventy-nine trees that will sustain Low, Moderate, High or Severe impact encroachments is included in **Appendix F.** TPZ encroachments are shown in the detailed Tree Plans provided in **Appendix G.**

Impact of TPZ Encroachments on One-hundred and Eighty-eight Assessed Trees				
N/A (0%)	Low (<10%)	Moderate (>10%<20%)	High (>20%<30%)	Severe (>30%)
Trees 1, 2, 4, 5-14, 21-24, 27, 32, 33, 39, 40, 41, 47, 49, 51, 57-76, 78, 79, 81-84, 156, 213, 239, 315-319, 335-348, 354, 364, 367, 404, 405, 406, 414, 428, 429, 431, 432, 478-482, 568-571 and 578-582	Trees 19, 26, 29, 31, 34, 45, 77, 143, 157, 207, 241, 353, 365 and 433	Trees 30, 37, 122-141, 145-148, 159, 211, 238, 241, 349, 355, 360, 361, 362, 363, 366, 411-413, 430 and 567	Trees 44, 46, 48, 50, 142, 158, 209, 210, 212, 237, 240, 309, 427 and 572	Trees 3, 20, 25, 35, 38, 42, 43, 56, 151, 152, 208, 320, 322, 356, 474, 475, 476, 477, 576 and 577

Four-hundred and eight trees will sustain Total TPZ encroachments. The stems of three-hundred and ninety-four trees within the subject site are within the footprint of the bulk-work excavation required for the proposed development. The stems of fourteen street trees along the eastern verge of Ashford Avenue (Trees 583-596) are within the footprint of proposed excavation required for the installation of new underground electrical services (**Appendix G** and **Appendix J**).

Sixteen High Retention Value Trees (Trees 167, 256, 257, 258, 260, 261, 264, 266, 267, 268, 270, 272, 275, 466, 470 and 324) are positioned inside the subject site within areas of minimal proposed earthworks (maximum excavation or fill depth of 300mm). These tree trees are proposed for removal under the proposed design plans. If practicable, the proposed bulk earthworks plan should be amended to facilitate the retention and protection of these five trees (**Appendix G**).

Seventy-six trees positioned outside the proposed development footprint will sustain major encroachments within their TPZs. Twenty trees will sustain major TPZ encroachments that may Severely impact on their viability while fourteen trees will sustain major encroachments that may have a High impact as part of the proposed development works within the subject site (Table 3).

Thirty-four trees will sustain major encroachments of greater than 20% of their TPZ area that may have a High or Severe impact on their viability.

The impact of the major encroachments sustained by Trees 3, 20, 56, 151, 152, 309, 320, 322, 356, 474, 475, 477 and 572 cannot be adequately mitigated. These thirteen trees will require removal under the proposed design plan.

The retention of Trees 35, 42, 142, 158, 208, 209, 210, 211, 212, 237, 238, 241, 576 and 577 may be feasible providing sensitive excavation methods are utilized. Sensitive excavation using a hydro-vac should be undertaken under the supervision of the Project Arborist along the nearest edge of the proposed encroaching feature to accurately determine the viability of these twelve trees.

The impact of the encroachments sustained by Trees 25, 38, 43, 44, 46, 48, 50 427 and 476 will be suitably mitigated by existing impervious landscape features or the reduced depth of proposed excavation or fill. These nine trees are therefore also suitable for retention and protection.

Trees 30, 37, 122-141, 145-148, 159, 211, 349, 355, 360, 361, 362, 363, 366, 411-413, 430 and 567will sustain major encroachments of less than 20% that are unlikely to negatively impact their viability due to observation of Good/Fair health and suitable compensation area adjacent to the unaffected portions of their TPZs. These forty Moderate impact encroachments are therefore considered acceptable without further investigation or design modification.

Trees 19, 26, 29, 31, 34, 45, 77, 143, 157, 207, 241, 353, 365 and 433 will sustain minor TPZ encroachments that are likely to have a Low impact on their viability. The minor encroachments sustained by these thirteen trees are considered to be acceptable.

One-hundred and three assessed trees are positioned outside the proposed development footprint and will not be directly impacted (Table 3) (**Appendix F**).

7. Tree Protection / Removal Plan

7.1. Tree Removal Schedule

Table 4. Tree removal / retention schedule for the proposed development of the Western Sydney University Milperra Campus development. Tree Data Tables are provided in **Appendix I.**

Retention Values of Four-hundred and Seventeen Trees Proposed for Removal			
Very Low	Low	Moderate	High
Trees 121, 169, 333, 402 and 424	Trees 28, 80, 86-94, 96-100, 103, 104, 106, 107, 109, 110, 152, 165, 166, 185, 218-227, 246, 247, 255, 259, 263, 273, 274, 277, 279, 287, 289, 293, 302-309, 311, 313, 314, 327, 331, 332, 334, 389, 434-445, 447-449, 447-449, 464, 473, 486-532, 536, 543-550, 552, 557-566, 573-575 and 584	Trees 36, 52, 55, 95, 101, 102, 105, 111, 116-120, 151, 160, 161, 163, 168, 176, 182, 186-188, 195, 206, 262, 265, 269, 271, 276, 284, 290, 291, 300, 310, 312, 325, 330, 352, 356, 358, 370-372, 374-384, 390, 391, 396, 415, 417-420, 446, 450, 451, 457, 459, 461, 462, 467, 468, 535, 537-542, 551, 553-556, 583 and 585-596	Trees 3, 15-18, 20, 53, 54, 56, 85, 108, 112-115, 149, 150, 153-155, 162, 164, 167, 170-175, 177-181, 183, 184, 189-194, 196-205, 214-217, 228-236, 242-245, 248-254, 256-258, 260, 261, 264, 266-268, 270, 272, 278, 280-283, 285, 286, 288, 292, 294-299, 301, 320-324, 326, 328, 329, 350, 351, 357, 368, 369, 373, 385, 388, 392-395, 397-401, 403, 407-410, 416, 421-423, 425, 426, 452-456, 458, 460, 463, 464, 466, 469-472, 474, 475, 477, 533, 534 and 572

Four-hundred and sventeen trees will require removal to facilitate the proposed development. These trees are within the footprint of the proposed bulk earthworks area or will sustain unacceptable major encroachments during these earthworks that are likely to compromise their viability. These Four-hundred and twenty-one trees cannot be retained under the proposed design plans.

Of the three-hundred and four trees proposed for removal, one-hundred and sixty-two were determined to be of High retention value within the surrounding landscape, ninety-eight were determined to be of Moderate retention value, one-hundred and fifty-two were determined to be of Low retention value and five were determined to be of Very Low retention value (Table 4).

Trees 36, 80, 90, 91, 95, 100, 109, 161 246, 247, 255, 263, 273, 287, 332, 441, 442, 495, 502, 503, 504, 505, 506, 508, 531, 536, 537, 538, 539, 541, 543, 544, 547, 562, 563, 573, 574 and 575 are positioned within the subject site and were measured to be less than 5 metres in height. Trees 121, 169, 333, 402 and 424 have died and do not contain any observed hollows. Trees 117, 118, 119, 120, 121, 152, 206, 315, 316, 337, 338, 339, 341 and 370 are of species that are listed in *Chater 2.3.2.5 – Exemptions on all other land in the Canterbury Bankstown DCP (2023)* (Canterbury Bankstown Council 2024). These

fifty-seven trees are not protected under *Chapter 2.3 of the City of Canterbury Bankstown DCP (2023).* These trees may therefore be removed without prior consent from the City of Canterbury Bankstown Council.

The remaining three-hundred and sixty trees proposed for removal are prescribed trees under *Chapter 3.2 of the City of Canterbury Bankstown DCP (2023).* Consent for the removal of these trees must be obtained as part of the Conditions of Consent for the proposed development.

If approved, proposed tree removal works should be undertaken by a suitably qualified arborist (minimum AQF Level 3) and must be in compliance with the *Work Safe Guide to Managing Risks of Tree Trimming and Removal Work (2016).*

Six trees proposed for removal were observed to contain hollows within their stem and / or canopy (Trees 178, 229, 276, 279, 371 and 421). In addition, Trees 169 and 402 are larger dead trees that may contain small canopy hollows or habitat within their upper canopies. A clearing inspection for potential must be undertaken for these eight trees with observed hollows and potential habiat no more than 7 days prior to the commencement of removal works. All potential habitat must be visually inspected by a suitably qualified ecologist. Any unidentified tree hollows or potential arboreal habitat identified by the Project Ecologist must be inspected and blocked at this time.

No obvious signs of hollow presence were observed in the remaining trees. However, there may be unseen hollows within the canopies of other trees that were not identified due to the inherent limitations associated with ground-based visual assessments. Tree removal or pruning works must be halted, and an ecologist notified, if any arboreal fauna, active hollows or active nests are encountered. An ecologist and the Project Arborist must be engaged to provide guidance in such cases.

7.2. Tree Protection Measures

Fenced protection zones must be established where possible to delineate construction activities from the TPZs and SRZs of retained trees. Fenced protection zones must be enclosed by 1.8 metre steel fencing that is securely fixed to the ground as stated in *Section 4.3 of AS4970 (2009)* (Figure 6). Shade cloth must be securely fastened to the steel fencing to reduce transport of dust and debris into tree protection areas. Plywood may be used as an alternative if steel fencing cannot be suitably installed. Signage stating the purpose of these exclusion zones should be fixed to the fencing so that it is visible

from all points within the site. Coarse-grained wood-chip mulch may be required within a fenced protection zone if specified. Bracing is permissible within the fenced protection zone providing supports avoid any damage to surface roots (Figure 6).

As per *Section 4.2 of AS4970 (2009),* the following activities are not permitted inside delineated protection zones:

(a) Machine excavation including trenching;
(b) Excavation for silt fencing;
(c) cultivation;
(d) storage;
(e) preparation of chemicals, including preparation of cement products;
(f) parking of vehicles and plant;
(g) refuelling;
(h) dumping of waste;
(i) wash down and cleaning of equipment;
(j) placement of fill
(k) lighting of fires;
(l) soil level changes;
(m) temporary or permanent installation of utilities and signs, and
(n) physical damage to the tree."

Once installed, fenced tree protection zones must remain undisturbed for the duration of proposed development works. No services either temporary or permanent are to be located within a specified fenced protection zone. If services are to be located within a Tree Protection Zone, special details will need to be provided by the Project Arborist for the protection of the tree regarding the location of the services.

Temporary access within a fenced protection zone may only occur under the supervision of the Project Arborist. The installation of ground protection measures compliant with *Section 4.5.3 of AS4970 (2009*) is required if any vehicles or machinery is required to temporarily access a specified fenced protection zone. In such cases, a geotextile membrane must be installed over the specified ground protection area. Coarse-grained wood-chip mulch must be installed to a depth of no less than 70mm and no more than 100 mm over the geotextile membrane. Timber rumble boards or heavy

vehicle protection plates/mats must then be installed over the mulch (Figure 7). Ground protection measures must remain in place for the entire duration of required vehicle or machinery access within a fenced protection zone. Protection fencing must be reinstalled to its original shape immediately after the completion of required works within the fenced protection zone.



Figure 7. Protection fencing should be erected around the specified perimeter of TPZs in accordance with Section 4.3 of *AS4970 (2009).* Figure 11 a. depicts correctly installed steel or plywood fence panelling (1 and 2) with mulch inside the protection area (3). Figure 11 b. shows depicts protection fencing signage.

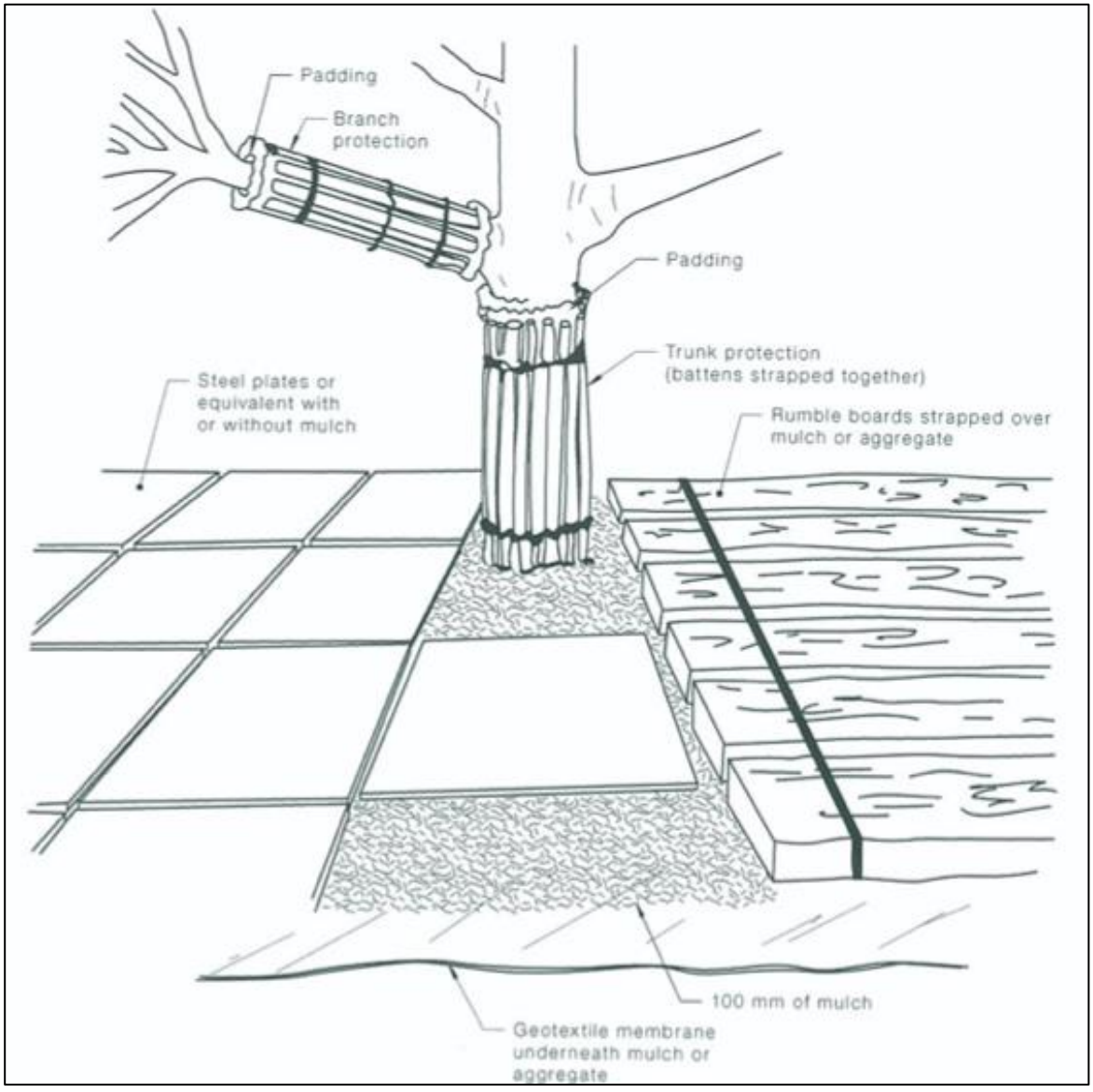


Figure 7. Ground protection measures specified in Section 4.5.3 of *AS4970 (2009)* for temporary access within a fenced protection zone. Steel plates or rumble boards are shown to be suitable for ground protection over mulch and geotextile fabric.

7.3. Site Specific Tree Protection Measures

One-hundred and eighty-three trees will sustain tolerable or negligible impacts under the proposed design plan (**Appendix I**). The retention of these trees as part of the development is supported providing the following design amendments, further investigation and protection measures are in implemented:

7.3.1. Prior to Commencement of Practical Works

- A Project Arborist must be appointed for the duration of this development to ensure compliance with the requirements outlined in Section 7 of this report.
- The proposed Bulk Earthworks and proposed Layout Plans must be reviewed to determine the suitability of retention of Trees 167, 256, 257, 258, 260, 261, 264, 266, 267, 268, 270, 272, 275, 466, 470 and 324.
- A fenced protection zones compliant in design with *Section 4.3 of AS4970 (2009)* must be installed around all retained trees.
- Site boundary fencing will provide suitable protection for all trees positioned outside the subject site (Trees 1, 2, 4-14, 22-27, 29-35, 37-51, 57-79, 81-84, 212, 213, 237-241, 404-406, 411-414, 427-433, 478-482, 567-571 and 576-582. No additional protection measures are required for these trees.
- Fenced protection zones compliant in design with Section 4.3 of AS4970 (2009) must be installed to ensure the trees within the subject site are suitably protected. Fenced protection zones must extend to the R_{TPZ} boundary of the adjacent retained tree where feasible. Fencing must be established no more than 0.3 metres from the nearest edge of proposed bulk earthworks in all other cases.
- Tree Protection Zone signage compliant with the specifications outlined in *Section 4.4 of AS4970 (2009*) must be installed on all specified fenced protection zones and be adequately visitable from all surrounding portions of the site.
- Coarse-grained wood-chip mulch must be applied to a depth of 50-70mm within all fenced tree protection areas that are within the boundaries of the subject site.
- The impact of the proposed footpaths within the R_{TPZs} of Trees 35, 42, 142, 158, 208, 209, 210, 211, 212, 237, 238, 241, 576 and 577 must be accurately determined prior to the commencement of practical works.
- Non-destructive excavation to a depth of 600mm must be undertaken under the supervision of the Project Arborist along the nearest edge of proposed earthworks within the TPZs of these trees. Non-destructive excavation must be undertaken in accordance with *Section 3.3.4(a) of*

AS4970 (2009). Determination of the suitability of root pruning must be determined by the Project Arborist during this assessment.

7.3.2. During Construction Works

- No access is permitted within the specified fenced protection zones. Any required access within the fenced protection zone must be approved by the Project Arborist prior to entry.
- Ground protection measures compliant with *Section 4.5.3 of AS4970 (2009)* must be installed prior to any approved access within a fenced protection zone.
- Plant equipment is to be kept away from the crown of each tree. No work is to be conducted within the R_{TPZ} of each tree. Where required, work is to be conducted from outside of the TPZ, by reaching into the fenced protection zones to minimise soil disturbance and compaction and avoid any branch and trunk damage.
- There must be no other access within the specified fenced tree protection zones. The Project Arborist must be notified and must provide certification if any access is required during the construction process.
- There must be no unapproved major root (diameter of 40mm or greater) damage or disturbance during the required excavation within the R_{TPZs} of retained trees.
- Major root pruning of retained trees is only considered to be suitable if approved by the Project Arborist and / or Consent Authority and design amendments are not possible. All major root cutting must be undertaken by the Project Arborist using a handsaw in compliance with Section 4.5.2 of *AS4970 (2009)* and *AS4373 (2007)* (p. 18). Documentation of all major root cutting and an ongoing monitoring schedule for all affected trees must be provided by the Project Arborist as part of the final arboricultural checklist.
- Utility services should not be located within the Tree Protection Zone of retained trees wherever possible. Any utility services are to be located underground within the TPZ are to be undertaken utilising excavation techniques that prevent or minimise damage to major roots. Such works should be conducted with non-motorised hand tools or with an air knife or water knife and vacuum truck or with directional drilling with minimum depth to top of bore of 600 mm, to prevent soil compaction and root damage and works are to be monitored and certified by the Project Arborist.

7.3.1. Post Construction - Landscaping

- It is recommended that the design of the proposed footpaths within the R_{TPZs} of Trees 208, 209, 210, 211, 212, 240, 364 and 365 is amended if excavation will require unacceptable major root pruning. Amended footpath design should be constructed above grade on a 100 mm bed of gap graded fill as 15-25 mm gravel with no fines, placed on a double layer of Geotextile fabric at grade and contained on both sides with a timber plinth edge, back filled and tapered off with topsoil towards the kerb and gutter and similarly on the side of the path towards the property boundary. Where space is insufficient the path will need to be narrowed past each tree to ensure the 300 mm setback from the trunk is maintained for future growth. This methodology construction is to be approved by the Project Engineer or Council Engineer.
- Where required, excavation for planting within a retained Tree's R_{TPZ} is to be undertaken manually, to prevent damage to structural roots. Existing soil grades should be maintained with plant container size restricted to a maximum size of 5 litres. No more than 2 plants per square metre for 5 litre pots and 5 plants per square metre for 150 mm pot size. Remedial pruning to crown of tree/s as required to be conducted per AS4373 (2007), to be determined by the Project Arborist.
- The installation of boundary fencing must be undertaken using hand tools only. Fences must be installed with excavated holes to a maximum depth of 600 mm for posts. Boundary fencing must have the flexibility of design to move a post or pier to be 100 mm clear of any structural root (a root greater than >40 mm diameter) to protect such roots and provide sufficient space for future growth without conflict between the 2 structures. Any posts to be relocated must be approved and certified by a structural engineer or architect.
- A Level 3 – Advanced Assessment must be undertaken prior to practical completion for Trees 344, 345 and 353 to accurately determine the level of risk they pose within the landscape. Risk mitigation works may be required for these three large trees to facilitate their retention within the proposed central park.

7.4. Certifications

To ensure the proposed development meets the objectives of the Tree Removal/Protection Plan, monitoring and certification process will be undertaken at the following hold points in line with *AS4970 (2009).*

· Installation Tree Protection Measures – Inspection and certification by the Project Arborist of fenced protection zones as specified in Section 7.3 of this report. This hold point must be complete prior to the commencement of any tree removal or excavation works.

· Tree Removal – If approved, Inspection and certification by the Project Arborist of the removal of four-hundred and twenty-one trees as specified in Section 7.1 and **Appendix I** of this report. Evidence of completion of the hollow clearing inspection must be presented to the Project Arborist prior to commencement of tree removal works. This hold point must be complete prior to the commencement of any excavation works.

· Non-destructive Excavation– Written certification by the Project Arborist of required non-destructive excavation recommended for proposed works within the R_{TPZs} of Trees 35, 42, 142, 158, 208, 209, 210, 211, 212, 237, 238, 241, 576 and 577 and the proposed road within. Any major roots encountered must be inspected, photographed and reported by the Project Arborist. This hold point must be carried out prior to the commencement of bulk earthworks.

· Certification of Required Root Pruning– Certification by the Project Arborist of any major roots encountered during excavation work that require pruning. Any major roots that require pruning must be severed by the Project Arborist using a hand saw as specified in *AS4373 (2007) (*p. 18). This hold point must be carried at any stage during the development as required.

· Supervision and Certification of Entry into Fenced Protection Zones – Inspection and certification by the Project Arborist of required ground protection measures prior to approved access within designated fenced protection zones. This hold point must be carried out prior to the commencement practical works required within established fenced protection zones. Any

additional entry within a specified fenced protection zone must be certified by the Project Arborist prior to commencement of practical works.

· Monitoring of Retained Trees– Regular inspection and certification by the Project Arborist of tree protection measures and condition of retained trees. Any required maintenance of the tree protection measures or retained trees must be undertaken by the Project Arborist at this time.

· Final Project Arborist Inspection– Final inspection by Project Arborist and certification of compliance with the Tree Protection Plan as specified in Section 7.3 of this report. All specified protection measures outlined in Section 7.3 must remain in place until this final inspection.

References:

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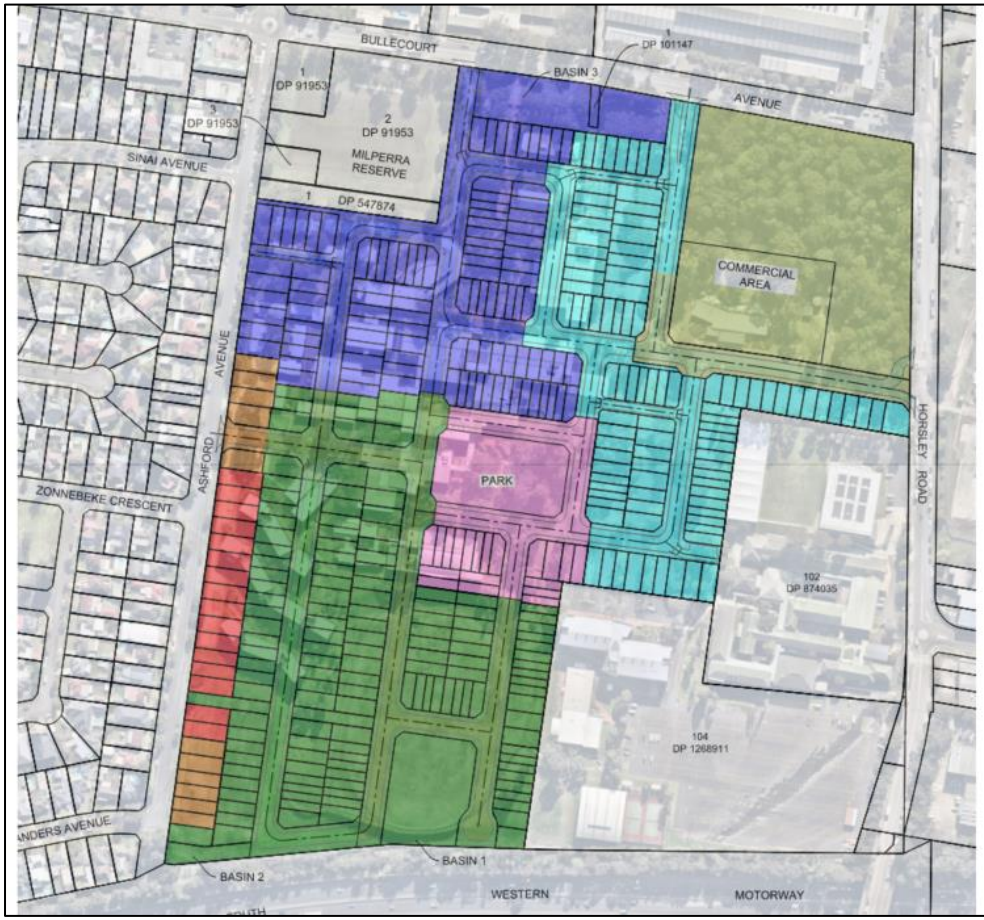
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Appendix A: Detailed Tree Location Maps

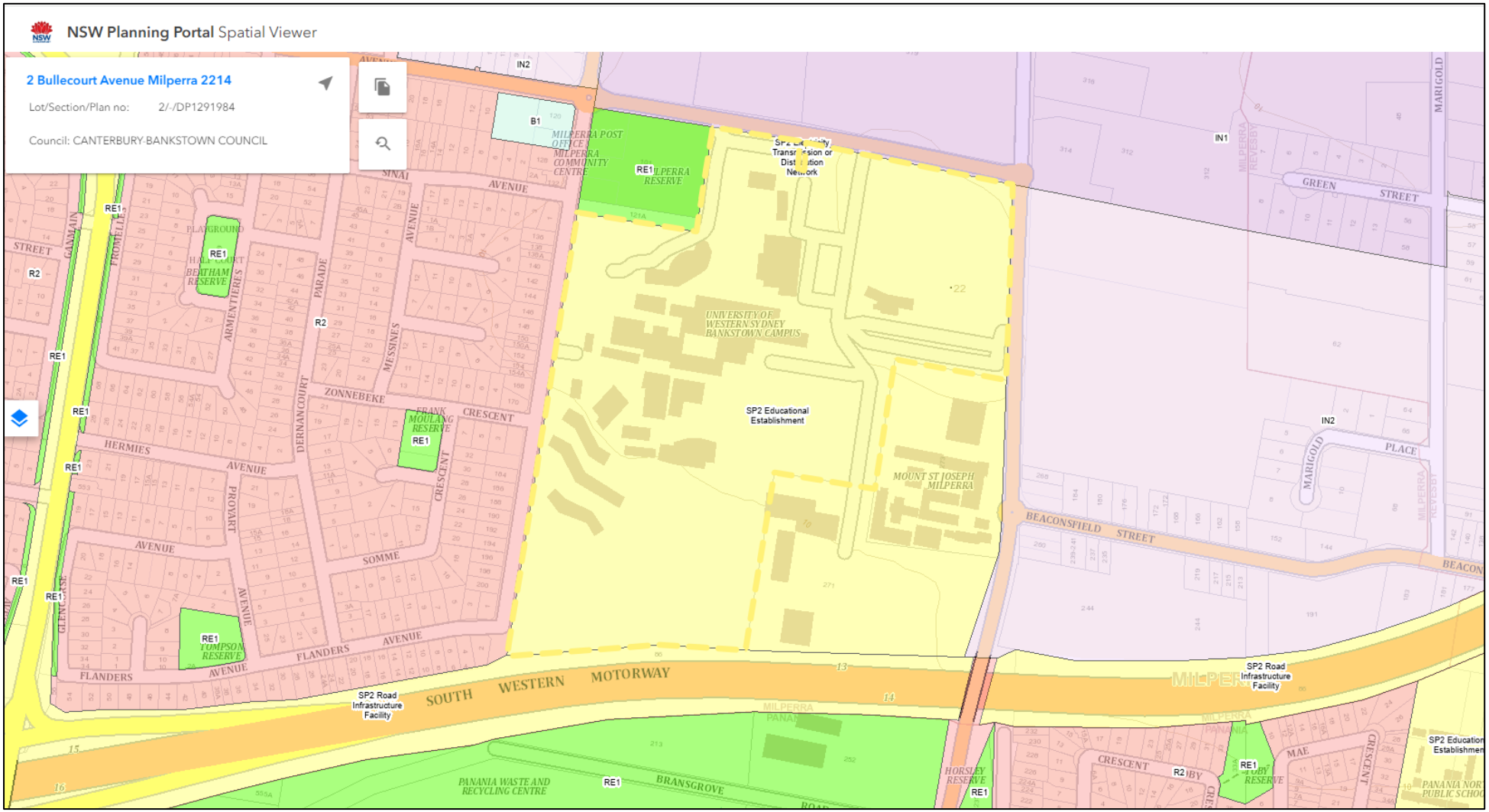


Stage No.	No. of Superlots Lots	No. of Residential Lots	No. of Public/Drainage Reserve Lots	Stage Area (m^2)
Stage 1	0	16	0	6030
Stage 2	0	11	0	4690
Stage 3	10	135	2	61674
Stage 4	2	19	1	15108
Stage 5	9	96	0	35176
Stage 6	9	105	1	40385
Commercial	1	0	0	33340

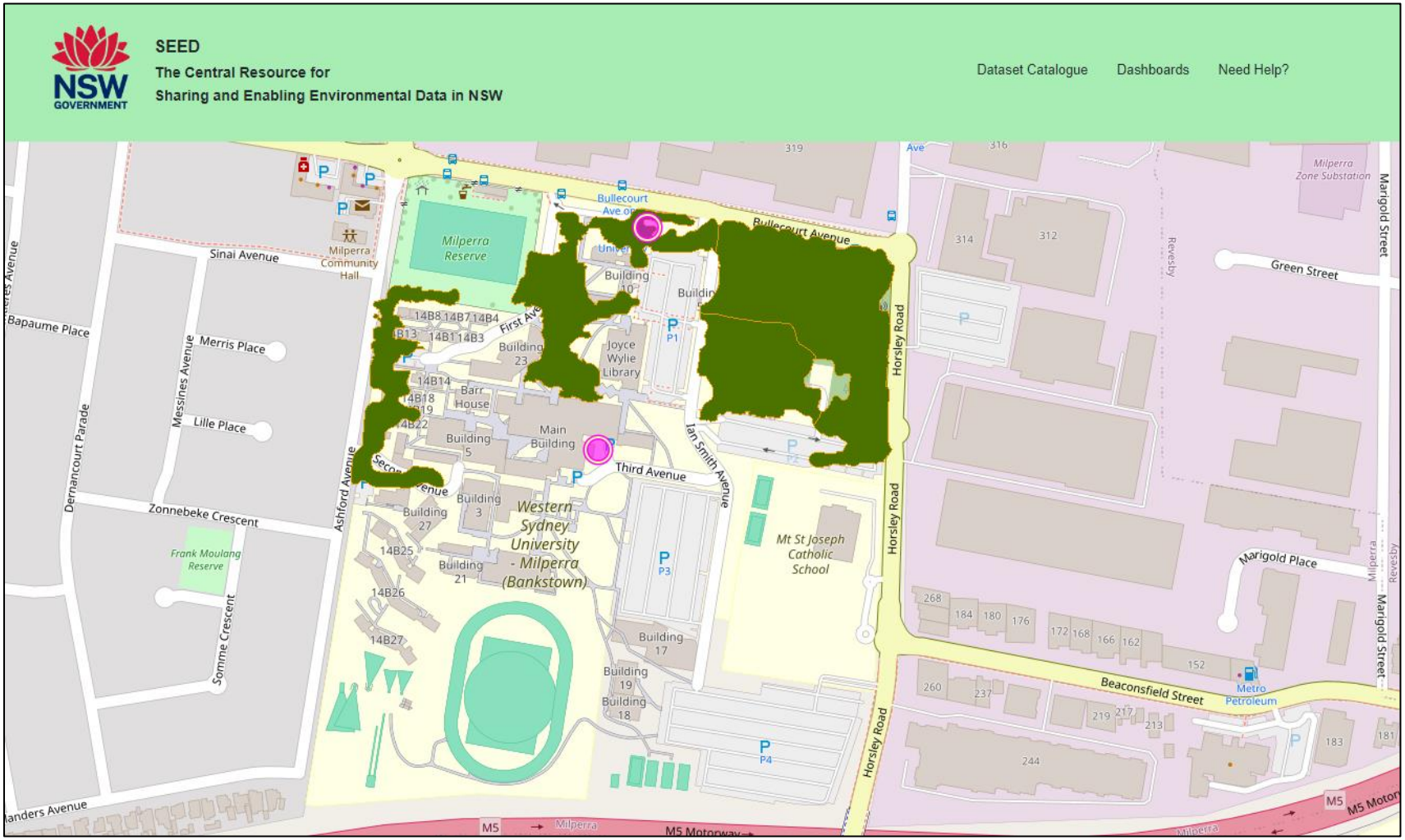
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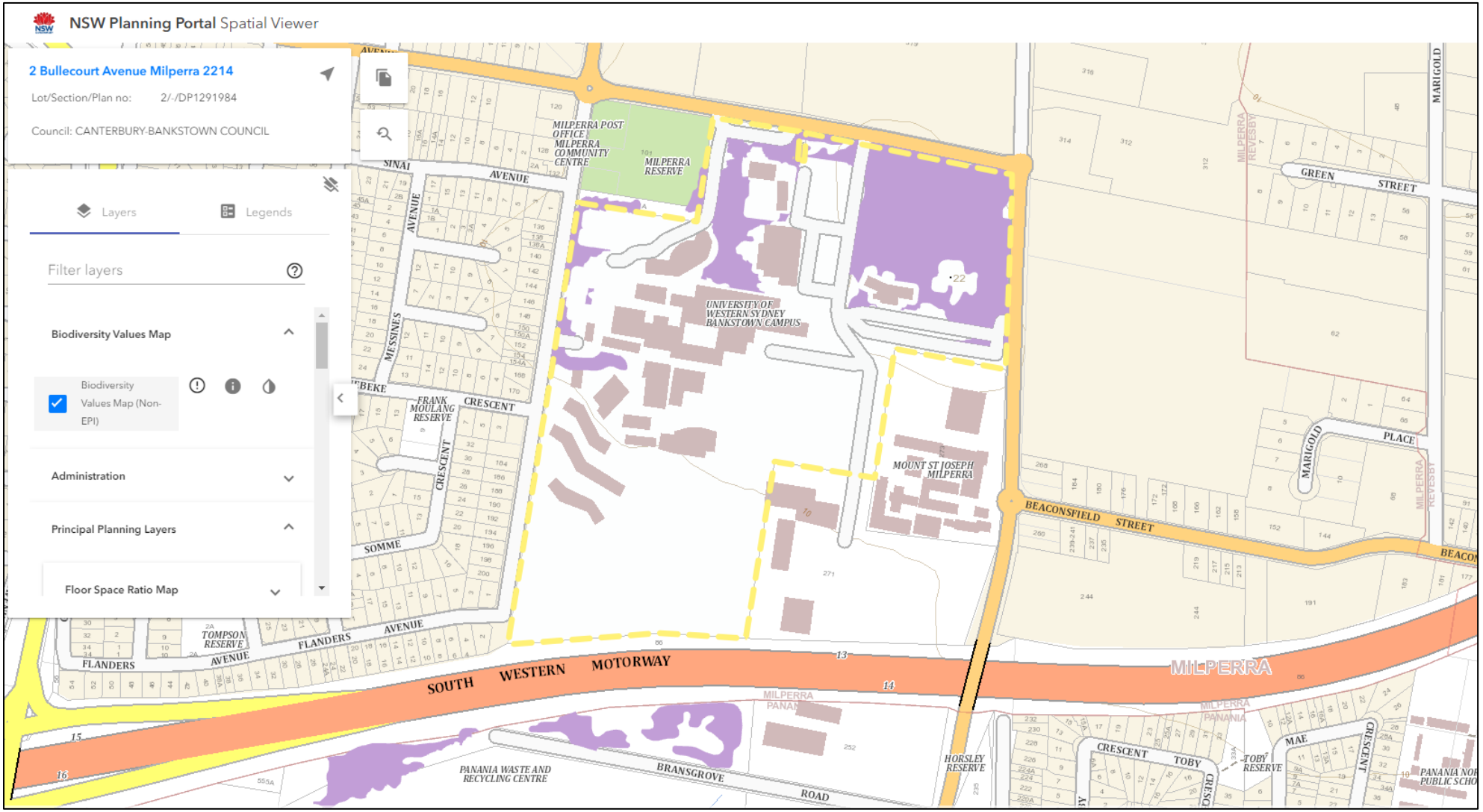
Functional Layout Plan, prepared *by Beveridge and Williams,* Project No: 2301879, Drawing No: 910, Rev: P4, drawn: 23/09/2024. Annotated by *Temporal Tree Management Pty Ltd.* (26/09/2024).



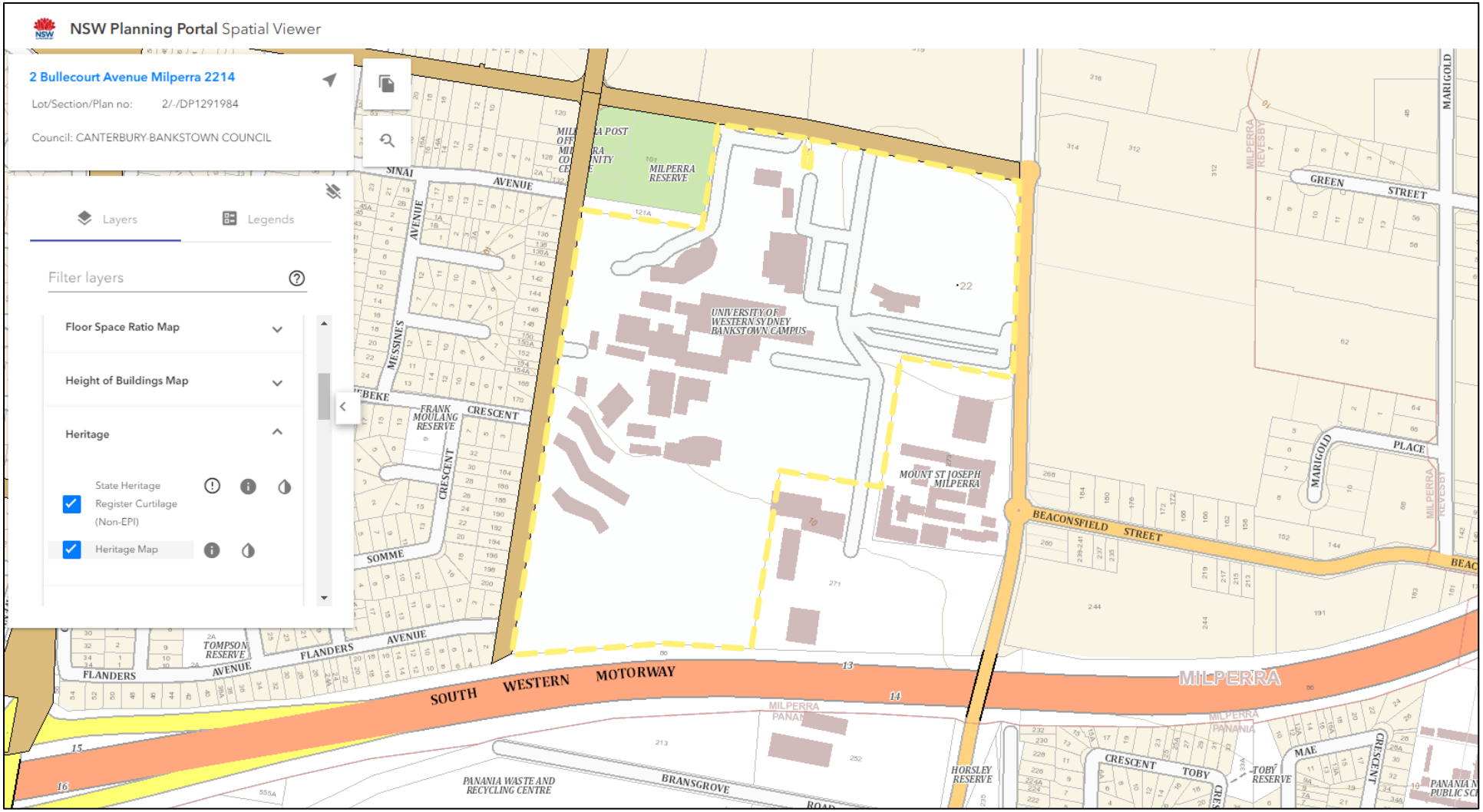
Site location is the Western Sydney University Milperra Campus at 2 Bullecourt Avenue, Milperra (YELLOW dashed boundary). Refer to Site Plans for accurate determination of site boundaries. Image sourced from Planning NSW (2024)



Site contains identified EEC (Cumberland Plain Woodland). Image sourced from NSW Govt. SEED Mapping Tool (2024).



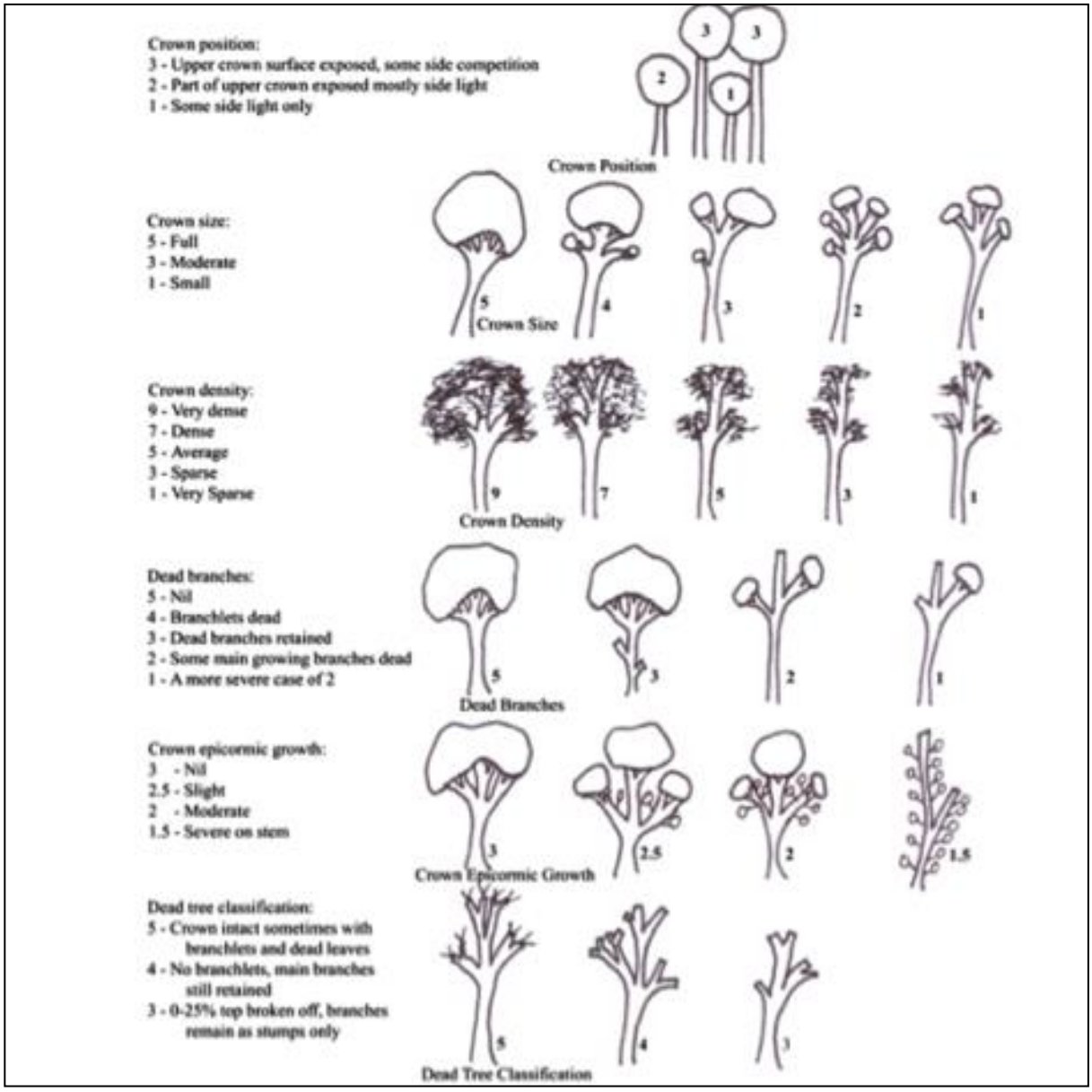
Site contains Biodiversity Values Mapped Area (YELLOW dashed site boundary). Image sourced from Planning NSW (2024).



Site is bounded by the Ashford Avenue and Bullecourt Avenue Heritage Items (YELLOW dashed site boundary). Image sourced from Planning NSW (2024).

Appendix B: Vitality using Visual Vitality Index (Johnstone et al. 2012).

VVI = 3/3 (Upper crown exposed) + 5/5 (Good crown size) + 8/9 (Good crown density) + 4/5 (Very little deadwood) + 2/3 (Moderate epicormic growth) + 5/5 (Crown in tact).
=26/30.



Appendix C: Tree Retention Values Priority Requirements

From Morton (2011). Accessed via the Leichardt Council Tree Technical Manual.

Retention value	Recommended action
"High"	• These trees are considered worthy of preservation; as such careful consideration should be given to their retention as a priority. • Proposed site design and placement of buildings and infrastructure should consider the Tree Protection Zones as discussed in the following sections to minimise any adverse impact. • In addition to Tree Protection Zones, the extent of the canopy (canopy drip-line) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
"Moderate"	• The retention of these trees is desirable. • These trees should be retained as part of any proposed development if possible, however these trees are considered less critical for retention. • If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity.
"Low"	• These trees are not considered to worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their SULE. • These trees should not be considered as a constraint to the future development of the site.
"Very Low"	• These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds. • The removal of these trees is therefore recommended regardless of the implications of any proposed development.

	Landscape Significance Reading						
Tree Sustainability	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Greater than 40 years	**High Retention Value**						
15 to 40 years			**Moderate**				
5 to 15 years				**Low**			
Less than 5 years					**Very Low Retention Value**		
Dead or hazardous							

Appendix D: Landscape Significance Definitions

From Morton (2011). Accessed via the Leichardt Council Tree Technical Manual.

Rating	Heritage value	Ecological value	Amenity value
1. SIGNIFICANT	The subject site is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed as a Significant Tree.	The subject tree is scheduled as a Threatened Species as defined under the *Threatened Species Conservation Act 1995 (NSW)* or the *Environmental Protection and Biodiversity Conservation Act 1999.*	The subject tree has a very large live crown size exceeding 100m² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species.
	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has important association with that item.	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species.	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity.
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event.	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area.	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.
2. VERY HIGH	The tree has a strong historical association with a Heritage Item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally-indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 60m²; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.

Rating	Heritage value	Ecological value	Amenity value
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence.	The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value.	The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% (normal); the subject tree is visible from the street and/or surrounding properties and makes a positive contribution to the visual character and the amenity of the area.
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of this Development Control Plan.	The subject tree has a medium live crown size exceeding 25m²; the tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% (thinning to normal); and The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a Heritage Item.	The subject tree is scheduled as exempt (not protected) under the provisions of this Development Control Plan due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 25m² and can be replaced within the short term (5-10 years) with new tree planting.
6. VERY LOW	The subject tree is causing damage to a Heritage Item.	The subject tree is listed as an Environment Weed Species in the Leichhardt Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).

Appendix E: Useful Life Expectancy Definitions

From Barrell (1996). Accessed via the Leichardt Council Tree Technical Manual.

	1. Long	2. Medium	3. Short	4. Removal	5. Moved or replaced
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 - 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 - 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years	Trees which can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small trees less than 5m in height.
B	Trees that could be made suitable for retention in the long term by remedial tree care.	Trees that may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through instability or recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in height.
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form.	Trees that have been pruned to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
				Trees that may live for more than 5 years but should be	

Appendix F: TPZ Encroachment Data for One-hundred and Eighty-eight Assessed Trees. Four-hundred and twelve trees are within the footprint of proposed excavation and not included in the tables below.

Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
1	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
2	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
3	66	Severe	Tree is positioned adjacent to edge of proposed internal road. Will sustain significant major encroachment.	Remove. Tree will require removal to facilitate development.
4	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
5	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
6	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
7	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
8	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
9	1	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
10	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
11	0	N/A	Tree will not be directly impacted by proposed works.	Remove. Tree will require removal to facilitate development.
12	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
13	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
14	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
19	6	Low	Existing asphalt wihtin root growth area will mitigate impact of minor encroachment.	Retain. Install tree protection measures compliant with AS4970 (2009).
20	53	Severe	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment.	Remove. Tree proposed for removal to facilitate earthworks.
21	0	N/A	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
22	0	N/A	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
23	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
24	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
25	31	Severe	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to fill up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
26	8	Low	Tree will sustain minor encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
27	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
29	9	Low	Tree will sustain minor encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).

Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
30	11	Moderate	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to fill up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
31	6	Low	Tree will sustain minor encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
32	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
33	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
34	3	Low	Tree will sustain minor encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
35	30	Severe	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to fill up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Proposed bulk work excavation plan will require modification to facilitate retention of this tree. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
37	17	Moderate	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to fill up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
38	30	Severe	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
39	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
40	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
41	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
42	31	Severe	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to fill up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Proposed bulk work excavation plan will require modification to facilitate retention of this tree. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
43	32	Severe	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to excavate up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
44	24	High	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to excavate up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
45	4	Low	Tree will sustain minor encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to excavate up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
46	22	High	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to excavate up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).

Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
47	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
48	24	High	Tree will sustain minor encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to excavate up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
49	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
50	30	High	Tree will sustain minor encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment. Bulk earthworks plan proposes to excavate up to 300mm within TPZ, which is unlikely to impact tree's viability.	Retain. Minimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
51	0	N/A	Tree will sustain major encroachment within northern portion of root plate during bulkwork excavation. Existing concrete pathway and asphalt carpark will mitigate impact of encroachment.	Retain. Minnimise excavation adjacent to school boundary to mitigate impact on tree. Install tree protection measures compliant with AS4970 (2009).
56	30	Severe	Tree will sustain unmitigated major encroachment within southern portion of root plate during bulkwork excavation for proposed roadway and service installation.	Remove. Tree will require removal to facilitate development.
57	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
58	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
59	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
60	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
61	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
62	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
63	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
64	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
65	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
66	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
67	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
68	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
69	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
70	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
71	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
72	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
73	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
74	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
75	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
76	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).

Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
77	2	Low	Tree will sustain minor encroachment during proposed excavation and demolition of existing raised garden adjacent to eastern boundary.	Retain. Install tree protection measures compliant with AS4970 (2009).
78	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
79	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
81	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
82	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
83	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
84	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
122	13	Moderate	Tree is within eastern edge of proposed park. Will sustain tolerable major encroachment within eastern portion of TPZ during excavation for new kerb. Remaining TPZ within new park. Proposed excavation and fill within park to a maximum depth of 300mm.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
123	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
124	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
125	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
126	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
127	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
128	12	Moderate	Tree is within southern edge of proposed park. Will sustain tolerable encroachment within southern portion of TPZ during excavation for proposed residential lot. Remaining TPZ within new park. Proposed excavation and fill within park to a maximum depth of 300mm.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
129	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
130	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
131	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
132	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
133	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).

Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
134	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
135	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
136	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
137	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
138	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
139	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
140	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
141	18	Moderate	Tree is within proposed park inside northern boundary. Tree will sustain a tolerable major encroachment within the southern portion of its TPZ during the installation of proposed stormwater services.Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
142	21	High	Tree is within proposed park inside northern boundary. Tree will sustain a major encroachment within the southern portion of its TPZ during the installation of proposed stormwater services.Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Project Arborist must supervise excavation for services within TPZ. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
143	8	Low	Tree is within proposed park inside northern boundary. Tree will sustain a tolerable minor encroachment within the southern portion of its TPZ during the installation of proposed stormwater services. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
145	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
146	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
147	10	Moderate	Tree is within proposed park inside northern boundary. Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).
148	15	Moderate	Tree is within proposed park inside northern boundary. Tree will sustain a tolerable major encroachment within the western portion of its TPZ during earthworks required for proposed drainage basin.Proposed excavation and fill within park to a maximum depth of 300mm. Tree will tolerate these minor excavation / fill works.	Retain. Minimise excavation / fill within park to a maximum depth of 200mm. Install tree protection measures compliant with AS4970 (2009).

Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
151	42	Severe	Tree will sustain a major TPZ enroachment during excavation for proposed drainage basin and internal driveway. Tree's low vitality and extent of TPZ encroachment suggests its viability will be compromised by these works.	Remove. Tree proposed for removal to facilitate earthworks.
152	49	Severe	Tree will sustain a major TPZ enroachment during excavation for proposed drainage basin and internal driveway. Tree's low vitality and extent of TPZ encroachment suggests its viability will be compromised by these works.	Remove. Tree proposed for removal to facilitate earthworks.
156	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
157	8	Low	Tree will sustain minor encroachment within TPZ during excavation for internal road.	Retain. Install tree protection measures compliant with AS4970 (2009).
158	27	High	Tree will sustain major encroachment within TPZ during excavation for internal road. A root mapping assessment will be required to determine tree's viability if retained. Tree is considered to be suitable for removal and replacement due to low species value.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
159	12	Moderate	Tree will sustain major encroachment within TPZ during excavation for internal road. Tree's good health, species resilience and undisturbed western portion of TPZ suggest tree will tolerate this encroachment of less than 20% of its TPZ area.	Retain. Install tree protection measures compliant with AS4970 (2009).
207	2	Low	Tree will sustain acceptable minor encroachment during excavation for proposed internal road.	Retain. Install tree protection measures compliant with AS4970 (2009).
208	27	Severe	Tree will sustain major encroachment during installation of proposed internal footpath. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
209	20	High	Tree will sustain major encroachment during installation of proposed internal footpath. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
210	26	High	Tree will sustain major encroachment during installation of proposed internal footpath. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
211	18	Moderate	Tree will sustain major encroachment during installation of proposed internal footpath. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
212	20	High	Tree will sustain major encroachment during installation of proposed internal footpath. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
213	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
237	23	High	Tree will sustain major encroachment during installation of proposed internal footpath and services. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
238	16	Moderate	Tree will sustain major encroachment during installation of proposed internal footpath and services. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
239	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
240	24	HIgh	Tree will sustain major encroachment during installation of proposed internal footpath and services. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.

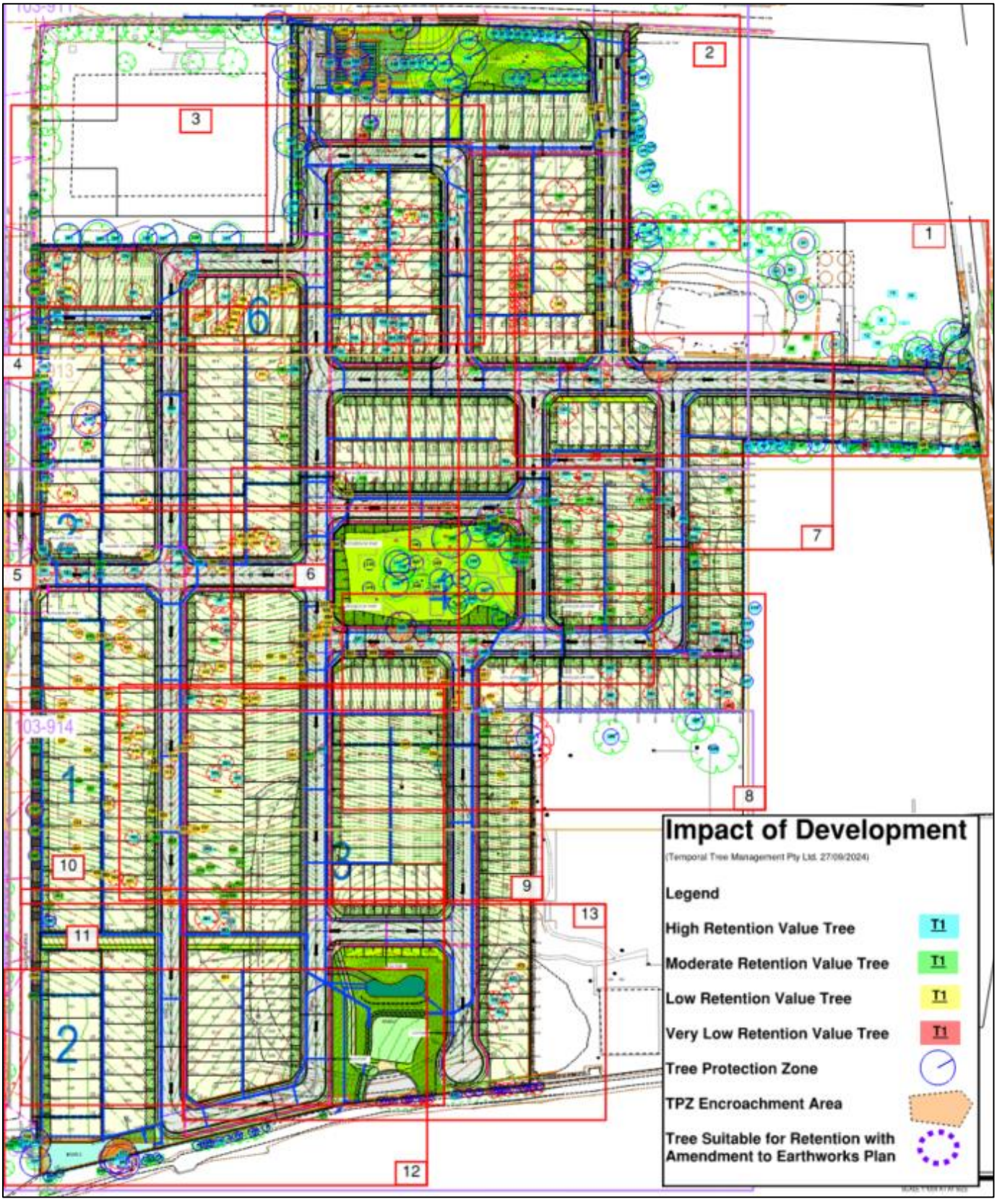
Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
241	14	Moderate	Tree will sustain major encroachment during installation of proposed internal footpath and services. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
309	22	High	Tree will sustain major encroachment during installation of proposed internal footpath.	Remove. Tree proposed for installation of footpath.
315	0	N/A	Tree positioned within park proposed within central portion of site will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
316	0	N/A	Tree positioned within park proposed within central portion of site will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
317	0	N/A	Tree positioned within park proposed within central portion of site will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
318	0	N/A	Tree positioned within park proposed within central portion of site will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
319	0	N/A	Tree positioned within park proposed within central portion of site will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
320	65	Severe	Stem is within footprint of proposed internal footpath and service installtion.	Remove. Tree proposed for installation of footpath.
322	58	Severe	Stem is within footprint of proposed internal footpath and service installtion.	Remove. Tree proposed for installation of footpath.
335	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
336	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
337	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
338	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
339	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
340	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
341	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
342	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
343	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
344	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
345	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
346	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
347	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
348	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
349	10	Moderate	Tree will sustain acceptable major encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).
353	5	Low	Tree will sustain acceptable minor encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).
354	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
355	11	Moderate	Tree will sustain acceptable major encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).
356	30	Severe	Tree will sustain major encroachment during installation of proposed internal footpath.	Remove. Tree proposed for installation of footpath.
360	17	Moderate	Tree will sustain acceptable major encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).
361	14	Moderate	Tree will sustain acceptable major encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).
362	16	Moderate	Tree will sustain acceptable major encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).

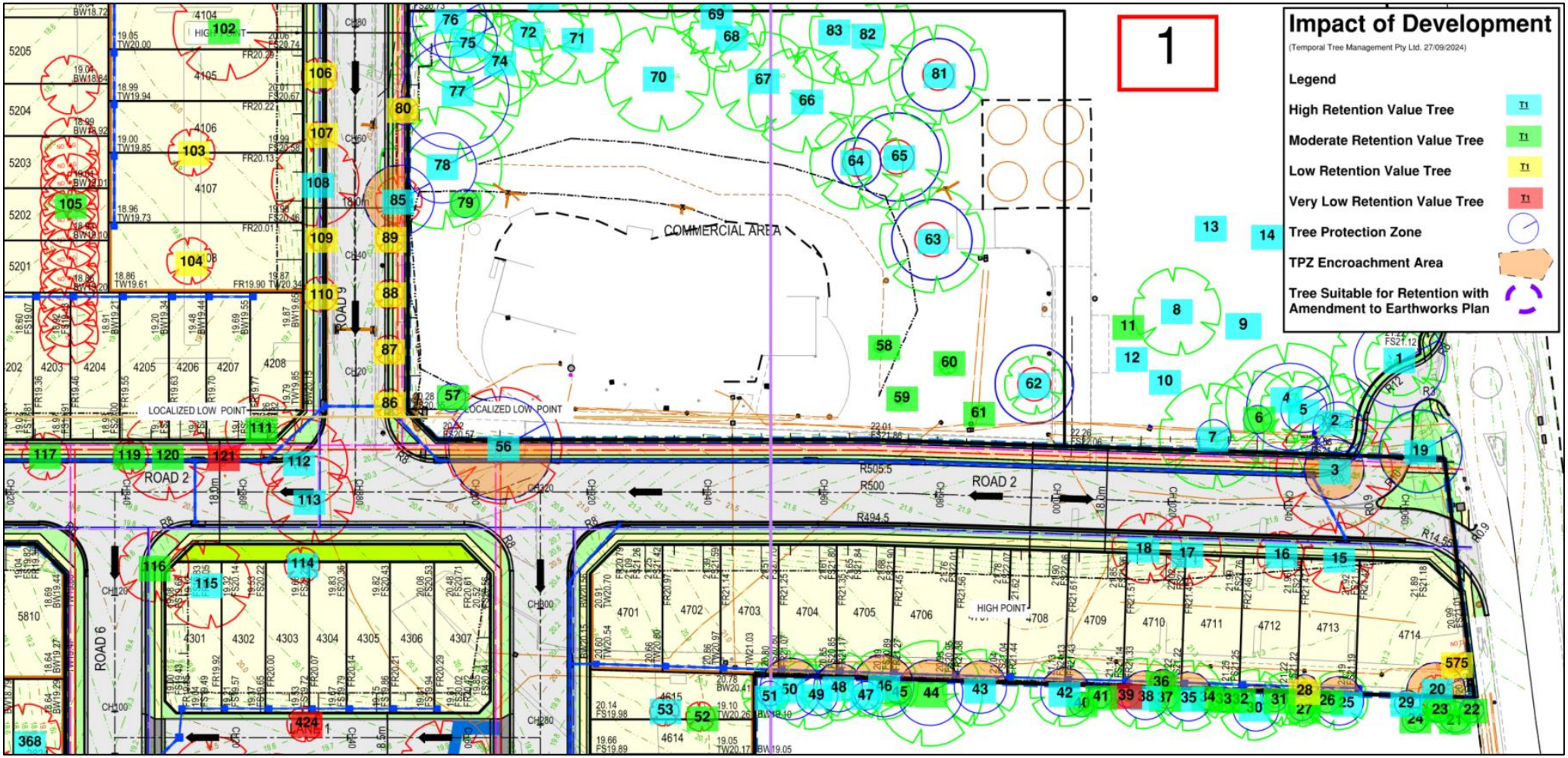
Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
363	17	Moderate	Tree will sustain acceptable major encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).
364	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
365	6	Low	Tree will sustain acceptable minor encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).
366	11	Moderate	Tree will sustain acceptable major encroachment during installation of proposed internal footpath.	Retain. Install tree protection measures compliant with AS4970 (2009).
367	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
404	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
405	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
406	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
411	14	Moderate	Tree will sustain acceptable major encroachment during proposed bulk earthwork excavation.	Retain. Install tree protection measures compliant with AS4970 (2009).
412	16	Moderate	Tree will sustain acceptable major encroachment during proposed bulk earthwork excavation.	Retain. Install tree protection measures compliant with AS4970 (2009).
413	17	Moderate	Tree will sustain acceptable major encroachment during proposed bulk earthwork excavation.	Retain. Install tree protection measures compliant with AS4970 (2009).
414	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
427	21	High	Tree will sustain major encroachment within western portion of TPZ during installation of services and new bounadry wall. Exising raised garden has restricted western root growth from this tree into the subject site. This structure will suitably mitigate the impact of the proposed encroachment. No further investigation or mitigation required.	Retain. Install tree protection measures compliant with AS4970 (2009).
428	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
429	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
430	14	Moderate	Tree will sustain major encroachment within western portion of TPZ during installation of services and new bounadry wall. Exising raised garden has restricted western root growth from this tree into the subject site. This structure will suitably mitigate the impact of the proposed encroachment. No further investigation or mitigation required.	Retain. Install tree protection measures compliant with AS4970 (2009).
431	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
432	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
433	5	Low	Tree will sustain minor encroachment within western portion of TPZ during installation of services and new bounadry wall. Exising raised garden has restricted western root growth from this tree into the subject site. This structure will suitably mitigate the impact of the proposed encroachment. No further investigation or mitigation required.	Retain. Install tree protection measures compliant with AS4970 (2009).
474	100	Severe	Trees stem is within proposed drainage basin within south-western corner of subject site.	Remove. Tree proposed for removal to facilitate earthworks.
475	100	Severe	Trees stem is within proposed drainage basin within south-western corner of subject site.	Remove. Tree proposed for removal to facilitate earthworks.
476	39	Severe	Tree positioned outsdie the southern boundary fence will sustain major TPZ encroachment during fill works for proposed drainage basin within south-western corner of subject site. Contoured fill towards the southern site boundary will mitigate the impact of this major encroachment. Tree is suitable for retention.	Retain. Install tree protection measures compliant with AS4970 (2009).
477	100	Severe	Trees stem is within proposed drainage basin within south-western corner of subject site.	Remove. Tree proposed for removal to facilitate earthworks.
478	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).

Tree	Encroachment (%)	Impact	Mitigation	Proposed Management
479	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
480	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
481	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
482	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
567	12	Moderate	Closest trees within group will sustain tolerable major encroachment during excavation works for proposed drainage basin within south-western boundary corner. Contoured excavation will mitigate impact of encroachment.	Retain. Install tree protection measures compliant with AS4970 (2009).
568	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
569	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
570	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
571	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
572	21	High	Closest trees within group will sustain major encroachment during excavation works for proposed drainage basin within south-western boundary corner. Deep excavation will increase impact of encroachment.	Remove. Tree proposed for removal to facilitate earthworks.
576	39	Severe	Tree will sustain major encroachment during excavation for proposed drainage basin and installation of services. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
577	31	Severe	Tree will sustain major encroachment during excavation for proposed drainage basin and installation of services. Root mapping assessment should be undertaken to accurately determine viability of tree under proposed encroachment.	Retain. Undertake root mapping assessment to accurately determine impact of Major TPZ encroachment.
578	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
579	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
580	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
581	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).
582	0	N/A	Tree will not be directly impacted by proposed works.	Retain. Install tree protection measures compliant with AS4970 (2009).

Appendix G: Detailed Tree Location Plans and TPZ Encroachments

Functional Layout Plan, prepared *by Beveridge and Williams,* Project No: 2301879, Drawing No: 910, Rev: P4, drawn: 23/09/2024. Annotated by *Temporal Tree Management Pty Ltd.* (26/09/2024).

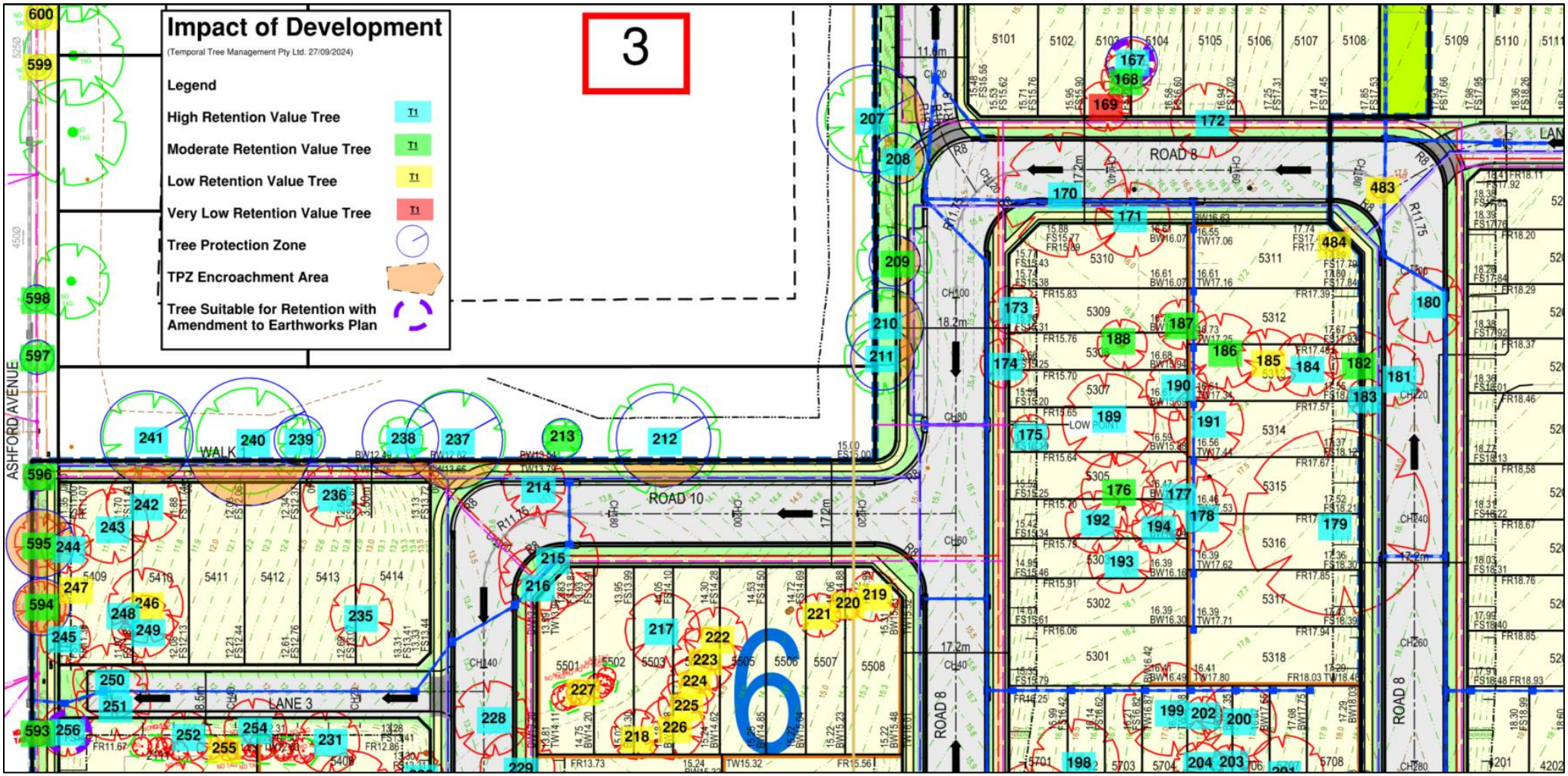




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William Dunlop: Consulting Arborist
(M. UrbHort, Grad. Dip(Arb), B.Sc).

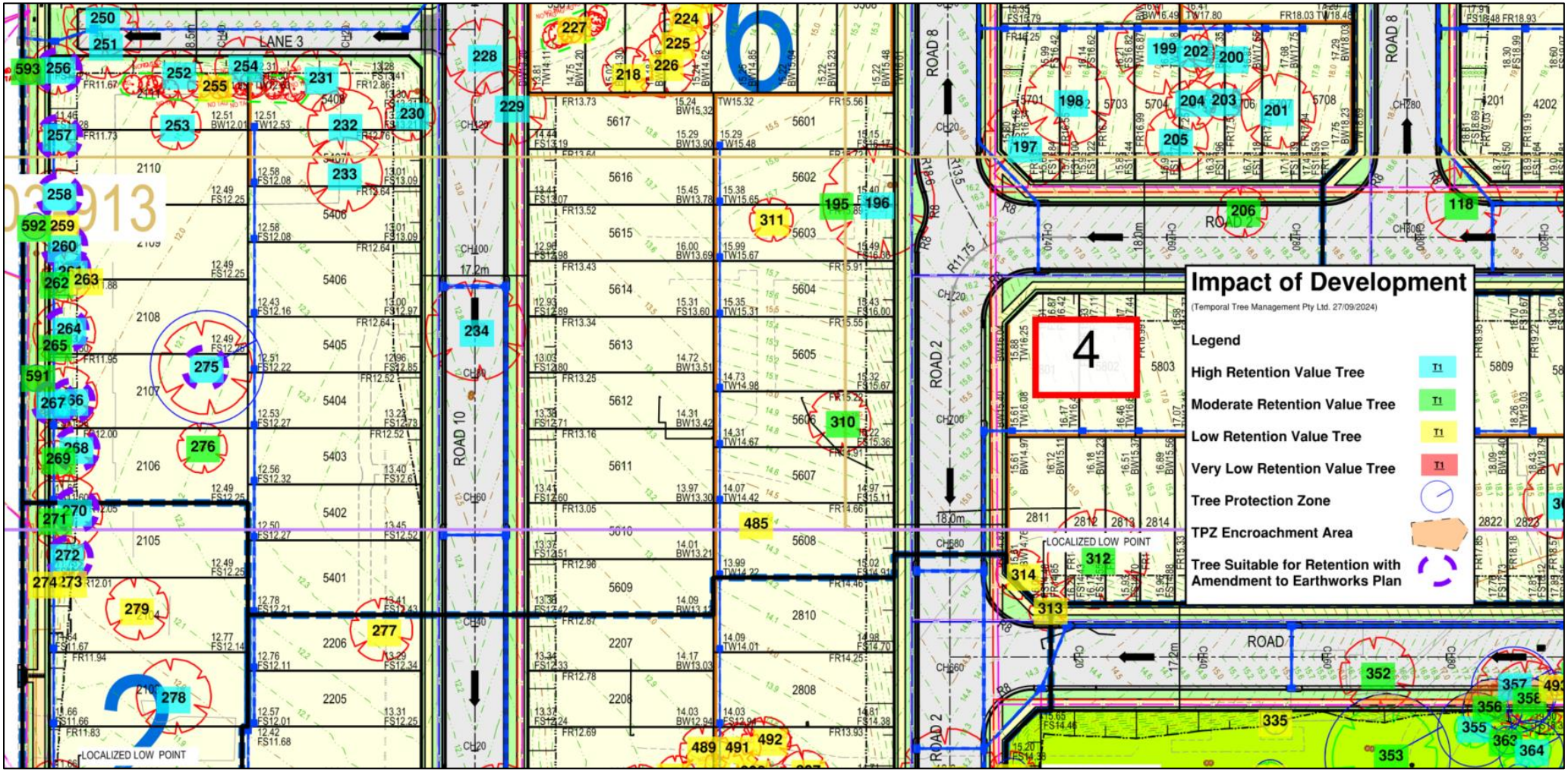


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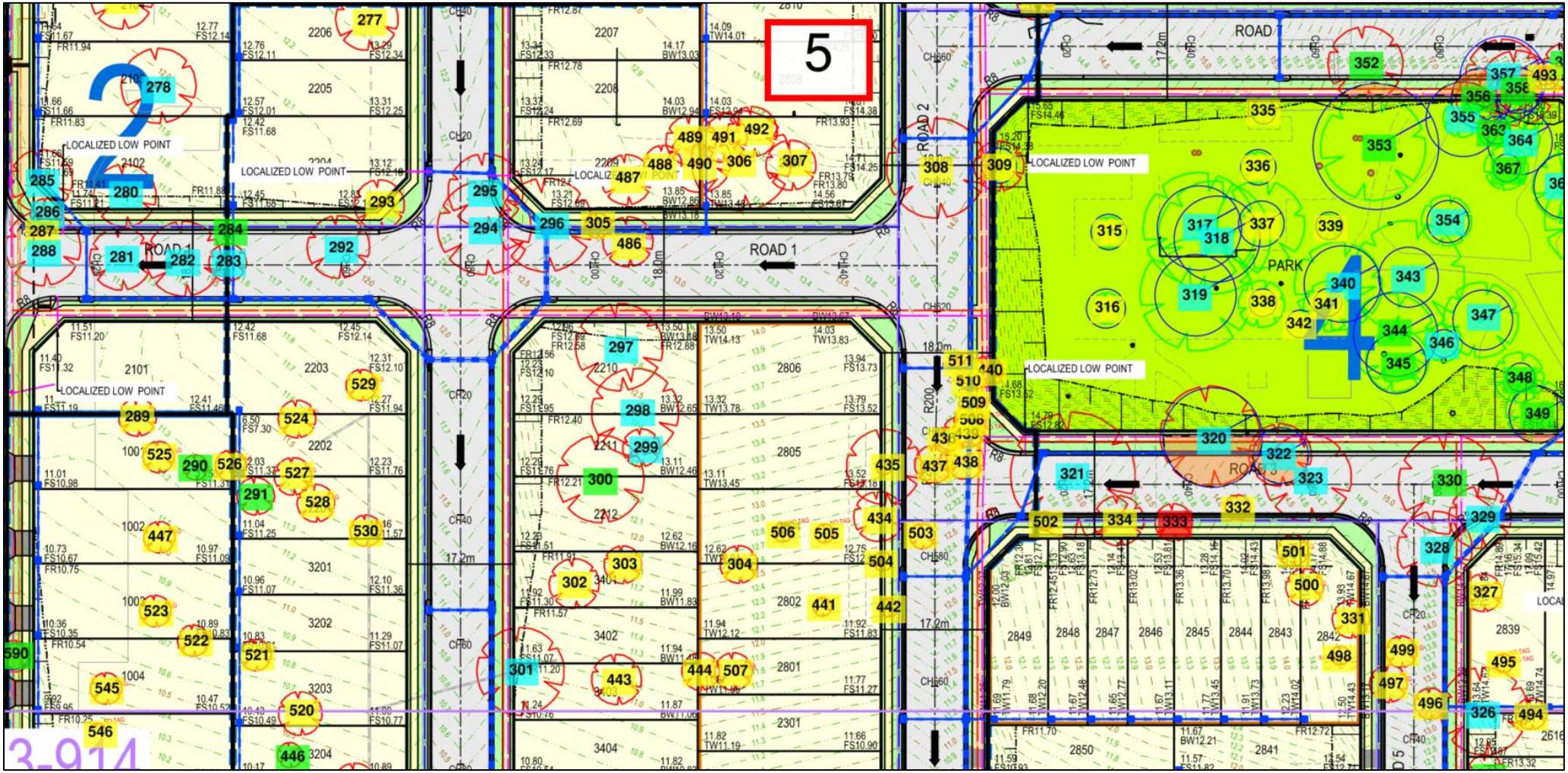


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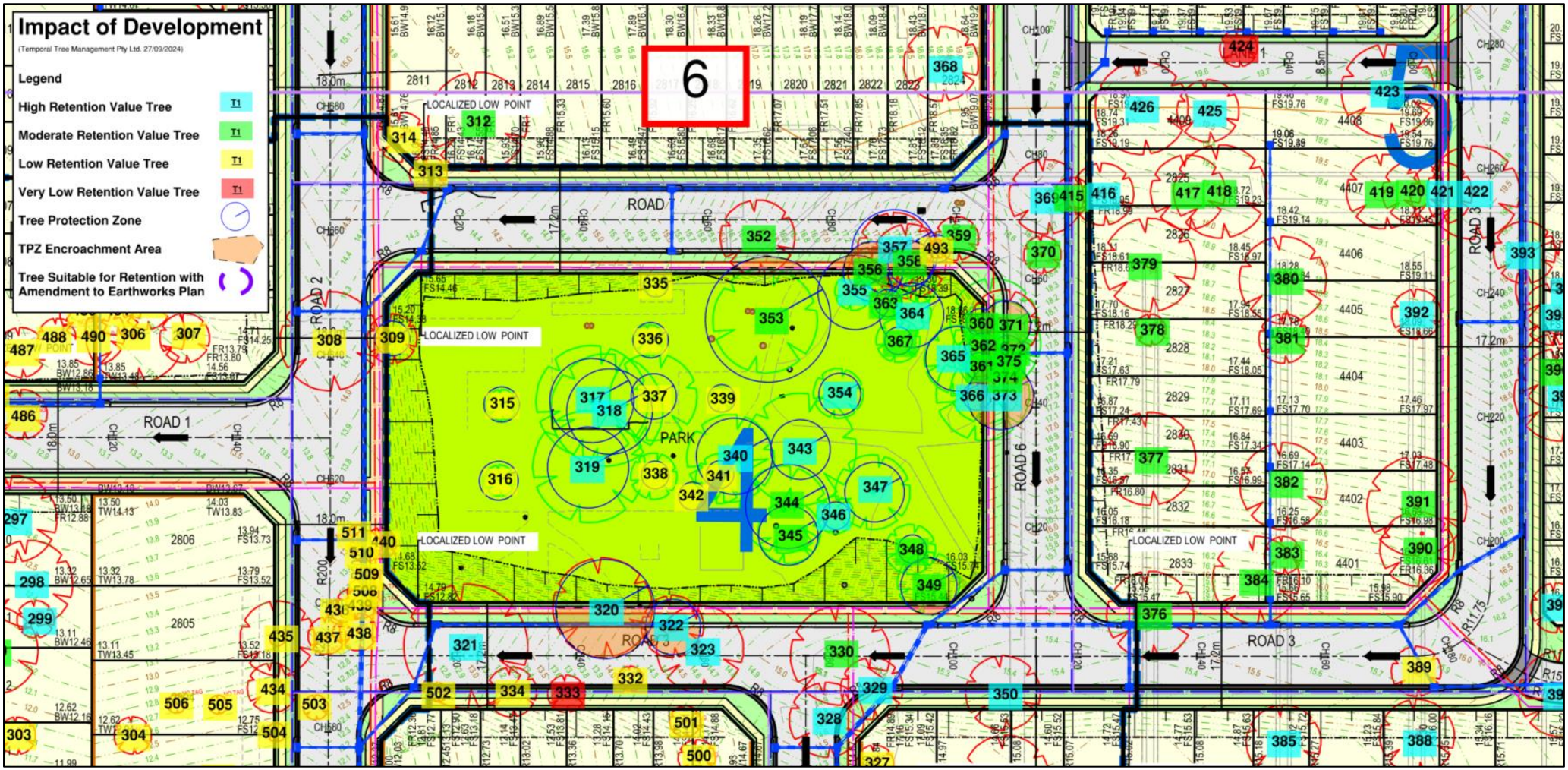
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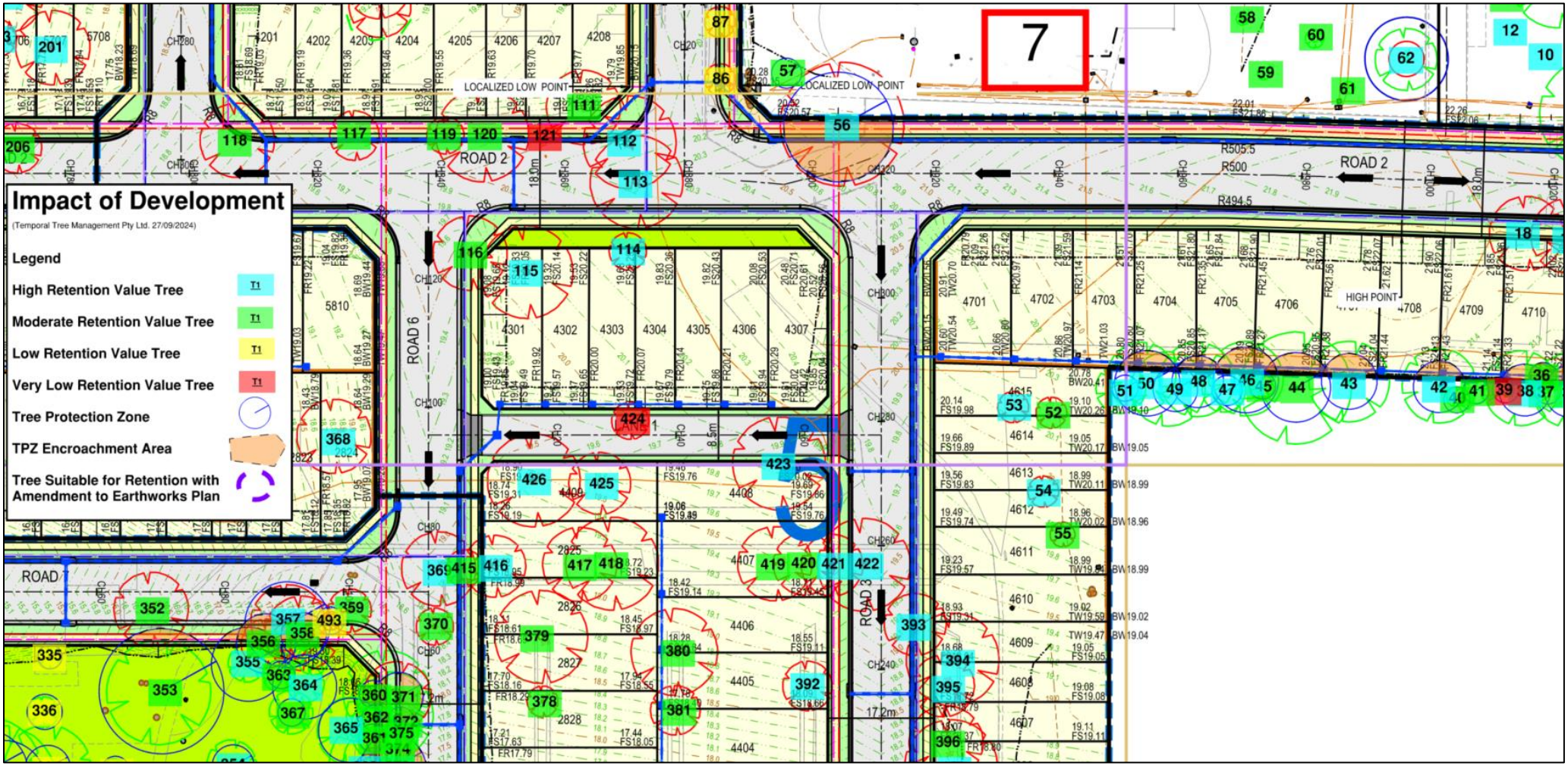
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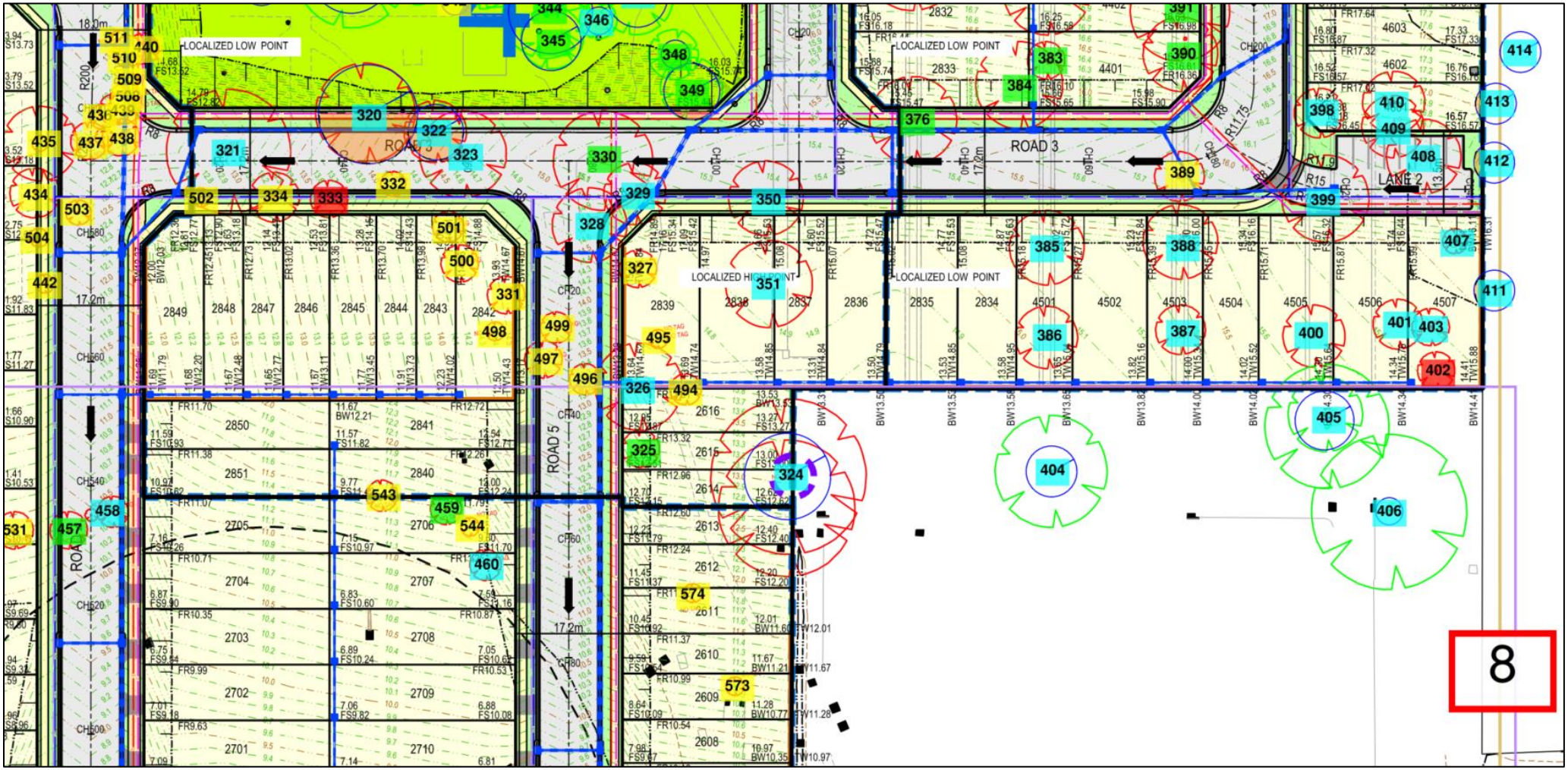
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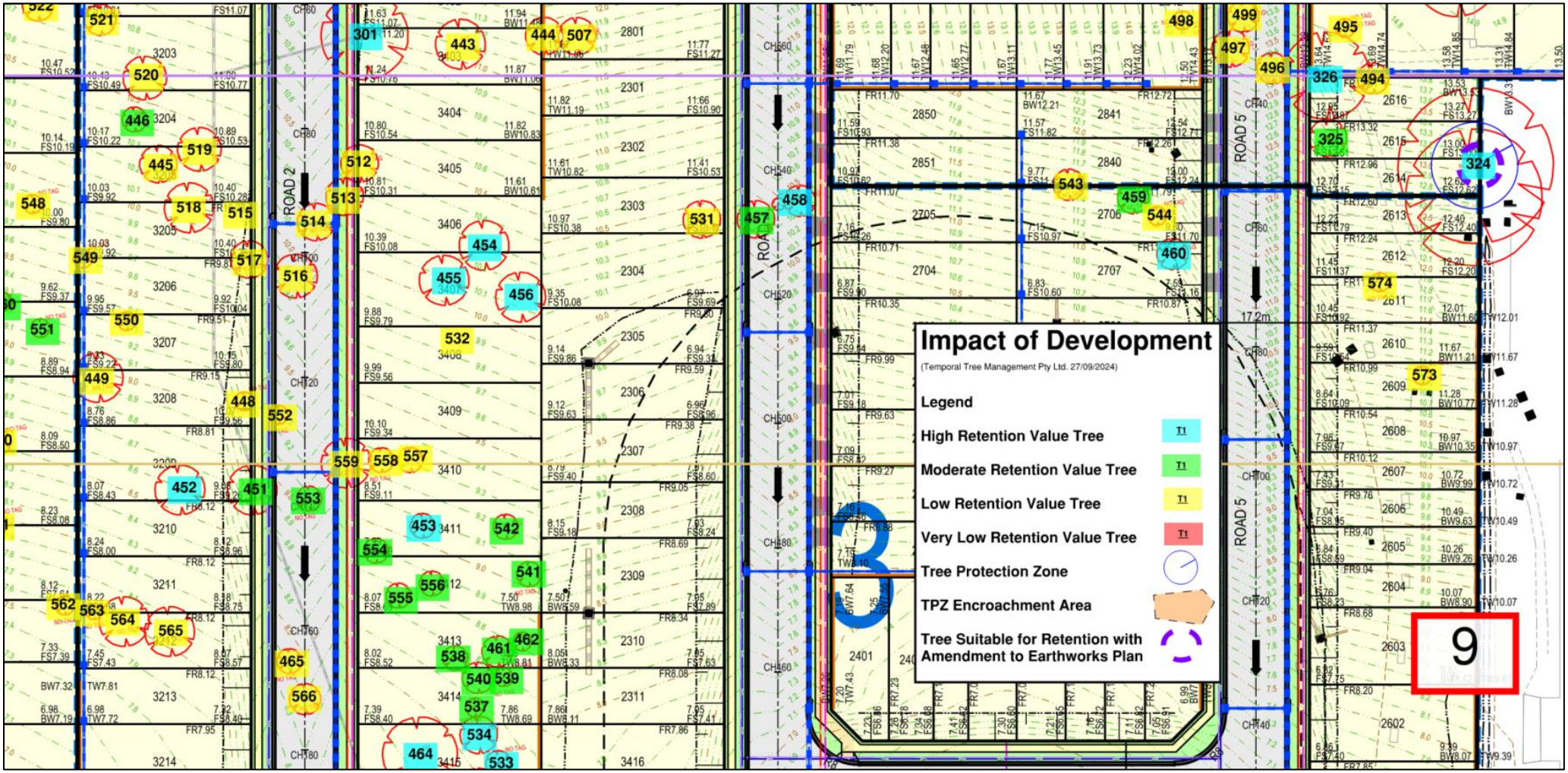
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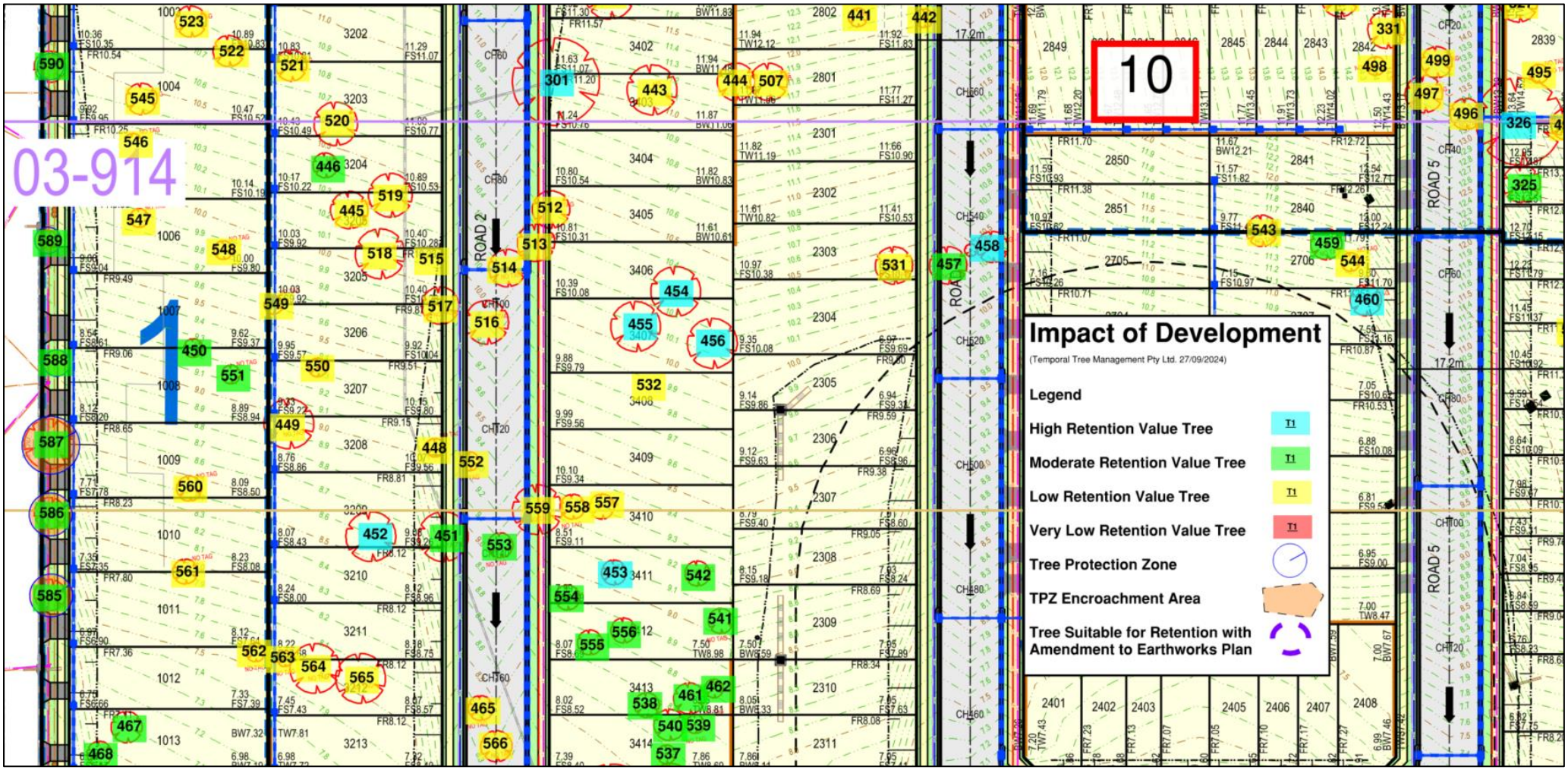
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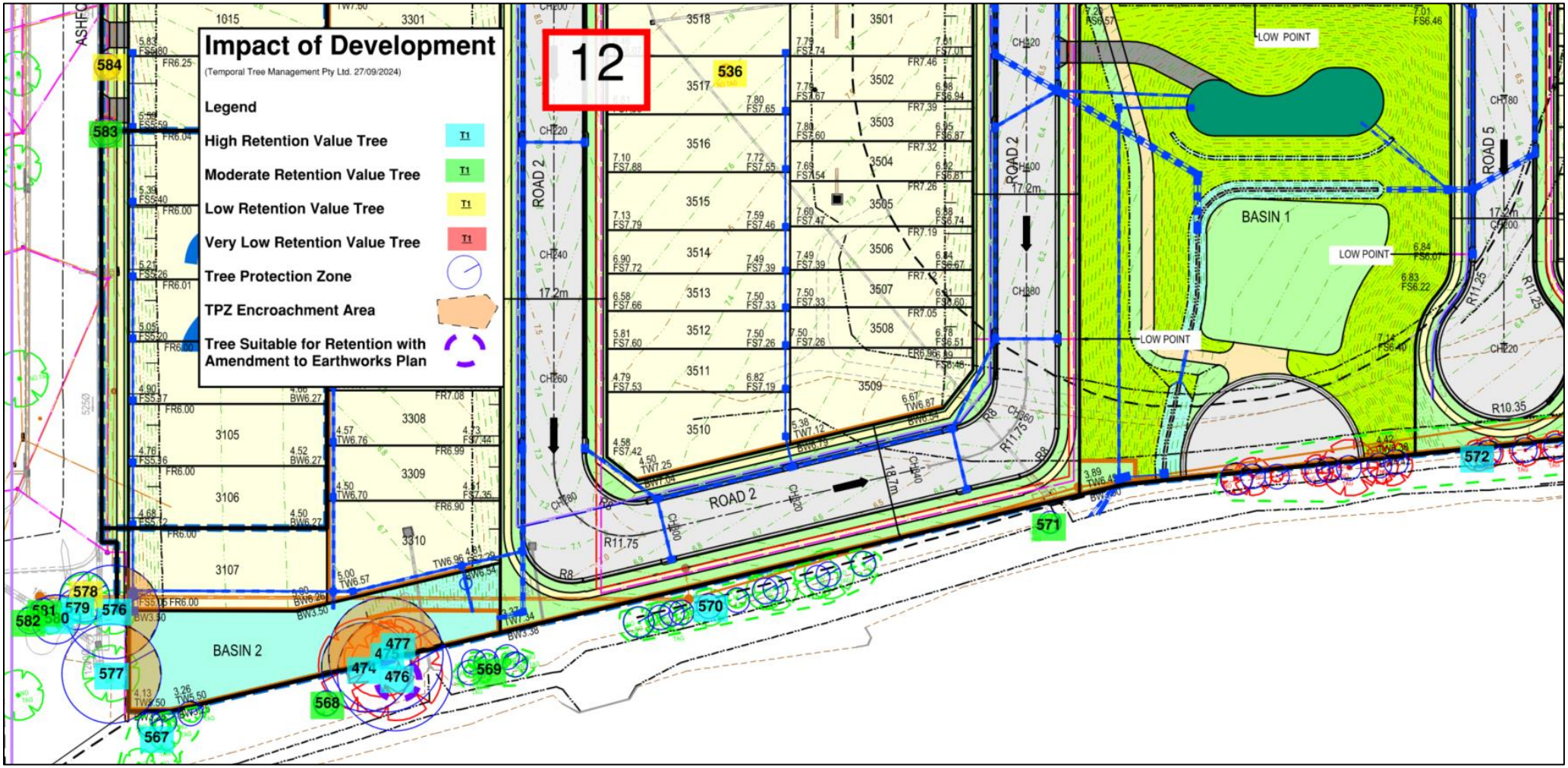
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13
Impact of Development
(Temporal Tree Management Pty Ltd. 27/09/2024)
Legend
High Retention Value Tree
Moderate Retention Value Tree
Low Retention Value Tree
Very Low Retention Value Tree
Tree Protection Zone
TPZ Encroachment Area
Tree Suitable for Retention with Amendment to Earthworks Plan
ROAD 2
ROAD 4
ROAD 5
BASIN 1
LOW POINT
LOW POINT
LOW POINT
17.2m
17.2m
18.7m
R11.25
R11.75
R10.35
465
566
538
461
462
540
539
537
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533
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473
572

Appendix H: Key Terms and Definitions

Chlorosis: Yellowing of foliage, typically associated with hydraulic stress or nutrient deficiency.

Dieback: Symptoms of accelerated decline associated with poor tree health. Symptoms include reduced canopy volume, foliar chlorosis and or the development of dead branches within canopy extremities.

Decayed Tissue: Advanced tissue necrosis that has resulted in the degradation of sapwood and / or heartwood tissue. No vascular functionality. Results in reduced wood flexure and compression strength. Can be accelerated by species' susceptibility to decay spread and / or the presence of decay fungi.

Heartwood: Inner wood layer extending to centre of tree. Consists of expired xylem vessels that have lost vascular function. Susceptible to aerobic decay.

Hollowing: Advanced decay leads to complete degradation of affected sapwood and / or heartwood tissue. Results in cavities forming within a tree's stem or branches that can vary in size.

Response Growth: Active growth response by affected tree to wounding or abnormal loading. Increased tissue growth is targeted by tree adjacent to wound to cover / seal exposed sapwood tissue and / or provide increased compression or tension strength.

Tissue Necrosis: Observed in sapwood tissue that has been wounded and exposed. Results in the loss of vascular function and reduced flexure. Xylem vessel elements still observable within the dead sapwood tissue.

Vitality: Observable signs within a tree's canopy density and foliar condition that may indicate its state of health and growth.

Appendix I: Tree Data – See Over

Data collected for six-hundred assessed trees assessed within and adjacent to the property boundaries of the Western Sydney University Milperra Campus Development site, Milperra. The tree data collection methodology is outlined in Section 4.2 of this report. **Tree proposed for removal are shaded**.

***********************See Over for Tree Data Sheets**************************

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
1	*Eucalyptus fibrosa*	Broad-leaved Red Ironbark	Mature	1	Commercial	15	10	67	75	Good	Fair	N/A	Long	High	High	8.0	2.9	**Retain**	Yes	Stem trifurcates at ground level. No signs of union weakness.
2	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	15	6	37	43	Fair	Good	N/A	Long	High	High	4.4	2.3	**Retain**	Yes	Minor dieback. Canopy somewhat thin. Partially suppressed. Hazardous deadwood present.
3	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	15	10	45	51	Good	Good	N/A	Long	High	High	5.4	2.5	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
4	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	16	14	64	76	Good	Fair	N/A	Long	High	High	7.7	2.9	**Retain**	Yes	Stem bifurcates at 2 and 3 metres height.
5	*Eucalyptus fibrosa*	Broad-leaved Red Ironbark	Semi mature	1	Commercial	10	8	31	34	Good	Fair	N/A	Long	High	High	3.7	2.1	**Retain**	Yes	Partially suppressed.
6	*Eucalyptus moluccana*	Grey Box	Semi mature	1	Commercial	5	4	13	18	Fair	Poor	Hollow	Short	High	Moderate	2.0	1.6	**Retain**	Yes	Suppressed. Decay and hollowing at base of stem.
7	*Eucalyptus fibrosa*	Broad-leaved Red Ironbark	Semi mature	1	Commercial	13	8	24	34	Good	Fair	N/A	Long	High	High	2.9	2.1	**Retain**	Yes	Partially suppressed.
8	*Eucalyptus fibrosa*	Broad-leaved Red Ironbark	Semi mature	1	Commercial	15	8	29	33	Good	Good	N/A	Long	High	High	3.5	2.1	**Retain**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
9	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	17	12	46	67	Good	Good	N/A	Long	High	High	5.5	2.8	**Retain**	Yes	Large tree of indigneous species significance observed to be be in good condition.
10	*Eucalyptus moluccana*	Grey Box	Semi mature	1	Commercial	13	6	20	26	Good	Fair	N/A	Long	High	High	2.4	1.9	**Retain**	Yes	Partially suppressed.
11	*Eucalyptus moluccana*	Grey Box	Semi mature	1	Commercial	10	8	34	42	Fair	Fair	N/A	Medium	High	Moderate	4.1	2.3	**Retain**	Yes	Partially suppressed. Stem bifurcates at 0.5 metres. Canopy with minor signs of dieback.
12	*Eucalyptus moluccana*	Grey Box	Semi mature	1	Commercial	8	5	21	32	Good	Fair	N/A	Long	High	High	2.5	2.1	**Retain**	Yes	Partially suppressed.
13	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	18	10	44	59	Good	Good	N/A	Long	High	High	5.3	2.7	**Retain**	Yes	Large tree of indigneous species significance observed to be be in good condition.
14	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	17	10	40	50	Good	Good	N/A	Long	High	High	4.8	2.5	**Retain**	Yes	Large tree of indigneous species significance observed to be be in good condition.
15	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	14	8	53	59	Good	Good	N/A	Medium	High	High	6.4	2.7	**Remove**	Yes	Maturing tree of indigenous species significance in narrow garden within carpark. Root growth has displaced kerb, gutter and asphalt carpark.
16	*Eucalyptus moluccana*	Grey Box	Semi mature	1	Commercial	11	4	16	21	Good	Good	N/A	Long	High	High	2.0	1.7	**Remove**	Yes	Maturing tree of indigenous species significance in narrow garden within carpark. Root growth has displaced kerb and gutter
17	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	14	8	33	37	Good	Fair	N/A	Medium	High	High	4.0	2.2	**Remove**	Yes	Maturing tree of indigenous species significance in narrow garden within carpark. Root growth has displaced kerb, gutter and asphalt carpark. Stem bifurcates at 2 metres. No signs of Union weakness.
18	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	13	8	39	43	Good	Fair	N/A	Medium	High	High	4.7	2.3	**Remove**	Yes	Maturing tree of indigenous species significance in narrow garden within carpark. Root growth has displaced kerb, gutter and asphalt carpark. Stem bifurcates at 5 metres. Union with signs of bark inclusion.
19	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	18	14	61	72	Good	Fair	N/A	Medium	High	High	7.3	2.9	**Retain**	Yes	Large tree of indigenous species significance in narrow garden within carpark. Root growth has displaced kerb and gutter. Canopy with minor dieback.
20	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 5	15	8	44	48	Good	Fair	N/A	Long	High	High	5.3	2.4	**Remove**	Yes	Large specimen of indigenous species significance in narrow garden on southern side of carpark within southern site boundary. Root growth has displaced kerb and gutter. Existing footpath within TPZ.
21	*Jacaranda mimosifolia*	Jacaranda	Mature	1	Outside	8	6	26	30	Good	Fair	N/A	Medium	High	Moderate	3.1	2.0	**Retain**	Yes	Smaller tree positioned outside southern boundary. Stem trifurcates at ground level. Suppressed.
22	*Acacia salicina*	Broughton Willow	Semi mature	1	Outside	3	3	6	9	Fair	Poor	N/A	Short	High	Moderate	2.0	1.2	**Retain**	No	Small, suppressed tree positioned outside southern site boundary. Stem with obvious easterly orientation.
23	*Eucalyptus sp.*	Gum	Semi mature	1	Outside	9	4	15	17	Fair	Poor	N/A	Short	High	Moderate	2.0	1.6	**Retain**	Yes	Suppressed tree positioned outside southern boundary. Stem with easterly orientation. Canopy with major dieback.
24	*Acacia salicina*	Broughton Willow	Mature	3	Outside	4	3	10	12	Fair	Fair	N/A	Medium	High	Moderate	2.0	1.4	**Retain**	No	GROUP of 3 closely positioned specimens of the same size and species positioned outside southern site boundary. Suppressed.
25	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	15	12	35	40	Good	Good	N/A	Long	High	High	4.2	2.3	**Retain**	Yes	Large tree of indigenous species value positioned outside southern site boundary.
26	*Callistemon rugulosus*	Scarlet Bottlebrush	Semi mature	1	Outside	3	2	10	15	Poor	Fair	N/A	Short	High	Moderate	2.0	1.5	**Retain**	No	Small tree positions outside southern boundary in suppressed position. Canopy with signs of dieback.
27	*Callistemon rugulosus*	Scarlet Bottlebrush	Semi mature	1	Outside	4	4	15	25	Poor	Fair	N/A	Short	High	Moderate	2.0	1.8	**Retain**	No	Small tree positions outside southern boundary in suppressed position. Canopy with minor signs of dieback.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
28	*Angophora floribunda*	Rough Barked Apple	Semi mature	1	Stage 5	12	3	13	16	Poor	Fair	N/A	Negligible	High	Low	2.0	1.5	**Remove**	Yes	Tree of indigenous species significance positioned within narrow garden within southern boundary. Canopy with signs of severe dieback.
29	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	11	5	20	25	Fair	Good	N/A	Long	High	High	2.4	1.8	**Retain**	Yes	Maturing tree of indigenous species significance positioned outside the southern site boundary. Canopy with minor signs of dieback.
30	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	14	10	32	40	Fair	Fair	N/A	Long	High	High	3.8	2.3	**Retain**	Yes	Maturing tree of indigenous species significance positioned outside the southern site boundary. Canopy with minor signs of dieback. Stem bifurcates at ground level.
31	*Callistemon rugulosus*	Scarlet Bottlebrush	Semi mature	1	Outside	3	2	10	15	Poor	Fair	N/A	Short	High	Moderate	2.0	1.5	**Retain**	No	Small tree positions outside southern boundary in suppressed position. Canopy with signs of dieback.
32	*Acacia salicina*	Broughton Willow	Semi mature	1	Outside	3	2	10	15	Poor	Fair	N/A	Short	High	Moderate	2.0	1.5	**Retain**	No	Small, suppressed tree positioned outside the southern site boundary.
33	*Callistemon viminalis*	Weeping Bottle Brush	Semi mature	1	Outside	3	3	15	20	Poor	Fair	N/A	Short	High	Moderate	2.0	1.7	**Retain**	No	Small tree positions outside southern boundary in suppressed position. Canopy with minor signs of dieback.
34	*Callistemon rugulosus*	Scarlet Bottlebrush	Semi mature	1	Outside	3	3	15	20	Good	Fair	N/A	Medium	High	Moderate	2.0	1.7	**Retain**	No	Small tree positions outside southern boundary in suppressed position.
35	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	15	10	35	45	Fair	Fair	N/A	Long	High	High	4.2	2.4	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
36	*Angophora floribunda*	Rough Barked Apple	Semi mature	1	Stage 5	4	2	7	10	Good	Fair	N/A	Medium	Low	Moderate	2.0	1.3	**Remove**	No	Small tree of indigenous species significance in suppressed position. Suitable for replacement if required.
37	*Acacia salicina*	Broughton Willow	Semi mature	1	Outside	3	2	5	7	Good	Fair	N/A	Medium	High	Moderate	2.0	1.1	**Retain**	No	Small tree in suppressed position outside southern boundary.
38	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	15	10	35	45	Fair	Fair	N/A	Long	High	High	4.2	2.4	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
39	*Callistemon rugulosus*	Scarlet Bottlebrush	Semi mature	1	Outside	2	3	5	10	Dead	Poor	N/A	Dead	High	Very Low	2.0	1.3	**Retain**	No	Small dead tree positioned outside southern boundary.
40	*Acacia salicina*	Broughton Willow	Semi mature	1	Outside	4	2	5	7	Good	Fair	N/A	Medium	High	Moderate	2.0	1.1	**Retain**	No	Small tree in suppressed position outside southern boundary.
41	*Grevillea sp.*	Grevillea	Semi mature	1	Outside	2	2	5	7	Good	Fair	N/A	Medium	Moderate	Moderate	2.0	1.1	**Retain**	No	Small tree in suppressed position outside southern boundary.
42	*Eucalyptus moluccana*	Grey Box	Mature	1	Outside	15	10	35	45	Fair	Fair	N/A	Long	High	High	4.2	2.4	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
43	*Eucalyptus moluccana*	Grey Box	Mature	1	Outside	16	10	40	45	Fair	Fair	N/A	Long	High	High	4.8	2.4	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
44	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Outside	18	12	49	60	Good	Poor	Hollow	Medium	High	Moderate	5.9	2.7	**Retain**	Yes	Large tree of native species significance positioned outside the southern site boundary. Decayed wound with hollowing on southern side of stem at 6 metres.
45	*Acacia binervia*	Coast Myall	Mature	1	Outside	3	4	15	20	Good	Fair	N/A	Medium	High	Moderate	2.0	1.7	**Retain**	No	Smaller tree in suppressed position outside southern site boundary.
46	*Eucalyptus moluccana*	Grey Box	Mature	1	Outside	16	10	42	45	Fair	Fair	N/A	Long	High	High	5.1	2.4	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
47	*Eucalyptus moluccana*	Grey Box	Mature	1	Outside	17	6	20	25	Fair	Fair	N/A	Long	High	High	2.4	1.8	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
48	*Eucalyptus moluccana*	Grey Box	Mature	1	Outside	16	12	36	45	Good	Fair	N/A	Long	High	High	4.3	2.4	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
49	*Eucalyptus moluccana*	Grey Box	Mature	1	Outside	16	7	30	40	Good	Fair	N/A	Long	High	High	3.6	2.3	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
50	*Eucalyptus moluccana*	Grey Box	Mature	1	Outside	17	10	46	50	Good	Fair	N/A	Long	High	High	5.5	2.5	**Retain**	Yes	Large tree of indigenous species significance positioned outside the southern site boundary.
51	*Eucalyptus moluccana*	Grey Box	Semi mature	1	Outside	7	4	15	20	Good	Fair	N/A	Long	High	High	2.0	1.7	**Retain**	Yes	Maturing tree of native species significance positioned outside the southern site boundary. Partially suppressed.
52	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 5	10	5	20	23	Fair	Good	N/A	Medium	High	Moderate	2.4	1.8	**Remove**	Yes	Maturing tree with signs of dieback. Canopy chlorotic.
53	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 5	15	6	25	34	Good	Good	N/A	Long	High	High	3.0	2.1	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
54	*Corymbia citriodora*	Lemon-scented Gum	Semi mature	1	Stage 5	12	7	16	23	Good	Good	N/A	Long	High	High	2.0	1.8	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
55	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 5	13	5	18	24	Fair	Good	N/A	Medium	High	Moderate	2.2	1.8	**Remove**	Yes	Maturing tree with minor signs of dieback. Canopy chlorotic.
56	*Eucalyptus moluccana*	Grey Box	Semi mature	1	Commercial	19	16	76	88	Good	Good	N/A	Long	High	High	9.1	3.1	**Remove**	Yes	Large tree of indigenous species significance positioned close to edge of existing garden. Root growth has displaced adjacent kerb and gutter.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
57	*Eucalyptus moluccana*	Grey Box	Young	1	Commercial	8	2	7	9	Good	Good	N/A	Long	Moderate	Moderate	2.0	1.2	**Retain**	Yes	Young tree in good condition.
58	*Eucalyptus fibrosa*	Broad-leaved Red Ironbark	Young	1	Commercial	5	1		5	Good	Good	N/A	Long	Moderate	Moderate		0.9	**Retain**	Yes	Young tree of indigenous species value in good condition.
59	*Eucalyptus fibrosa*	Broad-leaved Red Ironbark	Young	1	Commercial	5	2	4	5	Good	Good	N/A	Long	Moderate	Moderate	2.0	0.9	**Retain**	Yes	Young tree of indigenous species value in good condition.
60	*Eucalyptus tereticornis*	Forest Red Gum	Young	1	Commercial	7	2	4	6	Good	Good	N/A	Long	Moderate	Moderate	2.0	1.0	**Retain**	Yes	Young tree of indigenous species value in good condition.
61	*Eucalyptus moluccana*	Grey Box	Young	1	Commercial	5	2	4	5	Fair	Good	N/A	Medium	Moderate	Moderate	2.0	0.9	**Retain**	Yes	Minor dieback. Canopy with sooty mould.
62	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	18	10	56	69	Good	Fair	N/A	Long	High	High	6.7	2.8	**Retain**	Yes	Large tree of indigenous species significance positioned 3.5 metres from edge of existing driveway. Narrow column of tissue necrosis on northern side of lower stem. Good response growth along wound margin.
63	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	17	12	61	82	Good	Good	N/A	Long	High	High	7.3	3.0	**Retain**	Yes	Large tree of indigneous species significance observed to be be in good condition.
64	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	16	7	34	42	Good	Fair	N/A	Long	High	High	4.1	2.3	**Retain**	Yes	Partially suppressed.
65	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	18	14	57	42	Good	Fair	N/A	Long	High	High	6.9	2.3	**Retain**	Yes	Stem bifurcates at 1 metre. No signs of union weakness.
66	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	18	14	87	95	Good	Fair	Hollow	Medium	High	High	10.5	3.2	**Retain**	Yes	Large specimen of indigenous species significance. Stem trifurcates at ground level. No signs of union weakness. Hollowing in wound on eastern stem from previous lightning strike.
67	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	18	10	47	66	Good	Fair	N/A	Medium	High	High	5.6	2.8	**Retain**	Yes	Partially suppressed.
68	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	15	12	34	42	Good	Fair	N/A	Medium	High	High	4.1	2.3	**Retain**	Yes	Partially suppressed. Tissue necrosis and decay in narrow wound in northern side of lower stem. Good response growth along wound margin.
69	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	13	7	23	27	Fair	Fair	N/A	Medium	High	High	2.8	1.9	**Retain**	Yes	Canopy with minor dieback. Suppressed by adjacent tree.
70	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	19	16	62	79	Fair	Fair	N/A	Medium	High	High	7.4	3.0	**Retain**	Yes	Canopy with minor signs of dieback. Stem bifurcates at 8 metres. Union with signs of bark inclusion.
71	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	16	10	34	46	Good	Good	N/A	Long	High	High	4.1	2.4	**Retain**	Yes	Large tree of native species value observed to be in good condition.
72	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	17	9	40	58	Good	Fair	N/A	Long	High	High	4.8	2.6	**Retain**	Yes	Partially suppressed. Stem with slight northerly orientation.
73	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	15	14	46	50	Good	Fair	N/A	Long	High	High	5.5	2.5	**Retain**	Yes	Suppressed. Stem with northerly orientation and canopy with asymmetric form.
74	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	16	8	36	46	Good	Fair	N/A	Medium	High	High	4.3	2.4	**Retain**	Yes	Stem bifurcates at 7 metres. Union with signs of bark inclusion. Canopy with hazardous deadwood.
75	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	16	8	39	44	Good	Fair	N/A	Medium	High	High	4.7	2.3	**Retain**	Yes	Partially suppressed.
76	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	16	14	54	72	Good	Fair	N/A	Medium	High	High	6.5	2.9	**Retain**	Yes	Partially suppressed. Stem with northerly orientation and canopy with asymmetric form. Stem bifurcates are 8 metres. Union with tissue necrosis in wound from bird damage.
77	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	21	14	81	103	Good	Fair	N/A	Medium	High	High	9.7	3.4	**Retain**	Yes	Large tree of indigenous species significance. Tissue necrosis and decay in small wound in southern side of lower stem. Good response growth around wound. Tissue necrosis in bird damage wounds within codominant canopy unions. Canopy with hazardous deadwood.
78	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	15	12	51	72	Good	Poor	Hollow	Medium	High	High	6.1	2.9	**Retain**	Yes	Partially suppressed. Narrow wound on northern side of stem, possibly from lightning strike. Wound fully occluded. Larger wound on western side of stem at 8 metres with significant decay and hollowing.
79	*Eucalyptus tereticornis*	Forest Red Gum	Young	1	Commercial	4	2	4	5	Good	Good	N/A	Long	Moderate	Moderate	2.0	0.9	**Retain**	Yes	Young tree of indigenous species value in good condition.
80	*Pyrus calleryana*	Callery Pear	Semi mature	1	Stage 5	4	3	6	7	Good	Fair	N/A	Long	Low	Low	2.0	1.1	**Remove**	No	Small tree of low species significance.
81	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	14	12	49	56	Good	Fair	N/A	Medium	High	High	5.9	2.6	**Retain**	Yes	Partially suppressed. Stem with northerly orientation. Stem bifurcates at 2 metres. No signs of union weakness.
82	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	17	12	43	51	Good	Fair	N/A	Long	High	High	5.2	2.5	**Retain**	Yes	Partially suppressed.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
83	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	19	16	81	94	Good	Good	N/A	Long	High	High	9.7	3.2	**Retain**	Yes	Large tree of indigneous species significance observed to be be in good condition.
84	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	20	16	86	99	Poor	Poor	N/A	Short	High	Moderate	10.3	3.3	**Retain**	Yes	Large tree of indigenous species significance with signs of dieback. Large sounds on lower stem with tissue necrosis and decay. Signs of internal stem decay. Canopy with extensive hazardous deadwood.
85	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	21	13	51	67	Good	Fair	N/A	Long	High	High	6.1	2.8	**Remove**	Yes	Large tree if indigenous species significance in good condition. Wound in upper canopy with signs of tissue necrosis and decay.
86	*Pyrus calleryana*	Callery Pear	Semi mature	1	Commercial	5	4	14	20	Good	Fair	N/A	Long	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.
87	*Pyrus calleryana*	Callery Pear	Semi mature	1	Commercial	5	4	20	24	Good	Fair	N/A	Long	Low	Low	2.4	1.8	**Remove**	Yes	Small tree of reduced species value.
88	*Pyrus calleryana*	Callery Pear	Semi mature	1	Commercial	5	4	15	18	Good	Fair	N/A	Long	Low	Low	2.0	1.6	**Remove**	Yes	Small tree of reduced species value.
89	*Pyrus calleryana*	Callery Pear	Semi mature	1	Commercial	5	4	15	18	Good	Fair	N/A	Long	Low	Low	2.0	1.6	**Remove**	Yes	Small tree of reduced species value.
90	*Pyrus calleryana*	Manchurian Pear	Semi mature	1	Stage 5	4	3	10	15	Good	Fair	N/A	Long	Low	Low	2.0	1.5	**Remove**	No	Small tree of reduced species value.
91	*Pyrus calleryana*	Callery Pear	Semi mature	1	Stage 5	4	2	5	6	Good	Fair	N/A	Long	Low	Low	2.0	1.0	**Remove**	No	Small tree of reduced species value.
92	*Pyrus calleryana*	Manchurian Pear	Semi mature	1	Stage 5	5	2	5	7	Good	Fair	N/A	Long	Low	Low	2.0	1.1	**Remove**	Yes	Small tree of reduced species value.
93	*Pyrus calleryana*	Manchurian Pear	Semi mature	1	Stage 5	5	2	5	7	Good	Fair	N/A	Long	Low	Low	2.0	1.1	**Remove**	Yes	Small tree of reduced species value.
94	*Pyrus calleryana*	Manchurian Pear	Semi mature	1	Stage 5	5	2	5	7	Good	Fair	N/A	Long	Low	Low	2.0	1.1	**Remove**	Yes	Small tree of reduced species value.
95	*Corymbia ficifolia*	Flowering Gum	Semi mature	1	Stage 5	3	3	12	20	Fair	Fair	N/A	Medium	Moderate	Moderate	2.0	1.7	**Remove**	No	Small tree. Canopy with signs of dieback.
96	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 5	5	5	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.
97	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 5	5	5	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.
98	*Pyrus calleryana*	Callery Pear	Mature	1	Stage 5	6	3	22	25	Good	Fair	N/A	Medium	Low	Low	2.6	1.8	**Remove**	Yes	Small tree of reduced species value.
99	*Pyrus calleryana*	Callery Pear	Mature	1	Stage 5	6	3	22	25	Good	Fair	N/A	Medium	Low	Low	2.6	1.8	**Remove**	Yes	Small tree of reduced species value.
100	*Pyrus calleryana*	Callery Pear	Mature	1	Stage 5	4	2		20	Good	Fair	N/A	Medium	Low	Low		1.7	**Remove**	No	Small tree of reduced species value.
101	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	15	14	61	82	Good	Fair	N/A	Medium	High	Moderate	7.3	3.0	**Remove**	Yes	Larger tree of native species value. Stem bifurcates at 0.5m and 1m. No signs of Union weakness. Positioned in narrow garden bed within carpark. Root growth has displaced adjacent kerb, gutter and asphalt. Confined root growth area underpinned shortened ULE estimate.
102	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 5	14	14	48	52	Good	Fair	N/A	Medium	High	Moderate	5.8	2.5	**Remove**	Yes	Larger tree of native species value. Positioned in narrow garden bed within carpark. Root growth has displaced adjacent kerb, gutter and asphalt. Confined root growth area underpinned shortened ULE estimate.
103	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 5	8	6	37	40	Good	Fair	N/A	Medium	Low	Low	4.4	2.3	**Remove**	Yes	Larger tree of reduced species value. Becomes multistemmed at 0.5 metres. No signs of Union weakness. Positioned in narrow garden bed within carpark. Confined root growth area underpinned shortened ULE estimate.
104	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 5	8	6	30	45	Good	Fair	N/A	Medium	Low	Low	3.6	2.4	**Remove**	Yes	Larger tree of reduced species value. Becomes multistemmed at 1 metre. No signs of Union weakness. Positioned in narrow garden bed within carpark. Confined root growth area underpinned shortened ULE estimate.
105	*Lophostemon confertus*	Queensland Brush Box	Mature	12	Stage 5	10	5	20	25	Good	Poor	N/A	Medium	High	Moderate	2.4	1.8	**Remove**	Yes	GROUP of 12 closely positioned trees of the same size and species. Trees are within narrow garden in western side of existing building. Stems are less than 3 metres from western wall of building. Canopies have been lopped previously at 8 metres height. Poor canopy structure and confined position underpinned treesâ€™ shortened ULE estimates.
106	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 5	6	6	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
107	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 5	5	4	10	13	Good	Fair	N/A	Medium	Low	Low	2.0	1.4	**Remove**	Yes	Small tree of reduced species value.
108	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	18	14	52	67	Fair	Poor	N/A	Medium	High	High	6.2	2.8	**Remove**	Yes	Large tree of indigenous species significance positioned within narrow garden bed in carpark. Canopy with minor signs of dieback. Two fungal fruiting bodies on eastern side of lower stem.
109	*Pyrus calleryana*	Manchurian Pear	Mature	1	Commercial	4	3	10	13	Good	Fair	N/A	Medium	Low	Low	2.0	1.4	**Remove**	No	Small tree of reduced species value.
110	*Pyrus calleryana*	Manchurian Pear	Mature	1	Commercial	6	6	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.
111	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	19	12	36	41	Fair	Fair	N/A	Medium	High	Moderate	4.3	2.3	**Remove**	Yes	Larger tree of reduced species value. Stem bifurcates at 6 metres metres. No signs of union weakness. Stem positioned 0.5 metres from edge of garden bed within carpark. Confined root growth area underpinned shortened ULE estimate.
112	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Commercial	23	12	75	79	Good	Good	N/A	Long	High	High	9.0	3.0	**Remove**	Yes	Larger tree of reduced species value observed to be in good condition.
113	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Commercial	21	13	77	84	Good	Fair	N/A	Long	High	High	9.2	3.1	**Remove**	Yes	Larger tree of reduced species value observed to be in mostly good condition. Partially suppressed
114	*Cedrus deodara*	Deodar Cedar	Mature	1	Stage 5	8	6	27	31	Good	Good	N/A	Long	High	High	3.2	2.0	**Remove**	Yes	Maturing tree of reduced species significance in suppressed position
115	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 5	13	12	78	76	Fair	Fair	N/A	Medium	High	High	9.4	2.9	**Remove**	Yes	Larger tree of indigenous species value. Canopy with signs of dieback. Bulging on lower stem.
116	*Lophostemon confertus*	Queensland Brush Box	Mature	1	Stage 5	10	7	27	31	Poor	Good	N/A	Medium	High	Moderate	3.2	2.0	**Remove**	Yes	Dieback.
117	*Eucalyptus scoparia*	Wallangarra Gum	Mature	1	Stage 5	9	6	24	29	Fair	Fair	N/A	Medium	High	Moderate	2.9	2.0	**Remove**	No	Larger tree of native species value positioned within narrow garden on southern side of carpark. Canopy with minor signs of dieback.
118	*Eucalyptus scoparia*	Wallangarra Gum	Mature	1	Stage 5	11	10	38	49	Fair	Fair	N/A	Medium	High	Moderate	4.6	2.5	**Remove**	No	Larger tree of native species value positioned within narrow garden on southern side of carpark. Canopy with minor signs of dieback.
119	*Eucalyptus scoparia*	Wallangarra Gum	Mature	1	Stage 5	13	7	38	42	Fair	Fair	N/A	Medium	High	Moderate	4.6	2.3	**Remove**	No	Maturing tree of native species value. Canopy with signs of dieback.
120	*Eucalyptus scoparia*	Wallangarra Gum	Mature	1	Stage 5	13	9	36	43	Fair	Fair	N/A	Medium	High	Moderate	4.3	2.3	**Remove**	No	Larger tree of native species value positioned within narrow garden on southern side of carpark.
121	*Eucalyptus scoparia*	Wallangarra Gum	Semi mature	1	Stage 5	9	2	7	9	Dead	Poor	N/A	Dead	Moderate	Very Low	2.0	1.2	**Remove**	No	Small, suppressed tree. Canopy with signs of dieback.
122	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	14	40	44	Good	Good	N/A	Long	High	High	4.8	2.3	**Retain**	Yes	Large tree of native species value observed to be in good condition.
123	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	16	38	46	Good	Fair	N/A	Long	High	High	4.6	2.4	**Retain**	Yes	Partially suppressed. Laterally extended primary branches.
124	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	19	13	42	47	Good	Good	N/A	Long	High	High	5.0	2.4	**Retain**	Yes	Large tree of native species value observed to be in good condition.
125	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	14	41	48	Good	Good	N/A	Long	High	High	4.9	2.4	**Retain**	Yes	Large tree of native species value observed to be in good condition.
126	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	18	14	37	48	Good	Fair	N/A	Long	High	High	4.4	2.4	**Retain**	Yes	Partially suppressed.
127	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	16	40	43	Good	Fair	N/A	Long	High	High	4.8	2.3	**Retain**	Yes	Partially suppressed. Lowest primary branches laterally extended.
128	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 6	20	16	57	62	Good	Poor	Hollow	Short	High	Moderate	6.8	2.7	**Retain**	Yes	Large tree of native species value. Stem positioned 1 metre from northern tip she of carpark. Stem bifurcates at 3 metres. Union with significant decay and hollowing.
129	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	16	10	55	54	Good	Fair	N/A	Long	High	High	6.6	2.6	**Retain**	Yes	Stem bifurcates at 2 metres. No obvious signs of union weakness.
130	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	15	8	37	41	Good	Fair	N/A	Long	High	High	4.4	2.3	**Retain**	Yes	Partially suppressed.
131	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	17	8	38	52	Good	Fair	N/A	Long	High	High	4.6	2.5	**Retain**	Yes	Stem bifurcates at 9 metres. No obvious signs of union weakness.
132	*Eucalyptus microcorys*	Tallow Wood	Semi mature	1	Stage 6	9	1	16	20	Very poor	Poor	N/A	Negligible	High	High	2.0	1.7	**Retain**	Yes	Small suppressed tree. Canopy with signs of severe dieback.
133	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	16	6	28	32	Good	Fair	N/A	Long	High	High	3.4	2.1	**Retain**	Yes	Partially suppressed.
134	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	18	6	28	36	Good	Fair	N/A	Long	High	High	3.4	2.2	**Retain**	Yes	Maturing tree of native species value observed to be in mostly good condition.
135	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	18	10	41	49	Good	Fair	N/A	Long	High	High	4.9	2.5	**Retain**	Yes	Stem bifurcates at 4 metres. No obvious signs of union weakness.

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136	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	16	8	30	43	Good	Fair	N/A	Long	High	High	3.6	2.3	**Retain**	Yes	Partially suppressed.
137	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	18	8	38	45	Good	Good	N/A	Long	High	High	4.6	2.4	**Retain**	Yes	Maturing tree of native species value observed to be in mostly good condition.
138	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	17	7	34	41	Good	Fair	N/A	Long	High	High	4.1	2.3	**Retain**	Yes	Partially suppressed.
139	*Angophora costata*	Smooth-barked Apple Myrtle	Mature	1	Stage 6	13	12	43	49	Good	Fair	N/A	Long	High	High	5.2	2.5	**Retain**	Yes	Partially suppressed.
140	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	18	16	83	97	Good	Fair	N/A	Long	High	High	10.0	3.3	**Retain**	Yes	Stem trifurcates at 2 metres. No obvious signs of union weakness.
141	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	17	16	82	94	Good	Fair	N/A	Long	High	High	9.8	3.2	**Retain**	Yes	Stem bifurcates at 4 metres. No obvious signs of union weakness.
142	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	17	10	42	53	Good	Fair	N/A	Long	High	High	5.0	2.5	**Retain**	Yes	Partially suppressed.
143	*Stenocarpus sinuatus*	Firewheel Tree	Mature	1	Stage 6	8	4	21	23	Good	Poor	Hollow	Medium	Moderate	Moderate	2.5	1.8	**Retain**	Yes	Suppressed. Stem bifurcates at 1 metre. Codominant union with decay and hollowing.
144	*Stenocarpus sinuatus*	Firewheel Tree	Mature	1	Stage 6	7	4	14	18	Good	Good	N/A	Long	Moderate	Moderate	2.0	1.6	**Retain**	Yes	Maturing tree of native species value observed to be in mostly good condition.
145	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	19	8	43	52	Good	Good	N/A	Long	High	High	5.2	2.5	**Retain**	Yes	Large tree of native species value observed to be in good condition.
146	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	17	10	40	50	Good	Good	N/A	Long	High	High	4.8	2.5	**Retain**	Yes	Large tree of native species value observed to be in good condition.
147	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	16	7	34	39	Good	Fair	N/A	Long	High	High	4.1	2.2	**Retain**	Yes	Partially suppressed.
148	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	18	8	33	40	Good	Fair	N/A	Long	High	High	4.0	2.3	**Retain**	Yes	Stem bifurcates at 12 metres. Union with signs of bark inclusion. Common for species. Not a major concern.
149	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	17	10	36	42	Good	Fair	N/A	Long	High	High	4.3	2.3	**Remove**	Yes	Partially suppressed.
150	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	18	14	42	57	Good	Good	N/A	Long	High	High	5.0	2.6	**Remove**	Yes	Large tree of native species value observed to be in good condition.
151	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	7	6	40	44	Fair	Fair	N/A	Medium	High	Moderate	4.8	2.3	**Remove**	Yes	Medium - sized tree of native species significance. Stem bifurcates at 1 metre. No signs of union weakness. Canopy with minor signs of dieback
152	*Cinnamomum camphora*	Camphor Laurel	Mature	1	Stage 6	8	8	48	45	Good	Fair	N/A	Medium	Low	Low	5.8	2.4	**Remove**	No	Maturing tree of low species significance.
153	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	18	14	57	66	Good	Fair	N/A	Long	High	High	6.8	2.8	**Remove**	Yes	Stem bifurcates at 1.2 metres. No obvious signs of union weakness. Partially suppressed.
154	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	17	12	34	46	Good	Good	N/A	Long	High	High	4.1	2.4	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
155	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 6	16	12	39	54	Good	Good	N/A	Long	High	High	4.7	2.6	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
156	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Mature	1	Outside	13	12	74	88	Good	Fair	N/A	Long	High	High	8.9	3.1	**Retain**	Yes	Large tree of native species value positioned outside the north-western boundary within the neighbouring park.
157	*Cinnamomum camphora*	Camphor Laurel	Semi mature	1	Outside	6	4	22	38	Poor	Poor	N/A	Medium	Low	Low	2.7	2.2	**Retain**	Yes	Small tree of low species significance positioned outside the north-western boundary within the neighbouring property. Canopy with signs of major dieback.
158	*Cinnamomum camphora*	Camphor Laurel	Mature	1	Outside	8	8	78	110	Fair	Fair	N/A	Medium	Low	Low	9.4	3.4	**Retain**	Yes	Larger tree of low species significance positioned outside the north-western boundary within the neighbouring park. Canopy with minor signs of dieback.
159	*Cinnamomum camphora*	Camphor Laurel	Mature	1	Outside	8	8	56	65	Fair	Poor	N/A	Medium	Low	Low	6.7	2.8	**Retain**	Yes	Larger tree of low species significance positioned outside the north-western boundary within the neighbouring park. Canopy with minor signs of dieback. Mature basal shoots surround primary stem.
160	*Stenocarpus sinuatus*	Firewheel Tree	Mature	1	Stage 6	7	5	23	35	Good	Fair	N/A	Long	Moderate	Moderate	2.8	2.1	**Remove**	Yes	Stem trifurcates at ground level.
161	*Stenocarpus sinuatus*	Firewheel Tree	Semi mature	1	Stage 6	4	4	14	18	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.6	**Remove**	No	Stem bifurcates at ground level. Small tree.
162	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 6	16	10	46	51	Good	Fair	N/A	Medium	High	High	5.5	2.5	**Remove**	Yes	Stem bifurcates at 2 metres. No obvious signs of union weakness.
163	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 6	17	7	43	49	Fair	Poor	N/A	Short	High	Moderate	5.2	2.5	**Remove**	Yes	Larger tree of indigenous species significance. Northern stem has died and been removed. Canopy now poorly structured. Column of tissue necrosis with early signs of decay in lower stem. Canopy with signs of dieback.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
164	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 6	17	10	42	46	Good	Good	N/A	Long	High	High	5.0	2.4	**Remove**	Yes	Large tree of native species value observed to be in good condition.
165	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 6	17	8	32	38	Very poor	Poor	N/A	Negligible	High	Low	3.8	2.2	**Remove**	Yes	Canopy with signs of major dieback. Cluster of mushroom fungal fruiting bodies at base likely to be Armillaria luteobubalina.
166	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 6	17	8	32	35	Very poor	Poor	N/A	Negligible	High	Low	3.8	2.1	**Remove**	Yes	Tree with signs of severe dieback. Canopy with asymmetric form due to suppression.
167	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 6	11	7	34	39	Good	Fair	N/A	Long	High	High	4.1	2.2	**Remove**	Yes	Partially suppressed
168	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 6	18	12	61	82	Good	Poor	N/A	Medium	High	Moderate	7.3	3.0	**Remove**	Yes	Large tree of native species value. Large wound on northern side of lower stem with necrosis and early signs of decay. Large necrotic canker wounds within structural canopy.
169	*Eucalyptus sideroxylon*	Red Ironbark	Over mature	1	Stage 6	15	8	28	35	Dead	Poor	Potential Hollow	Dead	High	Very Low	3.4	2.1	**Remove**	No	Large dead tree.
170	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 6	22	20	96	114	Good	Fair	N/A	Long	High	High	11.5	3.5	**Remove**	Yes	Large tree of indigenous species significance. Stem bifurcates at 5 and 6 metres. Unions with signs of bark inclusion. Wound on lower northern canopy from previous branch failure.
171	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 6	23	15	52	64	Good	Fair	N/A	Long	High	High	6.2	2.7	**Remove**	Yes	A large tree of indigenous species significance. Stem bifurcates at 6 metres. Union with signs of bark inclusion.
172	*Eucalyptus racemosa*	Narrow-leaved Scribbly Gum	Mature	1	Stage 6	14	8	33	39	Good	Good	N/A	Long	High	High	4.0	2.2	**Remove**	Yes	Larger tree of native species value observed to be in good condition.
173	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	14	9	46	53	Good	Good	N/A	Long	High	High	5.5	2.5	**Remove**	Yes	Large tree of native species value observed to be in good condition.
174	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	15	10	44	65	Fair	Good	N/A	Long	High	High	5.3	2.8	**Remove**	Yes	Minor dieback.
175	*Corymbia citriodora*	Lemon-scented Gum	Semi mature	1	Stage 6	15	6	18	22	Good	Good	N/A	Long	High	High	2.2	1.8	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
176	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	16	8	38	55	Fair	Poor	N/A	Medium	High	Moderate	4.6	2.6	**Remove**	Yes	Dieback.
177	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	12	39	50	Good	Fair	N/A	Long	High	High	4.7	2.5	**Remove**	Yes	Partially suppressed. Hanger in upper canopy.
178	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 6	23	14	53	65	Good	Fair	Hollow	Long	High	High	6.4	2.8	**Remove**	Yes	Large tree of native species value. Tissue necrosis in bird damage wounds within canopy. Early signs of decay and hollowing.
179	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	23	12	52	67	Good	Good	N/A	Long	High	High	6.2	2.8	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
180	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	19	16	57	62	Good	Fair	N/A	Long	High	High	6.8	2.7	**Remove**	Yes	Stem bifurcates at 3 metres. No signs of union weakness.
181	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	20	12	23	35	Good	Good	N/A	Long	High	High	2.8	2.1	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
182	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	5	18	23	Good	Fair	N/A	Medium	High	Moderate	2.2	1.8	**Remove**	Yes	Suppressed.
183	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 5	18	16	44	56	Good	Fair	N/A	Long	High	High	5.3	2.6	**Remove**	Yes	Stem bifurcates at 8 metres. No signs of union weakness. Hanger in codominant union
184	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	17	16	46	53	Good	Fair	N/A	Long	High	High	5.5	2.5	**Remove**	Yes	Partially suppressed. canopy with wounds from previous failures. Small hangers in upper canopy.
185	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	12	5	16	19	Poor	Poor	N/A	Negligible	High	Low	2.0	1.6	**Remove**	Yes	Suppressed. Dieback.
186	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	16	14	48	61	Good	Poor	N/A	Short	High	Moderate	5.8	2.7	**Remove**	Yes	Suppressed. Minor dieback.
187	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 6	21	14	60	82	Fair	Poor	N/A	Short	High	Moderate	7.2	3.0	**Remove**	Yes	Dieback. Large wound on western side of stem at 8 metres height. Extensive tissue necrosis and decay around wound.
188	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	16	10	48	60	Good	Poor	N/A	Medium	High	Moderate	5.8	2.7	**Remove**	Yes	Stem with northerly orientation. Tissue necrosis and decay surround large pruning wound on stem at 6 metres height.
189	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	14	47	58	Good	Good	N/A	Long	High	High	5.6	2.6	**Remove**	Yes	Large tree of native species value observed to be in good condition.
190	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	21	13	35	46	Good	Good	N/A	Long	High	High	4.2	2.4	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
191	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	21	16	58	62	Good	Good	N/A	Long	High	High	7.0	2.7	**Remove**	Yes	Large tree of native species value observed to be in good condition.
192	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	8	28	39	Good	Fair	N/A	Long	High	High	3.4	2.2	**Remove**	Yes	Partially suppressed.
193	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	20	14	52	62	Good	Good	N/A	Long	High	High	6.2	2.7	**Remove**	Yes	Large tree of native species value observed to be in good condition.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
194	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	18	10	32	37	Good	Good	N/A	Long	High	High	3.8	2.2	**Remove**	Yes	Partially suppressed.
195	*Syzygium australe*	Brush Cherry	Mature	11	Stage 6	9	4	25	35	Fair	Fair	N/A	Medium	Moderate	Moderate	3.0	2.1	**Remove**	Yes	GROUP of 11 closely positioned Syzygium australe (7) and Syzygium leuhmanii (4) specimens in a narrow garden area. Stems are within 2 metres of an existing buildings. Canopies have been lopped previously at 6 metres height.
196	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 6	22	17	83	97	Good	Fair	N/A	Long	High	High	10.0	3.3	**Remove**	Yes	Large tree of native species value positioned within confined garden area. Tissue necrosis observed in small bird damage wound within codominant canopy union.
197	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	22	15	59	73	Good	Fair	N/A	Long	High	High	7.1	2.9	**Remove**	Yes	Large tree of native species value observed to be in good condition.
198	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	18	12	52	60	Good	Fair	N/A	Long	High	High	6.2	2.7	**Remove**	Yes	Partially suppressed. Stem bifurcates at 1.5 metres. No signs of union weakness.
199	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	15	12	47	59	Good	Good	N/A	Long	High	High	5.6	2.7	**Remove**	Yes	Large tree of native species value observed to be in good condition.
200	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 6	17	14	66	68	Fair	Fair	N/A	Long	High	High	8.0	2.8	**Remove**	Yes	Minor dieback. Stem bifurcated at 1 metre. No obvious signs of union weakness. Partially suppressed.
201	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	20	16	38	52	Fair	Fair	N/A	Long	High	High	4.6	2.5	**Remove**	Yes	Minor dieback. Stem bifurcated at 5 metres. No obvious signs of union weakness
202	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	20	8	20	24	Good	Good	N/A	Long	High	High	2.4	1.8	**Remove**	Yes	Maturing tree in good condition.
203	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	20	9	24	31	Good	Fair	N/A	Long	High	High	2.9	2.0	**Remove**	Yes	Partially suppressed.
204	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	20	8	31	38	Good	Good	N/A	Long	High	High	3.7	2.2	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
205	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	23	14	48	64	Good	Good	N/A	Long	High	High	5.8	2.7	**Remove**	Yes	Cluster of mushroom fungal fruiting bodies at base. May by Armillaria luteobubalina. Canopy shows no signs of dieback. Tree should be reassessed within 6 months..
206	*Eucalyptus scoparia*	Wallangarra Gum	Mature	1	Stage 6	13	8	22	29	Fair	Fair	N/A	Medium	Moderate	Moderate	2.6	2.0	**Remove**	No	Maturing tree of native species value. Canopy with signs of dieback.
207	*Melaleuca linariifolia*	Snow in Summer	Mature	1	Outside	10	8	74	81	Good	Fair	N/A	Long	High	High	8.9	3.0	**Retain**	Yes	Larger tree of native species value positioned outside the north-western boundary within the neighbouring park. Stem bifurcates at base.
208	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	12	9	34	43	Good	Fair	N/A	Long	High	High	4.1	2.3	**Retain**	Yes	Maturing tree of native species value observed to be in mostly good condition.
209	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	13	10	34	43	Fair	Fair	N/A	Medium	High	Moderate	4.1	2.3	**Retain**	Yes	Canopy with signs of dieback. Stem bifurcates at 3 metres. No obvious signs of Union weakness.
210	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 6	20	15	54	62	Good	Good	N/A	Long	High	High	6.5	2.7	**Retain**	Yes	Large tree of native species value observed to be in good condition.
211	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 6	14	8	46	59	Good	Fair	N/A	Long	High	High	5.5	2.7	**Retain**	Yes	Partially suppressed.
212	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Outside	15	14	65	70	Good	Fair	N/A	Long	High	High	7.8	2.8	**Retain**	Yes	Larger tree of native species value positioned outside the north-western boundary within the neighbouring park. Becomes multi-stemmed at 1.2 metres. No obvious signs of union weakness
213	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	7	5	25	30	Fair	Fair	N/A	Long	High	Moderate	3.0	2.0	**Retain**	Yes	Minor dieback. Partially suppressed.
214	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	13	8	41	47	Good	Good	N/A	Long	High	High	4.9	2.4	**Remove**	Yes	Large tree of native species value observed to be in good condition.
215	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	19	12	62	84	Good	Good	N/A	Long	High	High	7.4	3.1	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
216	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	17	9	47	63	Good	Fair	N/A	Long	High	High	5.6	2.7	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
217	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	19	10	50	64	Good	Good	N/A	Long	High	High	6.0	2.7	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
218	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	10	5	42	57	Fair	Fair	N/A	Medium	Low	Low	5.0	2.6	**Remove**	Yes	Partially suppressed.
219	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	8	5	46	52	Fair	Fair	N/A	Medium	Low	Low	5.5	2.5	**Remove**	Yes	Medium-sized tree of reduced species value.
220	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	8	5	31	38	Fair	Fair	N/A	Medium	Low	Low	3.7	2.2	**Remove**	Yes	Medium-sized tree of reduced species value.
221	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	8	6	39	56	Fair	Fair	N/A	Medium	Low	Low	4.7	2.6	**Remove**	Yes	Becomes multi-stemmed at 1.2 metres.

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222	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	10	8	47	54	Fair	Fair	N/A	Medium	Low	Low	5.6	2.6	**Remove**	Yes	Medium-sized tree of reduced species value.
223	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	13	10	45	50	Fair	Fair	N/A	Medium	Low	Low	5.4	2.5	**Remove**	Yes	Partially suppressed.
224	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	11	7	38	43	Fair	Fair	N/A	Medium	Low	Low	4.6	2.3	**Remove**	Yes	Partially suppressed.
225	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	9	7	23	34	Fair	Fair	N/A	Medium	Low	Low	2.8	2.1	**Remove**	Yes	Partially suppressed
226	*Triadica sebifera*	Chinese Tallow Tree	Mature	1	Stage 6	12	10	57	62	Fair	Fair	N/A	Medium	Low	Low	6.8	2.7	**Remove**	Yes	Medium-sized tree of reduced species value.
227	*Callistemon viminalis*	Weeping Bottle Brush	Mature	6	Stage 6	5	3	14	17	Good	Fair	N/A	Medium	Low	Low	2.0	1.6	**Remove**	Yes	GROUP of 6 closely positioned trees of the same size and species. Stems are between 1.5 and 3.5 metres from adjacent building. Canopies are impacting gutter. Smaller size and poor position underpinned Low landscape significance.
228	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 6	14	9	37	43	Good	Fair	N/A	Long	High	High	4.4	2.3	**Remove**	Yes	Partially suppressed
229	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 6	18	12	58	73	Good	Fair	Hollow	Long	High	High	7.0	2.9	**Remove**	Yes	Tissue necrosis, decay and signs of hollowing in bird damage wound within codominant canopy unions.
230	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 6	14	7	38	52	Good	Good	N/A	Long	High	High	4.6	2.5	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
231	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	17	10	35	43	Good	Good	N/A	Long	High	High	4.2	2.3	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
232	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	17	9	38	48	Good	Fair	N/A	Long	High	High	4.6	2.4	**Remove**	Yes	Tree positioned in narrow garden on eastern side of carpark. Root growth has displaced adjacent footpath and asphalt.
233	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	15	10	53	62	Good	Fair	N/A	Long	High	High	6.4	2.7	**Remove**	Yes	Tree positioned in narrow garden on eastern side of carpark. Root growth has displaced adjacent footpath and asphalt.
234	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 6	14	14	62	80	Fair	Fair	N/A	Long	High	High	7.4	3.0	**Remove**	Yes	Becomes multi-stemmed at 4 metres. No obvious signs of union weakness. Canopy with laterally extended primary branches.
235	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	18	14	64	67	Good	Fair	N/A	Long	High	High	7.7	2.8	**Remove**	Yes	Stem bifurcates at 2 metres. Union with signs of bark inclusion.
236	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 6	18	10	30	39	Good	Good	N/A	Long	High	High	3.6	2.2	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
237	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Outside	19	18	67	82	Good	Fair	N/A	Long	High	High	8.0	3.0	**Retain**	Yes	Larger tree of native species value positioned outside the north-western boundary within the neighbouring park.
238	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	17	7	52	59	Fair	Fair	N/A	Long	High	High	6.2	2.7	**Retain**	Yes	Minor dieback. Partially suppressed.
239	*Eucalyptus melliodora*	Yellow Box	Mature	1	Outside	16	7	35	40	Fair	Fair	N/A	Long	High	High	4.2	2.3	**Retain**	Yes	Minor dieback. Partially suppressed.
240	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Outside	20	18	90	105	Good	Fair	Hollow	Long	High	High	10.8	3.4	**Retain**	Yes	Large tree positioned outside northern boundary in adjacent park. Tissue necrosis, decay and hollowing in bird damage wounds within canopy. Lower primary branches on southern canopy laterally extended over subject site.
241	*Eucalyptus robusta*	Swamp Mahogany	Mature	1	Outside	16	14	63	86	Good	Fair	N/A	Long	High	High	7.6	3.1	**Retain**	Yes	Larger tree of native species value positioned outside the north-western boundary within the neighbouring park. Stem trifurcates at 3 metres. No obvious signs of union weakness
242	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	18	10	41	48	Good	Good	N/A	Long	High	High	4.9	2.4	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
243	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	17	12	47	53	Fair	Fair	N/A	Long	High	High	5.6	2.5	**Remove**	Yes	Stem bifurcates at 2 metres. No signs of union weakness. Tissue necrosis in small wounds on southern side of lower stem. Good response growth around wound margin. Canopy with signs of minor dieback.
244	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	15	8	21	28	Good	Good	N/A	Long	High	High	2.5	1.9	**Remove**	Yes	Maturing tree observed to be in mostly good condition. Stem bifurcates at 2 metres. No obvious signs of union weakness. Partially suppressed
245	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	13	5	18	23	Good	Good	N/A	Long	High	High	2.2	1.8	**Remove**	Yes	Maturing tree observed to be in good condition.
246	*Callistemon viminalis*	Weeping Bottle Brush	Semi mature	9	Stage 6	4	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	GROUP of 9 closely positioned specimens of the same size and species in suppressed position. Small size of trees underpinned Low landscape significance rating.
247	*Callistemon viminalis*	Weeping Bottle Brush	Semi mature	25	Stage 6	4	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	GROUP of 25 closely positioned specimens of the same size and species in suppressed position adjacent to western boundary. Small size of trees underpinned Low landscape significance rating.

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248	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	17	12	61	63	Good	Fair	N/A	Long	High	High	7.3	2.7	**Remove**	Yes	Large tree of native species value. Stem bifurcates at 2 metres. No signs of union weakness.
249	*Eucalyptus fibrosa*	Broad-leaved Red Ironbark	Mature	1	Stage 6	16	9	42	47	Good	Fair	N/A	Long	High	High	5.0	2.4	**Remove**	Yes	Partially suppressed. Stem bifurcates at 2 metres. Union with signs of bark inclusion.
250	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	16	10	35	40	Good	Good	N/A	Long	High	High	4.2	2.3	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
251	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 6	17	11	46	51	Good	Fair	N/A	Long	High	High	5.5	2.5	**Remove**	Yes	Partially suppressed. Canopy wounds from previous branch failures
252	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	16	10	41	50	Good	Fair	N/A	Long	High	High	4.9	2.5	**Remove**	Yes	Partially suppressed. Stem with northerly orientation.
253	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	17	11	43	50	Good	Good	N/A	Long	High	High	5.2	2.5	**Remove**	Yes	Tree positioned within narrow garden within carpark. Root growth has displaced adjacent asphalt.
254	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 6	17	12	45	57	Good	Good	N/A	Long	High	High	5.4	2.6	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
255	*Callistemon viminalis*	Weeping Bottle Brush	Semi mature	12	Stage 6	4	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	GROUP of 12 closely positioned specimens of the same size and species in suppressed position along northern edge of carpark. Small size of trees underpinned Low landscape significance rating.
256	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	13	7	29	40	Good	Good	N/A	Long	High	High	3.5	2.3	**Remove**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
257	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	12	5	22	35	Good	Good	N/A	Long	High	High	2.6	2.1	**Remove**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
258	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 6	13	5	35	38	Good	Fair	N/A	Long	High	High	4.2	2.2	**Remove**	Yes	Partially suppressed.
259	*Eucalyptus tereticornis*	Forest Red Gum	Young	1	Stage 6	6	2	6	10	Good	Fair	N/A	Medium	Low	Low	2.0	1.3	**Remove**	Yes	Suppressed small tree.
260	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	20	12	59	65	Good	Poor	N/A	Medium	High	High	7.1	2.8	**Remove**	Yes	Large tree of indigenous species significance. Stem bifurcates at 2 metres. Eastern stem with large wound from previous failure. Sapwood delaminating and decay in wound. Requires risk remediation.
261	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	13	7	31	38	Good	Good	N/A	Long	High	High	3.7	2.2	**Remove**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
262	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	10	5	16	27	Good	Poor	N/A	Medium	High	Moderate	2.0	1.9	**Remove**	Yes	Suppressed.
263	*Callistemon viminalis*	Weeping Bottle Brush	Semi mature	25	Stage 6	4	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	GROUP of 25 closely positioned specimens of the same size and species in suppressed position adjacent to western boundary. Small size of trees underpinned Low landscape significance rating.
264	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	16	8	44	52	Good	Good	N/A	Long	High	High	5.3	2.5	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
265	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	10	5	16	27	Good	Poor	N/A	Medium	High	Moderate	2.0	1.9	**Remove**	Yes	Suppressed
266	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	16	12	36	48	Good	Good	N/A	Long	High	High	4.3	2.4	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
267	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	13	6	25	33	Good	Fair	N/A	Long	High	High	3.0	2.1	**Remove**	Yes	Partially suppressed.
268	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	14	10	23	39	Good	Good	N/A	Long	High	High	2.8	2.2	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
269	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 6	8	5	14	22	Good	Poor	N/A	Medium	High	Moderate	2.0	1.8	**Remove**	Yes	Suppressed.
270	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 2	16	12	37	42	Good	Good	N/A	Long	High	High	4.4	2.3	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
271	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 2	7	4	15	18	Good	Poor	N/A	Medium	High	Moderate	2.0	1.6	**Remove**	Yes	Suppressed.
272	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 2	9	5	21	27	Good	Good	N/A	Long	High	High	2.5	1.9	**Remove**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
273	*Callistemon viminalis*	Weeping Bottle Brush	Semi mature	25	Stage 2	4	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	GROUP of 25 closely positioned specimens of the same size and species in suppressed position adjacent to western boundary. Small size of trees underpinned Low landscape significance rating.
274	*Eucalyptus tereticornis*	Forest Red Gum	Young	1	Stage 2	5	3	13	20	Good	Poor	N/A	Short	Moderate	Low	2.0	1.7	**Remove**	Yes	Regrowth from cut stump. Suppressed.
275	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	18	14	78	91	Good	Fair	N/A	Long	High	High	9.4	3.2	**Remove**	Yes	Large tree of indigenous species value. Tissue necrosis in bird damage wounds within canopy. Branches in lower northern canopy laterally extended

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
276	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 6	16	9	48	67	Good	Poor	Hollow	Short	High	Moderate	5.8	2.8	**Remove**	Yes	Partially suppressed. Decay and major hollowing within bird damaged codominant stem union. Western stem has been removed. Codominant canopy union above hollow with signs of bark inclusion.
277	*Acer negundo*	Box Elder	Mature	1	Stage 3	9	8	88	92	Poor	Poor	N/A	Short	Low	Low	10.6	3.2	**Remove**	Yes	Tree of reduced species value. Canopy with signs of dieback.
278	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 2	16	12	54	67	Good	Good	N/A	Long	High	High	6.5	2.8	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
279	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 2	16	10	52	67	Good	Very Poor	Hollow	Negligible	High	Low	6.2	2.8	**Remove**	Yes	Large tree of indigenous species significance. Stem bifurcates at 2 metres. Union with signs of bark inclusion. Large hollow with advanced decay in previous codominant union failure at 6 metres. Signs of partial union failure. Requires risk remediation.
280	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 2	12	8	37	43	Good	Good	N/A	Long	High	High	4.4	2.3	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
281	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 2	11	8	38	41	Good	Good	N/A	Long	High	High	4.6	2.3	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
282	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 2	16	8	51	49	Good	Fair	N/A	Long	High	High	6.1	2.5	**Remove**	Yes	Stem bifurcates at 1 metre. No signs of Union weakness.
283	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 3	17	12	58	79	Good	Good	N/A	Long	High	High	7.0	3.0	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
284	*Jacaranda mimosifolia*	Jacaranda	Mature	1	Stage 3	5	4	21	23	Fair	Fair	N/A	Medium	Moderate	Moderate	2.5	1.8	**Remove**	Yes	Small, suppressed tree.
285	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 2	18	12	43	49	Good	Fair	N/A	Long	High	High	5.2	2.5	**Remove**	Yes	Tree positioned within narrow garden within western boundary. Root growth has damaged adjacent footpath.
286	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 2	16	8	23	26	Good	Fair	N/A	Long	High	High	2.8	1.9	**Remove**	Yes	Tree positioned within narrow garden within western boundary. Partially suppressed
287	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Young	1	Stage 2	4	5	7	8	Good	Fair	N/A	Medium	Low	Low	2.0	1.1	**Remove**	Yes	Suppressed
288	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 2	16	12	49	55	Good	Fair	N/A	Long	High	High	5.9	2.6	**Remove**	Yes	Tree positioned within narrow garden within western boundary.
289	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 1	5	5	15	20	Good	Good	N/A	Medium	Moderate	Low	2.0	1.7	**Remove**	Yes	Medium sized tree of low species value.
290	*Eucalyptus racemosa*	Narrow-leaved Scribbly Gum	Semi mature	1	Stage 1	5	4	13	18	Good	Fair	N/A	Medium	Moderate	Moderate	2.0	1.6	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
291	*Eucalyptus racemosa*	Narrow-leaved Scribbly Gum	Semi mature	1	Stage 3	7	5	26	27	Good	Fair	N/A	Medium	Moderate	Moderate	3.1	1.9	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
292	*Eucalyptus botryoides*	Southern Mahogany	Mature	1	Stage 3	16	14	48	63	Good	Good	N/A	Long	High	High	5.8	2.7	**Remove**	Yes	Large tree of native species value observed to be in good condition.
293	*Jacaranda mimosifolia*	Jacaranda	Mature	1	Stage 3	6	5	23	36	Good	Fair	N/A	Medium	Low	Low	2.7	2.2	**Remove**	Yes	Small tree of reduced species value.
294	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 3	16	14	58	67	Good	Fair	N/A	Long	High	High	7.0	2.8	**Remove**	Yes	Partially suppressed.
295	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 3	16	14	53	72	Good	Fair	N/A	Long	High	High	6.4	2.9	**Remove**	Yes	Partially suppressed
296	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 3	17	16	54	65	Good	Good	N/A	Long	High	High	6.5	2.8	**Remove**	Yes	Large tree of native species value observed to be in good condition.
297	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 3	16	12	50	58	Good	Good	N/A	Long	High	High	6.0	2.6	**Remove**	Yes	Large tree of native species value observed to be in good condition.
298	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 3	15	12	38	43	Good	Fair	N/A	Long	High	High	4.6	2.3	**Remove**	Yes	Partially suppressed.
299	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 3	13	5	25	31	Good	Fair	N/A	Long	High	High	3.0	2.0	**Remove**	Yes	Partially suppressed.
300	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 3	15	12	52	61	Poor	Fair	N/A	Medium	High	Moderate	6.2	2.7	**Remove**	Yes	Dieback. Bracket fungi in decay column in southern site of stem at 2 metres.
301	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 3	16	14	42	61	Good	Good	N/A	Long	High	High	5.0	2.7	**Remove**	Yes	Large tree of native species value observed to be in good condition.
302	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	7	6	24	30	Good	Fair	N/A	Medium	Moderate	Low	2.9	2.0	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
303	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	5	4	13	14	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.4	**Remove**	Yes	Medium-sized tree positioned within 2 metres of existing building.
304	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	5	4	13	14	Good	Fair	N/A	Medium	Low	Low	2.0	1.4	**Remove**	Yes	Small tree of reduced species value.
305	*Pyrus calleryana*	Manchurian Pear	Semi mature	1	Stage 3	5	3	10	15	Good	Poor	N/A	Medium	Negligible	Low	2.0	1.5	**Remove**	Yes	Maturing tree of low species value.

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306	*Fraxinus 'Raywood'*	Claret Ash	Mature	1	Stage 3	10	7	65	78	Good	Fair	N/A	Medium	Low	Low	7.8	3.0	**Remove**	Yes	Medium-sized tree of reduced species value.
307	*Fraxinus 'Raywood'*	Claret Ash	Mature	1	Stage 3	7	6	32	37	Good	Fair	N/A	Medium	Low	Low	3.8	2.2	**Remove**	Yes	Partially suppressed
308	*Acer negundo*	Box Elder	Mature	1	Stage 3	13	10	79	84	Fair	Fair	N/A	Short	Low	Low	9.5	3.1	**Remove**	Yes	Large tree of low species significance
309	*Fraxinus 'Raywood'*	Claret Ash	Mature	1	Stage 4	7	6	25	30	Good	Fair	N/A	Medium	Low	Low	3.0	2.0	**Remove**	Yes	Partially suppressed
310	*Waterhousea floribunda*	Weeping Lilly Pilly	Mature	1	Stage 6	16	8	35	44	Good	Fair	N/A	Medium	High	Moderate	4.2	2.3	**Remove**	Yes	Tree positioned in confined garden adjacent to buildings. Stem bifurcates at 2 metres. Union with signs of bark inclusion.
311	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	5	Stage 6	5	3	8	10	Good	Fair	N/A	Medium	Low	Low	2.0	1.3	**Remove**	Yes	GROUP of 5 closely planted small trees of the same size and species. Positioned in narrow gardens less than 2 metres from existing buildings.
312	*Melia azedarach*	White Cedar	Mature	1	Stage 6	14	10	64	70	Fair	Fair	N/A	Medium	High	Moderate	7.6	2.8	**Remove**	Yes	Large specimen positioned in raised garden. Root growth has displaced retaining wall. Stem bifurcates at 1 metre. No signs of union weakness. Minor signs of dieback in upper canopy
313	*Pyrus calleryana*	Callery Pear	Mature	1	Stage 3	8	6	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.
314	*Pyrus calleryana*	Callery Pear	Mature	1	Stage 6	8	6	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.
315	*Prunus persica*	Peach/Nectarine	Mature	1	Stage 4	5	4	22	30	Poor	Fair	N/A	Short	Moderate	Low	2.7	2.0	**Retain**	No	Dieback.
316	*Prunus persica*	Peach/Nectarine	Mature	1	Stage 4	6	4	27	34	Poor	Fair	N/A	Short	Moderate	Low	3.2	2.1	**Retain**	No	Dieback.
317	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	18	14	58	66	Good	Good	N/A	Long	High	High	7.0	2.8	**Retain**	Yes	Large tree of native species value observed to be in good condition.
318	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	16	12	61	66	Fair	Fair	N/A	Long	High	High	7.3	2.8	**Retain**	Yes	Partially suppressed. Canopy with minor dieback.
319	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	17	13	57	68	Good	Good	N/A	Long	High	High	6.8	2.8	**Retain**	Yes	Partially suppressed.
320	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 4	18	15	67	75	Good	Good	N/A	Long	High	High	8.0	2.9	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
321	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 4	17	16	65	81	Fair	Good	N/A	Long	High	High	7.8	3.0	**Remove**	Yes	Canopy with chlorosis and signs of minor dieback.
322	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 4	16	12	39	51	Fair	Good	N/A	Long	High	High	4.7	2.5	**Remove**	Yes	Canopy with chlorosis and signs of minor dieback.
323	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 4	15	11	40	53	Good	Fair	N/A	Long	High	High	4.8	2.5	**Remove**	Yes	Partially suppressed
324	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 4	17	16	60	70	Good	Fair	N/A	Long	High	High	7.2	2.8	**Remove**	Yes	Large tree positioned outside south-eastern boundary within school. Stem impacting boundary fence.
325	*Lophostemon confertus*	Queensland Brush Box	Mature	1	Stage 4	9	7	37	41	Good	Fair	N/A	Medium	High	Moderate	4.4	2.3	**Remove**	Yes	Suppressed.
326	*Eucalyptus robusta*	Swamp Mahogany	Mature	1	Stage 4	12	10	53	57	Good	Fair	N/A	Long	High	High	6.4	2.6	**Remove**	Yes	Stem bifurcates at 1.2 metres. No obvious signs of Union weakness.
327	*Phoenix canariensis*	Canary Island Date Palm	Mature	1	Stage 4	9	4	60	80	Good	Good	N/A	Medium	Low	Low	7.2	3.0	**Remove**	Yes	Small tree of reduced species value.
328	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	16	10	48	59	Fair	Good	N/A	Long	High	High	5.8	2.7	**Remove**	Yes	Partially suppressed. Canopy with minor signs of dieback.
329	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 4	16	10	67	76	Fair	Fair	N/A	Long	High	High	8.1	2.9	**Remove**	Yes	Partially suppressed. Stem bifurcates at 1.2 metres. No signs of union weakness. Canopy with minor signs of dieback.
330	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 4	16	13	56	62	Fair	Poor	N/A	Short	High	Moderate	6.7	2.7	**Remove**	Yes	Partially suppressed. Canopy with tissue necrosis and decay in large wound from previous branch failure. Primary stem now with compromised structural form.
331	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 4	5	4	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Maturing tree of low species value becomes multi-stemmed at approximately 1 metre.
332	*Triadica sebifera*	Chinese Tallow Tree	Semi mature	1	Stage 4	4	4	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	No	Suppressed by larger adjacent tree.
333	*Pyrus calleryana*	Callery Pear	Semi mature	1	Stage 4	6	4	13	16	Dead	Poor	N/A	Dead	Low	Very Low	2.0	1.5	**Remove**	No	Dead tree.
334	*Pyrus calleryana*	Callery Pear	Semi mature	1	Stage 4	7	5	21	26	Fair	Poor	N/A	Medium	Low	Low	2.5	1.9	**Remove**	Yes	Small tree of reduced species value.
335	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 4	5	3	15	18	Good	Good	N/A	Medium	Low	Low	2.0	1.6	**Retain**	Yes	Small tree of reduced species value.

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336	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 4	5	4	22	28	Good	Good	N/A	Medium	Low	Low	2.6	1.9	**Retain**	Yes	Small tree of reduced species value.
337	*Prunus persica*	Peach/Nectarine	Mature	1	Stage 4	6	6	38	38	Good	Fair	N/A	Medium	Low	Low	4.5	2.2	**Retain**	No	Suppressed.
338	*Prunus persica*	Peach/Nectarine	Mature	1	Stage 4	5	4	21	20	Good	Fair	N/A	Medium	Low	Low	2.5	1.7	**Retain**	No	Small tree of reduced species value.
339	*Prunus persica*	Peach/Nectarine	Mature	1	Stage 4	5	4	20	23	Poor	Fair	N/A	Short	Low	Low	2.4	1.8	**Retain**	No	Dieback.
340	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	14	10	53	62	Good	Good	N/A	Long	High	High	6.4	2.7	**Retain**	Yes	Large tree of native species value observed to be in good condition.
341	*Prunus persica*	Peach/Nectarine	Mature	1	Stage 4	5	4	20	23	Good	Fair	N/A	Medium	Low	Low	2.4	1.8	**Retain**	No	Partially suppressed.
342	*Callistemon viminalis*	Weeping Bottle Brush	Semi mature	2	Stage 4	4	3	5	7	Good	Fair	N/A	Medium	Low	Low	2.0	1.1	**Retain**	No	GROUP of 2 closely positioned specimens of the same size and species. Small trees in suppressed position.
343	*Corymbia citriodora*	Lemon-scented Gum	Semi mature	1	Stage 4	15	13	39	45	Fair	Fair	N/A	Long	High	High	4.7	2.4	**Retain**	Yes	Partially suppressed. Canopy with signs of minor dieback.
344	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 4	18	13	61	73	Good	Poor	Hollow	Short	High	Moderate	7.3	2.9	**Retain**	Yes	Large wound in northern side of stem with advanced decay and hollowing. Tree will require Level 3 assessment of decay to determine risk and validate retention status. Picus or resistograph testing should be undertaken.
345	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 4	15	9	38	43	Good	Poor	Hollow	Short	High	Moderate	4.6	2.3	**Retain**	Yes	Partially suppressed. Canker wounds with advanced decay and hollowing throughout stem. Tree will require Level 3 assessment to validate suitability for retention.
346	*Flindersia australis*	Australian Teak	Mature	1	Stage 4	8	5	20	28	Good	Good	N/A	Long	High	High	2.4	1.9	**Retain**	Yes	Maturing tree of native species value observed to be in mostly good condition.
347	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	15	10	42	48	Good	Good	N/A	Long	High	High	5.0	2.4	**Retain**	Yes	Large tree of native species value observed to be in good condition.
348	*Ulmus parvifolia*	Chinese Elm	Mature	1	Stage 4	8	8	18	28	Good	Good	N/A	Long	Moderate	Moderate	2.2	1.9	**Retain**	Yes	Maturing tree of ornamental species value observed to be in mostly good condition.
349	*Ulmus parvifolia*	Chinese Elm	Mature	1	Stage 4	8	10	30	38	Good	Good	N/A	Long	Moderate	Moderate	3.6	2.2	**Retain**	Yes	Maturing tree of ornamental species value observed to be in mostly good condition.
350	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 4	13	10	38	47	Good	Good	N/A	Long	High	High	4.6	2.4	**Remove**	Yes	Stem positioned 0.5 metres from edge of existing carpark.
351	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 4	14	12	44	51	Good	Good	N/A	Long	High	High	5.3	2.5	**Remove**	Yes	Stem adjacent to edge of existing carpark
352	*Cedrus deodara*	Deodar Cedar	Mature	1	Stage 4	15	10	37	45	Fair	Good	N/A	Medium	High	Moderate	4.4	2.4	**Remove**	Yes	Canopy thin, with signs of minor dieback. Positioned within confined area within 2 metres of existing driveway.
353	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 4	21	16	86	98	Good	Poor	Hollow	Medium	High	Moderate	10.3	3.3	**Retain**	Yes	Large tree of native species value. Decay and hollowing on stem and within canopy unions in previous branch failure wounds. Fungal fruiting body in large wound on northern side of stem at 7 metres. Will require level 3 Advanced Assessment to accurately determine risk and suitability for retention within proposed park.
354	*Flindersia australis*	Australian Teak	Mature	1	Stage 4	10	6	28	34	Good	Good	N/A	Long	High	High	3.4	2.1	**Retain**	Yes	Maturing tree of native species value observed to be in mostly good condition.
355	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 4	23	14	51	68	Good	Fair	Hollow	Long	High	High	6.1	2.8	**Retain**	Yes	Large tree of native species value. Previous branch failure wound on southern stem with advanced decay and hollowing.
356	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 4	18	10	36	44	Fair	Fair	N/A	Medium	High	Moderate	4.4	2.3	**Remove**	Yes	Suppressed. Canopy with minor signs of dieback
357	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 4	21	15	59	64	Good	Good	N/A	Long	High	High	7.1	2.7	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
358	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	17	10	29	37	Poor	Poor	N/A	Medium	High	Moderate	3.5	2.2	**Remove**	Yes	Suppressed. Dieback. Stem with northerly orientation.
359	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	17	11	34	47	Poor	Poor	N/A	Medium	High	Moderate	4.1	2.4	**Remove**	Yes	Suppressed. Dieback. Stem with northerly orientation.
360	*Castanospermum australe*	Moreton Bay Chestnut	Semi mature	1	Stage 4	6	4	15	23	Good	Fair	N/A	Medium	Moderate	Moderate	2.0	1.8	**Retain**	Yes	Suppressed.
361	*Harpullia pendula*	Tulipwood	Mature	1	Stage 4	6	5	15	20	Good	Fair	N/A	Medium	Moderate	Moderate	2.0	1.7	**Retain**	Yes	Suppressed.
362	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 4	10	5	18	23	Fair	Fair	N/A	Medium	High	Moderate	2.2	1.8	**Retain**	Yes	Suppressed. Canopy with signs of dieback.
363	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 4	10	5	16	20	Fair	Fair	N/A	Medium	High	Moderate	2.0	1.7	**Retain**	Yes	Suppressed. Dieback.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
364	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	17	15	44	55	Good	Fair	N/A	Long	High	High	5.3	2.6	**Retain**	Yes	Partially suppressed. Stem with easterly orientation.
365	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 4	16	12	43	58	Fair	Fair	N/A	Long	High	High	5.2	2.6	**Retain**	Yes	Partially suppressed. Stem with easterly orientation. Minor dieback.
366	*Flindersia australis*	Australian Teak	Mature	1	Stage 4	4	3	13	14	Good	Good	N/A	Long	High	High	2.0	1.4	**Retain**	No	Partially suppressed
367	*Syzygium australe*	Brush Cherry	Semi mature	5	Stage 4	4	2	10	15	Good	Fair	N/A	Medium	Moderate	Moderate	2.0	1.5	**Retain**	No	GROUP of 5 closely positioned specimens of native species. Suppressed.
368	*Eucalyptus racemosa*	Narrow-leaved Scribbly Gum	Mature	1	Stage 6	12	10	50	63	Good	Good	N/A	Long	High	High	6.0	2.7	**Remove**	Yes	Large tree of native species value observed to be in good condition.
369	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	15	14	39	50	Good	Good	N/A	Long	High	High	4.7	2.5	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
370	*Eucalyptus nicholii*	Narrow-leaved Black Peppermint	Mature	1	Stage 4	15	6	44	57	Poor	Fair	N/A	Short	High	Moderate	5.3	2.6	**Remove**	No	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback.
371	*Angophora floribunda*	Rough Barked Apple	Mature	1	Stage 4	13	6	33	42	Fair	Poor	Hollow	Medium	High	Moderate	4.0	2.3	**Remove**	Yes	Partially suppressed. Stem with easterly orientation. Advanced decay and hollowing in large wound on lower western stem.
372	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	14	6	18	23	Poor	Poor	N/A	Medium	High	Moderate	2.2	1.8	**Remove**	Yes	Suppressed. Stem with easterly orientation. Minor dieback.
373	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 4	16	14	46	58	Good	Good	N/A	Long	High	High	5.5	2.6	**Remove**	Yes	Large tree of native species value observed to be in good condition.
374	*Angophora floribunda*	Rough Barked Apple	Semi mature	1	Stage 4	11	7	17	20	Good	Fair	N/A	Medium	High	Moderate	2.0	1.7	**Remove**	Yes	Suppressed.
375	*Callistemon salignus*	Willow Bottle Brush	Semi mature	1	Stage 4	8	6	18	20	Good	Fair	N/A	Medium	High	Moderate	2.2	1.7	**Remove**	Yes	Partially suppressed.
376	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	13	9	32	38	Poor	Fair	N/A	Medium	High	Moderate	3.8	2.2	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback.
377	*Eucalyptus alba*	White Gum	Mature	1	Stage 5	14	14	52	54	Good	Fair	N/A	Long	High	Moderate	6.2	2.6	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Necrosis in wound on lower stem. Good response growth around wound margin.
378	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 5	12	8	32	35	Poor	Fair	N/A	Medium	High	Moderate	3.8	2.1	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback
379	*Eucalyptus alba*	White Gum	Mature	1	Stage 5	15	14	55	60	Good	Fair	N/A	Long	High	Moderate	6.6	2.7	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Root growth has displaced adjacent kerb, gutter and asphalt.
380	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 5	10	12	42	54	Good	Fair	N/A	Long	High	Moderate	5.0	2.6	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Root growth has displaced kerb, gutter and asphalt
381	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 5	13	10	32	37	Poor	Fair	N/A	Medium	High	Moderate	3.8	2.2	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback.
382	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 5	13	14	41	48	Poor	Fair	N/A	Medium	High	Moderate	4.9	2.4	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback
383	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	12	9	19	34	Poor	Fair	N/A	Medium	High	Moderate	2.3	2.1	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback
384	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	12	10	28	35	Fair	Fair	N/A	Medium	High	Moderate	3.3	2.1	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Tree becomes multi-stemmed at base.
385	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 5	15	13	44	51	Fair	Fair	N/A	Long	High	High	5.3	2.5	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Root growth has displaced kerb and gutter.
386	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	13	12	34	48	Poor	Fair	N/A	Medium	High	High	4.1	2.4	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback.
387	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	17	14	33	45	Poor	Fair	N/A	Medium	High	High	4.0	2.4	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback.
388	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	16	14	39	50	Fair	Fair	N/A	Long	High	High	4.7	2.5	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth.
389	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	15	10	32	44	Poor	Poor	N/A	Negligible	High	Low	3.8	2.3	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback. Tissue necrosis and decay on western side of lower stem and root crown.
390	*Eucalyptus microcorys*	Tallow Wood	Semi mature	1	Stage 5	7	7	21	32	Fair	Fair	N/A	Medium	High	Moderate	2.5	2.1	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Suppressed. Stem bifurcates at base. Union with signs of bark inclusion.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
391	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	15	12	56	59	Poor	Fair	N/A	Short	High	Moderate	6.7	2.7	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback.
392	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 5	15	12	43	51	Good	Fair	N/A	Long	High	High	5.2	2.5	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Root growth has displaced kerb and gutter.
393	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	14	10	20	34	Good	Fair	N/A	Long	High	High	2.4	2.1	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Root growth has displaced kerb and gutter.
394	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	13	14	59	75	Good	Fair	N/A	Long	High	High	7.1	2.9	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Partially suppressed. Root growth has displaced kerb and gutter.
395	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	16	12	21	34	Good	Fair	N/A	Long	High	High	2.5	2.1	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth.
396	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	19	16	46	61	Poor	Fair	N/A	Medium	High	Moderate	5.5	2.7	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Dieback. Stem bifurcates at 3 metres.
397	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	17	18	81	82	Good	Fair	N/A	Medium	High	High	9.7	3.0	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth. Root growth has displaced kerb and gutter.
398	*Corymbia citriodora*	Lemon-scented Gum	Semi mature	1	Stage 5	14	8	15	20	Good	Good	N/A	Long	High	High	2.0	1.7	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
399	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	22	14	49	64	Good	Good	N/A	Long	High	High	5.9	2.7	**Remove**	Yes	Large tree of native species value observed to be in good condition.
400	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	12	8	22	32	Good	Fair	N/A	Long	High	High	2.6	2.1	**Remove**	Yes	Tree of native species significance in confined location within existing carpark. Restricted root growth.
401	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 5	16	8	23	43	Good	Fair	N/A	Long	High	High	2.8	2.3	**Remove**	Yes	Stem trifurcates at ground level.
402	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 5	17	6	27	36	Dead	Poor	Potential Hollow	Dead	Negligible	Very Low	3.2	2.2	**Remove**	No	Dead tree.
403	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 5	16	8	26	41	Good	Good	N/A	Long	High	High	3.1	2.3	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
404	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Outside	18	16	35	40	Good	Good	N/A	Long	High	High	4.2	2.3	**Retain**	Yes	Large tree of native species value positioned outside the southern site boundary within the adjacent school.
405	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Outside	21	14	42	61	Good	Good	N/A	Long	High	High	5.0	2.7	**Retain**	Yes	Large tree of native species value positioned outside the southern site boundary within the adjacent school.
406	*Eucalyptus fibrosa*	Broad-leaved Red Ironbark	Semi mature	1	Outside	10	5	15	20	Good	Good	N/A	Long	High	High	2.0	1.7	**Retain**	Yes	Small tree of indigenous species value positioned outside the southern site boundary within the adjacent school.
407	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 5	16	6	30	37	Good	Good	N/A	Long	High	High	3.6	2.2	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
408	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 5	18	14	54	72	Good	Good	N/A	Long	High	High	6.5	2.9	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
409	*Eucalyptus moluccana*	Grey Box	Mature	1	Stage 5	20	14	47	54	Good	Good	N/A	Long	High	High	5.6	2.6	**Remove**	Yes	Large tree of indigneous species significance observed to be be in good condition.
410	*Corymbia maculata*	Spotted Gum	Mature	1	Stage 5	16	13	41	50	Fair	Fair	N/A	Long	High	High	4.9	2.5	**Remove**	Yes	Partially suppressed. Canopy with minor chlorosis.
411	*Callistemon viminalis*	Weeping Bottle Brush	Mature	1	Outside	6	6	28	35	Good	Good	N/A	Long	High	High	3.4	2.1	**Retain**	Yes	Medium-sized tree of native species value positioned 1.5 metres outside south-eastern boundary within adjacent school. Maintain boundary setback for bulk earthworks to mitigate impact of encroachment.
412	*Callistemon viminalis*	Weeping Bottle Brush	Mature	1	Outside	6	6	28	35	Good	Good	N/A	Long	High	High	3.4	2.1	**Retain**	Yes	Medium-sized tree of native species value positioned 1.5 metres outside south-eastern boundary within adjacent school. Maintain boundary setback for bulk earthworks to mitigate impact of encroachment.
413	*Callistemon viminalis*	Weeping Bottle Brush	Mature	1	Outside	6	6	28	35	Good	Good	N/A	Long	High	High	3.4	2.1	**Retain**	Yes	Medium-sized tree of native species value positioned 1.5 metres outside south-eastern boundary within adjacent school. Maintain boundary setback for bulk earthworks to mitigate impact of encroachment.
414	*Callistemon viminalis*	Weeping Bottle Brush	Mature	2	Outside	6	6	28	35	Good	Good	N/A	Long	High	High	3.4	2.1	**Retain**	Yes	GROUP of 2 closely positioned specimens of the same size and species. Medium-sized trees of native species value positioned 5 metres outside south-eastern boundary within adjacent school. Maintain boundary setback for bulk earthworks to mitigate impact of encroachment.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
415	*Corymbia eximia*	Yellow Bloodwood	Semi mature	1	Stage 4	11	6	18	20	Fair	Poor	N/A	Medium	High	Moderate	2.2	1.7	**Remove**	Yes	Suppressed.
416	*Eucalyptus alba*	White Gum	Mature	1	Stage 5	13	12	58	56	Good	Fair	N/A	Long	High	High	7.0	2.6	**Remove**	Yes	Large tree of native species value observed to be in good condition.
417	*Eucalyptus alba*	White Gum	Mature	1	Stage 5	14	12	42	44	Good	Poor	N/A	Medium	High	Moderate	5.0	2.3	**Remove**	Yes	Large tree of native species value. Canopy with signs of dieback.
418	*Eucalyptus saligna*	Sydney Blue Gum	Mature	1	Stage 5	15	16	81	83	Poor	Poor	N/A	Short	High	Moderate	9.7	3.1	**Remove**	Yes	Dieback. Stem bifurcates at 2 metres. Union with decay and bracket fungus
419	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	14	12	20	27	Poor	Fair	N/A	Medium	High	Moderate	2.4	1.9	**Remove**	Yes	Suppressed. Dieback.
420	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	13	14	19	27	Poor	Fair	N/A	Medium	High	Moderate	2.3	1.9	**Remove**	Yes	Suppressed. Dieback.
421	*Eucalyptus sideroxylon*	Red Ironbark	Mature	1	Stage 5	19	16	46	54	Fair	Fair	Hollow	Long	High	High	5.5	2.6	**Remove**	Yes	Large tree of native species value. Bulging on stem at 4 metres around narrow hollow. Signs of good response growth around wound margin.
422	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 5	14	12	43	49	Fair	Fair	N/A	Long	High	High	5.2	2.5	**Remove**	Yes	Partially suppressed. Signs of minor dieback.
423	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Stage 5	15	14	58	64	Good	Fair	N/A	Long	High	High	7.0	2.7	**Remove**	Yes	Large tree of native species value observed to be in good condition.
424	*Cedrus deodara*	Deodar Cedar	Mature	1	Stage 5	6	4	21	24	Dead	Very Poor	N/A	Dead	Negligible	Very Low	2.5	1.8	**Remove**	No	Small dead tree.
425	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 5	15	14	39	47	Good	Fair	N/A	Long	High	High	4.7	2.4	**Remove**	Yes	Partially suppressed. Minor dieback. Stem bifurcates at 3 metres.
426	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Stage 5	16	14	48	49	Good	Fair	N/A	Long	High	High	5.8	2.5	**Remove**	Yes	Stem bifurcates at 4 metres. No obvious signs of Union weaknesses.
427	*Eucalyptus crebra*	Narrow-leaved Red Ironbark	Mature	1	Commercial	16	15	61	67	Good	Good	N/A	Long	High	High	7.3	2.8	**Retain**	Yes	Large tree of native species value observed to be in good condition.
428	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	15	13	36	50	Good	Fair	N/A	Long	High	High	4.3	2.5	**Retain**	Yes	Tree of indigenous species significance within western edge of conservation area. Existing retaining wall 3.5 metres from stem. Partially suppressed.
429	*Melaleuca decora*	White Feather Honeymyrtle	Mature	1	Commercial	12	7	2	26	Good	Fair	N/A	Long	High	High	2.0	1.9	**Retain**	Yes	Tree of indigenous species significance within western edge of conservation area. Existing retaining wall 3.5 metres from stem. Partially suppressed.
430	*Eucalyptus moluccana*	Grey Box	Mature	1	Commercial	16	12	55	70	Good	Good	N/A	Long	High	High	6.6	2.8	**Retain**	Yes	Tree of indigenous species significance within western edge of conservation area. Existing retaining wall 3.5 metres from stem. Partially suppressed.
431	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	14	8	20	30	Good	Fair	N/A	Long	High	High	2.4	2.0	**Retain**	Yes	Tree of indigenous species significance within western edge of conservation area. Existing retaining wall 3.5 metres from stem. Partially suppressed. Partially suppressed.
432	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	14	8	25	35	Good	Fair	N/A	Long	High	High	3.0	2.1	**Retain**	Yes	Large tree of indigneous species significance observed to be be in good condition.
433	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Commercial	15	7	25	35	Good	Fair	N/A	Long	High	High	3.0	2.1	**Retain**	Yes	Large tree of indigneous species significance observed to be be in good condition.
434	*Pyrus calleryana*	Callery Pear	Mature	1	Stage 3	7	8	25	32	Good	Fair	N/A	Medium	Low	Low	3.0	2.1	**Remove**	Yes	Medium-sized tree of reduced species value.
435	*Yucca sp.*	Yucca	Mature	1	Stage 3	5	8	150	200	Good	Poor	N/A	Short	Low	Low	18.0	4.4	**Remove**	Yes	Large specimen of reduced species value.
436	*Cupressus sempervirens*	Italian Cypress	Mature	1	Stage 3	6	1	15	15	Good	Fair	N/A	Short	Low	Low	2.0	1.5	**Remove**	Yes	Suppressed.
437	*Ginkgo biloba*	Maiden Hair Tree	Mature	1	Stage 3	7	5	20	23	Good	Fair	N/A	Short	Low	Low	2.4	1.8	**Remove**	Yes	Small tree of reduced species value.
438	*Tibouchina granulosa*	Purple Glory Tree	Mature	1	Stage 3	5	4	25	40	Fair	Fair	N/A	Medium	Low	Low	3.0	2.3	**Remove**	Yes	Suppressed
439	*Thuja occidentalis*	White Cedar	Mature	3	Stage 3	6	2	15	20	Fair	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	GROUP of 3 closely positioned specimens of the same size and species. Small trees of low species significance.
440	*Picea abies 'Pendula'*	Weeping Norway Spruce	Mature	1	Stage 3	6	4	20	25	Good	Fair	N/A	Medium	Low	Low	2.4	1.8	**Remove**	Yes	Small tree of reduced species value.
441	*Pyrus calleryana*	Callery Pear	Semi mature	1	Stage 3	4	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	Small tree of reduced species value.
442	*Pyrus calleryana*	Callery Pear	Semi mature	1	Stage 3	4	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	Small tree of reduced species value.
443	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	6	6	24	30	Good	Fair	N/A	Medium	Low	Low	2.9	2.0	**Remove**	Yes	Small tree of reduced species value.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
444	*Acer japonicum*	Full Moon Maple	Mature	1	Stage 3	5	4	20	25	Good	Fair	N/A	Medium	Moderate	Low	2.4	1.8	**Remove**	Yes	Confined location. Less than 3 metres from adjacent building.
445	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	7	6	20	25	Good	Fair	N/A	Medium	Moderate	Low	2.4	1.8	**Remove**	Yes	Medium sized tree of low species value
446	*Eucalyptus racemosa*	Narrow-leaved Scribbly Gum	Young	1	Stage 3	5	3	15	20	Good	Fair	N/A	Medium	Moderate	Moderate	2.0	1.7	**Remove**	Yes	Small tree of native species value observed to be in mostly good condition.
447	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	1	Stage 1	5	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of low species value.
448	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	1	Stage 3	5	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
449	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	5	4	20	25	Good	Fair	N/A	Medium	Low	Low	2.4	1.8	**Remove**	Yes	Small tree of reduced species value.
450	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Semi mature	1	Stage 1	7	3	15	20	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.7	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
451	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Semi mature	3	Stage 3	7	3	15	20	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.7	**Remove**	Yes	GROUP of 3 closely positioned specimens of the same size and species. Small trees of native species value.
452	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 3	7	4	10	4	Good	Fair	N/A	Long	High	High	2.0	0.9	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
453	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 3	7	4	10	4	Good	Fair	N/A	Long	High	High	2.0	0.9	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
454	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 3	10	6	23	32	Good	Good	N/A	Long	High	High	2.8	2.1	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
455	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 3	7	4	12	16	Good	Good	N/A	Long	High	High	2.0	1.5	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
456	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 3	7	4	12	16	Good	Good	N/A	Long	High	High	2.0	1.5	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
457	*Waterhousea floribunda*	Weeping Lilly Pilly	Semi mature	1	Stage 3	8	5	15	20	Good	Good	N/A	Long	Moderate	Moderate	2.0	1.7	**Remove**	Yes	Small tree of native species value observed to be in mostly good condition.
458	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 3	11	6	15	20	Good	Good	N/A	Long	High	High	2.0	1.7	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
459	*Waterhousea floribunda*	Weeping Lilly Pilly	Semi mature	1	Stage 3	8	5	15	20	Good	Good	N/A	Long	Moderate	Moderate	2.0	1.7	**Remove**	Yes	Small tree of native species value observed to be in mostly good condition.
460	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 3	8	4	10	15	Good	Good	N/A	Long	High	High	2.0	1.5	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
461	*Angophora costata*	Smooth-barked Apple Myrtle	Semi mature	1	Stage 3	5	4	15	17	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.6	**Remove**	Yes	Maturing tree in mostly good condition.
462	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Stage 3	6	4	10	20	Fair	Fair	N/A	Medium	High	Moderate	2.0	1.7	**Remove**	Yes	Maturing tree with minor signs of dieback. Canopy chlorotic.
463	*Corymbia citriodora*	Lemon-scented Gum	Semi mature	1	Stage 3	15	5	25	35	Good	Good	N/A	Long	High	High	3.0	2.1	**Remove**	Yes	Larger tree of native species value observed to be in good condition.
464	*Corymbia citriodora*	Lemon-scented Gum	Mature	1	Stage 3	17	15	42	52	Good	Good	N/A	Long	High	High	5.0	2.5	**Remove**	Yes	Large tree of native species value observed to be in good condition.
465	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	9	8	30	35	Good	Fair	N/A	Medium	Low	Low	3.6	2.1	**Remove**	Yes	Medium sized tree of reduced species significance.
466	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 1	14	4	20	15	Good	Good	N/A	Long	High	High	2.4	1.5	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
467	*Corymbia citriodora*	Lemon-scented Gum	Semi mature	1	Stage 1	8	4	15	20	Good	Poor	N/A	Medium	Moderate	Moderate	2.0	1.7	**Remove**	Yes	Significant whipper snipper damage at base.
468	*Angophora costata*	Smooth-barked Apple Myrtle	Semi mature	1	Stage 1	6	4	12	14	Good	Poor	N/A	Medium	Moderate	Moderate	2.0	1.4	**Remove**	Yes	Significant whipper snipper damage at base.
469	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 3	14	3	12	15	Good	Good	N/A	Long	High	High	2.0	1.5	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
470	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 3	14	5	30	35	Good	Good	N/A	Long	High	High	3.6	2.1	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
471	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 3	10	4	25	25	Good	Good	N/A	Long	High	High	3.0	1.8	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
472	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 3	12	8	35	35	Good	Good	N/A	Long	High	High	4.2	2.1	**Remove**	Yes	Maturing tree of indigenous species value observed to be in mostly good condition.
473	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 3	10	2	20	25	Poor	Poor	N/A	Negligible	High	Low	2.4	1.8	**Remove**	Yes	Major dieback. Column of tissue necrosis and advanced decay extending from canopy into root crown.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
474	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	20	16	62	77	Fair	Fair	N/A	Long	High	High	7.4	3.0	**Remove**	Yes	Large tree of indigenous species significance observed to be in mostly good condition. Stem with poor orientation and canopy with asymmetric form due to partial suppression from neighbouring tree. Sunken position below embankment will somewhat mitigate impact of potential TPZ encroachment
475	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Stage 3	20	16	78	95	Fair	Fair	N/A	Long	High	High	9.4	3.2	**Remove**	Yes	Large tree of indigenous species significance observed to be in mostly good condition. Stem with poor orientation and canopy with asymmetric form due to partial suppression from neighbouring tree. Sunken position below embankment will somewhat mitigate impact of potential TPZ encroachment.
476	*Eucalyptus tereticornis*	Forest Red Gum	Mature	1	Outside	17	14	80	95	Fair	Fair	N/A	Long	High	High	9.6	3.2	**Retain**	Yes	Large tree of indigenous species significance observed to be in mostly good condition. Positioned outside boundary fence. Sunken position below embankment will somewhat mitigate impact of potential TPZ encroachment
477	*Acacia implexa*	Lightwood	Mature	1	Stage 3	8	4	20	25	Fair	Fair	N/A	Long	High	High	2.4	1.8	**Remove**	Yes	Suppressed.
478	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Commercial	14	5	20	30	Good	Fair	N/A	Long	High	High	2.4	2.0	**Retain**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
479	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Commercial	5	4	10	15	Good	Fair	N/A	Long	High	High	2.0	1.5	**Retain**	Yes	Maturing tree of indigenous species significance observed to be in good condition. Partially suppressed.
480	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Commercial	13	16	25	30	Good	Good	N/A	Long	High	High	3.0	2.0	**Retain**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
481	*Eucalyptus moluccana*	Grey Box	Semi mature	1	Commercial	15	10	35	40	Good	Good	N/A	Long	High	High	4.2	2.3	**Retain**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
482	*Eucalyptus tereticornis*	Forest Red Gum	Semi mature	1	Commercial	14	8	25	30	Good	Good	N/A	Long	High	High	3.0	2.0	**Retain**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
483	*Corymbia ficifolia*	Flowering Gum	Semi mature	1	Stage 5	5	3	10	15	Fair	Fair	N/A	Medium	Low	Low	2.0	1.5	**Retain**	Yes	Small tree.
484	*Corymbia ficifolia*	Flowering Gum	Semi mature	1	Stage 6	4	3	10	15	Fair	Fair	N/A	Medium	Low	Low	2.0	1.5	**Retain**	No	Small tree.
485	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	5	Stage 6	5	3	8	10	Good	Fair	N/A	Medium	Low	Low	2.0	1.3	**Retain**	Yes	GROUP of 5 closely planted small trees of the same size and species. Positioned in narrow gardens less than 2 metres from existing buildings.
486	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	6	5	25	30	Good	Fair	N/A	Medium	Negligible	Low	3.0	2.0	**Remove**	Yes	Maturing tree of low species value.
487	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	6	6	30	35	Good	Very Poor	N/A	Medium	Low	Low	3.6	2.1	**Remove**	Yes	Maturing tree of low species value. Previous stem failure
488	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	7	6	25	35	Good	Fair	N/A	Medium	Low	Low	3.0	2.1	**Remove**	Yes	Maturing tree of low species value.
489	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	6	5	20	25	Good	Fair	N/A	Medium	Low	Low	2.4	1.8	**Remove**	Yes	Maturing tree of low species value.
490	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	7	5	30	35	Good	Fair	N/A	Medium	Low	Low	3.6	2.1	**Remove**	Yes	Maturing tree of low species value.
491	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	7	6	30	35	Good	Fair	N/A	Medium	Low	Low	3.6	2.1	**Remove**	Yes	Maturing tree of low species value.
492	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	6	6	20	25	Good	Fair	N/A	Medium	Low	Low	2.4	1.8	**Remove**	Yes	Small tree of reduced species value.
493	*Cupaniopsis anacardioides*	Tuckeroo	Semi mature	1	Stage 4	5	3	6	8	Good	Poor	N/A	Medium	Low	Low	2.0	1.1	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
494	*Fraxinus 'Raywood'*	Claret Ash	Mature	1	Stage 4	7	4	30	30	Fair	Fair	N/A	Medium	Low	Low	3.6	2.0	**Remove**	Yes	Maturing tree of low species value. Minor dieback
495	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 4	4	3	15	15	Very poor	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	Maturing tree of low species value. Major dieback.
496	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 4	5	4	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Maturing tree of low species value becomes multi-stemmed at approximately 1 metre.
497	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 4	6	5	20	25	Good	Fair	N/A	Medium	Low	Low	2.4	1.8	**Remove**	Yes	Small tree of reduced species value.
498	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 4	5	3	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.
499	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 4	7	4	25	25	Good	Fair	N/A	Medium	Low	Low	3.0	1.8	**Remove**	Yes	Small tree of reduced species value.

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500	*Triadica sebifera*	Chinese Tallow Tree	Semi mature	1	Stage 4	5	4	15	25	Good	Fair	N/A	Medium	Low	Low	2.0	1.8	**Remove**	Yes	Maturing tree of low species value.
501	*Triadica sebifera*	Chinese Tallow Tree	Semi mature	2	Stage 4	5	4	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	GROUP of 2 closely positioned trees of the same size and species. Suppressed by larger adjacent tree.
502	*Prunus nigra*	Purple Cherry Plum	Semi mature	1	Stage 4	4	4	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	Larger shrub of low species significance.
503	*Prunus nigra*	Purple Cherry Plum	Semi mature	1	Stage 3	4	4	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	Small tree of reduced species value.
504	*Prunus nigra*	Purple Cherry Plum	Semi mature	1	Stage 3	4	4	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	Small tree of reduced species value.
505	*Prunus nigra*	Purple Cherry Plum	Semi mature	1	Stage 3	4	4	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	Small tree of reduced species value.
506	*Prunus nigra*	Purple Cherry Plum	Semi mature	1	Stage 3	4	4	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	No	Small tree of reduced species value.
507	*Acer japonicum*	Full Moon Maple	Mature	1	Stage 3	5	4	20	25	Good	Fair	N/A	Medium	Moderate	Low	2.4	1.8	**Remove**	Yes	Confined location. Less than 3 metres from adjacent building.
508	*Viburnum tinus*	Vibernum	Mature	1	Stage 3	4	4	10	20	Fair	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	No	Small tree of low species value in suppressed position.
509	*Acer japonicum*	Full Moon Maple	Mature	1	Stage 3	5	4	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Small tree of reduced species value.
510	*Thuja occidentalis*	White Cedar	Semi mature	1	Stage 3	6	3	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Small tree of reduced species value.
511	*Draceana marginata*	Dracaena	Semi mature	1	Stage 3	5	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Small tree of reduced species value.
512	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	5	4	13	14	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.4	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
513	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	5	4	13	14	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.4	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
514	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	5	4	13	14	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.4	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
515	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	5	4	13	14	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.4	**Remove**	Yes	Medium sized tree of low species value
516	*Pyrus calleryana*	Callery Pear	Mature	1	Stage 3	6	5	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Medium sized tree of low species value
517	*Pyrus calleryana*	Callery Pear	Mature	1	Stage 3	6	5	15	20	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	Yes	Medium sized tree of low species value
518	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	8	8		35	Good	Fair	N/A	Medium	Moderate	Low		2.1	**Remove**	Yes	Medium sized tree of low species value
519	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	6	6	15	15	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
520	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	6	5	15	15	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
521	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	7	5	15	15	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
522	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	5	4	15	15	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of low species value.
523	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	5	4	15	15	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of low species value.
524	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 3	5	4	15	15	Good	Good	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of low species value.
525	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 1	5	4	15	15	Good	Good	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of low species value.
526	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 1	5	4	15	15	Good	Good	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of low species value.
527	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 3	5	5	15	15	Good	Good	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of low species value.
528	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 3	6	5	25	30	Good	Good	N/A	Medium	Moderate	Low	3.0	2.0	**Remove**	Yes	Medium sized tree of low species value.
529	*Fraxinus 'Raywood'*	Claret Ash	Semi mature	1	Stage 3	6	5	20	30	Good	Good	N/A	Medium	Moderate	Low	2.4	2.0	**Remove**	Yes	Medium sized tree of low species value.
530	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	1	Stage 3	5	4	15	15	Good	Good	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of low species value.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
531	*Corymbia ficifolia*	Flowering Gum	Mature	1	Stage 3	4	4	20	30	Poor	Fair	N/A	Short	Moderate	Low	2.4	2.0	**Remove**	No	Small tree of native species. Canopy with signs of dieback.
532	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	6	4	15	15	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.5	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
533	*Corymbia citriodora*	Lemon-scented Gum	Semi mature	1	Stage 3	12	4	15	25	Good	Good	N/A	Long	High	High	2.0	1.8	**Remove**	Yes	Partially suppressed
534	*Corymbia maculata*	Spotted Gum	Semi mature	1	Stage 3	14	5	25	35	Good	Good	N/A	Long	High	High	3.0	2.1	**Remove**	Yes	Maturing tree of indigenous species significance observed to be in good condition.
535	*Angophora costata*	Smooth-barked Apple Myrtle	Semi mature	1	Stage 3	5	4	20	25	Fair	Good	N/A	Medium	Moderate	Moderate	2.4	1.8	**Remove**	Yes	Small tree with minor signs of dieback.
536	*Eucalyptus racemosa*	Narrow-leaved Scribbly Gum	Young	1	Stage 3	3	2	10	15	Fair	Fair	N/A	Short	Moderate	Low	2.0	1.5	**Remove**	No	Small tree. Canopy with signs of major dieback.
537	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Young	1	Stage 3	4	2	10	10	Fair	Fair	N/A	Medium	Moderate	Moderate	2.0	1.3	**Remove**	No	Small tree of native species value in partially suppressed position.
538	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Young	1	Stage 3	4	2	10	10	Fair	Fair	N/A	Medium	Moderate	Moderate	2.0	1.3	**Remove**	No	Young tree of native species value in good condition.
539	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Young	1	Stage 3	4	2	10	10	Fair	Fair	N/A	Medium	Moderate	Moderate	2.0	1.3	**Remove**	No	Young tree of native species value in good condition.
540	*Angophora costata*	Smooth-barked Apple Myrtle	Semi mature	1	Stage 3	5	4	15	17	Fair	Fair	N/A	Medium	Moderate	Moderate	2.0	1.6	**Remove**	Yes	Maturing tree of native species. Canopy with minor signs of dieback.
541	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Young	1	Stage 3	4	2	10	10	Fair	Fair	N/A	Medium	Moderate	Moderate	2.0	1.3	**Remove**	No	Young tree of native species value in good condition.
542	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Young	1	Stage 3	6	2	20	30	Fair	Fair	N/A	Medium	Moderate	Moderate	2.4	2.0	**Remove**	Yes	Young tree of native species value in good condition.
543	*Corymbia ficifolia*	Flowering Gum	Mature	1	Stage 4	4	4	20	30	Poor	Fair	N/A	Short	Moderate	Low	2.4	2.0	**Remove**	No	Small tree of native species. Canopy with signs of dieback.
544	*Corymbia ficifolia*	Flowering Gum	Mature	3	Stage 3	3	3	20	30	Poor	Fair	N/A	Short	Moderate	Low	2.4	2.0	**Remove**	No	GROUP of 3 closely positioned specimens of the same size and species. Small trees show signs of dieback.
545	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	5	4	10	10	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.3	**Remove**	Yes	Maturing tree of low species value.
546	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	5	4	13	14	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.4	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
547	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	4	4	10	10	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.3	**Remove**	No	Maturing tree of low species value.
548	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	6	6	15	20	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.7	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
549	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	8	5	10	10	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.3	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
550	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	6	5	10	10	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.3	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
551	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Semi mature	1	Stage 1	5	2	10	15	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.5	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
552	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	1	Stage 3	5	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Medium sized tree positioned within 2 metres of existing building.
553	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Semi mature	1	Stage 3	6	2	15	20	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.7	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
554	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Semi mature	1	Stage 3	6	2	20	25	Good	Fair	N/A	Long	Moderate	Moderate	2.4	1.8	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
555	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Semi mature	1	Stage 3	7	2	15	20	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.7	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
556	*Melaleuca quinquenervia*	Broad-leaved Paperbark	Semi mature	1	Stage 3	6	2	15	20	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.7	**Remove**	Yes	Maturing tree of native species value observed to be in mostly good condition.
557	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	1	Stage 3	5	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Maturing tree of low species value positioned within 3 metres of adjacent building.
558	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	1	Stage 3	5	3	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Small tree of low species significance.
559	*Lagerstroemia indica*	Crepe Myrtle	Semi mature	1	Stage 3	5	4	15	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Small tree of low species significance.
560	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	5	4	10	10	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.3	**Remove**	Yes	Small tree of low species significance.
561	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	5	4	10	10	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.3	**Remove**	Yes	Small tree of low species significance.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
562	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 1	3	2	10	10	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.3	**Remove**	No	Small tree of low species significance.
563	*Lagerstroemia indica*	Crepe Myrtle	Mature	1	Stage 3	3	2	10	10	Good	Fair	N/A	Medium	Moderate	Low	2.0	1.3	**Remove**	No	Small tree of low species significance.
564	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	9	8	30	35	Good	Fair	N/A	Medium	Low	Low	3.6	2.1	**Remove**	Yes	Medium sized tree of reduced species significance.
565	*Pyrus calleryana*	Manchurian Pear	Mature	1	Stage 3	8	8	30	35	Good	Fair	N/A	Medium	Low	Low	3.6	2.1	**Remove**	Yes	Medium sized tree of reduced species significance.
566	*Pyrus calleryana*	Manchurian Pear	Semi mature	1	Stage 3	6	4	10	15	Good	Fair	N/A	Medium	Low	Low	2.0	1.5	**Remove**	Yes	Medium sized tree of reduced species significance. Suppressed by larger neighbouring tree.
567	*Casuarina glauca*	Grey She-oak	Semi mature	6	Outside	15	3	15	20	Good	Fair	N/A	Long	High	High	2.0	1.7	**Retain**	Yes	GROUP of 6 closely positioned maturing trees of the same size and species. Positioned 1-3 metres outside boundary fence. Likely to be mature sucker growth,
568	*Acacia implexa*	Lightwood	Mature	10	Outside	6	2	10	15	Poor	Fair	N/A	Short	High	Moderate	2.0	1.5	**Retain**	Yes	GROUP of approximately 10 closely positioned maturing trees of the same size and species. Positioned 2-3 metres outside boundary fence. Most show signs of major dieback.
569	*Acacia implexa*	Lightwood	Mature	20	Outside	10	2	15	25	Poor	Fair	N/A	Short	High	Moderate	2.0	1.8	**Retain**	Yes	GROUP of approximately 20 closely positioned maturing trees of the same size and species. Positioned 2-3 metres outside boundary fence. Most show signs of major dieback.
570	*Casuarina glauca*	Grey She-oak	Mature	12	Outside	15	3	20	30	Good	Fair	N/A	Long	High	High	2.4	2.0	**Retain**	Yes	GROUP of 12 closely positioned maturing trees of the same size and species. Positioned 1-2 metres outside boundary fence. Likely to be mature sucker growth,
571	*Triadica sebifera*	Chinese Tallow Tree	Semi mature	1	Outside	4	4	15	20	Good	Fair	N/A	Short	Low	Moderate	2.0	1.7	**Retain**	No	Small tree of low species significance positioned outside the boundary fence.
572	*Casuarina glauca*	Grey She-oak	Mature	17	Outside	16	4	30	40	Good	Fair	N/A	Long	High	High	3.6	2.3	**Remove**	Yes	GROUP of 17 closely positioned maturing trees of the same size and species. Positioned 1-2 metres outside boundary fence.
573	*Gordonia axillaris*	Fried Egg Plant	Mature	1	Stage 3	3	3	10	20	Poor	Poor	N/A	Short	Low	Low	2.0	1.7	**Remove**	No	Large shrub of low species significance. Canopy with minor signs of dieback.
574	*Gordonia axillaris*	Fried Egg Plant	Mature	1	Stage 3	4	4	10	20	Poor	Poor	N/A	Short	Low	Low	2.0	1.7	**Remove**	No	Large shrub of low species significance.
575	*Callistemon rugulosus*	Bottlebrush	Mature	3	Stage 6	4	3	5	10	Good	Fair	N/A	Medium	Low	Low	2.0	1.7	**Remove**	No	GROUP of 3 closely positioned specimens of the same size and species. Small trees of low species significance.
576	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Outside	17	14	66	81	Good	Good	N/A	Long	High	High	7.9	3.0	**Retain**	Yes	Large Council street tree observed to be in good condition.
577	*Eucalyptus microcorys*	Tallow Wood	Mature	1	Outside	15	14	69	87	Good	Fair	N/A	Long	High	High	8.3	3.1	**Retain**	Yes	Large Council street tree observed to be in mostly good condition. Partially suppressed by neighbouring tree.
578	*Casuarina glauca*	Grey She-oak	Mature	1	Outside	7	7	32	39	Good	Very Poor	N/A	Negligible	High	Low	3.8	2.2	**Retain**	Yes	Tree with very poor stem orientation and asymmetric canopy structure due to suppression. Signs of partial root plate failure.
579	*Casuarina glauca*	Grey She-oak	Mature	1	Outside	16	4	26	32	Good	Good	N/A	Long	High	High	3.1	2.1	**Retain**	Yes	Maturing Council street tree in good condition.
580	*Casuarina glauca*	Grey She-oak	Mature	1	Outside	17	7	41	46	Good	Fair	N/A	Long	High	High	4.9	2.4	**Retain**	Yes	Maturing Council street tree in mostly good condition. Stem bifurcates at 5 metres. No signs of union weakness.
581	*Casuarina glauca*	Grey She-oak	Mature	1	Outside	10	6	18	26	Good	Poor	N/A	Short	High	Moderate	2.2	1.9	**Retain**	Yes	Tree with poor stem orientation and asymmetric canopy structure due to suppression.
582	*Casuarina glauca*	Grey She-oak	Mature	1	Outside	10	6	24	39	Good	Poor	N/A	Short	High	Moderate	2.9	2.2	**Retain**	Yes	Tree in suppressed position. Stem bifurcates at ground level. Union with signs of bark inclusion.
583	*Tristaniopsis laurina*	Water Gum	Mature	1	Stage 1	5	4	16	18	Good	Fair	N/A	Medium	Moderate	Moderate	2.0	1.6	**Remove**	Yes	Street tree in poor position. Canopy within ABC powerline. Stem bifurcates at ground level.
584	*Tristaniopsis laurina*	Water Gum	Mature	1	Stage 1	2	2	6	8	Poor	Poor	N/A	Negligible	High	Low	2.0	1.1	**Remove**	Yes	Small street tee in poor condition. Major dieback due to excessive whipper snipper damage at base.
585	*Eucalyptus melliodora*	Yellow Box	Mature	1	Stage 1	7	6	29	34	Good	Poor	N/A	Short	High	Moderate	3.5	2.1	**Remove**	Yes	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
586	*Eucalyptus melliodora*	Yellow Box	Mature	1	Stage 1	7	9	30	40	Good	Poor	N/A	Short	High	Moderate	3.6	2.3	**Remove**	Yes	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
587	*Eucalyptus melliodora*	Yellow Box	Mature	1	Stage 1	7	10	38	39	Good	Poor	N/A	Short	High	Moderate	4.6	2.2	**Remove**	Yes	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
588	*Tristaniopsis laurina*	Water Gum	really young	1	Stage 1	2	1	3	4	Good	Good	N/A	Long	Moderate	Moderate	2.0	0.9	**Remove**	Yes	Very small street tree in good condition. Reduced landscape significance due to small size and suitability for replacement.
589	*Tristaniopsis laurina*	Water Gum	Semi mature	1	Stage 1	4	2	12	14	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.4	**Remove**	Yes	Small street tree in good condition. Reduced landscape significance due to small size and suitability for replacement.
590	*Tristaniopsis laurina*	Water Gum	Semi mature	1	Stage 1	5	3	16	24	Good	Fair	N/A	Long	Moderate	Moderate	2.0	1.8	**Remove**	Yes	Smaller street tree poorly positioned below powerlines. Stem trifurcates at ground level. No obvious signs of union weakness.

Tree	Genus and Species	Common Name	Maturity	No. trees	Position within Site	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	Habitat Observed	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Remove / Retain	Protected under DCP	Comments
591	*Tristaniopsis laurina*	Water Gum	Semi mature	1	Stage 6	4	3	9	23	Poor	Fair	N/A	Long	Moderate	Moderate	2.0	1.8	**Remove**	Yes	Small street tree with signs of dieback. Stem trifurcates at ground level. Poorly positioned beneath powerlines.
592	*Tristaniopsis laurina*	Water Gum	Semi mature	1	Stage 6	4	3	7	16	Poor	Fair	N/A	Long	Moderate	Moderate	2.0	1.5	**Remove**	Yes	Small street tree with signs of dieback. Tissue necrosis at base. Stem bifurcates at 0.5 metres. Poorly positioned beneath powerlines.
593	*Tristaniopsis laurina*	Water Gum	Semi mature	1	Stage 6	3	3	8	13	Poor	Fair	N/A	Long	Moderate	Moderate	2.0	1.4	**Remove**	Yes	Small street tree with signs of dieback. Tissue necrosis at base. Stem bifurcates at 0.5 metres. Poorly positioned beneath powerlines.
594	*Eucalyptus melliodora*	Yellow Box	Mature	1	Stage 6	10	10	38	41	Good	Poor	N/A	Short	High	Moderate	4.6	2.3	**Remove**	Yes	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
595	*Eucalyptus melliodora*	Yellow Box	Mature	1	Stage 6	12	10	46	63	Good	Poor	N/A	Short	High	Moderate	5.5	2.7	**Remove**	Yes	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
596	*Tristaniopsis laurina*	Water Gum	Semi mature	1	Stage 6	5	4	18	21	Fair	Fair	N/A	Medium	Moderate	Moderate	2.1	1.7	**Remove**	Yes	Small street tree poorly positioned below powerlines. Stem bifurcates at ground level, no signs of union weakness.
597	*Tristaniopsis laurina*	Water Gum	Mature	1	Outside	6	5	24	25	Good	Fair	N/A	Medium	Moderate	Moderate	2.8	1.8	**Retain**	Yes	Small street tree poorly positioned below powerlines. Multistemmed at 1 metre.
598	*Tristaniopsis laurina*	Water Gum	Mature	1	Outside	4	3	9	16	Fair	Fair	N/A	Medium	Moderate	Moderate	2.0	1.5	**Retain**	Yes	Small street tree poorly positioned below powerlines. Minor dieback.
599	*Tristaniopsis laurina*	Water Gum	Mature	1	Outside	3	2	6	12	Poor	Fair	N/A	Short	Moderate	Low	2.0	1.4	**Retain**	Yes	Small street tree poorly positioned below powerlines. Canopy with signs of dieback. Major tissue necrosis at base of stem.
600	*Tristaniopsis laurina*	Water Gum	Mature	1	Outside	3	2	9	21	Poor	Fair	N/A	Short	Moderate	Low	2.0	1.7	**Retain**	Yes	Small street tree poorly positioned below powerlines. Canopy with signs of dieback. Major tissue necrosis at base of stem.

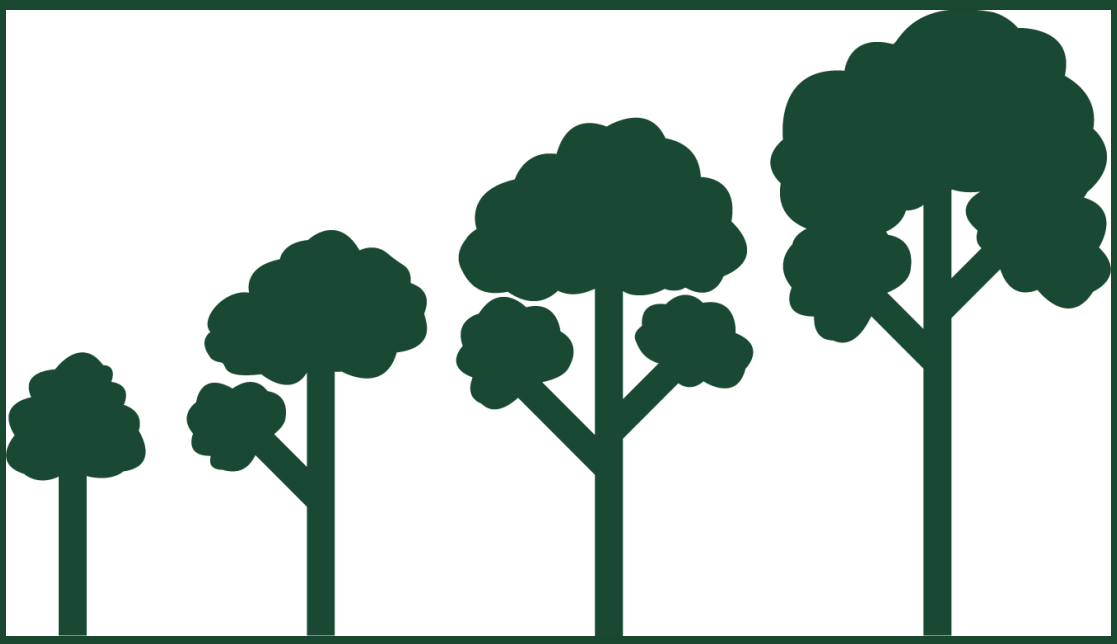
Appendix J: Addendum Arboricultural Impact Assessment for Stage 1 Area

Addendum Arboricultural Impact Assessment prepared for Ashford Avenue street trees by *Temporal Tree Management Pty Ltd.* (17/05/2024).

***********************See Over for Report***************************

Temporal
TREE MANAGEMENT

Addendum Arboricultural Impact Assessment



Western Sydney University, Milperra Campus
Ashford Avenue Boundary Trees
NSW, 2214
2/-/DP1291984
17/05/2024

PREPARED BY:

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DISCLAIMER and LIMITATIONS

This addendum report has been prepared for *Mirvac* as part of the proposed development of the Western Sydney University Milperra Campus. This addendum report is pursuant to the proposed works outside the western boundary of the site along the eastern Ashford Avenue verge between Bullecourt Avenue and South-western Motorway. This report provides an assessment of the impact on twenty-five street trees positioned along this portion of the Ashford Avenue verge.

The author of this report is *Temporal Tree Management Pty Ltd.* This report is not designed for any other purpose. The author accepts no responsibility for the use of this report for purposes other than as an Arboricultural Impact Assessment or if used by any other person / party. The collection of tree data and the preparation of this report have been undertaken without prejudice.

All observations, recommendations and advice expressed within this report are based on *the Australian Standard for the Protection of Trees on Development Sites (AS 4970 2009),* the professional experience of the author, information gathered during the site assessments and information provided by the client(s). Trees are dynamically growing organisms that change over time. Recommendations provided in this report reflect the information within the supporting documentation and the condition of the assessed trees on the day of assessment. No guarantee is implied with respect to future tree condition or safety beyond the advice and recommendations within the report.



William Dunlop

Director of *Temporal Tree Management Pty Ltd.*

B. Sc (Adv.), Grad. Dip (Arb) (AQF Level 8), M. UrbHort.

17th May 2024

1. Executive Summary

The purpose of this report is to provide an Addendum Arboricultural Impact Assessment for the trees located along the eastern verge of Ashford Avenue between Bullecourt Avenue and the South-western Motorway. This street verge is adjacent to the western boundary of the Western Sydney University (WSU) Milperra Campus, which is proposed for redevelopment. An Arboricultural Impact Assessment (AIA) for all trees positioned within the boundaries of the WSU Milperra Campus was prepared by *Ecological* (09/04/2024). This addendum report must be read as an accompanying document of the AIA prepared by *Ecological*.

Twenty-five trees are included in this assessment. A ground-based visual assessment of Trees 1-25 was undertaken by William Dunlop of *Temporal Tree Management Pty Ltd* on 07/05/2024. Tree data tables are provided in **Appendix G.** Tree protection measures are drawn from the *Australian Standard for the Protection of Trees on Development Sites* (AS4970 2009).

Tree Retention Values

Table 1. Summarised tree retention value data for forty-two trees assessed on 07/05/2024 within the subject site. Tree data tables are provided in **Appendix G.**

Retention Values Determined for Twenty-five Assessed Trees			
Very Low	Low	Moderate	High
N/A	Trees 3, 9, 24 and 25	Trees 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23	Trees 1, 2, 4 and 5

The retention value of the assessed trees was determined using the Tree Retention Values Assessment Methodology (Morton 2011). Four trees were determined to be of High retention value within the surrounding landscape. The retention of these trees should be prioritised as part of the proposed works. Seventeen trees were determined to be of Moderate retention value. These trees should be retained if reasonably practicable. Moderate retention value trees must be suitably replaced if proposed for removal. Four trees were determined to be of Low retention value within the surrounding landscape. The retention of these four trees should not obstruct or require alteration of the proposed plans. If removed, Low retention value trees should be suitably replaced within the landscape.

Impact of Proposed Development

The primary impact of the development works associated with the WSU Milperra Campus on the assessed trees will be during the upgrading of existing above-ground powerlines to be below-ground. Proposed excavation of the eastern verge of Ashford Avenue for the installation of underground electrical service between Sinai Avenue and Flanders Avenue will Severely impact the viability of all trees within the proposed pathway of services. The stems of Trees 8-21 are within the footprint of the proposed excavation footprint for the installation of underground services. These fourteen trees will sustain entire TPZ encroachments that will severely impact their viability.

The remaining trees (Trees 1-7 and 22-25) are not within the footprint of the proposed excavation for the installation of underground services and will not be impacted by excavation required for proposed vehicle crossing installation along the western boundary of the development site.

Tree Retention / Removal Schedule

Table 3. Tree removal / retention schedule for proposed works. Detailed Tree Data Tables are provided in **Appendix I.**

Retention Values of Fourteen Trees Proposed for Removal			
Very Low	Low	Moderate	High
N/A	Tree 9	Trees 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21	N/A

Fourteen trees included in this assessment are recommended for removal as part of the proposed development. The stems of Trees 8-21 are within the footprint of proposed excavation and therefore cannot be retained. Trees 8 and 10-21 are of Moderate retention value while Tree 9 was determined to be of Low retention value within the landscape.

The removal of these fourteen trees is considered to be acceptable providing they are suitably replaced as part of the proposed development. It is recommended that each tree is replaced with a specimen of the same species along the western verge of Ashford Avenue. Each tree must be suitably positioned in between the proposed vehicle crossings for the new lots to ensure the ULEs are entirely fulfilled. All replacement trees must come in a minimum 75L pot and be grown under conditions compliant with *the Australian Standard for Tree Stock for Landscape Use (AS 2303 2015).*

Trees 1-7 and 22-25 are suitable for retention as part of the proposed development. Three fenced protection zones compliant with the specifications outlined in Section 4.3 of *AS4970 (2009)* must be installed prior to the commencement of practical works. The R_{TPZs} of retained trees must be used to establish the northern and southern edges of the protection zones. The edges of the grassed verge must be used to establish the eastern and western boundaries. Fenced protection zones must be installed prior to the commencement of practical works and remain in place for the duration of the development. Any required access within one of the fenced protection zones must be approved by the Project Arborist prior to entry. Suitable ground or stem protection measures must be temporarily installed for the duration of required access as specified in *Sections 4.5.2 and 4.5.3 of AS4970 (2009)*. New utility services are to be located outside the R_{TPZs} of retained trees. Any additional excavation required for service installation within a retained tree's R_{TPZ} must be assessed and certified by the Project Arborist. Replacement tree planting for Trees 8-21 must be undertaken in accordance with Section 7.1 of this report upon completion of practical works along the eastern Ashford Avenue verge.

2. Location

2.1. Site Location

The subject site for this Addendum Arboricultural Impact Assessment (AIA) is the eastern verge of Ashford Avenue, Milperra, which fronts the western boundary of the Western Sydney University (WSU) Milperra Campus (Figure 1). The subject site is positioned within an R2 Low-density Residential zone (Planning NSW 2024).

This report has relied upon the following plans and documents:

- *Staging Plan,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: C, Reference: 302, Drawing No: 010, drawn 31/01/2024).
- *Layout Plan Overall,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: -, Sheet: 4 of 20, Drawing No: 010, drawn 31/01/2024).
- *Arboricultural Impact Assessment*, prepared by *Ecological* (09/04/2024).
- *Bulk Earthworks and Lot Benching Plan,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: A, Reference: 303, Drawing No: 012).
- *Underground Residential Subdivision-Stage 1: 271 Horsely Road, Milperra, NSW,* prepared by *Edgewater Connections (*Ausgrid Project No: AN-25851, Sheet 6 of 7.
- The Australian Standard for the Protection of Trees on Development Sites (*AS4970 – 2009*).

2.2. Relevant Policy Controls

The subject site is located within the City of Canterbury Bankstown local government area. All land within the subject site is within an R2 zone that is managed by the City of Canterbury Bankstown.

The environmental policy regulations relevant to the trees within and surrounding the subject site are drawn from *the NSW State Environmental Planning Policy (SEPP) (Biodiversity and Conservation) 2021.* Management of the trees within the subject site falls under the control of the City of Canterbury Bankstown. The policy controls governing the management of the trees within the City of Canterbury Bankstown are outlined in *Part B11 'Tree Preservation Order' of the Bankstown Development Control Plan (2015)* and *the City of Canterbury-Bankstown Council Tree Management Manual* (City of Canterbury-Bankstown Council 2024). These policy controls draw from *the Australian Standard for the Protection of Trees on Development Sites* (AS4970 2009) and *the Australian Standard for Pruning Amenity Trees* (AS4373 2007).

The central - northern portion of the subject site is positioned within an identified Endangered Ecological community (SEED 2024) (**Appendix A**). *Cumberland Plains Woodland* in the Sydney Basin Bioregion (as described in the final determination of the Scientific Committee to list the ecological community) is listed as an Endangered Ecological Community under *the Biodiversity Conservation Act 2016* and under *the Environment Protection and Biodiversity Conservation Act 1999* of the Commonwealth (NSW Dept. of Planning and Environment 2021). The indigenous trees within and adjacent to the boundary of these identified EEC areas were therefore determined to be of increased Landscape Significance.

The subject site is also within the Ashford Avenue Heritage Item (**Appendix A**). The contribution of the street trees included in this assessment to the amenity of this heritage item was therefore also considered in determining their Landscape Significance.

2.3. Tree Locations and Diversity

As stipulated in the *Part B11 of the Bankstown DCP (2015)* and *the City of Canterbury-Bankstown Council Tree Management Manual,* all trees regardless of size were included in this assessment due to the position of the subject site within a Heritage Item (City of Canterbury Bankstown Council 2024).

Twenty-five trees were included in this assessment (**Appendix G, Appendix H**). All twenty-five trees street trees are positioned within land managed by the City of Canterbury Bankstown (Figure 1) (**Appendix A**). See **Appendix H** for Photographs of each assessed tree.

A narrow range of species was observed (Table 4). Of the four species observed, one is locally indigenous (*Casuarina glauca*). This species does not form part of the canopy formation of the *Cumberland Plains Woodland* (NSW Dept. of Planning and Environment 2021). There were no threatened species included in this assessment. The five trees of the five locally indigenous species are likely to be planted or remnant progeny of the *Swamp Oak Floodplain Forest* vegetation formation that previously comprised alluvial areas within the Milperra area.

The trees of the three native species (*Eucalyptus microcorys, Eucalyptus melliodora* and *Tristaniopsis*) observed in this assessment are planted street tree specimens.

Table 4. Range of species and number of assessed trees within each.

Scientific Name	Common Name	Locally Indigenous	Native	Scheduled Weed	Number of Trees
Eucalyptus microcorys	Tallow Wood	No	Yes	No	2
Casuarina glauca	Grey She-oak	Yes	Yes	No	5
Tristaniopsis laurina	Water Gum	No	Yes	No	13
Eucalyptus melliodora	Yellow Box	No	Yes	No	5

3. Site Development Plans

Redevelopment of the Western Sydney University Milperra Campus into residential lots has been proposed. The AIA prepared by *Ecological* provides an assessment of the impact of this development and a Tree Removal / Protection Plan for all trees positioned within the campus boundaries. This Addendum Arboricultural Impact Assessment is pursuant to the Ashford Avenue Street trees that are positioned adjacent to the western boundary of this development site (Figure 2-Figure 5). Excavation required for the installation of vehicle crossings and upgrading existing above-ground electrical services to be below-ground along the portion of the eastern verge of Ashford Avenue between Sinai Avenue and Flanders Avenue is proposed as part of the development plan for this site (Figure 6 and Figure 7).



Figure 1. Position of twenty-five assessed trees. Image sourced from *Google (2024).*



Figure 2. Subject site (RED boundaries) positioned adjacent to western boundary of WSU development site. *Layout Plan Overall,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: -, Sheet: 4 of 20, Drawing No: 010, drawn 31/01/2024). Annotated by Temporal Tree Management Pty Ltd. (17/05/2024).

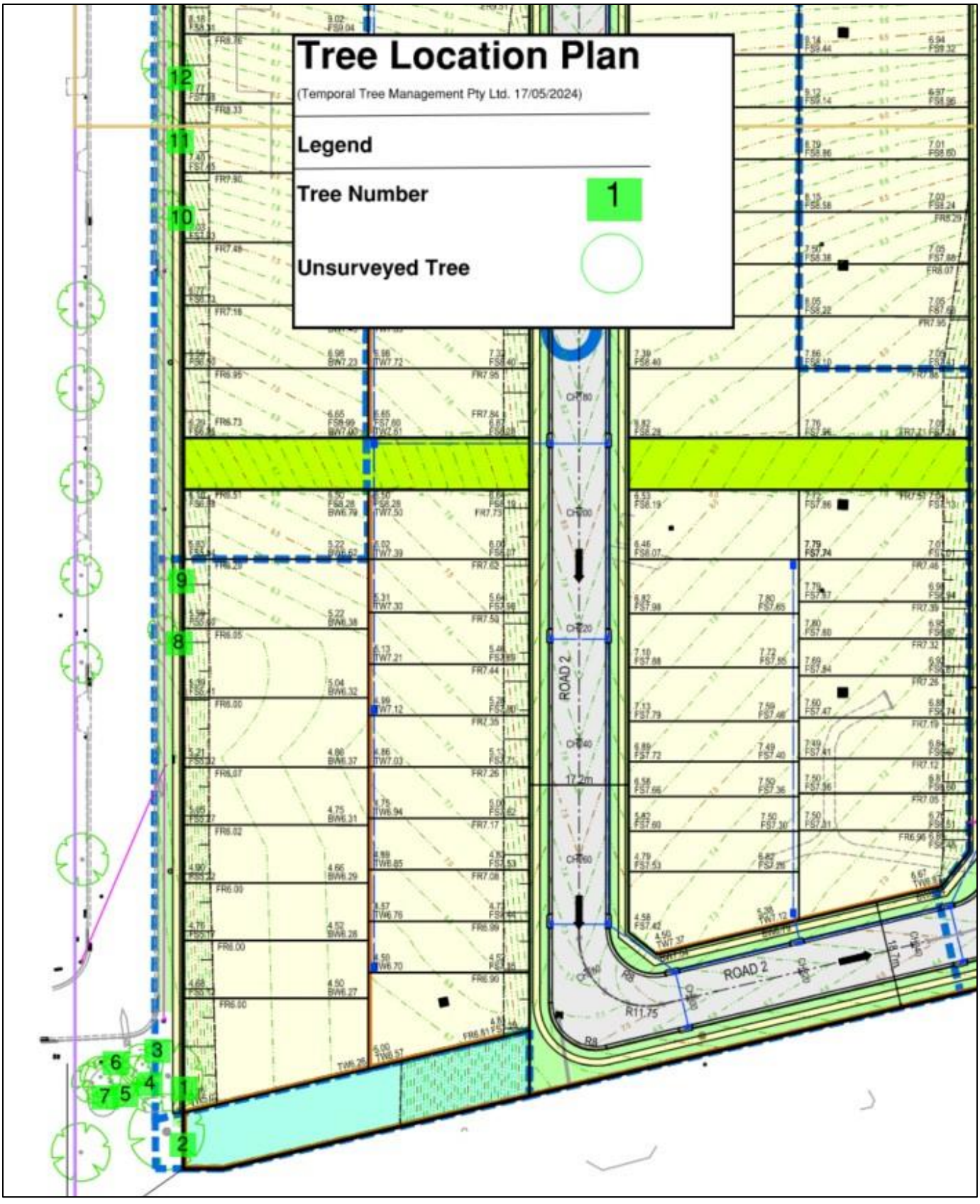


Figure 3. Trees 1-12 positioned within southern – central portion of subject site. *Layout Plan Overall,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: -, Sheet: 4 of 20, Drawing No: 010, drawn 31/01/2024). Annotated by Temporal Tree Management Pty Ltd. (17/05/2024).

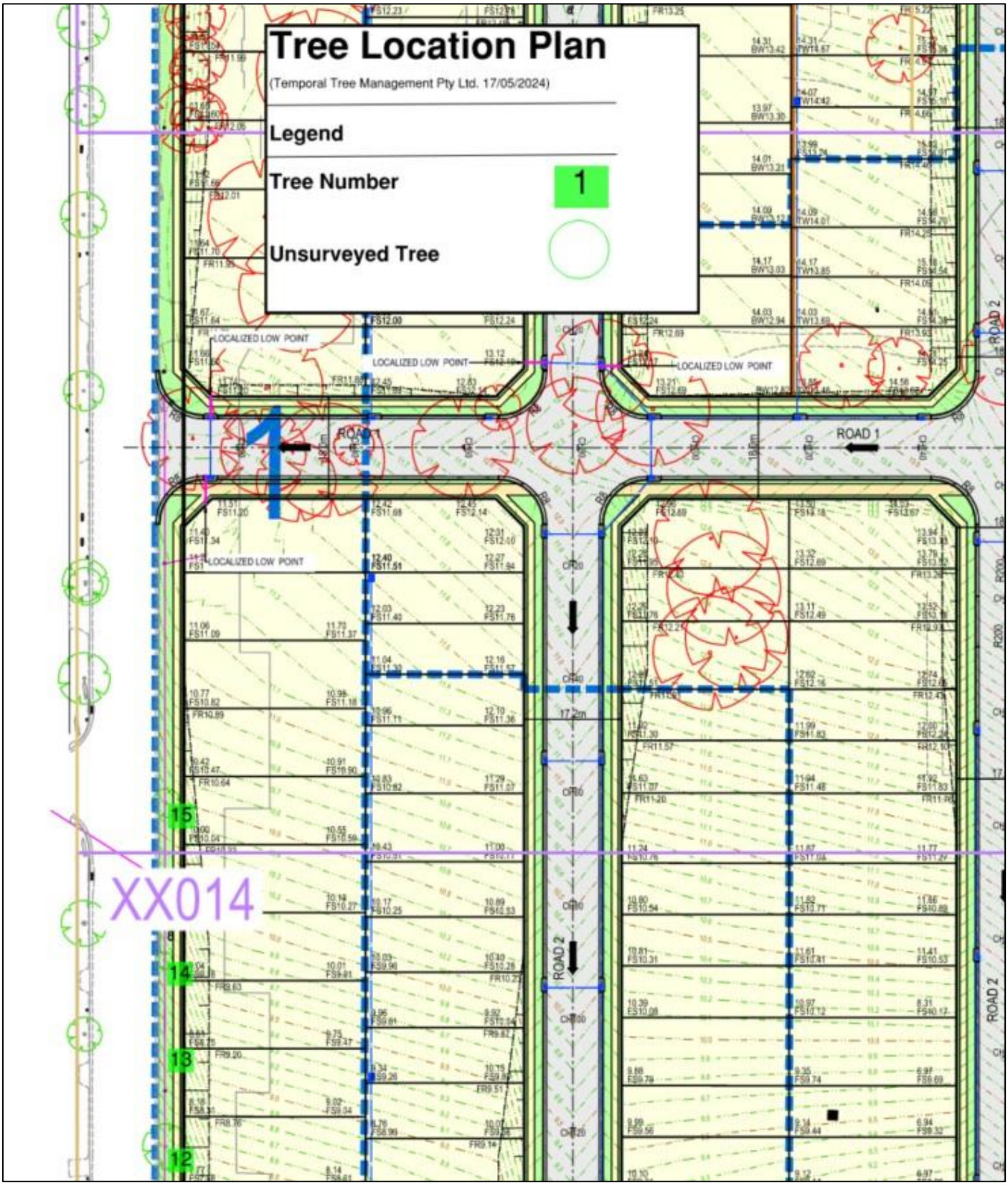


Figure 4. Trees 12-15 positioned within central portion of subject site. *Layout Plan Overall,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: -, Sheet: 4 of 20, Drawing No: 010, drawn 31/01/2024). Annotated by Temporal Tree Management Pty Ltd. (17/05/2024).

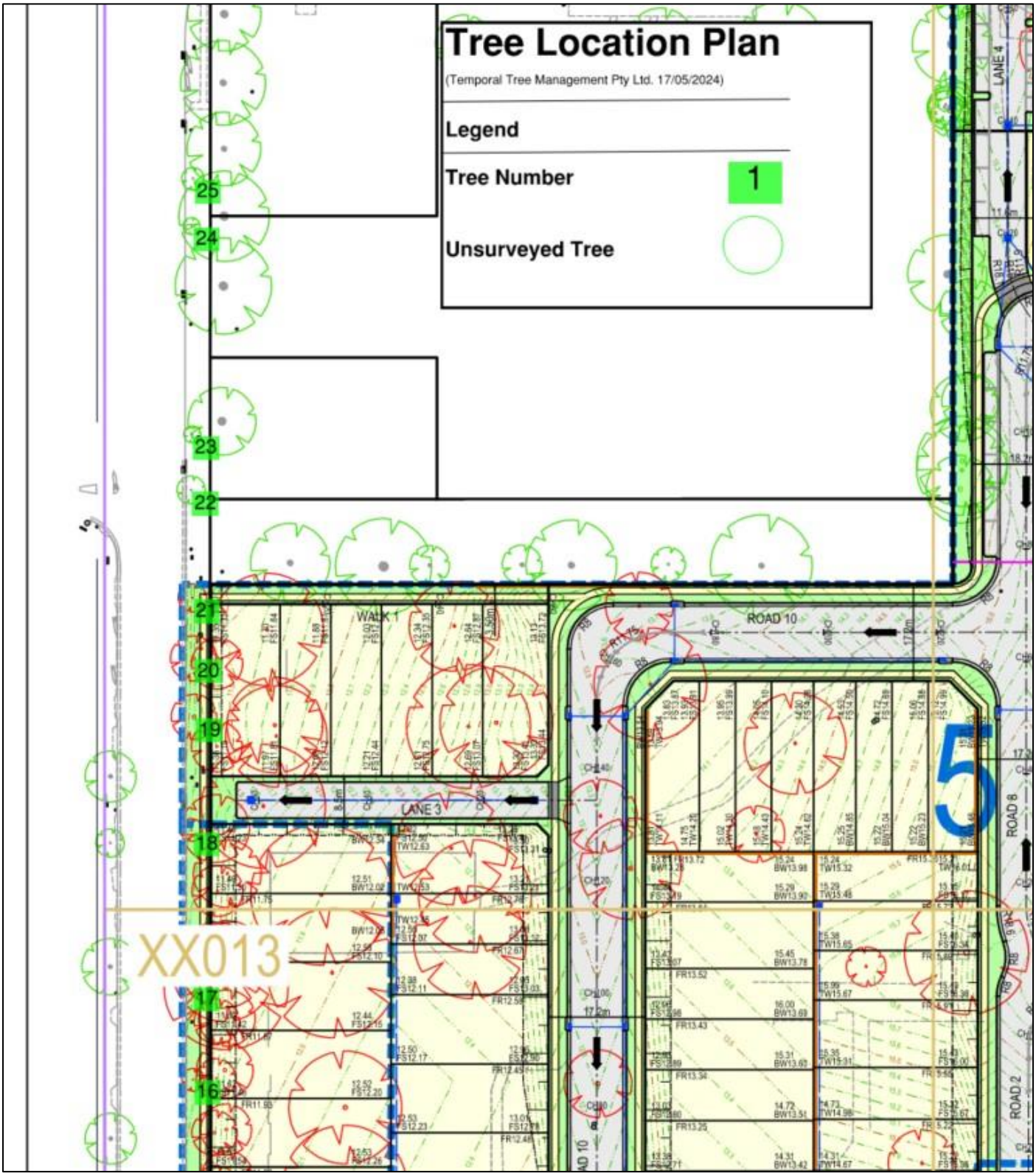


Figure 5. Trees 16-25 positioned within central – northern portion of subject site. *Layout Plan Overall,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: -, Sheet: 4 of 20, Drawing No: 010, drawn 31/01/2024). Annotated by Temporal Tree Management Pty Ltd. (17/05/2024).

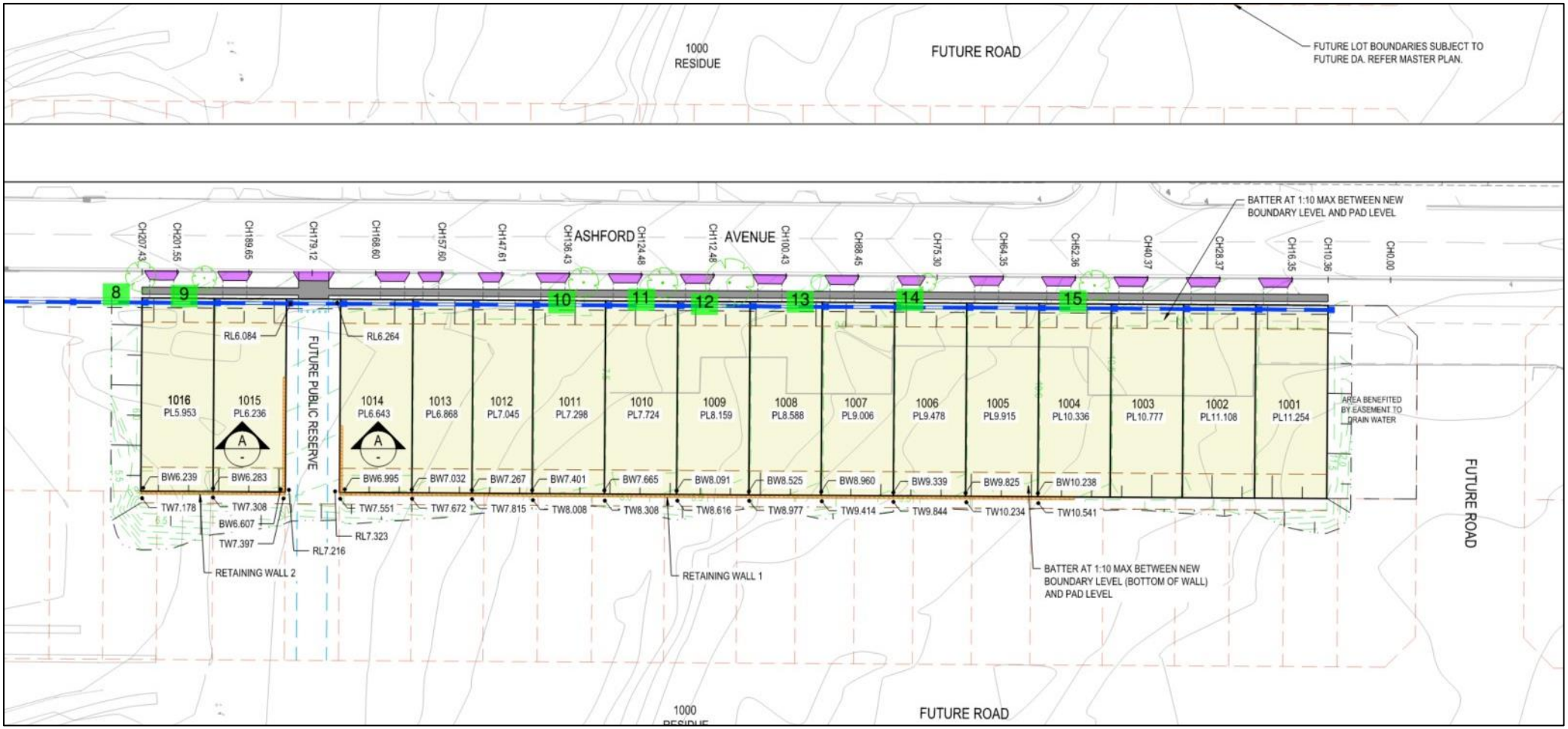


Figure 6. Trees 8-15 positioned adjacent to the western boundary of the Stage 1 development area in relation to proposed vehicle crossings. positioned within central – northern portion of subject site. *Bulk Earthworks and Lot Benching Plan,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: A, Reference: 303, Drawing No: 012). Annotated by Temporal Tree Management Pty Ltd. (17/05/2024).



Figure 7: *Underground Residential Subdivision-Stage 1: 271 Horsely Road, Milperra, NSW,* prepared by *Edgewater Connections (*Ausgrid Project No: AN-25851, Sheet 6 of 7. Annotated by Temporal Tree Management Pty Ltd. (17/05/2024). Proposed underground LV electrical service locations are annotated in BLUE.

4. Assessment Methodology

A ground-based visual assessment of Trees 1-25 was undertaken by William Dunlop of *Temporal Tree Management Pty Ltd* on 07/05/2024. Tree data tables are provided in **Appendix J.**

Ø Tree Number Schedule: Twenty trees were included in this assessment. The tree number schedule from previous assessments of the trees were not retained in this assessment.

Ø Scientific Name: Vegetation was identified and described using scientific names.

Ø Common Name: One common is provided.

Ø Maturity: **Juvenile, Semi – mature, Mature or Over Mature**. Judgement on these four categories was determined by professional knowledge and existing research on the species present.

Ø Height: Estimated in metres.

Ø Canopy Width: Estimated in metres as an average in metres from two planes.

Ø Diameter at Breast Height (DBH): DBH was measured at 1.4 metres height and is described in centimetres. The DBH of the largest specimen in a group was applied to all trees in that group. DBH was estimated for Trees 9 and 10 due to restricted access within an existing fenced works area.

Ø Diameter at Root Flare (DRF): DRF was measured at the height of the trees' root flare and is described in centimetres. The DRF of the largest specimen in a group was applied to all trees. DRF was estimated for Trees 9 and 10 due to restricted access within an existing fenced works area.

Ø Health: **Dead, Poor, Fair, Good or Excellent**. Professional experience along with the visual vitality index established by Johnston et al. (2012) was used to underpin this category **(Appendix B).**

Ø Structure: **Failed, Very Poor, Poor, Fair, Good or Excellent**. Professional experience along with Visual Tree Assessment methodology established by Mattheck and Breloar (1994) was used to underpin this category.

Ø Useful Life Expectancy (ULE): This estimate provides an important estimate of a tree's remaining safe life span within a landscape (Barrell 1996). Estimates are based on species knowledge and an individual's structure, health and position within the landscape. ULE estimate categories used were: **Long** (>40 years), **Medium** (between 15 and 40 years), **Short** (between 5 and 15 years), **Negligible** (Less than 5 years) or **Dead** (less than 12 months). A framework for the ULE determination methodology is provided in **Appendix E** (Barrell 1996).

Ø Landscape Value: **Significant** (1), **Very High** (2), **High** (3), **Moderate** (4), **Low** (5), **Very Low** (6), **Insignificant** (7). These categories account for each tree's size, ecological significance as a food or habitat resource, structural integrity, visual prominence within the landscape and any additional heritage or protection controls that may be relevant to it. A framework for the Landscape Significance determination methodology is provided in **Appendix D** (Morton 2011).

Ø Retention Value: **High, Moderate, Low and Very Low**. ULE and Landscape Significance categories were used for each tree to determine their retention value (**Appendix C**). The retention and protection of trees determined to be of **High** retention value should be prioritised for any proposed development within the subject site. Trees determined to be of **Moderate** retention value should be retained and protected if feasible. The retention of trees determined to be of **Low** retention value should not obstruct any proposed development within the subject site. Tree determined to be of **Very Low** retention value should be removed as part of any development within the site. The Tree Retention Values Matrix and framework for the Retention Value priorities is provided in **Appendix C** (Morton 2011).

Ø Tree Protection Zone Radius (R_{TPZ}): A Tree Protection Zone is a circular area surrounding a tree that provides the principal means of protecting trees on development sites. A Tree Protection Zone (TPZ) radius (R_{TPZ}) may be calculated using the equation from the Australian Standard for the Protection of Trees on Development Sites (AS 4970 2009):

$$\mathbf{R_{(TPZ)} = DBH \times 12.}$$

As per *Section 3.2 of AS4970 (2009),* a minimum R_{TPZ} measure of 2 metres and maximum measure of 15 metres were calculated for this assessment.

Ø Structural Root Zone Radius (R_{SRZ}): This measure provides an indication of the portion of a tree's root plate that is considered fundamentally important for the maintenance of structural integrity. A Structural Root Zone (SRZ) radius (R_{SRZ}) may be calculated using the equation from the *Australian Standard for the Protection of Trees on Development Sites* (AS 4970 2009):

$$\mathbf{R_{(SRZ)} = (DRF \times 50)^{0.42} \times 0.64}$$

5. Tree Data Summary

Of the twenty-five assessed trees, -four were determined to be of High Retention Value within the surrounding landscape, seventeen were determined to be of Moderate Retention Value, four were determined to be of Low Retention Value and none were determined to be of Very Low Retention Value.

Trees 1, 2, 4 and 5 were determined to be of High Retention Value within the surrounding landscape (Table 1). These street trees are dominant specimens within that are of indigenous/native species value and are visually prominent within the landscape. These factors underpinned the High Landscape Significance determined for them. All four trees were observed to be in good condition, which underpinned their Long ULE estimates. The retention of the four High priority trees should be prioritised as part of the proposed development. Protection measures compliant with *the Australian Standard for the Protection of Trees on Development Sites (AS4970 2009)* must be established for these trees where necessary.

Trees 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23 were determined to be of Moderate retention value. Trees 6, 7, 10, 11, 12, 19 and 20 are larger trees that were determined to be of High Landscape Significance. Structural defects observed for these trees, primarily due to severe canopy pruning to facilitate the above-ground Low-voltage powerlines underpinned the shortened ULE estimates and reduced Retention Value rating determined for them. Despite their Council ownership, Trees 8, 13, 14, 15, 16, 17, 18, 21, 22, and 23 were determined to be of Moderate Landscape Significance due to their smaller size and suitability for effective replacement. The reduction in the Landscape Significance rating determined for these trees underpinned their reduced Retention Value ratings. Trees 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23 should be retained as part of the proposed development if feasible. These seventeen trees are suitable for removal and replacement as part of the proposed development if design alterations to facilitate their retention are not feasible. If removed, Moderate retention value trees must be replaced.

Trees 3, 9, 24 and 25 were determined to be of Low retention value within the surrounding landscape due to their poor condition, with signs of dieback and / or major structural defects observed for them. The retention of these four trees should not obstruct or require alteration of the planned development works.

6. Impact of Development

6.1. Tree Protection Zones

Tree Protection Zones prevent soil compaction, contamination and physical damage to trees above and below ground through the exclusion of all development activity from within the specified radius (Matheny and Clark 1994). Trees within the proposed development profile or bulk earthworks excavation areas cannot be protected and will require removal as part of the proposed development.

6.2. TPZ Encroachments

Minor encroachments of less than 10% of the total TPZ area may occur without the site presence of the Project Arborist providing there is an equal compensation of protected area elsewhere adjacent to the TPZ. The potential impact on the viability of tree with a TPZ encroachment that is less than 10% is unlikely to impact the viability of a tree and is defined as Low in this assessment.

Major encroachments of more than 10% of the total TPZ area may occur if it can be demonstrated that the impact of the encroachment is mitigated or won't impact the viability of the affected tree. The impact of a major TPZ encroachment that is between 10-20% is defined as Moderate in this assessment and is generally considered to be acceptable providing the tree's condition is shown to be Good/Fair, it can be shown that the affected tree will remain viable. The impact on the viability of tree with a major TPZ encroachment that is between 20-30% is defined as High in this assessment. The impact of a major encroachment within this range may compromise the viability of an impacted tree. Retention under a High impact major TPZ encroachment must demonstrate mitigation of impact from existing infrastructure and / or demonstrate it by through a Root Mapping Assessment to show that the affected tree will remain viable. Modification of the design plan may be required to mitigate the impact of the encroaching structure. There must also be an equal compensation of protected area elsewhere adjacent to the TPZ.

The impact on the viability of tree with a major TPZ encroachment that is greater than 30% is defined as Severe in this assessment. Major encroachments of this magnitude are likely to impact a tree's health and may impact the structural integrity of their root plate. Retention under such encroachments is unacceptable unless there will be significant mitigation of impact from existing infrastructure and / or it can be shown through a Root Mapping Assessment and significant mitigation of the impact. Modification of the design plan may be required to mitigate the impact of the encroaching structure. There must also be an equal compensation of protected area.

Instances where a tree's stem is positioned within the footprint of a proposed structure is in this assessment determined to be a 100% TPZ encroachment that will have a Severe impact.

6.3. Impact of Development and TPZ Encroachments

The proposed Ashford Avenue vehicle crossings along the western boundary of the development site will result in major TPZ encroachments for some of the assessed trees. However, the primary impact associated with the development of the WSU Milperra Campus on the assessed trees will be associated with upgrading the existing above-ground Low-voltage powerlines to be below-ground. Proposed excavation of the eastern verge of Ashford Avenue between Sinai Avenue and Flanders Avenue for the installation of underground electrical service will Severely impact the viability of all trees within the proposed pathway of services. The stems of Trees 8-21 are within the footprint of the proposed excavation footprint for the installation of underground services. These fourteen trees will sustain entire TPZ encroachments that will severely impact their viability (Figure 10-Figure 12).

The remaining trees (Trees 1-7 and 22-25) are not within the footprint of the proposed excavation for the installation of underground services and will not be impacted by excavation required for proposed vehicle crossing installation. These eleven trees will therefore not sustain a direct impact as part of the proposed development (Figure 10-Figure 12).

7. Tree Protection / Removal Plan

7.1. Tree Removal Schedule

Fourteen trees included in this assessment are recommended for removal as part of the proposed development. The stems of Trees 8-21 are within the footprint of proposed excavation and therefore cannot be retained. Trees 8 and 10-21 were determined to be of Moderate retention value within the landscape while Tree 9 was determined to be of Low retention value.

The removal of these fourteen trees is considered to be acceptable providing they are suitably replaced as part of the proposed development. It is recommended that each tree is replaced with a specimen of the same species along the western verge of Ashford Avenue. Each tree must be suitably positioned in between the proposed vehicle crossings for the new lots to ensure the ULEs are entirely fulfilled. All replacement trees must come in a minimum 75L pot and be grown under conditions compliant with *the Australian Standard for Tree Stock for Landscape Use (AS 2303 2015).*

No hollows or nests were observed within the canopies of Trees 8-21 during the site assessment. However, there may be unseen hollows within the canopies of other trees that were not identified due to the inherent limitations associated with ground-based visual assessments. Tree removal or pruning works must be halted, and an ecologist notified, if any arboreal fauna, active hollows or active nests are encountered. An ecologist and the Project Arborist must be engaged to provide guidance in such cases.

Consent for the removal of Trees 8-21 must be obtained from the City of Canterbury Bankstown Council prior to the commencement of any recommended works. If approved, tree removal works should be undertaken by a suitably qualified arborist (minimum AQF Level 3) and must be in compliance with the *Work Safe Guide to Managing Risks of Tree Trimming and Removal Work (2016).*

7.2. Tree Protection Measures

Fenced protection zones must be established where possible to delineate construction activities from the TPZs and SRZs of retained trees. Fenced protection zones must be enclosed by 1.8 metre steel fencing that is securely fixed to the ground as stated in *Section 4.3 of AS4970 (2009)* (Figure 4). Shade cloth must be securely fastened to the steel fencing to reduce transport of dust and debris into tree protection areas. Plywood may be used as an alternative if steel fencing cannot be suitably installed. Signage stating the purpose of these exclusion zones should be fixed to the fencing so that it is visible

from all points within the site. Coarse-grained wood-chip mulch may be required within a fenced protection zone if specified. Bracing is permissible within the fenced protection zone providing supports avoid any damage to surface roots (Figure 8).

As per *Section 4.2 of AS4970 (2009),* the following activities are not permitted inside delineated protection zones:

(a) Machine excavation including trenching;
(b) Excavation for silt fencing;
(c) cultivation;
(d) storage;
(e) preparation of chemicals, including preparation of cement products;
(f) parking of vehicles and plant;
(g) refuelling;

(h) dumping of waste;
(i) wash down and cleaning of equipment;
(j) placement of fill
(k) lighting of fires;
(l) soil level changes;
(m) temporary or permanent installation of utilities and signs, and
(n) physical damage to the tree."

Once installed, fenced tree protection zones must remain undisturbed for the duration of proposed development works. No services either temporary or permanent are to be located within a specified fenced protection zone. If services are to be located within a Tree Protection Zone, special details will need to be provided by the Project Arborist for the protection of the tree regarding the location of the services.

Temporary access within a fenced protection zone may only occur under the supervision of the Project Arborist. The installation of ground protection measures compliant with *Section 4.5.3 of AS4970 (2009*) is required if any vehicles or machinery is required to temporarily access a specified fenced protection zone. In such cases, a geotextile membrane must be installed over the specified ground protection area. Coarse-grained wood-chip mulch must be installed to a depth of no less than 70mm and no more than 100 mm over the geotextile membrane. Timber rumble boards or heavy vehicle protection plates/mats must then be installed over the mulch (Figure 9). Ground protection measures must remain in place for the entire duration of required vehicle or machinery access within a fenced protection zone. Protection fencing must be reinstalled to its original shape immediately after the completion of required works within the fenced protection zone.



Figure 8. Protection fencing should be erected around the specified perimeter of TPZs in accordance with Section 4.3 of *AS4970 (2009).* Figure 11 a. depicts correctly installed steel or plywood fence panelling (1 and 2) with mulch inside the protection area (3). Figure 11 b. shows depicts protection fencing signage.

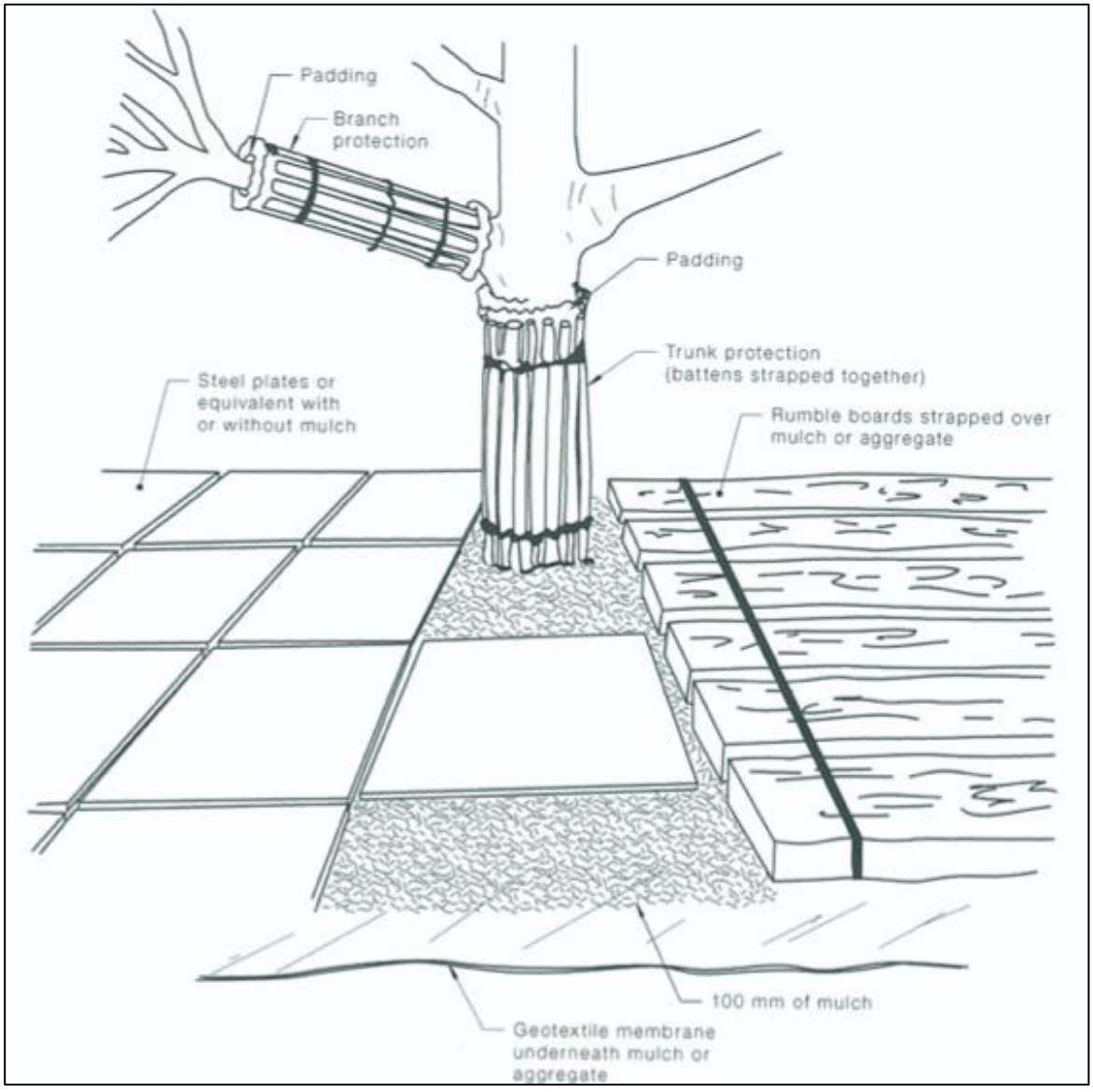


Figure 9. Ground protection measures specified in Section 4.5.3 of *AS4970 (2009)* for temporary access within a fenced protection zone. Steel plates or rumble boards are shown to be suitable for ground protection over mulch and geotextile fabric.

7.3. Site Specific Tree Protection Measures

Trees 1-7 and 22-25 are suitable for retention as part of the proposed development providing the following protection measures are in implemented:

7.3.1. Prior to Commencement of Practical Works

- A Project Arborist must be appointed for the duration of this development to ensure compliance with the requirements outlined in Section 7 of this report.
- Three fenced protection zones compliant with the specifications outlined in Section 4.3 of *AS4970 (2009)* must be installed prior to the commencement of practical works (Figure 10 and Figure 12).
- The R_{TPZs} of retained trees must be used to establish the northern and southern edges of the protection zones. The edges of the grassed verge must be used to establish the eastern and western boundaries.
- TPZ signage compliant with *Section 4.4 of AS4970 (2009)* must be installed on all three fenced protection zones.

7.3.2. During Construction Works

- Fenced protection zones must be installed prior to the commencement of practical works and remain in place for the duration of the development. Any required access within one of the fenced protection zones must be approved by the Project Arborist prior to entry. Suitable ground or stem protection measures must be temporarily installed for the duration of required access as specified in *Sections 4.5.2 and 4.5.3 of AS4970 (2009)* (Figure 9).
- New utility services are to be located outside the R_{TPZs} of retained trees. Any additional excavation required for service installation within a retained tree's R_{TPZ} must be assessed and certified by the Project Arborist.
- There must be no major root (diameter of 40mm or greater) damage or disturbance within the TPZs of retained trees.

7.3.3. Post Construction - Landscaping

- Replacement tree planting for Trees 8-21 must be undertaken in accordance with Section 7.1 of this report upon completion of practical works along the eastern Ashford Avenue verge.

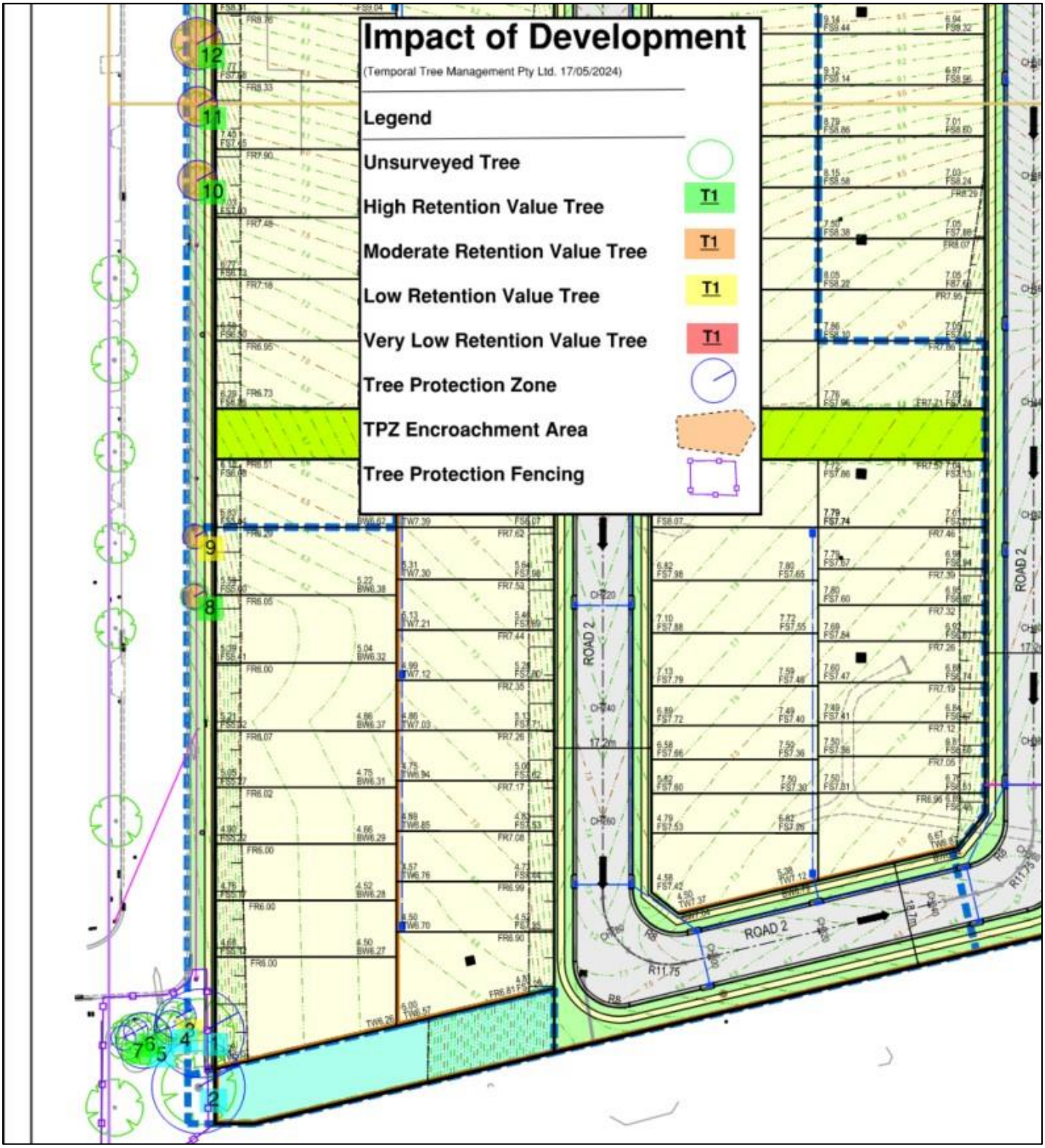


Figure 10. Encroachments and tree protection measures required for Trees 1-12 within southern – central portion of subject site. *Layout Plan Overall,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: -, Sheet: 4 of 20, Drawing No: 010, drawn 31/01/2024). Annotated by Temporal Tree Management Pty Ltd. (17/05/2024).

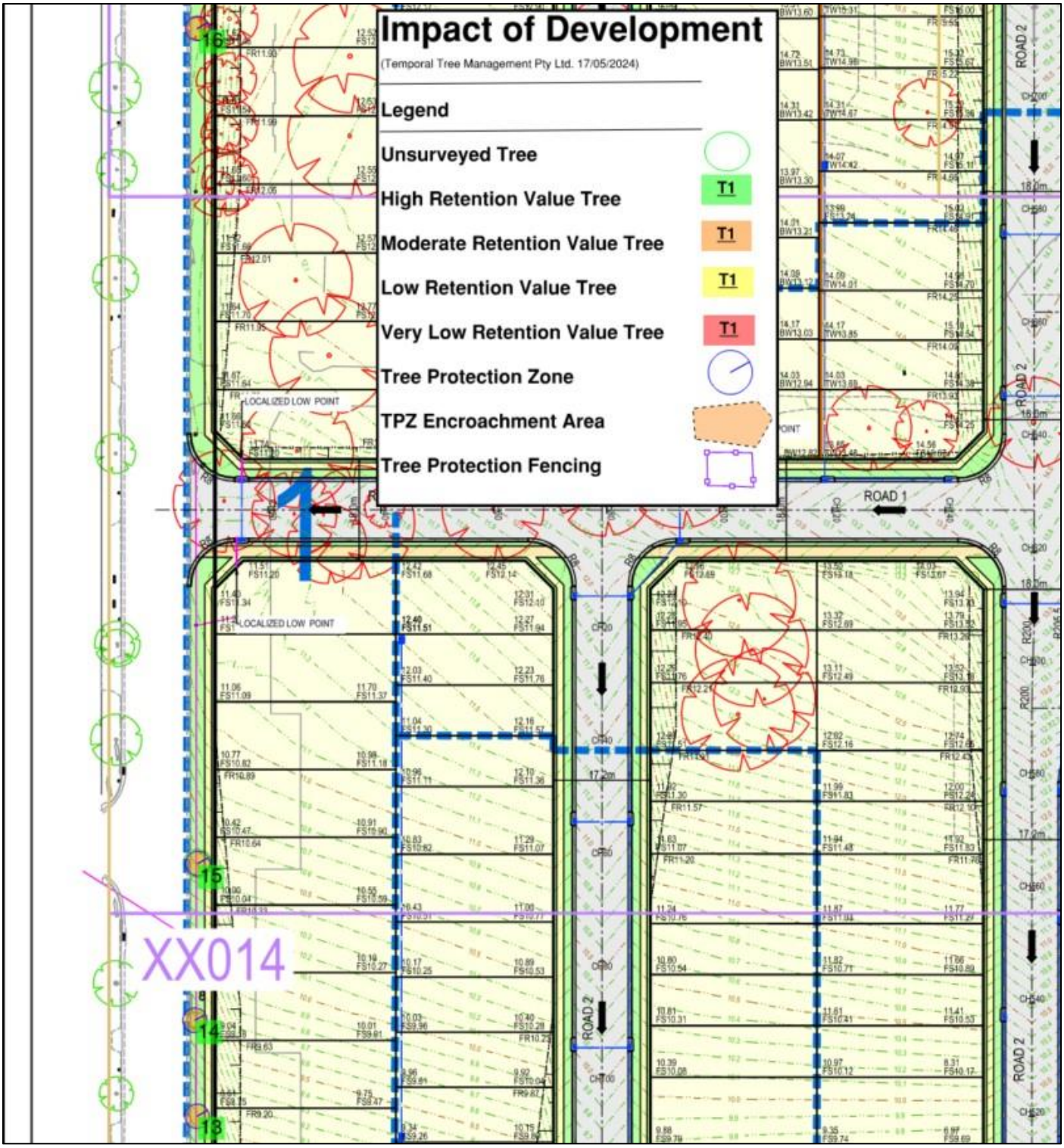


Figure 11. Encroachments and tree protection measures required for Trees 13-16 within central portion of subject site. *Layout Plan Overall,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: -, Sheet: 4 of 20, Drawing No: 010, drawn 31/01/2024). Annotated by Temporal Tree Management Pty Ltd. (17/05/2024).

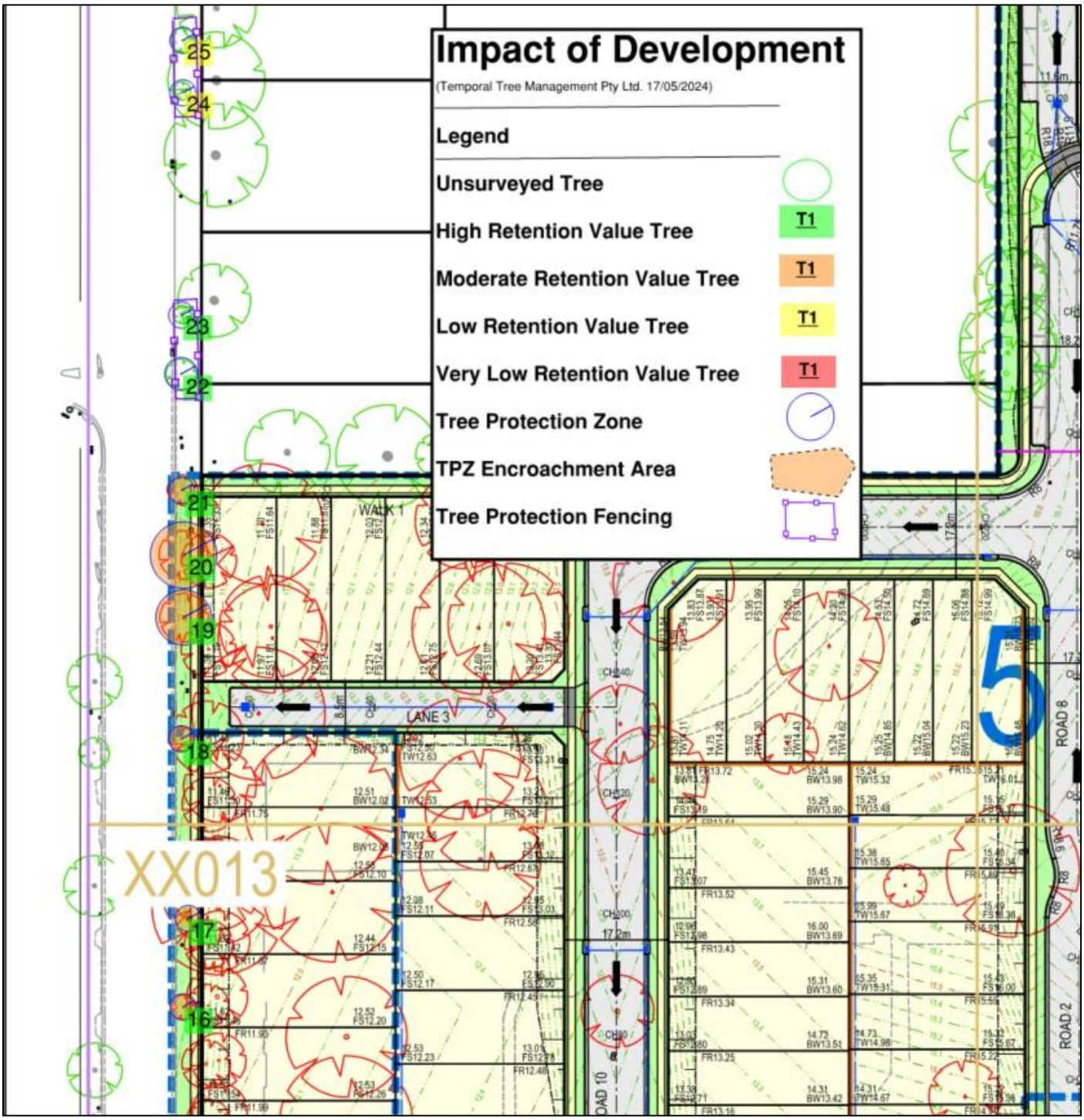


Figure 12. Encroachments and tree protection measures required for Trees 16-25 within central-northern portion of subject site. *Layout Plan Overall,* prepared by *Beveridge Williams* (Project No: 2301879, Revision: -, Sheet: 4 of 20, Drawing No: 010, drawn 31/01/2024). Annotated by Temporal Tree Management Pty Ltd. (17/05/2024).

7.4. Certifications

To ensure the proposed development meets the objectives of the Tree Removal/Protection Plan, monitoring and certification process will be undertaken at the following hold points.

· Installation Tree Protection Measures – Inspection and certification by the Project Arborist of fenced protection zones as specified in Section 7.3 of this report. This hold point must be complete prior to the commencement of any practical works.

· Tree Removal –The Project Arborist must supervise the proposed removal of seventeen trees as specified in Section 7.1 of this report. Written certification from the Project Arborist must be provided confirming that (if approved) only Trees 8-21 are removed in accordance with the consent conditions. This hold point must be complete after the installation of tree protection measures.

· Monitoring of Retained Trees– Regular inspection and certification by the Project Arborist of condition of retained trees. Inspections must be undertaken every 2-3 months during the construction process.

· Supervision and Certification of Entry into Fenced Protection Zone – Supervision and certification by the Project Arborist of any additional required access into any of the fenced protection zones. Any required ground protection measures must be installed and certified by the Project Arborist as part of this hold-point. This inspection must certify that no major tree roots have been damaged or disturbed. This hold point must be carried out prior to the completion of any practical works within a fenced protection zone.

· Final Project Arborist Inspection– Final inspection by Project Arborist and certification of compliance with the Tree Protection Plan as specified in Section 7.3 of this report. All specified protection measures outlined in Section 7.3 must remain in place until this final inspection.

References:

Australian Standard AS 4970 (2009) Protection of trees on development sites. Standards Australia.

Australian Standard AS 4373 (2007) Pruning of amenity trees. Standards Australia.

Australian Standard AS 2303 (2015) Tree stock for landscape use. Standards Australia.

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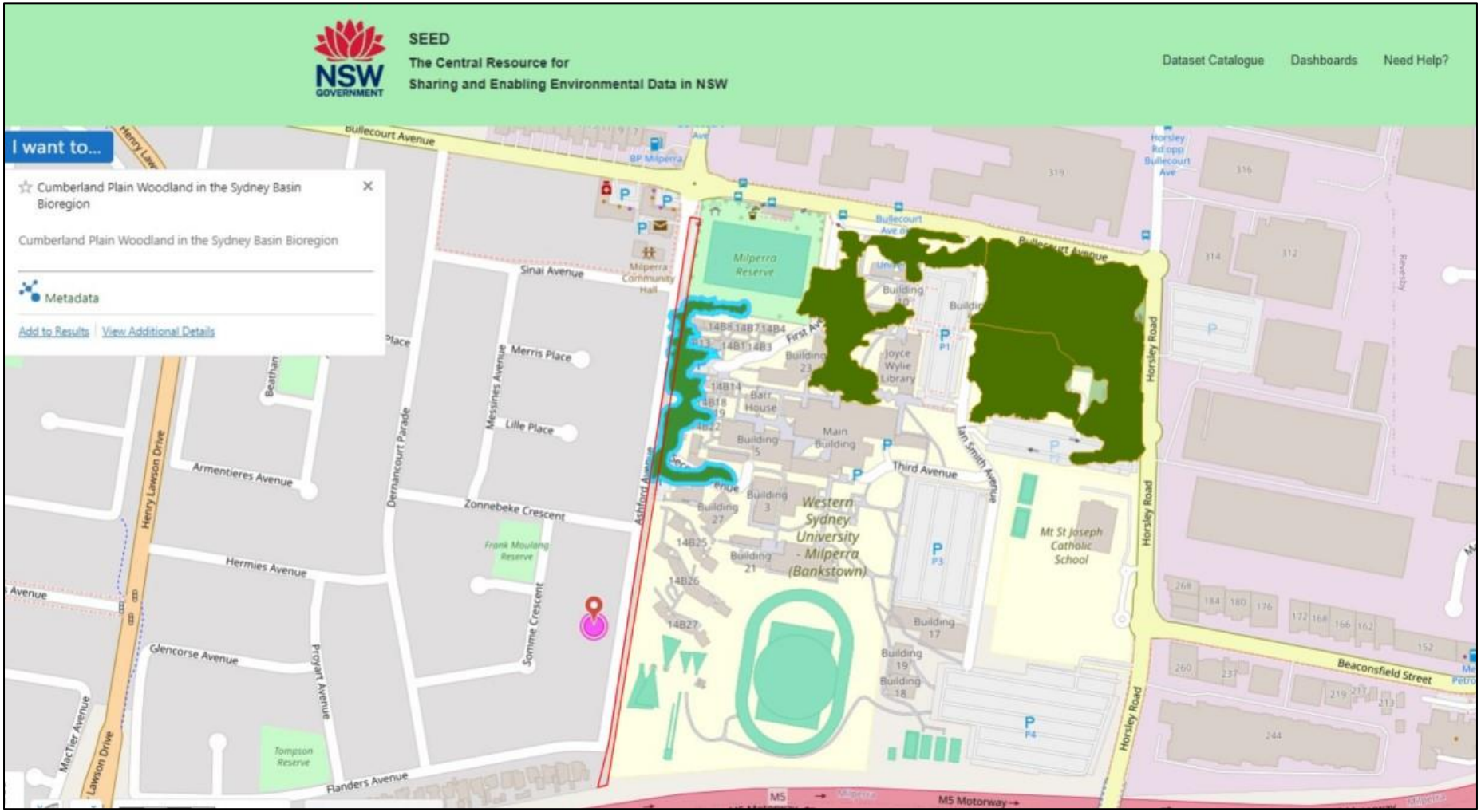
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Appendix A: Detailed Site Location Maps



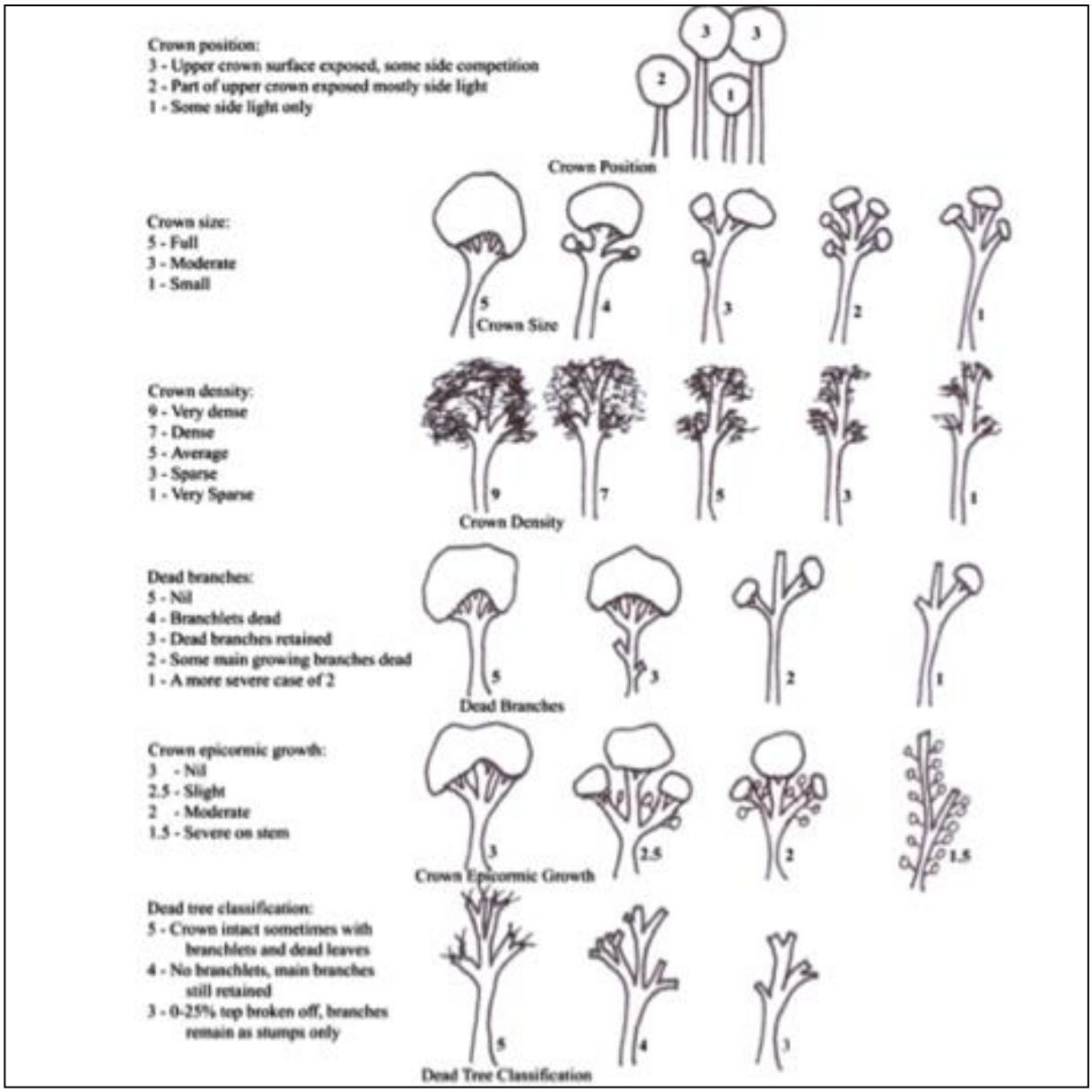
Subject site (RED boundary) contains positioned adjacent to identified EEC (annotated as GREEN polygons). Image from NSW SEED Mapping (2024).



Subject site (RED boundary) positioned within the Ashford Avenue Heritage Item (annotated as a BROWN polygon). Image from Planning NSW (2024).

Appendix B: Vitality using Visual Vitality Index (Johnstone et al. 2012).

VVI = 3/3 (Upper crown exposed) + 5/5 (Good crown size) + 8/9 (Good crown density) + 4/5 (Very little deadwood) + 2/3 (Moderate epicormic growth) + 5/5 (Crown in tact).
=26/30.



Appendix C: Tree Retention Values Priority Requirements

From Morton (2011). Accessed via the Leichardt Council Tree Technical Manual.

Retention value	Recommended action
"High"	• These trees are considered worthy of preservation; as such careful consideration should be given to their retention as a priority. • Proposed site design and placement of buildings and infrastructure should consider the Tree Protection Zones as discussed in the following sections to minimise any adverse impact. • In addition to Tree Protection Zones, the extent of the canopy (canopy drip-line) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
"Moderate"	• The retention of these trees is desirable. • These trees should be retained as part of any proposed development if possible, however these trees are considered less critical for retention. • If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity.
"Low"	• These trees are not considered to worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their SULE. • These trees should not be considered as a constraint to the future development of the site.
"Very Low"	• These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds. • The removal of these trees is therefore recommended regardless of the implications of any proposed development.

Appendix C: Tree Retention Values Methodology

From Morton (2011)

	Landscape Significance Reading						
Tree Sustainability	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Greater than 40 years	**High Retention Value**						
15 to 40 years			**Moderate**				
5 to 15 years				**Low**			
Less than 5 years					**Very Low Retention Value**		
Dead or hazardous							

Appendix D: Landscape Significance Definitions

From Morton (2011). Accessed via the Leichardt Council Tree Technical Manual.

Rating	Heritage value	Ecological value	Amenity value
1. SIGNIFICANT	The subject site is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed as a Significant Tree.	The subject tree is scheduled as a Threatened Species as defined under the *Threatened Species Conservation Act 1995 (NSW)* or the *Environmental Protection and Biodiversity Conservation Act 1999.*	The subject tree has a very large live crown size exceeding 100m² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species.
	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has important association with that item.	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species.	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity.
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event.	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area.	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.
2. VERY HIGH	The tree has a strong historical association with a Heritage Item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally-indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 60m²; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.

Rating	Heritage value	Ecological value	Amenity value
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence.	The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value.	The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% (normal); the subject tree is visible from the street and/or surrounding properties and makes a positive contribution to the visual character and the amenity of the area.
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of this Development Control Plan.	The subject tree has a medium live crown size exceeding 25m²; the tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% (thinning to normal); and The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a Heritage Item.	The subject tree is scheduled as exempt (not protected) under the provisions of this Development Control Plan due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 25m² and can be replaced within the short term (5-10 years) with new tree planting.
6. VERY LOW	The subject tree is causing damage to a Heritage Item.	The subject tree is listed as an Environment Weed Species in the Leichhardt Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).

Appendix E: Useful Life Expectancy Definitions

From Barrell (1996). Accessed via the Leichardt Council Tree Technical Manual.

	1. Long	2. Medium	3. Short	4. Removal	5. Moved or replaced
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 - 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 - 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years	Trees which can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small trees less than 5m in height.
B	Trees that could be made suitable for retention in the long term by remedial tree care.	Trees that may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through instability or recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in height.
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form.	Trees that have been pruned to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
				Trees that may live for more than 5 years but should be	

Appendix F: Key Terms and Definitions

Bifurcates: Stem becomes codominant, with two subsidiary stems extending from a joined union at a specified height.

Chlorosis: Yellowing of foliage, typically associated with hydraulic stress or nutrient deficiency.

Dieback: Symptoms of accelerated decline associated with poor tree health. Symptoms include reduced canopy volume, foliar chlorosis and or the development of dead branches within canopy extremities.

Decayed Tissue: Advanced tissue necrosis that has resulted in the degradation of sapwood and / or heartwood tissue. No vascular functionality. Results in reduced wood flexure and compression strength. Can be accelerated by species' susceptibility to decay spread and / or the presence of decay fungi.

Heartwood: Inner wood layer extending to centre of tree. Consists of expired xylem vessels that have lost vascular function. Susceptible to aerobic decay.

Hollowing: Advanced decay leads to complete degradation of affected sapwood and / or heartwood tissue. Results in cavities forming within a tree's stem or branches that can vary in size.

Response Growth: Active growth response by affected tree to wounding or abnormal loading. Increased tissue growth is targeted by tree adjacent to wound to cover / seal exposed sapwood tissue and / or provide increased compression or tension strength.

Trifurcates: Stem becomes codominant, with three subsidiary stems extending from a joined union at a specified height.

Tissue Necrosis: Observed in sapwood tissue that has been wounded and exposed. Results in the loss of vascular function and reduced flexure. Xylem vessel elements still observable within the dead sapwood tissue.

Vitality: Observable signs within a tree's canopy density and foliar condition that may indicate its state of health and growth.

Appendix G: Tree Data

Data collected for twenty-five trees positioned within close proximity of proposed works within subject site. The tree data collection methodology is outlined in Section 4.2 of this report.

Tree	Scientific Name	Common Name	Maturity	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Comments
1	Eucalyptus microcorys	Tallow Wood	Mature	17	14	66	81	Good	Good	Long	High	High	7.9	3.0	Large Council street tree observed to be in good condition.
2	Eucalyptus microcorys	Tallow Wood	Mature	15	14	69	87	Good	Fair	Long	High	High	8.3	3.1	Large Council street tree observed to be in mostly good condition. Partially suppressed by neighbouring tree.
3	Casuarina glauca	Grey She-oak	Mature	7	7	32	39	Good	Very Poor	Negligible	High	Low	3.8	2.2	Tree with very poor stem orientation and asymmetric canopy structure due to suppression. Signs of partial root plate failure.
4	Casuarina glauca	Grey She-oak	Mature	16	4	26	32	Good	Good	Long	High	High	3.1	2.1	Maturing Council street tree in good condition.
5	Casuarina glauca	Grey She-oak	Mature	17	7	41	46	Good	Fair	Long	High	High	4.9	2.4	Maturing Council street tree in mostly good condition. Stem bifurcates at 5 metres. No signs of union weakness.
6	Casuarina glauca	Grey She-oak	Mature	10	6	18	26	Good	Poor	Short	High	Moderate	2.2	1.9	Tree with poor stem orientation and asymmetric canopy structure due to suppression.
7	Casuarina glauca	Grey She-oak	Mature	10	6	24	39	Good	Poor	Short	High	Moderate	2.9	2.2	Tree in suppressed position. Stem bifurcates at ground level. Union with signs of bark inclusion.
8	Tristaniopsis laurina	Water Gum	Mature	5	4	16	18	Good	Fair	Medium	Moderate	Moderate	2.0	1.6	Street tree in poor position. Canopy within ABC powerline. Stem bifurcates at ground level.
9	Tristaniopsis laurina	Water Gum	Mature	2	2	6	8	Poor	Poor	Negligible	High	Low	2.0	1.1	Small street tee in poor condition. Major dieback due to excessive whipper snipper damage at base.
10	Eucalyptus melliodora	Yellow Box	Mature	7	6	29	34	Good	Poor	Short	High	Moderate	3.5	2.1	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
11	Eucalyptus melliodora	Yellow Box	Mature	7	9	30	40	Good	Poor	Short	High	Moderate	3.6	2.3	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
12	Eucalyptus melliodora	Yellow Box	Mature	7	10	38	39	Good	Poor	Short	High	Moderate	4.6	2.2	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.

Tree	Scientific Name	Common Name	Maturity	Height (m)	Width (m)	DBH (cm)	DRF (cm)	Health	Structure	ULE	Landscape Significance	Retention Value	R_{TPZ} (m)	R_{SRZ} (m)	Comments
13	Tristaniopsis laurina	Water Gum	really young	2	1	3	4	Good	Good	Long	Moderate	Moderate	2.0	0.9	Very small street tree in good condition. Reduced landscape significance due to small size and suitability for replacement.
14	Tristaniopsis laurina	Water Gum	Semi mature	4	2	12	14	Good	Fair	Long	Moderate	Moderate	2.0	1.4	Small street tree in good condition. Reduced landscape significance due to small size and suitability for replacement.
15	Tristaniopsis laurina	Water Gum	Semi mature	5	3	16	24	Good	Fair	Long	Moderate	Moderate	2.0	1.8	Smaller street tree poorly positioned below powerlines. Stem trifurcates at ground level. No obvious signs of union weakness.
16	Tristaniopsis laurina	Water Gum	Semi mature	4	3	9	23	Poor	Fair	Long	Moderate	Moderate	2.0	1.8	Small street tree with signs of dieback. Stem trifurcates at ground level. Poorly positioned beneath powerlines.
17	Tristaniopsis laurina	Water Gum	Semi mature	4	3	7	16	Poor	Fair	Long	Moderate	Moderate	2.0	1.5	Small street tree with signs of dieback. Tissue necrosis at base. Stem bifurcates at 0.5 metres. Poorly positioned beneath powerlines.
18	Tristaniopsis laurina	Water Gum	Semi mature	3	3	8	13	Poor	Fair	Long	Moderate	Moderate	2.0	1.4	Small street tree with signs of dieback. Tissue necrosis at base. Stem bifurcates at 0.5 metres. Poorly positioned beneath powerlines.
19	Eucalyptus melliodora	Yellow Box	Mature	10	10	38	41	Good	Poor	Short	High	Moderate	4.6	2.3	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
20	Eucalyptus melliodora	Yellow Box	Mature	12	10	46	63	Good	Poor	Short	High	Moderate	5.5	2.7	Street tree has been severely pruned to maintain clearance from powerlines. Canopy now poorly structured.
21	Tristaniopsis laurina	Water Gum	Semi mature	5	4	18	21	Fair	Fair	Medium	Moderate	Moderate	2.1	1.7	Small street tree poorly positioned below powerlines. Stem bifurcates at ground level, no signs of union weakness.
22	Tristaniopsis laurina	Water Gum	Mature	6	5	24	25	Good	Fair	Medium	Moderate	Moderate	2.8	1.8	Small street tree poorly positioned below powerlines. Multistemmed at 1 metre.
23	Tristaniopsis laurina	Water Gum	Mature	4	3	9	16	Fair	Fair	Medium	Moderate	Moderate	2.0	1.5	Small street tree poorly positioned below powerlines. Minor dieback.
24	Tristaniopsis laurina	Water Gum	Mature	3	2	6	12	Poor	Fair	Short	Moderate	Low	2.0	1.4	Small street tree poorly positioned below powerlines. Canopy with signs of dieback. Major tissue necrosis at base of stem.
25	Tristaniopsis laurina	Water Gum	Mature	3	2	9	21	Poor	Fair	Short	Moderate	Low	2.0	1.7	Small street tree poorly positioned below powerlines. Canopy with signs of dieback. Major tissue necrosis at base of stem.

Appendix H: Tree Data Sheets and Photographs – See Over

Data sheets and individual photographs of Trees 1-25 taken during the site assessment on 07/05/2024.

***********************See Over for Tree Data Sheets**************************

Appendix K: Addendum Preliminary Arboricultural Assessment

Addendum Preliminary Arboricultural Assessment for trees within M5 vegetated area outside southern boundary prepared by *Accurate Tree Assessment* (12/2023).

**********See Over for Report**********

Preliminary Arboricultural Assessment



Figure 1 Council managed Trees 1 - 8 in the drainage reserve

Site Address: 2 Bullecourt Ave Milperra NSW

Client: Mirvac Residential (NSW) Developments Pty Ltd

Date: December 2023

Prepared by Ian Hills - Associate Diploma Horticulture
Cert III Arboriculture
Diploma Arboriculture (AQF5)
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1.0 Summary

Accurate Tree Assessment has been commissioned by Beveridge Williams on behalf of Mirvac Residential Developments (the client) to provide a preliminary arboricultural assessment for trees located on the drainage reserve and M5 vegetated corridor at the rear of the property at 2 Bullecourt Ave Milperra.

The purpose of this assessment is to provide an overview of the trees' health and condition and to calculate tree protection zones in accordance with AS4970-2009, 'Protection of Trees on Development Sites', which will be used to inform the design of a proposed retaining wall.

The trees are subject to the provisions of Bankstown Development Control Plan 2015 Part B11 – '*Tree Preservation Order*' (DCP).

Conclusions

Trees 1 – 8 located in the reserve at the end of Ashford Ave are unlikely to be affected by the proposed development.

Trees 1 *Callistemon viminalis* and Tree 6 *Casuarina glauca* should be considered for removal based on their poor condition which reduces their retention value irrespective of any proposed development.

Trees 9, 10 and 11 *Eucalyptus tereticornis* are assessed with high retention value and should be considered as a material constraint to any proposed development.

Remaining trees within the assessment area provide amenity value but can be easily replaced if the proposed design causes high levels of encroachment.

Recommendations

That Trees 1 *Callistemon viminalis* and Tree 6 *Casuarina glauca* are considered for removal based on their poor structural condition.

That the removal of trees must not cause damage to any tree proposed for retention.

All tree work is to be undertaken by a suitably qualified contracting arborist in accordance with the Worksafe Australia Code of Practice for Amenity Tree Work, 1998 and Australian Standard AS4373-2007, "Pruning of Amenity Trees".

That Trees 2 – 7 will not be affected by the proposal and are to be retained.

That the proposed design takes into consideration the high value of Trees 9, 10 and 11 *Eucalyptus tereticornis* and is modified as required to allow their retention.

That remaining trees are retained if possible, to maintain landscape amenity values in the area.

That retained trees throughout the site may benefit from routine maintenance pruning to remove deadwood and other potentially defective branches.

2.0 Disclaimer

This report is to be read and considered in its entirety. The subject trees were inspected from the ground using Visual Tree Assessment methodology, no aerial investigations; underground or internal investigations were undertaken. It is the responsibility of the client to implement all recommendations contained in this report.

The assessment is made having regard for the prevailing site conditions; and does not account for the effects that extreme weather events may have on trees.

Photographs used in this report are originals taken at the time of inspection and are not altered in anyway.

Information contained in this report reflects the condition of the trees at the time of the inspection. As trees are living organisms their condition will change over time, there is no guarantee that problems or deficiencies of the subject trees may not arise in the future. It must be accepted that living near trees involves some level of risk.

This report is for the information of the client, their contractors, and Canterbury-Bankstown City Council; distribution to others is not permitted except with the express permission of the author, Ian Hills.

3.0 Brief

Accurate Tree Assessment has been commissioned by Beveridge Williams on behalf of Mirvac Residential Developments (the client) to provide a preliminary arboricultural assessment for trees located on the drainage reserve and M5 vegetated corridor at the rear of the property at 2 Bullecourt Ave Milperra.

The purpose of this assessment is to provide an overview of the trees' health and condition and to calculate tree protection zones in accordance with AS4970-2009, 'Protection of Trees on Development Sites', which will be used to inform the design of a future proposed development.

4.0 Method

An inspection of the subject trees was conducted from the ground on 15 December 2023. The assessment of the tree was made using Visual Tree Assessment (VTA) procedure (Matheny & Clark, 1994), (Mattheck & Breloer, 2004) having regard for the provisions of AS4970-2009, *'Protection of Trees on Development Sites'*.

Tree dimensions have been measured using a Nikon Forestry pro laser hypsometer and standard arboricultural diameter tape.

The assessment is limited to those trees prescribed under the provisions of Canterbury-Bankstown Development Control Plan, 2023.

4.1. Documents

The following documents are relied upon and have been used for refence in the process of this assessment:

- An aerial photomap identifying the assessment area was provided by Beveridge Williams.
- Australian Standard 4970-2009 Protection of Trees on Development Sites
- Australian Standard 4373-2007 '*Pruning of Amenity Trees*, Standards Australia GPO Box 476 Sydney NSW 2001, Australia.
- Workcover NSW, 1998. 'Amenity Tree Industry Code of Practice'
- Canterbury-Bankstown Development Control Plan 2023, Section 2 Tree management
- Tree identification Plan Prepared by Beveridge Williams, Project No. 2301879, Ref, 2301879(TR)-MSC Sheets 1 – 4, Version A Dated 1 February 2024 (Appendices

5.0 Site Conditions

The trees are subject to the provisions of Canterbury Bankstown Development Control Plan 2023, Chapter 2 - Site Considerations, Section 2.3 Tree Management (DCP). Vegetation in the assessment area is not identified on the NSW Biodiversity Values Map. (Appendix 11.2)

The soil is mapped as the Blacktown Landscape (9030bt) and has the following characteristics:

- *"Landscape—gently undulating rises on Wianamatta Group shales. Local relief to 30 m, slopes usually >5%. Broad rounded crests and ridges with gently inclined slopes. Cleared Eucalypt woodland and tall open-forest (dry sclerophyll forest).*

- *Soils—shallow to moderately deep (>100 cm) hard setting mottled texture contrast soils, red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and in drainage lines.*

- *Limitations—localised seasonal waterlogging, localised water erosion hazard, moderately reactive highly plastic subsoil, localised surface movement potential".* (NSW Environment and Heritage, 2023)

According to climate data from the weather station at Bankstown Airport, which is approximately 1 kilometre from the site, the area experiences prevailing winds from the West, with frequent windspeeds above 39km/h (Willyweather, 2023). Most of the trees are protected by their close grouping, the taller trees are exposed due to their projection above the surrounding canopy.



Figure 2 Subject site (source Sixmaps, 2023)

6.0 Tree Assessment

No.	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	Height (M)	SPREAD (M)	Vigour	Age Class	SULE	Comments
1	Weeping Bottlebrush	*Callistemon viminalis*	0.5	6	2.67	8	8	AV	M	3a	Damaged, Council managed tree.
2	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	8	4	G	M	1a	Co-dominant trunks, Council managed tree.
3	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	8	4	G	M	1a	Co-dominant trunks, Council managed tree.
4	Swamp Oak	*Casuarina glauca*	0.35	4.2	2.37	10	5	G	M	1a	Appears structurally sound, Council managed tree.
5	Swamp Oak	*Casuarina glauca*	0.25	3	2.00	10	3	G	M	1a	Appears structurally sound, Council managed tree.
6	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	8	8	G	M	3a	Excessive lean angle, Council managed tree.
7	Tallowwood	*Eucalyptus microcorys*	0.5	6	2.67	20	7	G	M	1a	Appears structurally sound, Council managed tree.
8	Tallowwood	*Eucalyptus microcorys*	0.6	7.2	2.85	14	9	G	M	1c	Appears structurally sound, small diameter deadwood in canopy, Council managed tree.
9	Forest Red-gum	*Eucalyptus tereticornis*	0.8	9.6	3.17	23	20	G	M	1c	Appears structurally sound, canopy bias over subject site, within the site boundary
10	Forest Red-gum	*Eucalyptus tereticornis*	0.6	7.2	2.85	23	8	G	M	1c	Appears structurally sound, wound on trunk, within the site boundary
11	Forest Red-gum	*Eucalyptus tereticornis*	0.9	10.8	3.31	22	20	G	M	1c	Appears structurally sound
12	Hickory Wattle	*Acacia implexa*	0.25	3	2.13	7	5	G	SM	1a	Appears structurally sound, within the site boundary
13	Forest Red-gum	*Eucalyptus tereticornis*	0.35	4.2	2.25	9	5	G	SM	2a	Appears structurally sound
14	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	8	5	G	SM	1a	Appears structurally sound, codominant trunks

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No.	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	Height (M)	SPREAD (M)	Vigour	Age Class	SULE	Comments
15	Swamp Oak	*Casuarina glauca*	0.5	6	2.67	9	5	G	SM	1a	Appears structurally sound, multiple trunks
16	Swamp Oak	*Casuarina glauca*	0.35	4.2	2.37	12	5	G	M	1a	Appears structurally sound
17	Swamp Oak	*Casuarina glauca*	0.25	3	2.13	8	3	G	SM	1a	Appears structurally sound
18	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	8	4	G	SM	1a	Appears structurally sound, codominant trunks
19	Swamp Oak	*Casuarina glauca*	0.2	2.4	2.00	7	3	G	J	1a	Appears structurally sound
20	Cherry Ballart	*Exocarpus cuppressiformis*	0.25	3	2.13	6	4	G	M	1a	Appears structurally sound
21	Hickory Wattle	*Acacia implexa*	0.15	1.8	1.68	7	2	AV	SM	2a	Appears structurally sound, small diameter deadwood in canopy
22	Hickory Wattle	*Acacia implexa*	0.15	1.8	1.68	6	2	AV	SM	2a	Appears structurally sound, small diameter deadwood in canopy
23	Hickory Wattle	*Acacia implexa*	0.15	1.8	1.68	7	2	AV	SM	2a	Appears structurally sound, small diameter deadwood in canopy
24	Hickory Wattle	*Acacia implexa*	0.15	1.8	1.68	6	3	AV	SM	2a	Appears structurally sound, small diameter deadwood in canopy
24.1	Hickory Wattle	*Acacia implexa*	0.1	2	1.50	5	1	G	J	1a	Appears structurally sound
24.2	Hickory Wattle	*Acacia implexa*	0.1	2	1.50	5	1	G	J	1a	Appears structurally sound
25	Hickory Wattle	*Acacia implexa*	0.3	3.6	2.25	7	4	AV	M	2a	Appears structurally sound, small diameter deadwood in canopy
25.2	Hickory Wattle	*Acacia implexa*	0.1	2	1.50	5	1	G	J	1a	Appears structurally sound
26	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	12	5	G	M	1a	Appears structurally sound
27	Swamp Oak	*Casuarina glauca*	0.15	1.8	1.85	8	2	G	SM	1a	Appears structurally sound, wound on trunk
28	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	12	5	G	M	1a	Appears structurally sound

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No.	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	Height (M)	SPREAD (M)	Vigour	Age Class	SULE	Comments
29	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	12	5	G	M	1a	Appears structurally sound
30	Swamp Oak	*Casuarina glauca*	0.1	1.2	1.68	7	2	G	J	1a	Appears structurally sound
31	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	14	6	G	M	1a	Appears structurally sound
32	Swamp Oak	*Casuarina glauca*	0.2	2.4	2.00	9	3	G	SM	1a	Appears structurally sound, multiple trunks
33	Swamp Oak	*Casuarina glauca*	0.35	4.2	2.37	12	6	G	M	1a	Appears structurally sound
34	Swamp Oak	*Casuarina glauca*	0.45	5.4	2.57	12	7	G	M	1a	Appears structurally sound
35	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	12	7	G	M	1a	Appears structurally sound
36	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	12	8	G	M	1a	Appears structurally sound
37	Swamp Oak	*Casuarina glauca*	0.45	4.8	2.57	10	4	G	SM	1a	Appears structurally sound, multiple trunks
37.1	White Cedar	*Melia azederach*	0.15	2	1.70	5	3	G	J	1a	Appears structurally sound
38	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	14	5	G	M	1a	Appears structurally sound
39	Swamp Oak	*Casuarina glauca*	0.5	6	2.67	15	6	G	M	1a	Appears structurally sound
40	Swamp Oak	*Casuarina glauca*	0.12	1.44	1.75	8	2	G	SM	1a	Appears structurally sound
41	Swamp Oak	*Casuarina glauca*	0.35	4.2	2.37	12	5	G	M	1a	Appears structurally sound
42	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	12	4	G	M	1a	Appears structurally sound
43	Swamp Oak	*Casuarina glauca*	0.55	6.6	2.76	15	9	G	M	1a	Appears structurally sound, tri-dominant trunks
44	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	15	6	G	M	1a	Appears structurally sound
45	Swamp Oak	*Casuarina glauca*	0.45	5.4	2.57	15	7	G	M	1a	Appears structurally sound, codominant trunks
46	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	15	5	G	M	1a	Appears structurally sound
47	Swamp Oak	*Casuarina glauca*	0.35	4.2	2.37	14	5	G	M	1a	Appears structurally sound
48	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	15	5	G	M	1a	Appears structurally sound
49	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	15	5	G	M	1a	Appears structurally sound

No.	Common Name	Species	DBH (M)	TPZ (M)	SRZ (M)	Height (M)	SPREAD (M)	Vigour	Age Class	SULE	Comments
50	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	16	8	G	M	1a	Appears structurally sound
51	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	16	7	G	M	1a	Appears structurally sound
52	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	12	5	G	M	2a	Appears structurally sound, heavily pruned
53	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	16	7	G	M	1a	Appears structurally sound
54	Swamp Oak	*Casuarina glauca*	0.5	6	2.67	15	7	G	M	1a	Appears structurally sound
55	Swamp Oak	*Casuarina glauca*	0.3	3.6	2.25	14	5	G	M	1a	Appears structurally sound
56	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	15	8	G	M	2a	Appears structurally sound, heavily pruned
57	Swamp Oak	*Casuarina glauca*	0.15	1.8	1.85	10	3	G	M	1a	Appears structurally sound
58	Swamp Oak	*Casuarina glauca*	0.4	4.8	2.47	16	9	G	M	1a	Appears structurally sound
59	Swamp Oak	*Casuarina glauca*	0.35	4.2	2.37	16	5	G	M	1a	Appears structurally sound

DBH = Diameter at 1.4 metres above ground level
TPZ = Tree Protection Zone radius calculated in accordance with AS4970
SRZ = Structural Root Zone radius calculated in accordance with AS4970

Vigour - P = Poor, F = Fair, Av = Average, G =Good, E = Excellent
Age class – J = Juvenile, SM =Semi-mature M = Mature, V = Veteran
SULE = Safe Useful Life Expectancy (Barrel, J -1993-95) see appendix 12.1

7.0 Development impact

All parts of a tree may be damaged by construction activities, and the effects of damage are often cumulative meaning that seemingly minor damage to the tree can have adverse effects that may not become apparent until well after the project has been completed.

Crown damage often occurs when machinery Impacts branches of the tree resulting in a loss of foliage. As the foliage is where the tree produces the sugars required for healthy growth it therefore stands to reason that any loss of foliage will affect the tree's ability to function normally.

In addition, when branches are torn or improperly pruned the tree's ability to recover is affected and pathogens that cause wood decay or disease have an increased opportunity to penetrate the trees' natural defenses.

Trunk damage is usually caused by mechanical impact, and again wounding predisposes the tree to infection by pathogens.

Root damage is the most common cause of damage to trees on development sites, and often has the most serious effects as it commonly goes unnoticed for some time. Damage can be caused by mechanical factors such as tearing during excavation, as well as factors such as chemical contamination, changes in hydrology and altering gaseous exchange rates by filling, and compaction during movement of equipment.

Australian Standard 4970, *Protection of Trees on Development Sites* was adopted in 2009 to provide Arborists and the construction industry with a guide to assist in the preservation of retained trees on all types of development sites.

To assist professionals working to protect trees the Standard proposes the following:

> "Tree Protection Zone - A specified area above and below ground level at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.
>
> *Structural Root Zone – The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres.*
>
> *This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be much larger."* (Ref. AS4970-2009)

Minor encroachment of the TPZ is sometimes unavoidable and at levels less than 10% of the total TPZ area can be tolerated if there is scope to increase the area of the TPZ contiguously about the unaffected perimeter. Where encroachment exceeds 10% further investigation will be required to determine the measures required to offset the incursion. Encroachment of the SRZ is not recommended as tree health and condition will almost certainly be adversely affected.

8.0 Discussion

Trees on the site are a combination of remnant native trees and planted native species which appear in generally good health and condition. The majority of trees are outside the Southern boundary of the subject site within the vegetation buffer to the South-western motorway which is managed by Transport for NSW.

Mirvac Residential NSW are proposing a re-development of the Western Sydney University campus, part of which will involve construction of a retaining wall along the Southern boundary which will be located within the TPZ and SRZ of some of the trees.

The purpose of this assessment is to provide an overview of the trees' health and condition and to calculate tree protection zones in accordance with AS4970-2009, 'Protection of Trees on Development Sites', which will be used to inform the design of a proposed retaining wall.

Sixty-three (63) prescribed trees have been identified within the zone of influence of the proposed works, details of the trees assessed are included in the tree assessment schedule at Section 6.0 of this report.

Several trees less than 5-metres tall (Clause 2.3.a) and dead trees that do not provide habitat for native fauna (Clause 2.4.d) have not been assessed as they do not meet the criteria for prescription under the provisions of Canterbury-Bankstown Development Control Plan 2023 and are therefore not protected.

Tree retention value is directly associated with the Safe Useful Life Expectancy (SULE) rating (Appendix 11.1) which is colour coded in the tree assessment schedule above. The following table is a summary of the findings:

SULE	No. of Trees
Rating 1 – Long, Greater than 40 years	53
Rating 2 – Medium, 15 to 40 years	8
Rating 3 – Short, 5-15 years	2
Rating 4 – Remove, less than 5 years	-

It should be noted that SULE is an assessment of the trees under current conditions and does not account for adverse impacts that may be caused by development.

Trees 9, 10 and 11 *Eucalyptus tereticornis* are large examples of the species and assessed with the highest rating trees due to being remnant of endemic vegetation. It would be preferable to modify the design of any proposed structure to minimise root disturbance within the respective TPZ's to allow retention of these trees.

Casuarina glauca and *Acacia implexa* located within the vegetation buffer appear to have been planted during the initial construction of the motorway and are therefore assessed with a reduced retention value. Trees in the drainage reserve on the corner of Ashford and Flanders Ave are also noted as planted native species.

While their retention value is lower these trees still provide landscape amenity to the area and should be considered for retention if possible.

Retained trees throughout the site may benefit from routine maintenance pruning to remove deadwood and other potentially defective branches. This will become more important once the site is developed and the occupation rate increases notably around target areas such as seating playgrounds and structures.

Tree 1 *Callistemon viminalis* which exhibits storm damage and Tree 6 *Casuarina glauca* which exhibits an excessive lean angle are assessed with short SULE and should be considered for removal on that basis.

All tree work is to be undertaken by a suitably qualified contracting arborist in accordance with the Worksafe Australia Code of Practice for Amenity Tree Work, 1998 and Australian Standard AS4373-2007, "Pruning of Amenity Trees".

9.0 Conclusions

Trees 1 – 8 located in the reserve at the end of Ashford Ave are unlikely to be affected by the proposed development.

Trees 1 *Callistemon viminalis* and Tree 6 *Casuarina glauca* should be considered for removal based on their poor condition which reduces their retention value irrespective of any proposed development.

Trees 9, 10 and 11 *Eucalyptus tereticornis* are assessed with high retention value and should be considered as a material constraint to any proposed development.

Remaining trees within the assessment area provide amenity value but can be easily replaced if the proposed design causes high levels of encroachment.

10.0 Recommendations

That Trees 1 *Callistemon viminalis* and Tree 6 *Casuarina glauca* are considered for removal based on their poor structural condition.

That the removal of trees must not cause damage to any tree proposed for retention.

All tree work is to be undertaken by a suitably qualified contracting arborist in accordance with the Worksafe Australia Code of Practice for Amenity Tree Work, 1998 and Australian Standard AS4373-2007, "Pruning of Amenity Trees".

That Trees 2 – 7 will not be affected by the proposal and are to be retained.

That the proposed design takes into consideration the high value of Trees 9, 10 and 11 *Eucalyptus tereticornis* and is modified as required to allow their retention.

That remaining trees are retained if possible, to maintain landscape amenity values in the area.

That retained trees throughout the site may benefit from routine maintenance pruning to remove deadwood and other potentially defective branches.



Ian Hills - Principal Arborist
Accurate Tree Assessment

QTRA Registered User

Arboriculture Australia 2023 MEMBER



Figure 3 Small and dead trees within the assessment area.



Figure 4 Trees 9 -11 *Eucalyptus tereticornis* and 12 *Acacia implexa*



Figure 5 Tree 14 -15 *Casuarina glauca*



Figure 6 Tree 20 *Exocarpus cupressiformis*



Figure 7 21 – 25.1 *Acacia implexa*



Figure 8 26 – 37 *Casuarina glauca*



Figure 9 Tree 37.1 *Melia azederach*



Figure 10 Trees 38-49 *Casuarina glauca*



Figure 11 Trees 50-59 *Casuarina glauca*

11.0 Appendices

11.1. Safe Useful Life Expectancy Categories

1: Long SULE: Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.
(a) Structurally sound trees located in positions that can accommodate future growth.
(b) Trees that could be made suitable for retention in the long term by remedial tree care.
(c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

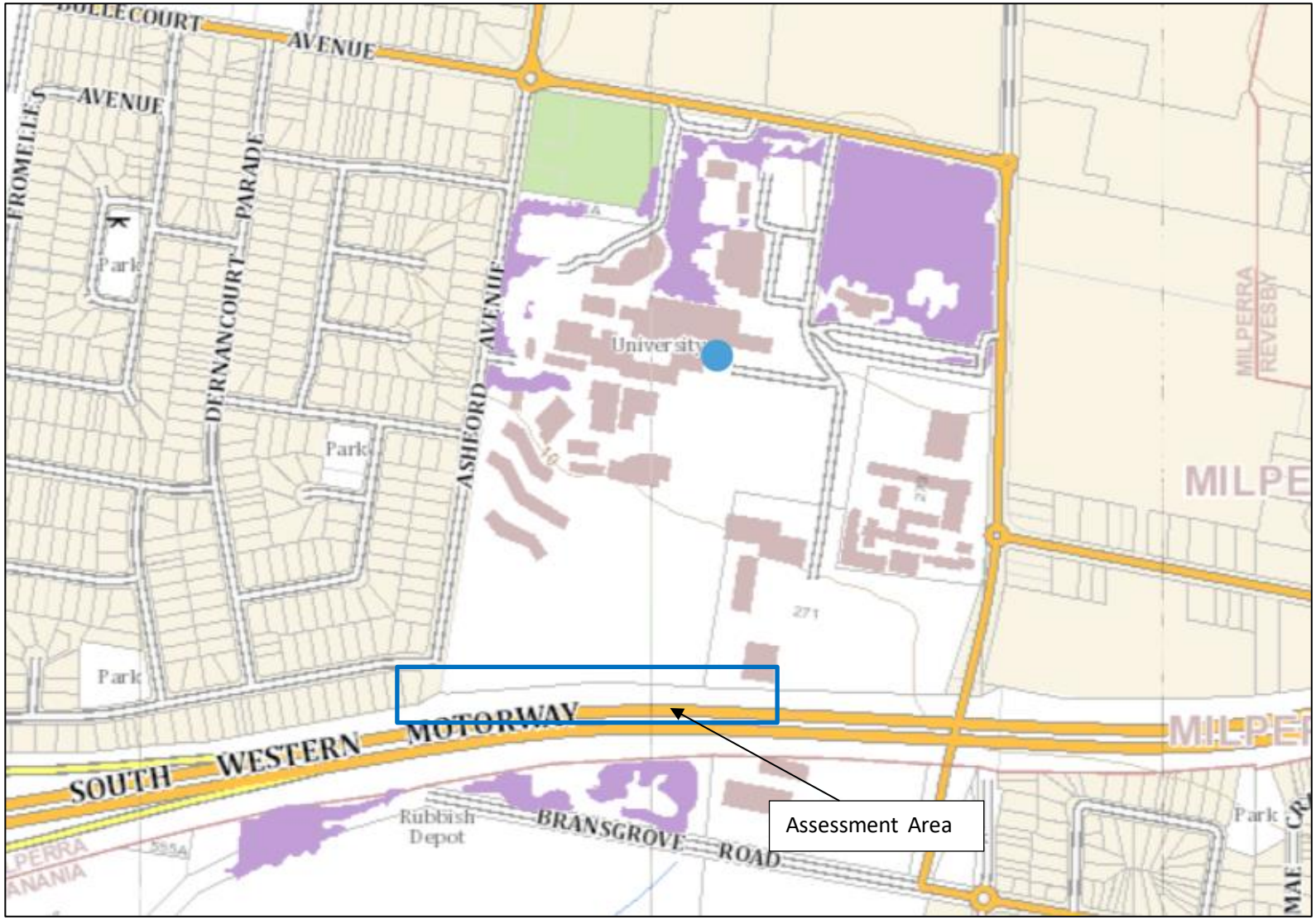
2: Medium SULE: Trees that appeared to be retainable at the time of assessment for 15–40 years with an acceptable level of risk.
(a) Trees that may only live between 15 and 40 more years.
(b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
(c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
(d) Trees that could be made suitable for retention in the medium term by remedial tree care.

3: Short SULE: Trees that appeared to be retainable at the time of assessment for 5–15 years with an acceptable level of risk.
(a) Trees that may only live between 5 and 15 more years.
(b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
(c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
(d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.

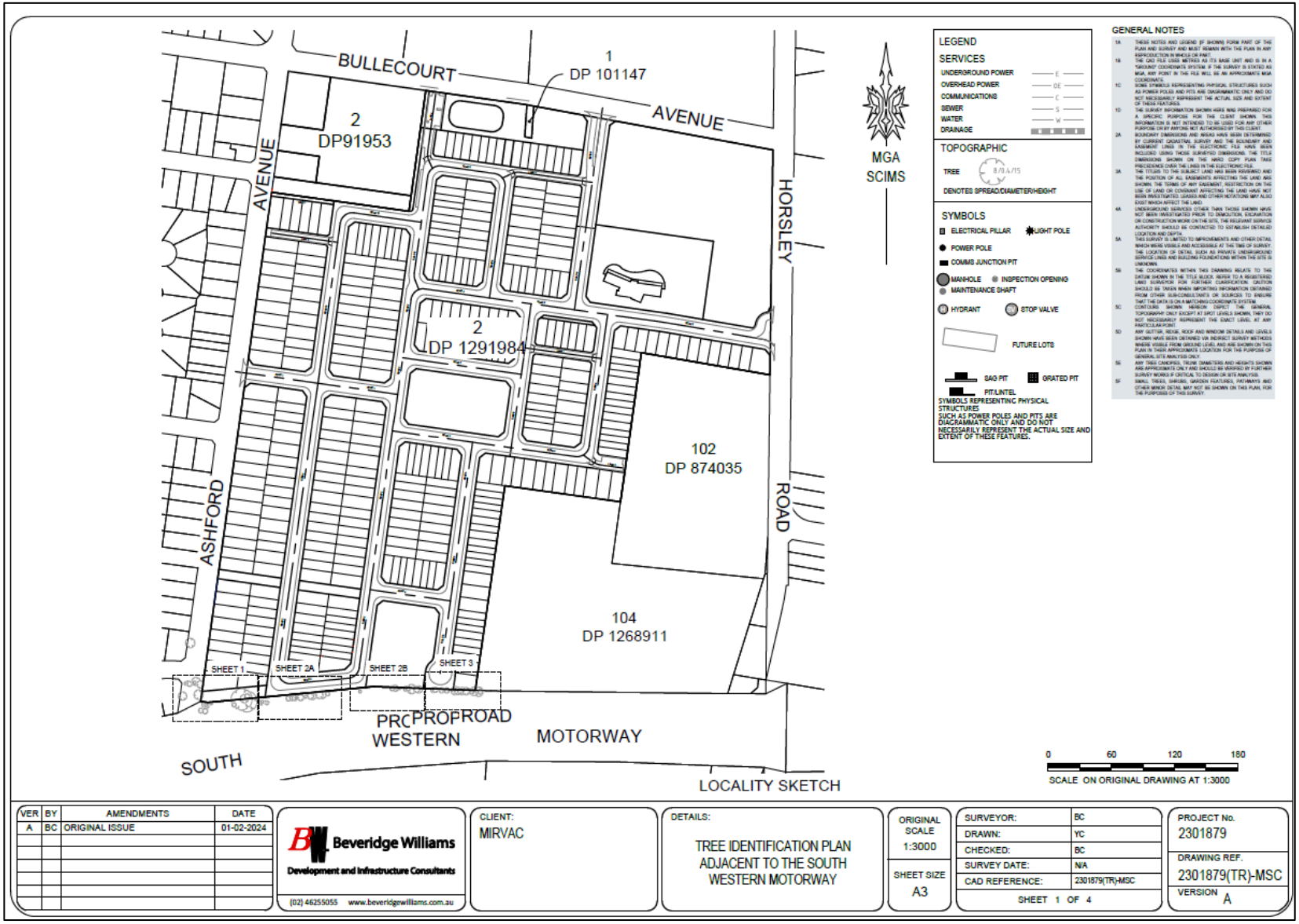
4: Remove: Trees that should be removed within the next 5 years.
(a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
(b) Dangerous trees because of instability or recent loss of adjacent trees.
(c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
(d) Damaged trees that are clearly not safe to retain.
(e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
(f) Trees that are damaging or may cause damage to existing structures within 5 years.
(g) Trees that will become dangerous after removal of other trees for the reasons given in (a)to(f)
(h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment could be retained subject to regular review.

5: Small, young or regularly pruned: Trees that can be reliably moved or replaced.
(a) Small trees less than 5m in height.
(b) Young trees less than 15 years old but over 5m in height.
(c) Formal hedges and trees intended for regular pruning to artificially control growth.

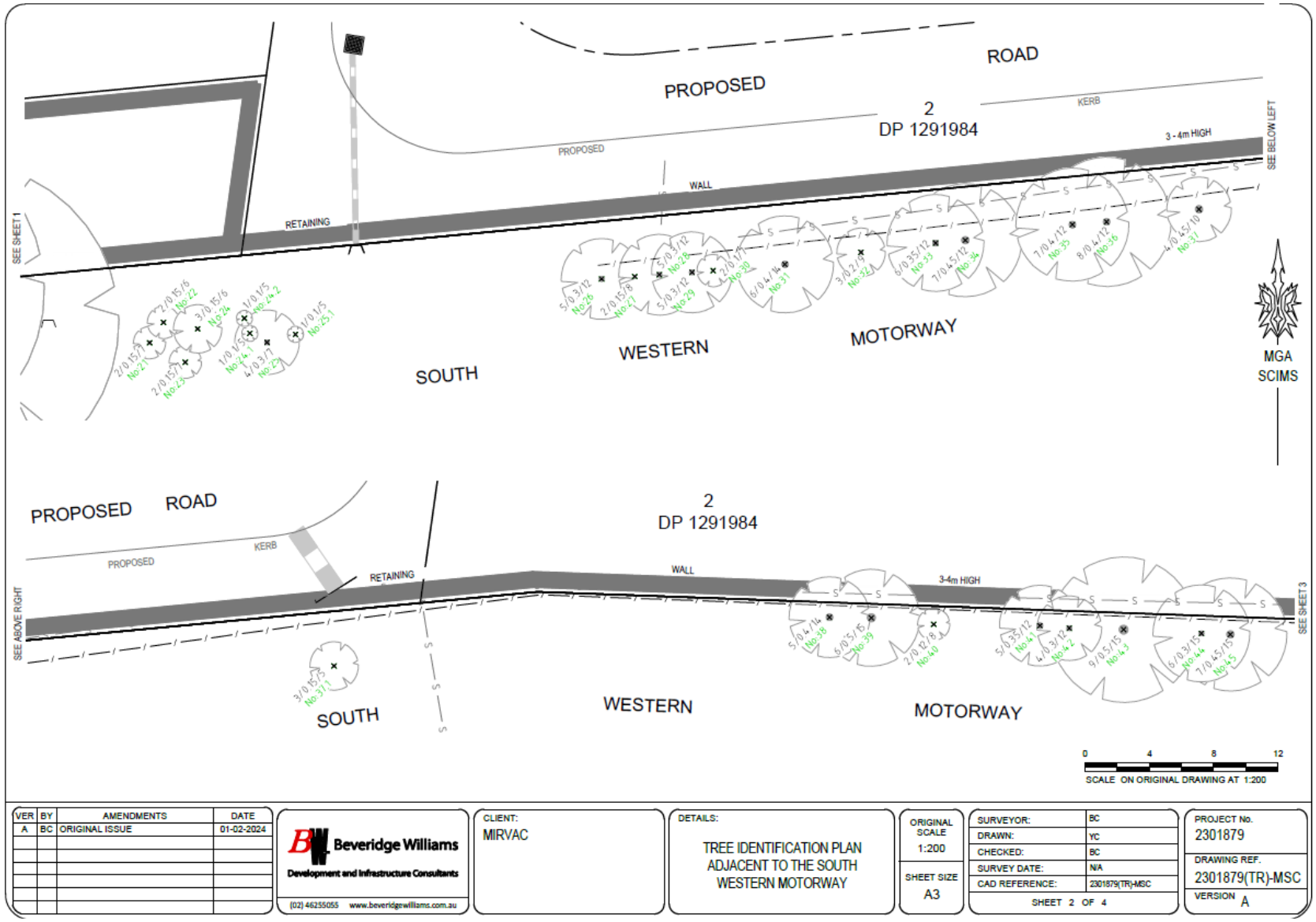
11.2 NSW Biodiversity Mapping



11.3. Tree Identification Plan – Sheet 1



11.4. Tree Identification Plan – Sheet 2



VER	BY	AMENDMENTS	DATE
A	BC	ORIGINAL ISSUE	01-02-2024

Beveridge Williams
Development and Infrastructure Consultants
(02) 46255055 www.beveridgewilliams.com.au

CLIENT: MIRVAC

DETAILS: TREE IDENTIFICATION PLAN ADJACENT TO THE SOUTH WESTERN MOTORWAY

ORIGINAL SCALE 1:200

SHEET SIZE A3

SURVEYOR:	BC
DRAWN:	YC
CHECKED:	BC
SURVEY DATE:	N/A
CAD REFERENCE:	2301879(TR)-MSC

SHEET 2 OF 4

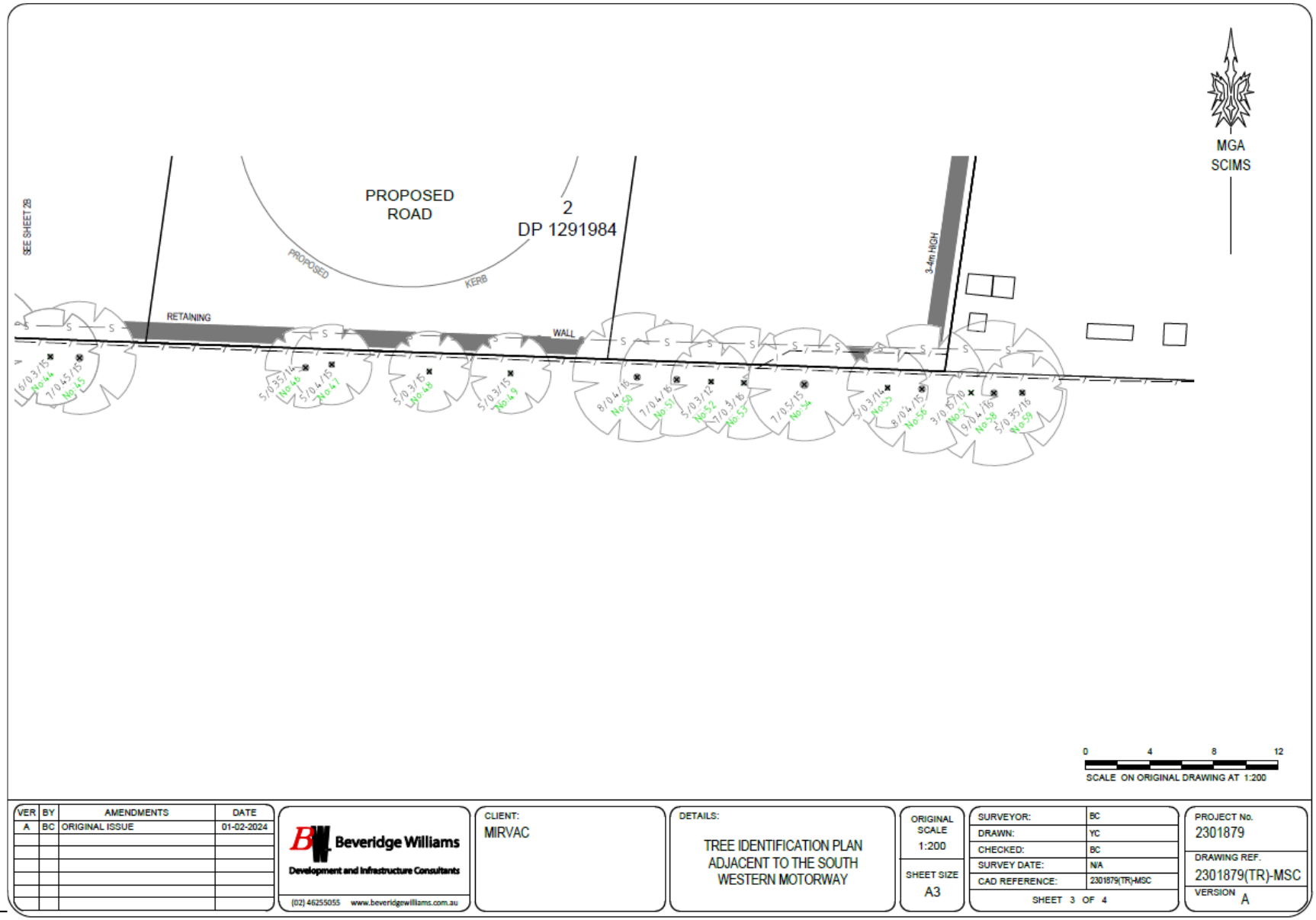
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11.5. Tree Identification Plan – Sheet 3



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A	BC	ORIGINAL ISSUE	01-02-2024

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Development and Infrastructure Consultants
(02) 46255055 www.beveridgewilliams.com.au

CLIENT: MIRVAC

DETAILS: TREE IDENTIFICATION PLAN ADJACENT TO THE SOUTH WESTERN MOTORWAY

ORIGINAL SCALE 1:200

SHEET SIZE A3

SURVEYOR:	BC
DRAWN:	YC
CHECKED:	BC
SURVEY DATE:	N/A
CAD REFERENCE:	2301879(TR)-MSC

SHEET 3 OF 4

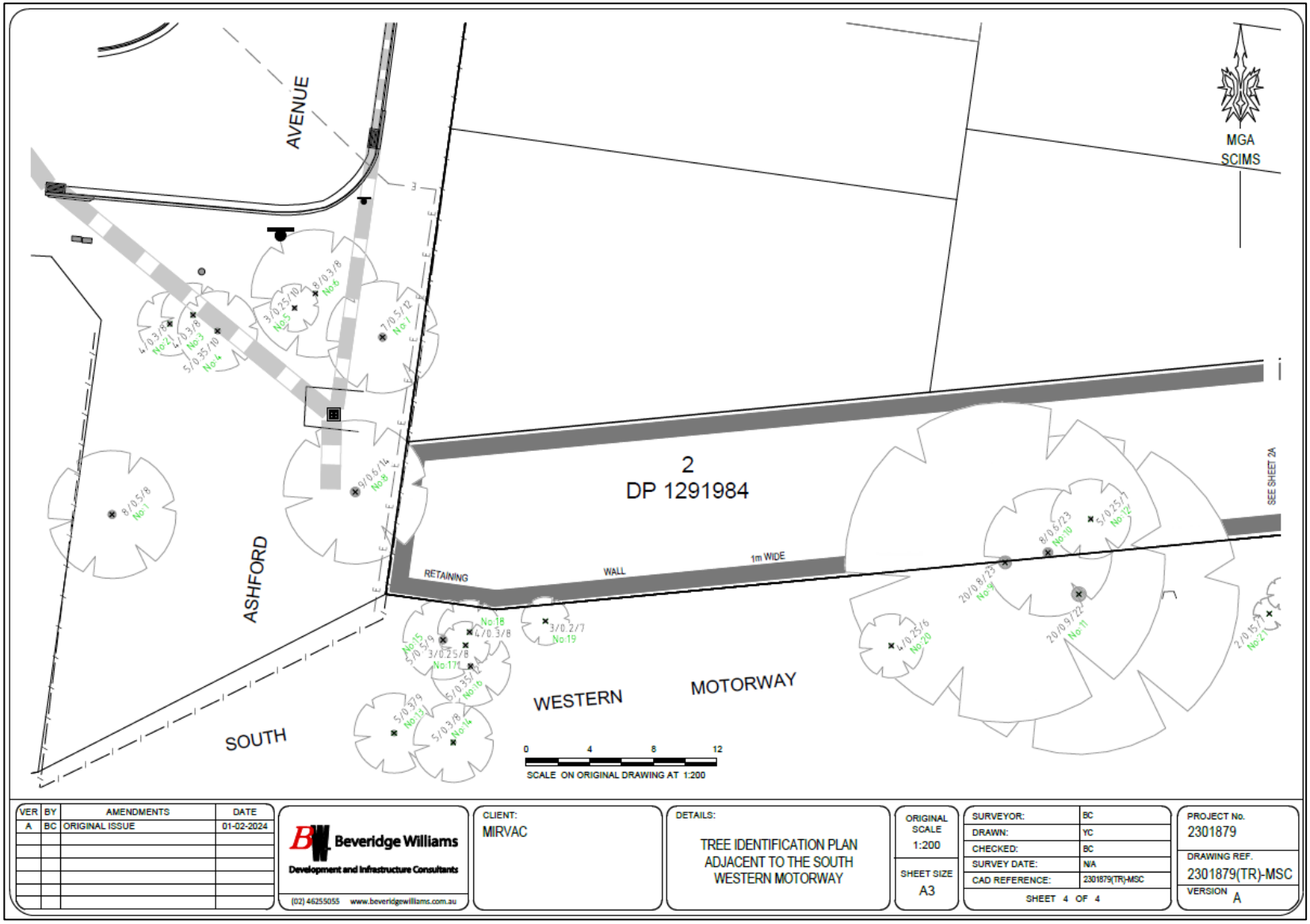
PROJECT No. 2301879

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11.6. Tree Identification Plan – Sheet 4



11.7. References

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11.8 Qualifications – Ian Hills

Associate Diploma Horticulture	Ryde TAFE 1984
AQF3 Horticulture (Arboriculture)	Ourimbah TAFE 1998
AQF5 Diploma Horticulture (Arboriculture)	Kurri Kurri TAFE 2009 (Dux) Cert No. 5934155
QTRA Registered User 2083	December 2013
QTRA Advanced User 4469	March 2018
Working with Children Check Number	WWC1780469E
National Coordinated Criminal History Check Certificate	CAD5579CB8
QTRA Advanced User 4469	March 2020
QTRA Advanced User 4469	April 2023

APPENDIX E: BUSHFIRE HAZARD ASSESSMENT

BLACKASH
BUSHFIRE CONSULTING

Bushfire Hazard Assessment

Residential Subdivision

2 Bullecourt Ave Milperra NSW 2214

Prepared for:

Mirvac Residential (NSW) Developments Pty Ltd



Version V1

18 September 2024

Project Name:	Residential Subdivision – 2 Bullecourt Ave Milperra NSW 2214
Client Details:	Mirvac Residential (NSW) Developments Pty Limited 200 George Street, Sydney NSW 2000
Project Address	2 Bullecourt Ave Milperra NSW 2214
Project Number:	J3738 - 2 Bullecourt Ave Milperra

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Document Control:

Version	Primary Author (s)	Reviewed By	Description	Date Completed
1	Mark Hawkins	Lew Short	Final	24 September 2024

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Fire Protection Association of Australia BPAD Level 3 BPD-PA 16373

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1. Summary

Table 1 is a summary of compliance with relevant documents and approaches to limit bushfire attack and meet the requirements of the NSW planning framework for new development in Bushfire Prone Areas.

Table 1: Summary

Planning for Bushfire Protection 2019 Classification	Residential Subdivision
NCC Classification	Not Applicable
Location	2 Bullecourt Ave Milperra NSW 2214
Local Government Area	Canterbury Bankstown Council
Can this proposal comply with AS3959:2018	Yes, the proposed lots can comply with the required 29kW/m^2 radiant heat levels
Does this development comply with the requirements of *Planning for Bushfire Protection 2019?*	Yes
Does this development comply with the Aims and objectives of *Planning for Bushfire Protection 2019?*	Yes
Is the proposal for a State Significant Development (SSD)	No
Is referral to the NSW RFS required?	No
Is a Bush Fire Safety Authority (BFSA) required?	No

Assessment Framework	☒ *Planning for Bushfire Protection 2019:*
	☒ Meets the deemed to satisfy provisions
	☐ Alternate solution/ performance-based assessment

2. Introduction

Blackash Bushfire Consulting has been engaged by Beveridge Williams on behalf of Mirvac Residential (NSW) Developments Pty Limited, to assess the proposed residential subdivision of land at 2 Bullecourt Ave Milperra (the site), legally known as Lot 2 DP1291984 (refer Figure 1).

The site is zoned as R1 - General Residential with areas of RE1 (Public Recreation), C2 - Environmental Conservation and B1 – Neighbourhood Centre under the Canterbury Bankstown Local Environmental Plan 2014 (LEP), which permits the application of dwelling houses with consent.

The site is located on the interface between the residential suburbs and Central Business District of Milperra (see Figure 1), within the Canterbury Bankstown Council Local Government Area. The site is approximately 20 ha in size and houses the Bankstown Campus of Western Sydney University.

The site has a range of existing uses including the Western Sydney University Bankstown Campus, Tennis First Academy, sports fields and has areas of remnant vegetation onsite. The site adjoins existing residential development, commercial and industrial properties and the South-Western Motorway to the south.

The site is NOT on designated Bushfire Prone Land as per Canterbury Bankstown Councils Bushfire Prone Land (BFPL) map (Figure 2) and therefore does not require referral to the NSW Rural Fire Service (RFS).

The NSW Planning Portal indicates that the nearest Bush Fire Prone Land (BFPL) is approximately 600 metres to the south-west. Therefore, the configuration of the proposed subdivision should have adequate provision for Asset Protection Zones (APZ) and other requirements of *Planning for Bushfire Protection 2019* (PBP).

Residential subdivision on designated BFPL would trigger the integrated development referral requirements of Section 4.46 of the *Environmental Planning and Assessment Act, 1979* (EPA Act) and require assessment by the NSW RFS under Section 100B of the *Rural Fires Act 1997* (RF Act), if it where mapped as BFPL. However, as the site is not affected by designated BFPL, the assessment has been completed against Section 4.14 of the EPA Act.

This assessment has been prepared by Mark Hawkins, Senior Bushfire Specialist and reviewed by Mr. Lew Short, Principal at Blackash Bushfire Consulting (Level 3 FPAA BPAD-A Certified Practitioner No. BPD-PA-16373) who is recognised by the NSW RFS as qualified in bushfire risk assessment and has been accredited by the Fire Protection Association of Australia as a suitably qualified consultant to undertake alternative solution proposals.

3. Bushfire Prone Land

The site is NOT identified as 'bush fire prone land' (see Figure 2) for the purposes of Section 10.3 of the EPA Act and the legislative requirements for development on bush fire prone lands are not applicable.

Bush fire prone land maps provide a trigger for the development assessment provisions and consideration of sites that are bushfire prone. Bushfire prone land (BPL) is land that has been identified by council, which can support a bushfire or is subject to bushfire attack. Bushfire prone land maps are prepared by local council and certified by the Commissioner of the NSW RFS. However, as the site is **not** affected by designated BFPL, the assessment has been completed against Section 4.14 of the EPA Act.

4. Legislative Framework

As the site is **not** affected by designated BFPL, the assessment has been completed against Section 4.14 of the EPA Act. The application has been completed having regard to the requirements of PBP as though the application was an Integrated Development, under s.4.46 of the EPA Act. However, as the site is not Integrated development, Canterbury Bankstown Council do not require General Terms of Approval or a Bushfire Safety Authority from the NSW RFS.

As a new residential subdivision, the application is able to demonstrate that the proposal can achieve a Bushfire Attack Level (BAL) of a maximum of BAL-29 on all new lots. This can be achieved on all proposed lots and is demonstrated in this report.

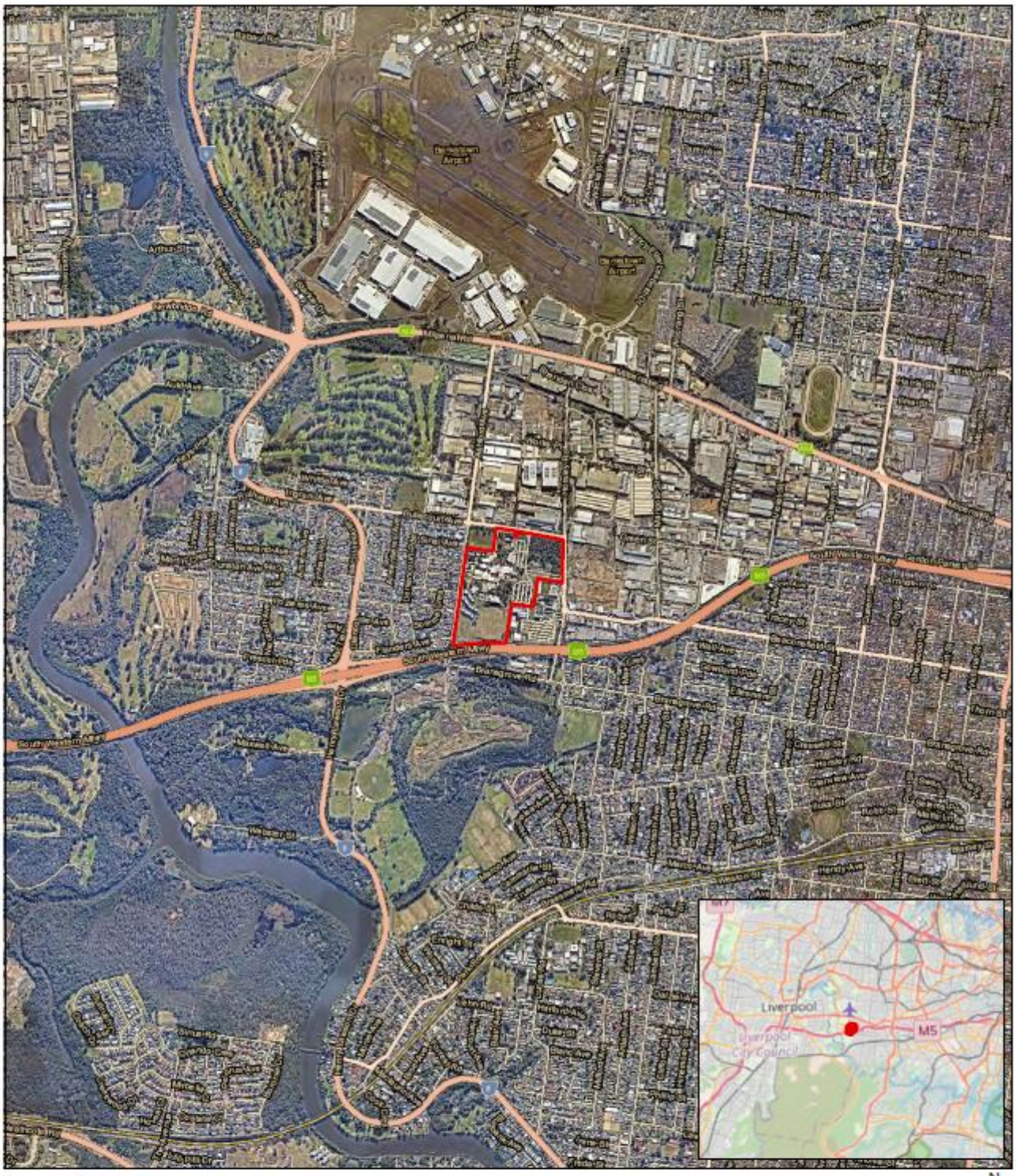


Figure 1: Location

5. Site Context and Proposed Development

This application seeks approval for the residential subdivision into stages with suitable building envelopes, a commercial lot housing an existing child care centre and public drainage reserves. Under the Canterbury Bankstown LEP the development area of the site supports the proposed subdivision and residential development.

The total land allocated to the proposed residential subdivision is approximately 20 ha.

- Stage 1 subdivision;
- Stages 2A & 2B will be a staged DA; Stage 2A creates 9 residential lots and Stage 2B creates 2 residential lots;
- Stage 3 will be a standalone DA;
- Stage 4 will be a standalone DA;
- Stage 5 will be a standalone DA;
- Stage 6 will be a standalone DA; and
- A Commercial lot will be created as a separate lot as part of the stage 1 subdivision to house the Western Sydney University Early Learning Bankstown.

The development consent includes the following scope of works:

- Staged delivery of Torrens Title Subdivision
- Site clearing
- Demolition of existing structures
- New road layout
- New services
- Stormwater and drainage infrastructure
- Landscaping works

The site has a range of existing uses including the Western Sydney University Bankstown Campus, Tennis First Academy, sports fields and has areas of remnant vegetation onsite. The site adjoins existing residential development, commercial and industrial properties and the South-Western Motorway to the south.

The surrounding landscape further to the south has large cleared and disturbed areas associated with the Kelso Waste facility and riparian vegetation associated with a tributary of the Georges River.

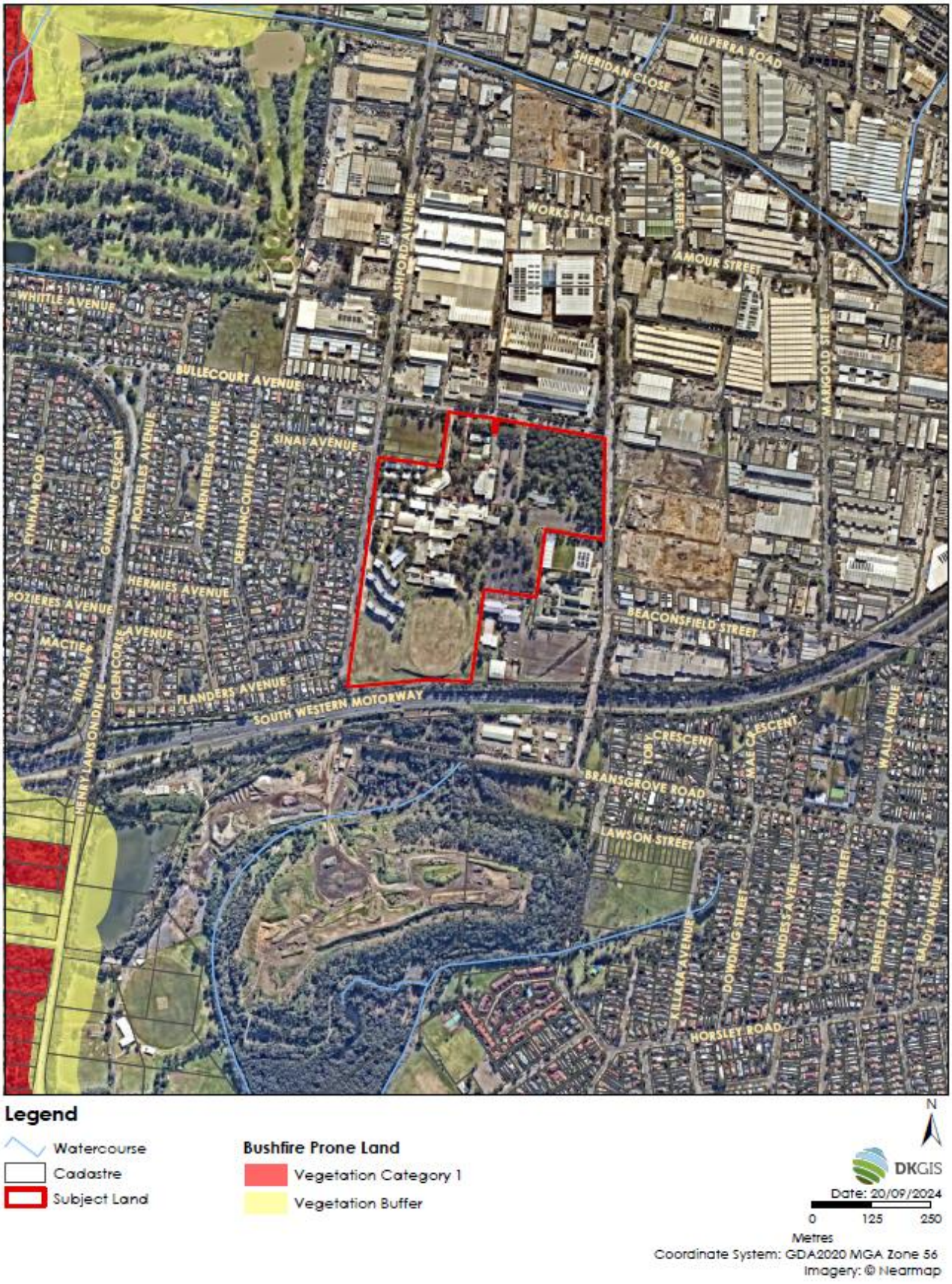


Figure 2: Bushfire prone land ma

6. Bushfire Threat Assessment

6.1. Methodology

PBP provides a methodology to determine the bushfire threat and commensurate size of any asset protection zone (APZ) that may be required to offset possible bushfire attack. These elements include the potential hazardous landscape that may affect the site and the effective slope within that hazardous vegetation. Although not formally required, the APZ requirements in this assessment are in accordance with PBP and are based on keeping radiant heat levels at new buildings below 29kW/m^2 (BAL-29).

The following assessment is prepared in accordance with Section 100B of the RF Act, Clause 44 of the RF Reg and PBP. This assessment is based on the following resources:

- Planning for Bush Fire Protection (NSW RFS, 2019);
- Canterbury Bankstown Council Bushfire Prone Land Map;
- Aerial mapping; and
- Detailed GIS and Site analysis.

The methodology used in this assessment is in accordance with PBP and is outlined in the following sections.

6.2. Bushfire Hazard

An assessment of the Bushfire Prone Land is necessary to determine the application of bushfire protection measures such as APZ locations and future building construction levels. The vegetation formations (bushfire fuels) and the topography (effective slope) combine to create the bushfire threat that may affect bushfire behavior at the site, and which determine the planning and building response of PBP 2019.

The site is not exposed to a bushfire hazard.

6.3. Fire Danger District

The fire weather is dictated by PBP and assumes a credible worst-case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds. The Canterbury Bankstown Council LGA has a Forest Fire Danger Index (FFDI) of 100, which has been applied as per PBP.

6.4. Vegetation Assessment

The RF Regulation requires a classification of the vegetation on and surrounding the property (out to a distance of 140 metres from the boundaries of the property) in accordance with the system for classification of vegetation contained in PBP 2019.

Predominant vegetation is classified by structure or formation using the system adopted by Keith (2004) and by the general description provided in PBP.

As per Figure 4, the nearest vegetation to the site is Estuarine Swamp Oak Twig-rush Forest (Forested Wetland) vegetation to the south (that has NOT been mapped as BFPL).

6.5. Slopes Influencing Bushfire Behavior

The RF Reg requires an assessment of the slope of the land on and surrounding the property out to a distance of 100 metres from the boundaries of the property or from the proposed development footprint.

The 'effective slope' influencing fire behaviour approaching the sites has been assessed in accordance with the methodology specified within PBP 2019. The effective slope is the slope of the ground under the hazard (vegetation). It is not the slope between the vegetation and the building (slope located between the asset and vegetation is the site slope).

The effective slopes adjoining the proposed residential subdivision comprise a range of downslopes and are demonstrated in Figure 3.

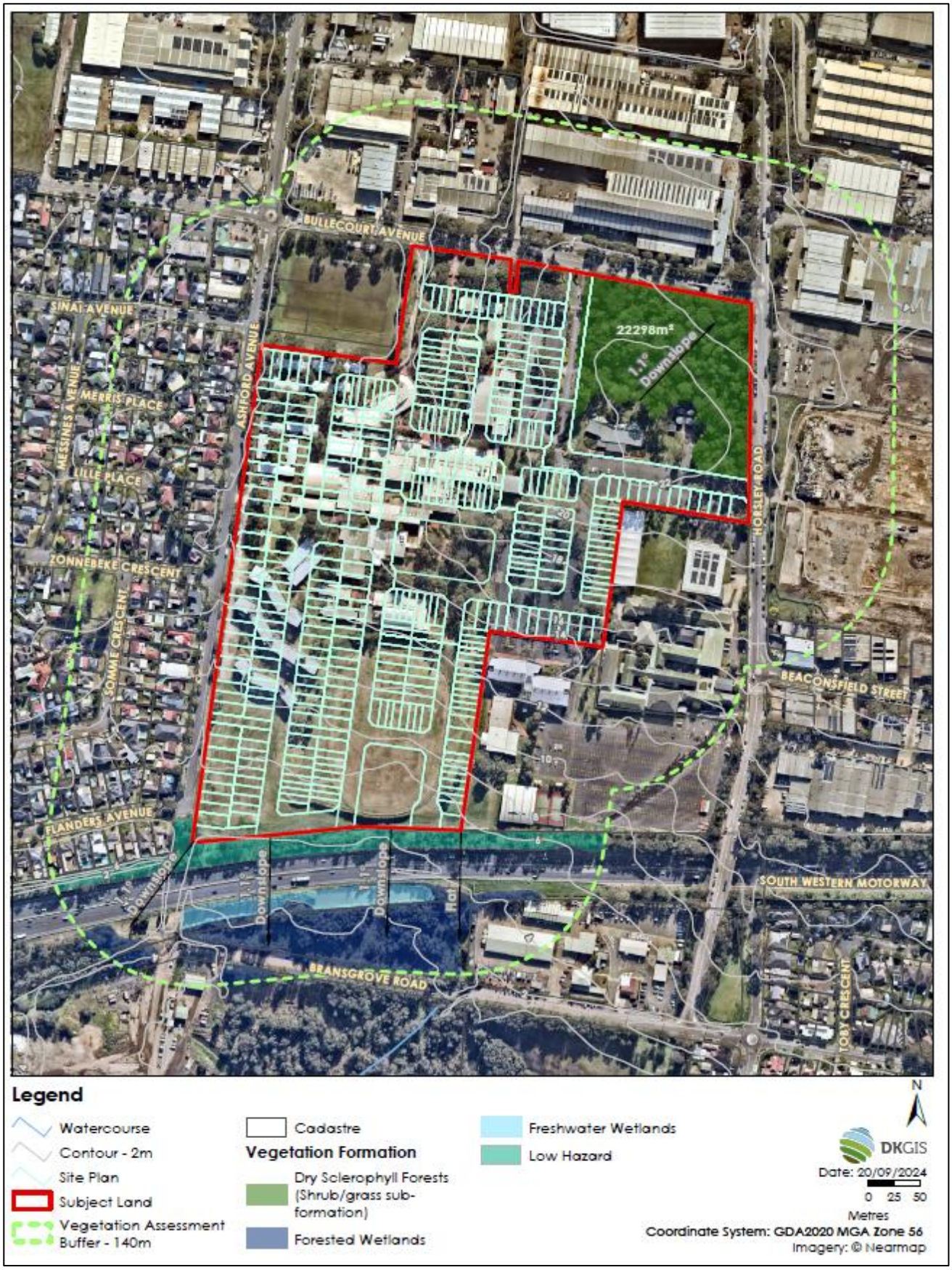


Figure 3: Vegetation & Slope Analysis

7. Bushfire Protection Measures

PBP recognises the unique attributes of an application and promotes detailed site analysis and the application of a combination of bushfire protection measures (BPMs) to achieve an acceptable outcome.

The BPMs work in combination to provide a suite of measures that meet the aim and objective and Chapter 5 of PBP 2019. The BPMs are shown in Figure 4.

Appropriate combinations depend upon geographic location and site circumstances.

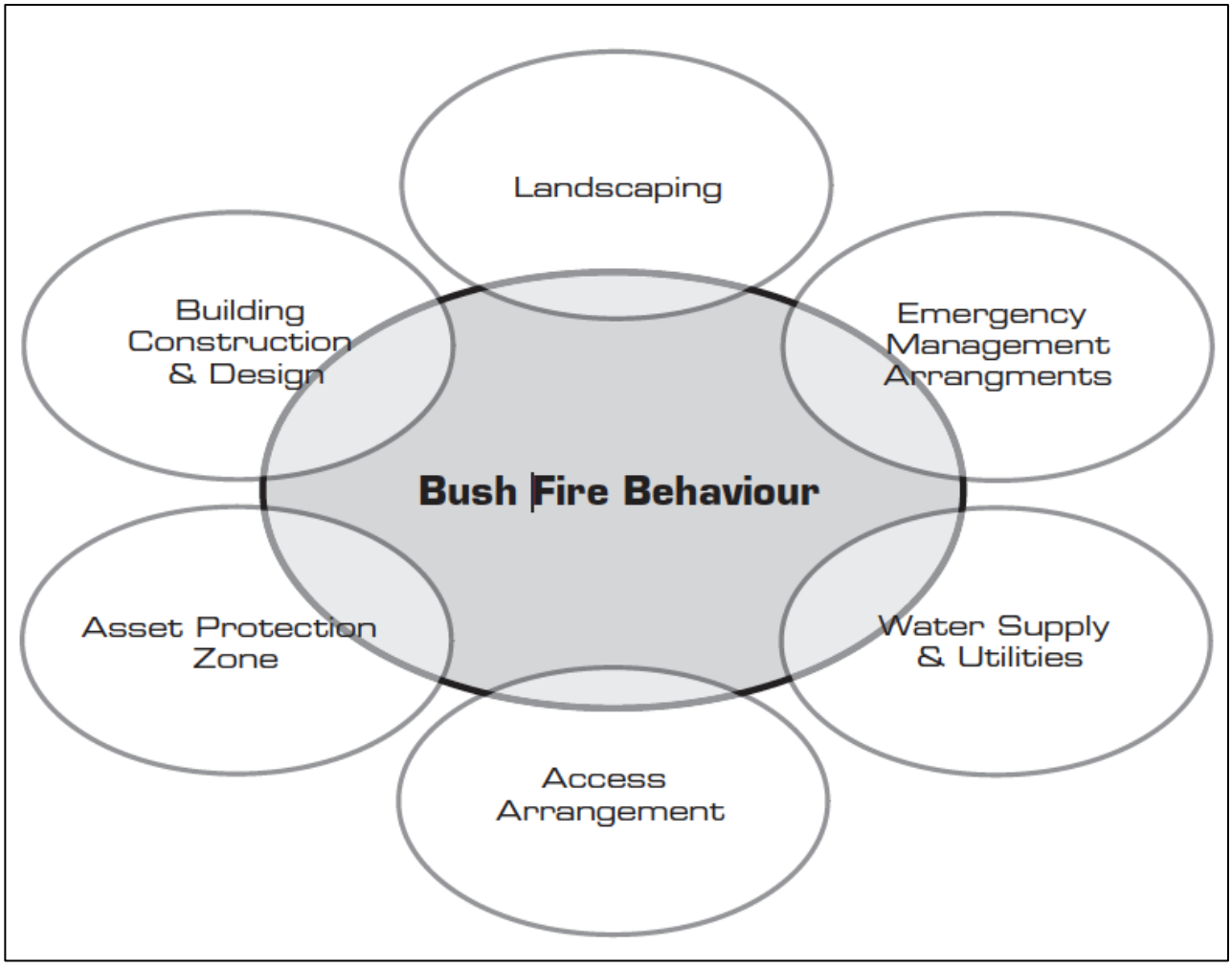


Figure 4: Bushfire Protection Measures in Combination (source PBP p. 26).

7.1. Asset Protection Zones

For proposed new residential subdivisions, PBP requires that a minimum separation is provided in the form of APZ. The APZ is a fuel-reduced, physical separation between buildings and bushfire hazards. For residential developments, APZ requirements are based on keeping radiant heat levels at buildings below 29kW/m^2 as the maximum exposure on all sides of the building.

The proposed subdivision is not classified as BFPL and as such does not require APZs for the purposes of protection from bushfires.

7.2. Water Supply & Utilities

PBP (p. 47) requires that adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.

Blackash have been advised that the proposed site will have access to reticulated water supply.

The provision of water, gas and electricity will be considered at the individual building stage which will be able to comply with PBP.

7.3. Access

The access arrangements have been assessed under the appropriate provisions for Residential Subdivision including the provision of "*perimeter roads are provided for residential subdivisions of three or more allotments*".

All Acceptable Solutions can be designed and implemented for the proposed subdivision development.

7.4. Bushfire Attack Levels

The Bushfire Attack Levels (BAL) is a means of measuring the ability of a building to withstand attack from bushfire. The form of bushfire attack and the severity will vary according to the conditions (FDI, vegetation, slope and setback) on the site.

The BAL assesses the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per square metre, which is the basis for establishing the requirements for construction to improve protection of a building from potential

attack by a bushfire, as defined in *Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas* (AS 3959-2018).

The proposed subdivision is not classified as BFPL and as such does not require BAL ratings for the purposes of protection from bushfires.

8. Recommendations

The following recommendation is not mandatory but has been made to ensure the proposed development remains compliant for future landscaping with *Planning for Bush Fire Protection 2019*:

NIL

9. Conclusion

This assessment has demonstrated that the site is not affected by BFPL.

In the authors professional opinion, the proposed development does not require the issue of a Bush Fire Safety Authority under Section 100B of the *Rural Fires Act* 1997. However, the bushfire protection measures demonstrated in this report comply with the aim and objectives of *Planning for Bush Fire Protection* 2019 and therefore can be approved without referral to the NSW RFS.



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Appendix - 1 References

Councils of Standards Australia AS3959 (2018) – *Australian Standard Construction of buildings in bushfire-prone areas*

Councils of Standards Australia AS2419 (2017) – *Fire Hydrant Installations*

Keith, David (2004) – *Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT*. The Department of Environment and Climate Change

NSW Rural Fire Service (2015) *Guide for Bushfire Prone Land Mapping*

NSW Rural Fire Service (2019). *Planning for Bushfire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.*

NSW Government (1979) *Environmental Planning and Assessment Act 1979*. NSW Government Printer.

APPENDIX F: COST ESTIMATE REPORT

2 BULLECOURT AVENUE, MILPERRA - STAGE 1
ROADS & STORMWATER DRAINAGE WORKS SCHEDULE

Estimated Cost of Works for DA purposes

2101879 Stage 1 DA Civil plans

Note: Earthworks quantities are based on natural surface prior to Stage 1 construction

ROADS & STORMWATER DRAINAGE SUB TOTAL	$470,922.50
G.S.T.	$47,092.25
ROADS & STORMWATER DRAINAGE TOTAL	$518,014.75

SCHEDULE VERSION : A

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	SITE ESTABLISHMENT				$58,400.00
(a)	Site Establishment and Environmental Management				
(i)	Site establishment including all plant and equipment, site fencing and access arrangements of compound and site office. Maintenance of compound, site office and temporary fencing as required. Site to be kept presentable.	1	Item	$ 20,000.00	$ 20,000.00
(ii)	Removal of all existing utilities and underground services within the Stage 1 limit of works	1	item	$ 10,000.00	$ 10,000.00
(iii)	Sawcut and remove existing kerb in Ashford Ave at future driveway locations	17	item	$ 800.00	$ 13,600.00
(b)	Traffic Management				
(i)	Traffic Management during driveway kerb cross-overs to meet relevant Authority requirements	1	Item	$ 10,000.00	$ 10,000.00
(c)	Tree Removal and mulching of trees - including stumps and disposal of all mulch offsite	6	No	$ 800.00	$ 4,800.00
2	EARTHWORKS				$148,982.50
	Excavation for road works and site works including the stripping and respreading of topsoil on all disturbed areas, tree removal unless included elsewhere, clearing and grubbing, trimming, grading and boxing Rate to include loading and carting of excess excavation to single stockpile on site to area specified by Superintendent :-				
(a)	Topsoiling				
(i)	Strip topsoil 0.15m thick and stockpile	22500	sq.m	$ 1.50	$ 33,750.00
(ii)	Place and spread topsoil 0.2m thick on footpath and disturbed areas	7,500	sq.m	$ 3.50	$ 26,250.00
(iii)	Remove excess topsoil from site (spoil)	2,250	cu.m	$ 25.00	$ 56,250.00
	Site excavation				
(i)	Cut to fill for lot benching and regrading works in all classes of material including placement and compaction subject to geotechnical assessment	637	cu.m	$ 12.00	$ 7,644.00
(ii)	Cut to stockpile for lot benching and regrading works in all classes of material	2,626	cu.m	$ 8.50	$ 22,321.00
(iii)	Excavate for drainage trenches to spoil and cart to stockpile	105	cu.m	$ 15.00	$ 1,567.50
(vii)	Trim and compact verge subgrade	800	sq.m	$ 1.50	$ 1,200.00
3	ROAD PAVEMENT				$0.00
	Road pavement material supply, spread, compact and grade pavement for compacted thickness as per Council specification including all testing required :-				
(a)	Ashford Avenue				
(i)	40mm AC10	0	sq.m		$ -
(ii)	10mm seal	0	sq.m		$ -
(iii)	200mm thick basecourse	0	sq.m		$ -
(iv)	270mm thick subbase course	0	sq.m		$ -

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
4	CONCRETE WORKS				$36,700.00
	Construction of concrete works as specified including supply of all labour and materials in accordance with the plans :-				
(a)	Kerb				
(i)	Barrier Kerb and Gutter	0	lin.m		$ -
(i)	Roll top kerb	0	lin.m		$ -
(i)	Flush kerb	0	lin.m		$ -
(i)	Dish Crossing	0	lin.m		$ -
(i)	Dish Crossing	0	lin.m		$ -
	Footpath				
	1.5m wide reinforced concrete footpath	200	lin.m	$ 85.00	17000
	Kerb Crossings				
	Concrete pram ramp	1	No	$ 500.00	$ 500.00
	Driveway Vehicle Crossing	16	No	$ 1,200.00	$ 19,200.00
	Overland flow path				
	Concrete v-drain	0	lin.m		$ -
	Concrete flow path	0	lin.m		$ -
5	DRAINAGE				$70,770.00
	Supply and install drainage including testing, excavation, shoring, laying, bedding, backfilling, dewatering, removal of spoil for the pipes specified below :-				
	Drainage Pipes				
(a)	uPVC SN8 RRJ interallotment				
(i)	150mm dia	0	lin.m		$ -
(ii)	225mm dia	0	lin.m		$ -
(b)	RCP SN8 RRJ				
(i)	375mm dia CL2	209	lin.m	$ 180.00	$ 37,620.00
(c)	Backfill				
(i)	Extra granular backfill under roads	0	cu.m		
	Drainage Pits				
(d)	Interallotment Pits as per Council Standard				
(i)	450 x 450	0	No.		$ -
(ii)	600 x 600	9	No.	$ 1,400.00	$ 12,600.00
(iii)	900 x 900	9	No.	$ 2,000.00	$ 18,000.00
(iv)	Kerb inlet pit 2.4m lintel	0	No.		$ -
(v)	Kerb inlet pit 2.4m lintel (sag)	0	No.		$ -
(e)	Provide pipe stubs, bends, risers and caps for future connections				
(i)	90mm dia pipe	17	No	$ 150.00	$ 2,550.00
(f)	Subsoil Drainage				
(i)	Supply, excavate, lay and backfill approved subsoil drainage including filter material and flushing points under roads	0	lin.m		$ -
6	OTHER WORKS				$156,070.00
(a)	Retaining Walls				
	Including supply of all labour and materials incl. but not limited to backfill aggregate, agline, posts, concrete sleepers and all other incidentals				
(i)	Internal post and concrete sleeper retaining walls - max. 1.5m deep	102	No.	$ 650.00	$ 66,300.00
(b)	Raingarden				
(i)	Fill works (incl. under filling item)	0	No.		$ -
(ii)	Construction of media, sand transition layer, gravel layer, aglines & pipes	68	sq.m	$ 140.00	$ 9,520.00
(iii)	Adjustment of Outlet pit	1	No.	$ 1,000.00	$ 1,000.00
(iv)	Rock Rip Rap	10	sq.m	$ 100.00	$ 1,000.00
(a)	Traffic Signs				

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
	Including supply and install traffic sign as per Council standard				
(i)	Road name signs	0	No.		$ -
(ii)	No parking	0	No.		$ -
(iii)	No through road sign G9-18	0	No.		$ -
	TURFING & EROSION CONTROL				
(b)	Revegetation of disturbed areas				
(i)	Supply and place turf as required by Council along footpaths (kerb to boundary) , around stormwater pits	200	sq.m	$ 12.00	$ 2,400.00
(ii)	Hydro seeding of other disturbed areas	16000	sq.m	$ 1.00	$ 16,000.00
(c)	Erosion control				
(i)	Sediment fence	600	lin.m	$ 25.00	$ 15,000.00
(ii)	Straw Bales	1	Item	$ 1,000.00	$ 1,000.00
(iii)	Utilisation and maintenance of sediment basin including testing and monitoring, flocculation as required and removal of basin on completion of works	1	Item	$ 5,000.00	$ 5,000.00
(iv)	Temporary diversion mound/swale	230	lin.m	$ 5.00	$ 1,150.00
(v)	Provide gravel bag inlet Sediment Trap	14	Item	$ 50.00	$ 700.00
(vi)	Geotextile Filter Around Grated Surface Inlet Pits	20	Item	$ 50.00	$ 1,000.00
(vii)	Provide parawebbing Hi-Vis fence	600	Item	$ 50.00	$ 30,000.00
(viii)	1.8m high fence	300	Item	$ 20.00	$ 6,000.00

APPENDIX G: HERITAGE IMPACT ASSESSMENT

EXTENT

WESTERN SYDNEY UNIVERSITY

MILPERRA CAMPUS

Statement of Heritage Impact for the subdivision of the Milperra Campus

Prepared by Extent Heritage Pty. Ltd.

Prepared for Mirvac

September 2024 — Final 0.2

SYDNEY
MELBOURNE
BRISBANE
HOBART

PEOPLE CENTRED HERITAGE

Document information

Extent Heritage project no.:	0224014
Client:	Beveridge Williams on behalf of Mirvac
Project:	Western Sydney University – Milperra campus redevelopment Statement of Heritage Impact
Site Location:	WSU Milperra Campus, Horsley Road and Bullecourt Avenue, Milperra NSW 2214
Author(s):	Reuel Balmadres

Document Control

Version	Internal reviewer	Date	Review type
Draft 0.1	K. Watson	19/02/2024	QA
Final Draft 0.2	K. Watson	11/03/2024	Client comments
Final 0.1	K. Watson	30/05/2024	Minor comments
Final 0.2	K. Watson	16/09/2024	Updated staging plan

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EXECUTIVE SUMMARY

Project background

Extent Heritage Pty Ltd has been engaged by Beveridge Williams on behalf of Mirvac to prepare a Statement of Heritage Impact (SOHI) for the subdivision of the former Western Sydney University (WSU) Milperra Campus (hereafter referred to as the 'site'). The subdivision forms part of redevelopment of the former WSU campus into a low-rise neighbourhood incorporating a range of attached, semi-detached and free-standing homes. The proposal seeks to facilitate the redevelopment through the subdivision of the site over seven (7) stages.

While the subject site is not a heritage listed item, it is bordered by Bullecourt Avenue to its north and Ashford Avenue to its west, roads that form part of the locally listed heritage item *Milperra Soldier Settlement (former)* on the *Canterbury Bankstown LEP 2023*. This report concludes that the proposed development will not have any impact on these roads as all works proposed are to be contained within the subject site, and as such will not affect the alignment of the roads which is key to the item's significance. The subdivision will facilitate the suburban redevelopment of the area, which seeks to improve the residential amenity of the wider area, as it will provide much needed housing in the area and its surrounds. The proposed subdivision will not result in any adverse impacts on the significance or character of the heritage item in the vicinity or on the identified heritage values of the *Milperra Soldier Settlement (former)*.

Recommendations

In recognition of the historical associations of the site with the *Milperra Soldier Settlement (former*), the following recommendations are provided to inform the proposed development.

- It is recommended that all future development proposals should give regard to the heritage controls outlined in Chapter 4 of Canterbury Bankstown Development Control Plan (DCP) and Section 3.9 of the draft Site-Specific DCP for Western Sydney University Milperra Former Campus. The objectives outlined in the DCP seek to ensure that adjacent development does not have a detrimental impact on the identified heritage values, is a compatible development, and retains key features that contribute to the character of the area. For the subject site, retaining the historical form of the road corridors of Bullecourt and Ashford Avenues will be integral to the conservation of heritage values.

- Under Clause 5.10(5) of the *Canterbury Bankstown Local Environmental Plan 2023*, subsequent Development Applications for construction may require a Statement of Heritage Impact (SOHI) to assess the potential impacts to the heritage significance of the *Milperra Soldier Settlement (former)*. Given the significance of the heritage item is embodied in the layout of the Bullecourt and Ashford Avenues, it is considered unlikely that built form in the adjacent lot would adversely impact the identified heritage values of the item, however, pre-DA advice from Canterbury Bankstown's Council heritage officer should be sought.

- Section 3.9 of the DCP stipulates that a Heritage Interpretation Plan should be provided as part of any future Development Application or subdivision of the former Western Sydney University Milperra Campus. It is recommended that an Interpretation Plan is prepared following the subdivision, in line with the controls provided in Section 3.9 of the DCP cited above. The Heritage Interpretation Plan would establish a thematic framework to interpret the Milperra Soldier Settlement by exploring the historical and social values associated with the site. The interpretation plan would identify suitable interpretative devices for implementation based on a thorough site analysis.

- The site, like all places in NSW, is subject to the general conditions of the *Heritage Act 1977*, there are however no specific permitting or consent requirements under the Act for this site. As part of the on-site environmental management process, an unexpected finds procedure should be put in place, developed by an archaeologist with demonstrated experience and understanding of the required obligations in accordance with the *Act*. This protocol would include a pre-start briefing of contractors regarding the type of material that may be uncovered during works and their obligations under the *Act*. The procedure should also outline a process for protecting and identifying unexpected archaeological material, if uncovered during works.

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Figure 3. Undated Parish of Bankstown maps showing early land grants. The general location of the site is indicated in red within land granted to Johnston Junior. *Source*: NSW Planning Portal. 5
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1. THE HERITAGE ITEM

Extent Heritage Pty Ltd has been engaged by Beveridge Williams on behalf of Mirvac to prepare a Statement of Heritage Impact (SOHI) for the subdivision of the former Western Sydney University (WSU) Milperra Campus (hereafter referred to as the 'site'). The subdivision forms part of redevelopment of the former WSU campus into a low-rise neighbourhood incorporating a range of attached, semi-detached and free-standing homes. The proposal seeks to facilitate the redevelopment through the subdivision of the site over seven (7) stages.

The purpose of the report is to analyse the proposed subdivision pattern of the site, and the potential impacts on the heritage significance of the *Milperra Soldier Settlement (former)* (LEP I218). The methodology used in the preparation of this Statement of Heritage Impact (SOHI) is in accordance with the principles and definitions as set out in the guidelines to *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance (the Burra Charter) (Australia ICOMOS 2013)* and the latest version of the *Statement of Heritage Impact Guidelines* (Department of Planning and Environment, 2023). This SOHI will review the relevant statutory heritage controls, assess the impact of the proposal on the site and heritage items in the vicinity and make recommendations as to the level of impact. This report specifically relates to built heritage and historical archaeological potential and includes recommendations and conclusions drawn from the impact assessment.

1.1. Site description

The site forms part of the former WSU Milperra campus located in the southwest Sydney suburb of Milperra within the Local Government Area (LGA) of Canterbury Bankstown. It is located at 272 Horsley Road, Milperra, and comprises land legally defined as Lot 2 in DP 1291984 and Lot 1 in DP 101147 (refer to Figure 1 below). Within this context, the site is bounded by the M5 Motorway to the south, Horsley Road to the east, Bullecourt Avenue to the north, and Ashford Avenue to the west.

The site contains a complex of educational, administration, and accommodation university campus buildings that date from the c.1970s. The buildings are predominately low scale in massing and are interconnected by a network of paved pathways and carparks with large open spaces at the south and north of the site.



Figure 1. Aerial photograph showing the defined site extent indicated in red. Source: Nearmap 2024 with Extent Heritage mark-up.

1.1.1. Heritage item

The site is bordered by Bullecourt Avenue to its north and Ashford Avenue to its west, roads that are part of the locally listed item *Milperra Soldier Settlement (former)*. The heritage item is significant at the local level for its conservation of the last surviving evidence of the former subdivision pattern of the Milperra Soldiers Settlement, a national scheme that was intended to repatriate returning servicemen during and after World War I.

1.1.2. Heritage listings

The site, being part of the former WSU Milperra campus, **is not listed** as a heritage item on any statutory register or planning instrument.

The site is located within the vicinity of one (1) heritage item, the *Milperra Soldier Settlement (former)* (LEP I218) which is an item of local heritage significance listed on Schedule 5 of the *Canterbury Bankstown Local Environmental Plan 2023*.

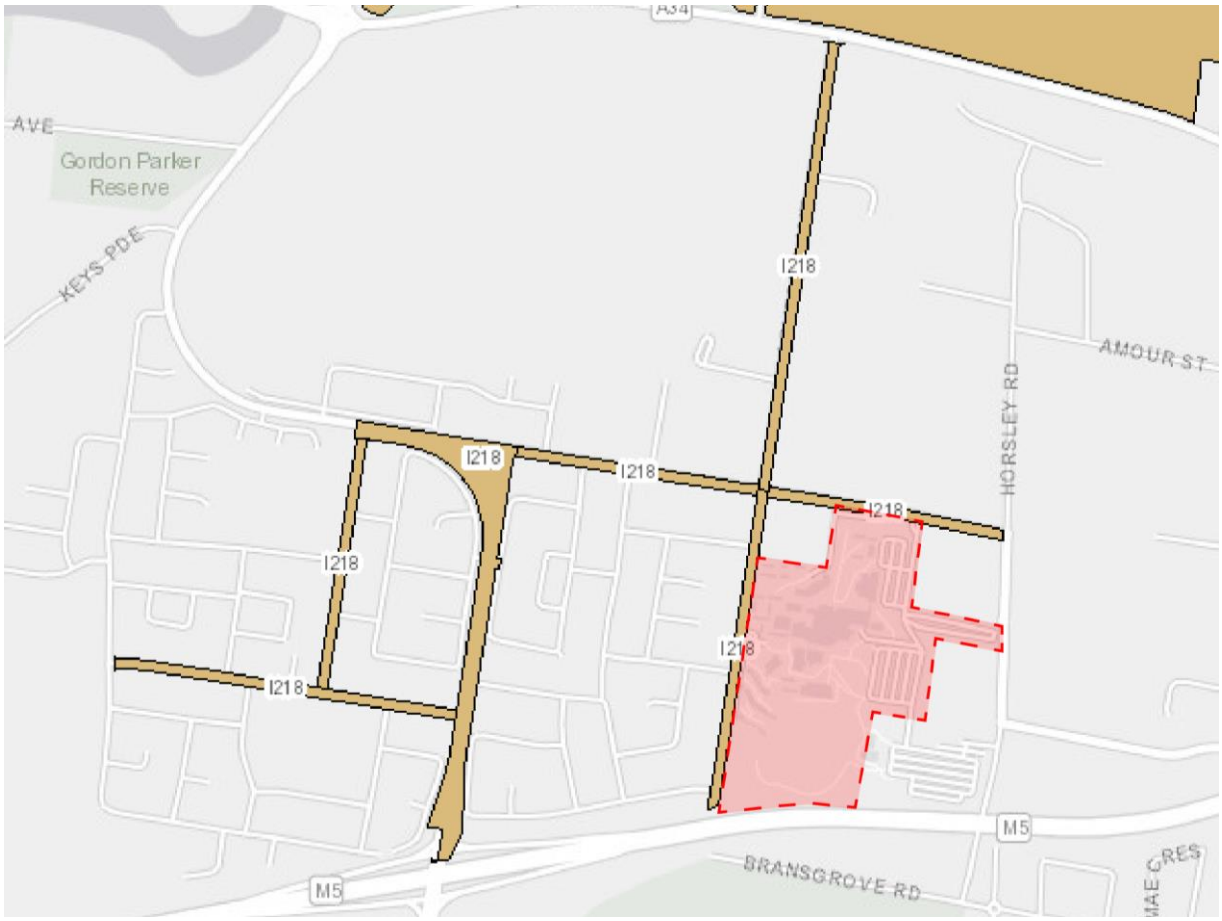


Figure 2. Heritage map showing the defined site indicated in red within context of the heritage curtilage of the *Milperra Soldier Settlement (former)* (LEP I218)

1.2. Historical context

1.2.1. Traditional owners

The site is located within the suburb of Milperra. The wider area is land that has been lived on and cared for by the Aboriginal people for millennia. Natural features such as the Georges River (to the west of the site) formed geographic boundaries for the various clans of the Eora Nation. Land north of the Georges River is reported to be the home of people from Darug language groups, while land to the south was the home of people who spoke the Dharawal language (Georges Riverkeeper n.d.)

The Aboriginal groups hunted for kangaroos, emu, and possum while foraging for wild honey, plants, and roots, and also collected fish and shellfish from the rivers and coast. Life for the Darug, Dharawal and other Aboriginal peoples forever changed with the arrival of the First Fleet in 1788, bringing dispossession through the spread of agricultural land, frontier conflict, and the introduction of foreign disease.

The current name of Milperra is derived from an Aboriginal word that means 'a company, a welcome, a place of recovery of men injured in tribal war or initiation, or a gathering of people' (also spelled milpera) (Beckett 1984, 145 in Allison 2009, 144-157).

1.2.2. Early land tenure

The present suburb of Milperra extends across land grants that were made to William Heath, Thomas Bevan, William Mitchell, John Connell, James Connell, Edward Weston, Esther Julian, George Johnston and George Johnston Junior from the late eighteenth century (Figure 4).

The site is located on land granted to George Johnston Junior in 1819. Johnston Junior first received 500 acres of land at Bankstown in 1804, granted by Governor Philip Gidley King. It was reported that Johnston Junior's father, Captain George Johnston as Lieutenant-Governor, made a conditional grant to his son of 2,000 acres along the Nepean River which was rejected by then-Governor Lachlan Macquarie as inadmissible. However, Macquarie eventually restored parts of the conditional grant to Johnston Junior which included 650 acres comprising part of the site on 31 August 1819 (HLRV Primary Application No. 8299) (Yarwood 2006).

The Johnstons accumulated large tracts of land in the region, including the family's homestead, which was located at the confluence of Prospect Creek with the Georges River (approximately 3.2 kilometres north of the site). Many of the elder Johnston's landholdings passed to Johnston Junior following his death in 1823. Johnston Junior resided at the family homestead, and it was noted that areas of the estate were cleared and used for cultivation (SHR n.d.). Specific land use within the former WSU Campus site is not known.

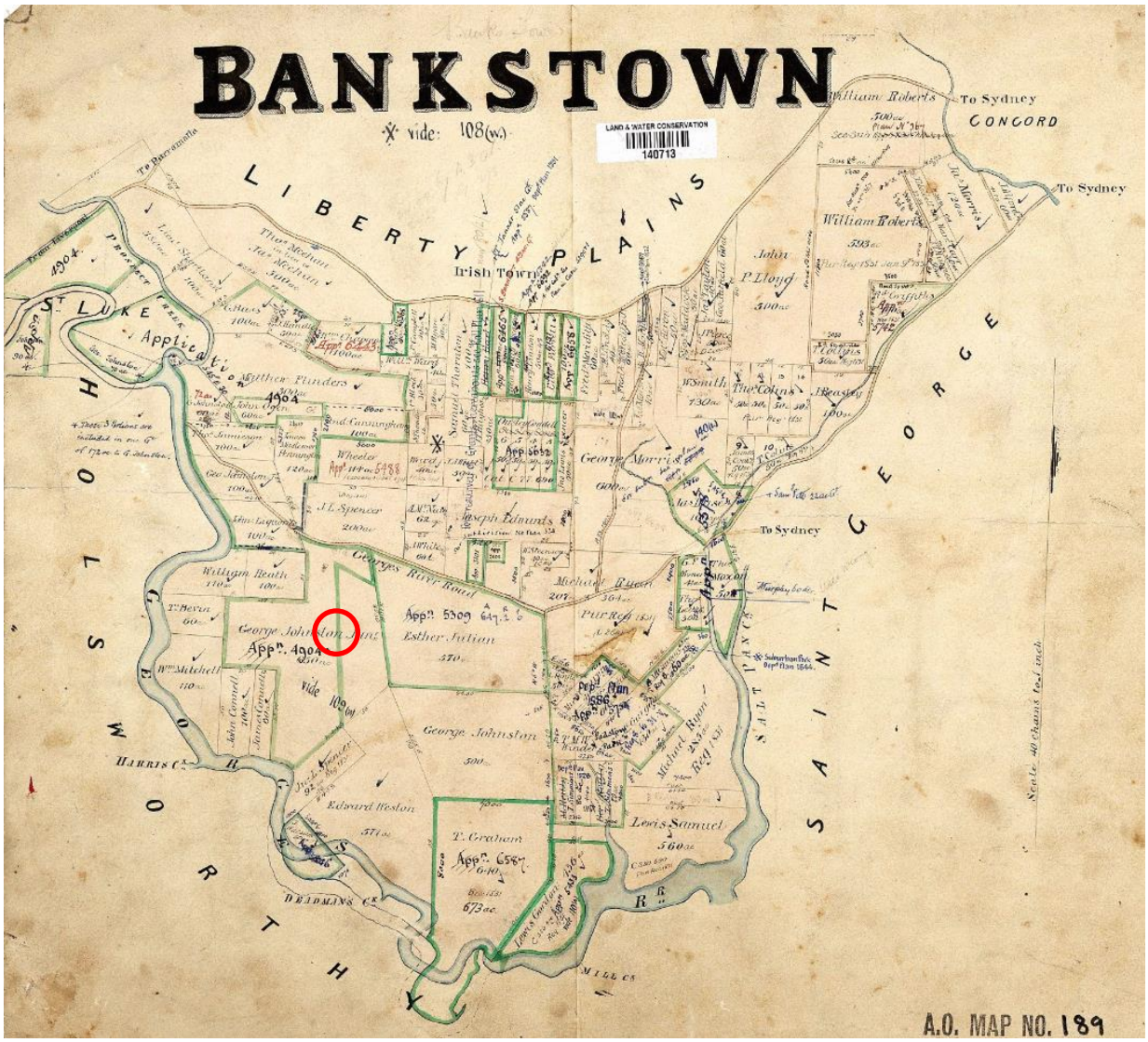


Figure 3. Undated Parish of Bankstown maps showing early land grants. The general location of the site is indicated in red within land granted to Johnston Junior. *Source*: NSW Planning Portal.

1.2.3. Soldier Settlement Scheme

In 1917, the Bankstown Soldier Settlement was established in the location of present-day Milperra. It was the first of the group soldier settlements in the Greater Sydney Metropolitan Area established as part of the Soldier Settlement Scheme. The Soldier Settlement Scheme was one of the rehabilitation projects undertaken by the Commonwealth and State governments after World War I, to help repatriate servicemen who had served overseas. NSW was the first state to introduce legislation for this with *The Returned Soldiers Settlement Act 1916* (Allison 2009).

The aim of this scheme was to assist returned men to settle on rural land by offering preferential terms and conditions for repayment (Allison 2010). The settlement at Milperra contained forty-eight poultry and eight vegetable farms, with farm sizes ranging from four to ten acres (Allison 2009).

The settlement had five roads – Bullecourt, Amiens, Fleurbaix, and Pozieres Avenues, which were named after French towns and key World War I battlefields, and Ashford Avenue, which was named after the then-New South Wales Minister for Lands (Department of Lands, NRS 8052).

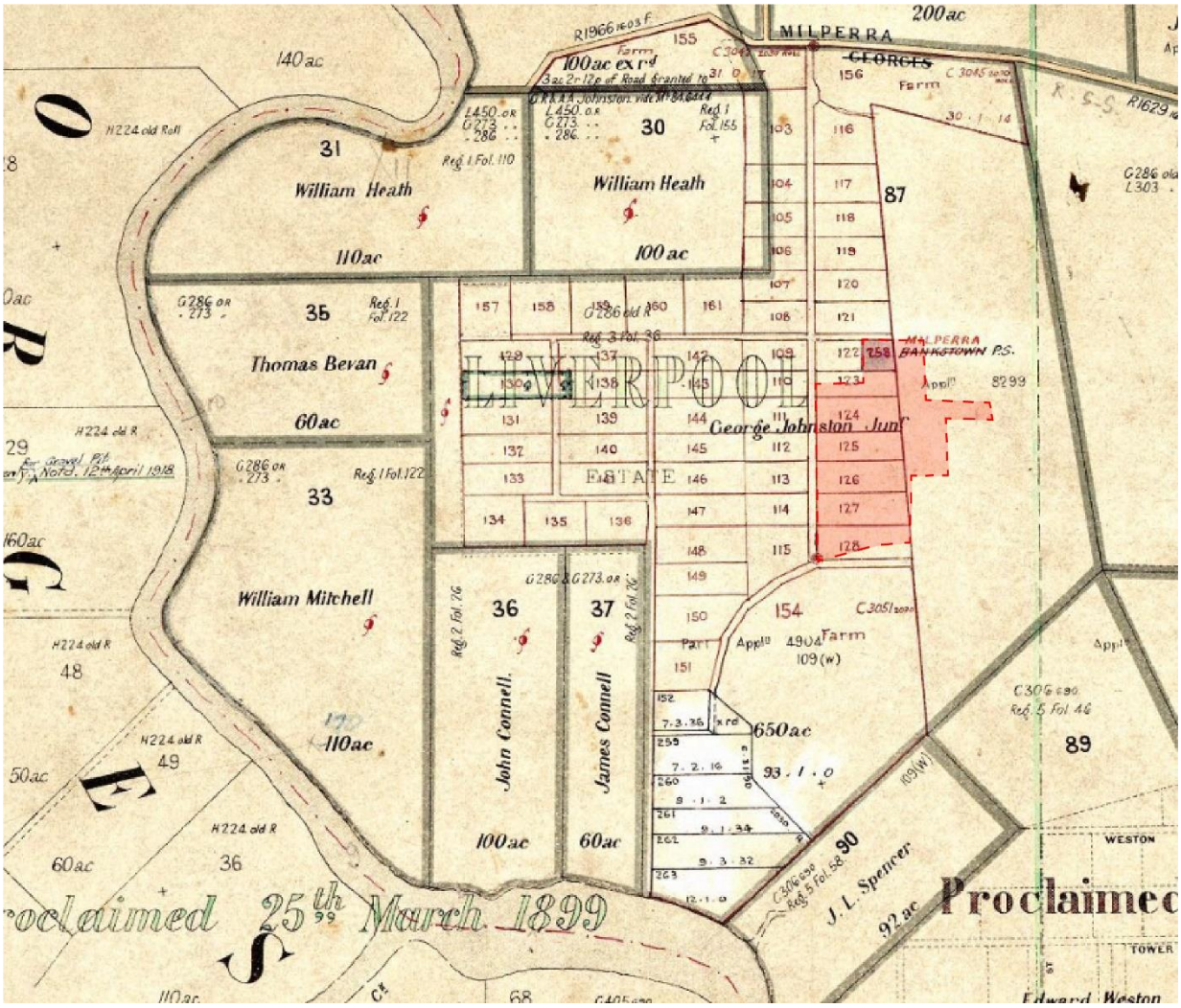


Figure 4. c.1918 Parish of Bankstown map showing the Milperra Soldier Settlement road alignment and subdivision. The extent of the site is indicated in red. *Source*: NSW Planning Portal with Extent Heritage overlay.

A c.1918 parish map (Figure 4) shows the Soldier Settlement road alignment and planned subdivision. The western portion of former WSU Campus site falls within the planned settlement area. Land at the north of the site, fronting Bullecourt Avenue, was set aside for Milperra Primary School. The eastern extent of the site is outside of the planned settlement.

The Soldier Settlement received returned soldiers and their families between 1917 and 1923. By this later date, only eighteen of the fifty-six farms were occupied. Subsequently, the remaining vacant blocks were offered to civilians. Residences constructed on each plot of land were reported to be standard two-bedroom weatherboards cottages each with verandahs and galvanised iron roofing home to 120 ex-servicemen and their families (Allison 2010).

With the establishment of a Public School and Post Office in 1918, Milperra slowly began to develop as a residential suburb. The Bankstown Soldier Settlement was largely unsuccessful with one-third of the ex-servicemen living there for less than two years (Allison 2010). All that remains of this soldier settlement is the original streets which retain their original names and alignments.

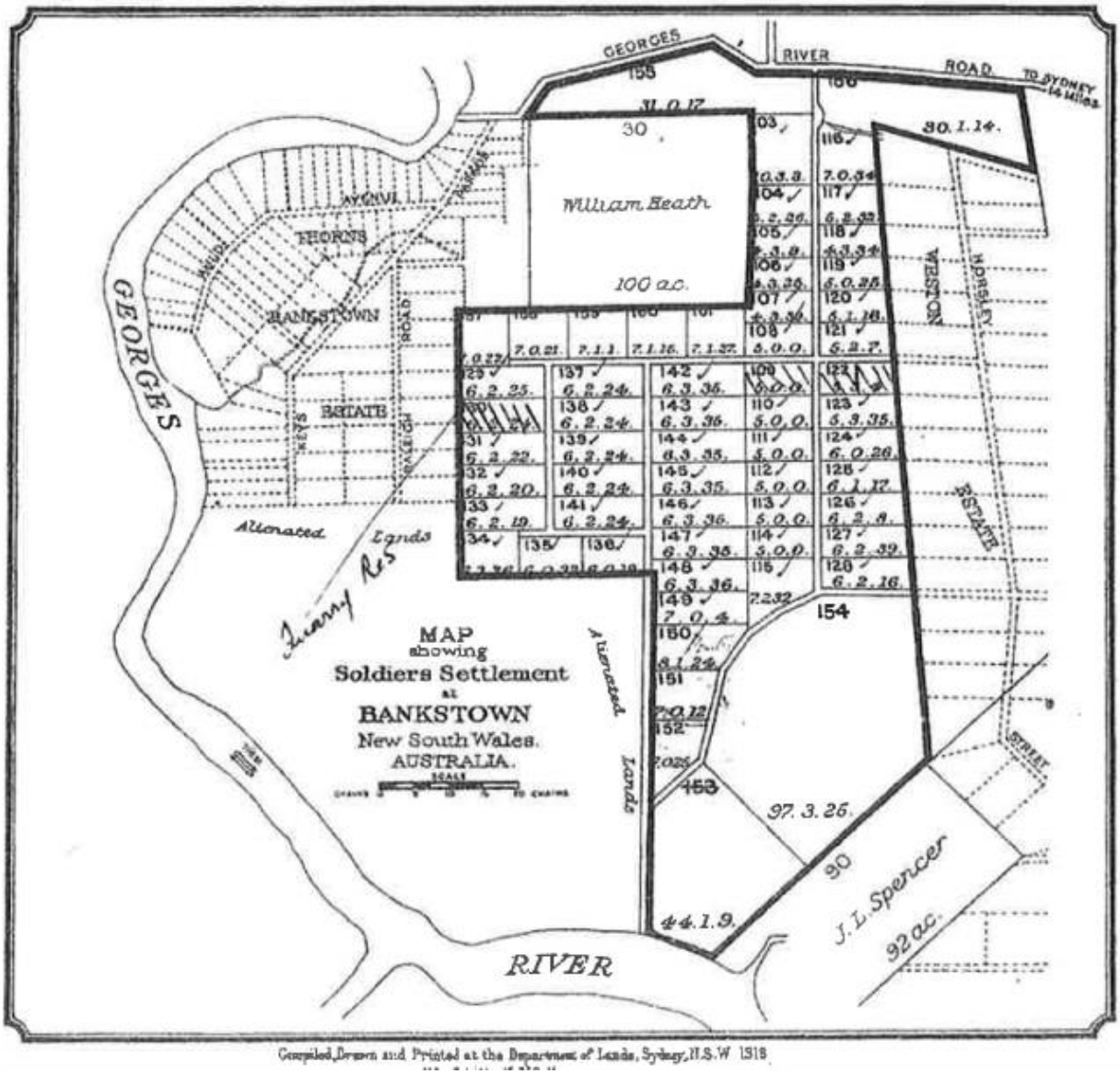


Figure 5. Bankstown Soldiers Settlement, 1918 showing block numbers and acreage. *Source*: State Records NSW Department of Lands, Closer Settlement Promotion Files Call No. 10/137114 in Allison 2009, 149



Figure 6. Bankstown Soldiers' Settlement Estate clearing land. *Source*: State Archives and Records, 2017.



Figure 7. Bankstown Soldiers' Settlement Estate – initial stages of development. *Source*: State Archives and Records, 2017.



Figure 8. Bankstown Soldiers' Settlement Estate general view of cleared and uncleared land. *Source*: State Archives and Records, 2017.



Figure 9. Bankstown Soldiers' Settlement Estate settlers' cottages. *Source*: State Archives and Records, 2017.



Figure 10. Bankstown Soldiers' Settlement Estate spraying the crops. *Source*: State Archives and Records, 2017.



Figure 11. Bankstown Soldiers' Settlement Estate attending the poultry. *Source*: State Archives and Records, 2017.

1.2.4. Development in the early twentieth century

As Milperra continued to develop as a residential suburb, the site of the Milperra WSU campus underwent a series of changes. Land at the north of the site was occupied by Milperra Public School from 1918. The location of the 1918 school building is indicated on the below 1943 (Figure 12). The 1918 school building comprised of a two-roomed, gabled roof building with a front verandah covered by a skillion roof (Figure 14). Built on brick piers, the original school building was of brick and timber construction with galvanised metal sheets to the gable and skillion roofs. The school was relocated to its present site on Pozieres Avenue in 1975 (southwest of and outside the defined site boundary) (WSU 2017; Allison 2009, 150).



Figure 12. 1943 historical aerial of Milperra showing the indicative extent of the site outlined in red. The location of the school is indicated outlined in blue. *Source*: NSW Historical Imagery with Extent Heritage overlay



Figure 13**.** Closeup view of the 1943 historical aerial of Milperra showing original school building outlined in blue. *Source*: NSW Historical Imagery with Extent Heritage overlay



Figure 14. The original 1918 Milperra Public School. *Source*: History of Padstow Revesby Panania Picnic Point East Hills Milperra, 2017



Figure 15. 1955 historical aerial showing the indicative extent of the site outlined in red. The location of the school is indicated outlined in blue. *Source*: NSW Historical Imagery with Extent Heritage overlay



Figure 16. 1965 historical aerial showing the indicative extent of the site outlined in red. The location of the original school which appears demolished by this time is indicated outlined in blue. *Source*: NSW Historical Imagery with Extent Heritage overlay.

The site and wider area remained predominantly agricultural in land use throughout the c.1950s and c.1960s (Figure 15 and Figure 16). By 1965 it appears that much of the development associated with the Milperra Soldier Settlement within the site boundary was demolished. The allotments remained agricultural in use, with new industrial development established to the east and north of the site (Figure 16). The 1965 historical aerial also shows that the 1918 Milperra Public School building was demolished by this time, with new school buildings surrounding its original location (Figure 16).



Figure 17. 1971 historical aerial showing the indicative extent of the site outlined in red. *Source*: NSW Historical Imagery with Extent Heritage overlay.

The 1971 historical aerial (Figure 17) shows that most of the agricultural buildings within the site was demolished by this time with the surrounding area largely suburbanised. The former Milperra Public School site remains visible at the northern side of the site with buildings along its eastern, southern, and western internal boundary.

The closeup extract of the 1975 historical aerial (the year of the school's relocation) shows the school buildings located within the site at the time. It also shows the establishment of the off-street return driveway which remains extant in its alignment on the southern side of Bullecourt Avenue (Figure 18).

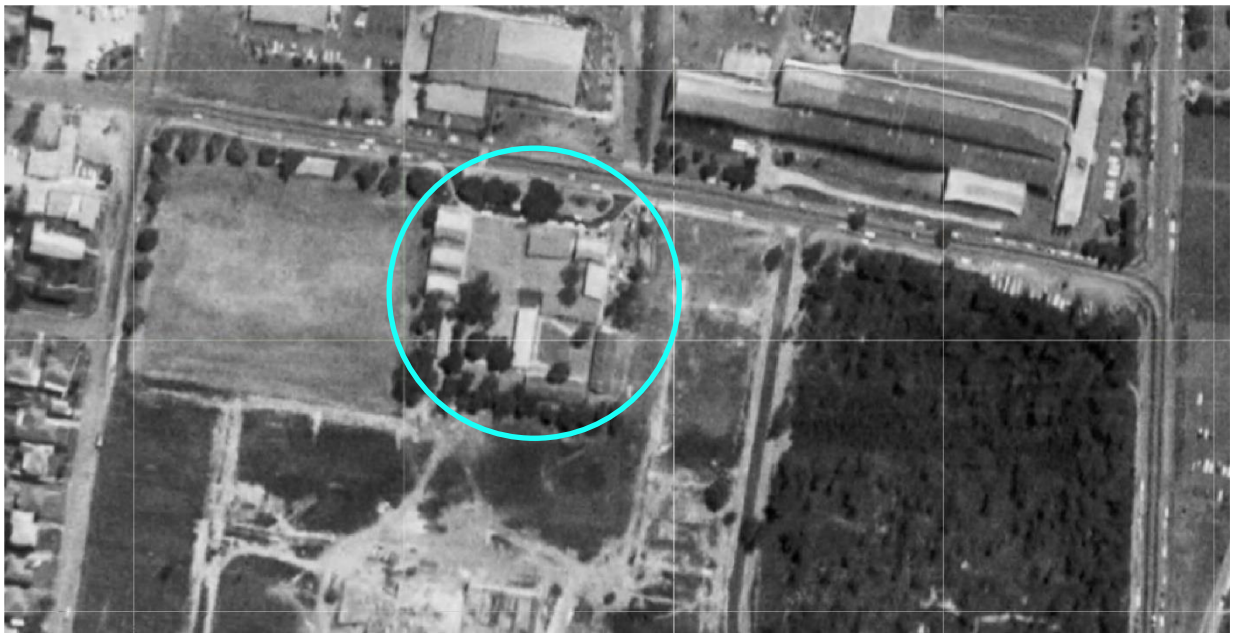


Figure 18. Closeup of the 1975 historical aerial showing the extent of the school grounds and building along Bullecourt Avenue. *Source*: NSW Historical Imagery with Extent Heritage overlay

1.2.5. Establishment of Western Sydney University

The Milperra College of Advanced Education (CAE) was established on the site in 1973 to cater to the growing need for teachers' education in NSW. Changes made to the site while it was the CAE campus included the construction of the current multipurpose Building 1 in 1976 (Figure 20). The 1975 historical aerial (Figure 19) shows the site cleared of all previous agricultural structures, with site establishment works for the new educational campus underway.



Figure 19. 1975 historical aerial showing the indicative extent of the site outlined in red. *Source*: NSW Historical Imagery with Extent Heritage overlay.



Figure 20. The 1976 College of Advance Education building. *Source*: History of Padstow Revesby Panania Picnic Point East Hills Milperra, 2017

In 1983, the Milperra CAE was renamed Macarthur Institute of Higher Education (State Records NSW Call No, AGY-2956). Original plans to accommodate 2,500 teachers on site were altered, and there was a push to start tertiary education programs. The Macarthur Institute of Higher Education was absorbed into the University of Western Sydney in 1989 becoming the third campus in its growing network of campuses. During the 1980s, the site underwent numerous changes including extensions to Building 1, the construction of Building 19 and Building 2; and in the 1990s with the construction of Building 4. Most of the structures on the site dates from the 1990s onwards (Western Sydney University 2017).

1.2.6. Contemporary development

The site remained in use as one of the eleven campuses for WSU until c.2020s. The campus supported students, staff, and faculty through providing education spaces, student accommodation, staff offices, parking and all other typical amenities. In 2016, the campus supported approximately 8,166 students, 195 academic staff and 128 professional staff (NSW Department of Planning and Environment 2022).

The site is currently not in use, as the area is earmarked for redevelopment and subdivision following the establishment of a development agreement between WSU and Mirvac. The redevelopment seeks to create a low low-rise neighbourhood incorporating a range of attached, semi-detached and free-standing homes.

1.3. Physical analysis

Extent Heritage carried out a physical assessment of the site on 14 February 2024. The inspection was undertaken as a visual study from the public domain only with limited views to the site. Internal photographs of the site are utilised from Extent Heritage's previous site inspection, undertaken in November 2019, and are cited accordingly.

The analysis involved an investigation into the built form and landscape setting. It does not provide a detailed investigation of all fabric but an overview of the elements of the place to assist in determining significance.

1.3.1. WSU Milperra campus

The WSU Milperra campus contains twenty-nine (29) educational, administrative, and accommodation facilities. The campus buildings date from the c.1970s to the c.2000s, and are generally low-scale in massing and form of one to three-storeys. The buildings are generally brick veneer and steel structures with corrugated sheet metal roofing and large areas of glazing. The buildings are interconnected by a network of paved pathways with large open carparks to the east of the campus buildings accessed off Horsley Road (Figure 25 to Figure 34). Internal roads within the campus include Ian Smith Avenue, First Avenue and Third Avenue (Figure 35).

Refer to the campus map below (Figure 35) showing the internal campus layout and buildings.



Figure 21. View along the internal Third Avenue looking south from Bullecourt Avenue. *Source*: Extent Heritage 2024.



Figure 22. Overview of the campus viewed south from Bullecourt Avenue. *Source*: Extent Heritage 2024.



Figure 23. Overview of the campus viewed southeast from Ashford Avenue. *Source*: Extent Heritage 2024.



Figure 24. Overview of the campus oval viewed northeast from the Ashford Avenue. *Source*: Extent Heritage 2024.



Figure 25. View of building 1 – the 1976 building with extensions. *Source*: Extent Heritage 2019.



Figure 26. View of buildings 2 and 3. *Source*: Extent Heritage 2019.



Figure 27. View of building 11. *Source*: Extent Heritage 2019.



Figure 28. View of building 12. *Source*: Extent Heritage 2019.



Figure 29. View of building 23 (Margot Hardy Gallery). *Source*: Extent Heritage 2019.



Figure 30. View of Library. *Source*: Extent Heritage 2019.



Figure 31. View of WSU village. *Source*: Extent Heritage 2019.



Figure 32. View of WSU village. *Source*: Extent Heritage 2019.



Figure 33. View of WSU Bankstown Campus Oval to the southern end of campus. *Source*: Extent Heritage 2019.



Figure 34. View of existing university student housing from Ashford Avenue. *Source*: Extent Heritage 2019.

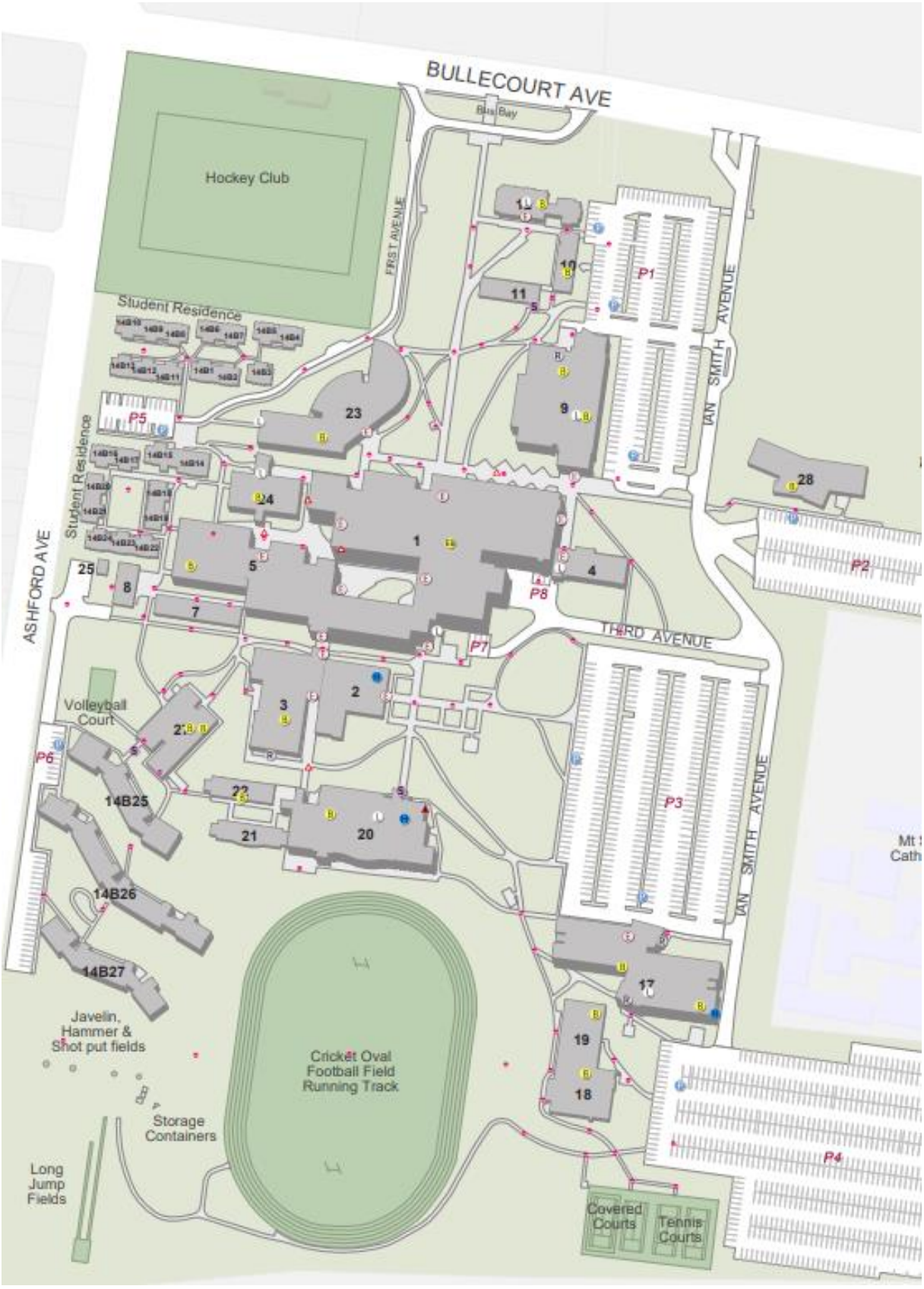


Figure 35. WSU Milperra campus map showing the various buildings at the site. *Source*: WSU

1.3.1.1. Location of the former Milperra Public School

The former Milperra Public School was located along Bullecourt Avenue, along the northern side of the campus and defined site boundary. It operated in this location between 1918 – 1975. Historical aerials showing the former school site indicates that it was situated within an area that presently contains a bus bay. The bus bay was established in the c.1970s while the site was still used for the former public school.

There are no visible remnants of the 1918 Milperra Public School building or other associated structures at ground level when viewed from the public domain. The grounds which comprised the former Milperra Public School has been integrated into the wider campus lawn landscape with paved pathways and interspersed tree planting, and a roadside bus stop and university sign along Bullecourt Avenue (Figure 37 to Figure 40).

However, an overlay of the school buildings visible in the 1975 historical aerial (Figure 18) over a present 2024 aerial photograph shows two (2) campus buildings (identified as Building 10 and 11 on the WSU campus map) occupying the footprint of the former school buildings which were constructed between 1955-1965 (Figure 15Figure 15 and Figure 16). However, limitations of site access excluded the direct inspection of Building 10 and 11. Any association with the former Milperra Public School, and the potential existence of these former school buildings has not been ascertained. The two (2) structures appear on the 1965 historical aerial and are indicated in green in Figure 36 below.



Figure 36. Overlay of the former Milperra Public School buildings (in blue) within the site boundary indicated with the red dashed line. The two c.1960s school buildings that appear to have been integrated into the university campus (now Building 10 and 11) is indicated in green.



Figure 37. Overview of the general location of the former Milperra Public School and bus bay from Bullecourt Avenue. *Source*: Extent Heritage 2024.



Figure 38. Closeup view of the landscape of the former school site from Bullecourt Avenue. *Source*: Extent Heritage 2024.



Figure 39. Closeup view of the landscape of the former school site from Bullecourt Avenue. *Source*: Extent Heritage 2024.



Figure 40. Closeup view of the landscape of the former school site from Bullecourt Avenue. *Source*: Extent Heritage 2024.

1.3.1.2. Remnant Cumberland Plains Woodland

A tract of remnant Cumberland Plains Woodland is located at the northeastern side of the site. It is heavily vegetated with mature trees and occupies a roughly square block bordered by Bullecourt Avenue to the north, Horsley Road to the east, and the internal campus carparks to the south and west (Figure 41 and Figure 42). This area remains outside the site boundary.



Figure 41. Overview of the remnant woodland viewed southwest from the junction of Bullecourt Avenue and Horsley Road. *Source*: Extent Heritage 2024.



Figure 42. Overview of the remnant woodland viewed southwest from Bullecourt Avenue. *Source*: Extent Heritage 2024.

1.3.2. Milperra Soldier Settlement (former) (LEP I218)

The Milperra Soldier Settlement was subdivided in the c.1910s as part of the national effort to repatriate soldiers returning from WWI. The wider area which contained part of the campus and defined site was subdivided into market garden and farm allotments set on a neat, grid road alignment. The settlement at Milperra contained five streets, Bullecourt, Fleurbaix, Amiens, and Pozieres Avenue, and Ashford Avenue. Residences constructed on the farm allotments were reported to comprise two-roomed timber cottages.

The timber cottages were mostly demolished by c.1970, and the site was redeveloped as a higher education campus (Figure 17). No structures associated with the Soldier Settlement remain within the site boundary. The agricultural landscape and allotments of the wider landscape surrounding the site have since been re-subdivided for suburban development from the c.1970s.

The existing road layout of the principal streets named above, as well as street names relating to the post-1970s subdivision, remain the only tangible evidence of the former Milperra Soldier Settlement.

1.3.2.1. Bullecourt Avenue

Bullecourt Avenue forms the northern boundary of the site and is adjacent to industrial development. It is a bi-directional road on an east-west axis, laid with bitumen with concrete gutters, kerbing, and crossovers. Street furniture and other elements including street signs, bus stops, power lines, and boundary fencing are contemporary in nature. It includes concrete footpaths and a nature strip on either side with inconsistent street tree planting. The remnant Cumberland Plain Woodland is located along Bullecourt Avenue to the northeast side of the site. Bullecourt Avenue forms the junction with Ashford Avenue off the northwestern side of the site (Figure 43 to Figure 46).



Figure 43. Overview of Bullecourt Avenue generally looking east along the campus showing the adjacent industrial development. *Source*: Extent Heritage 2024.



Figure 44. Overview of Bullecourt Avenue generally looking west along the campus. *Source*: Extent Heritage 2024.



Figure 45. Overview of Bullecourt Avenue generally looking west along the campus towards the junction with Ashford Avenue. *Source*: Extent Heritage 2024.



Figure 46. Overview of the junction of Bullecourt and Ashford Avenue looking west. *Source*: Extent Heritage 2024.

1.3.2.2. Ashford Avenue

The section of Ashford Avenue bordering the western boundary of the site extends south from the junction with Bullecourt Avenue. Suburban streets extend from the west of Ashford Avenue, which include Sinai Avenue, Zonnebake Crescent, and Flanders Avenue, which are not associated with the original settlement alignment. Ashford Avenue is a bi-directional road laid on a north-south axis with contemporary street furniture. However, it only includes a concrete footpath on the western side between Bullecourt Avenue to Sinai Avenue. The eastern side of Ashford Avenue does not include a footpath and comprises a wide nature street with inconsistent street tree planting (Figure 47 to Figure 50). Ashford Avenue retains a residential character with a mix of single and double-storey housing along its alignment.



Figure 47. Overview of Ashford Avenue looking south. *Source*: Extent Heritage 2024.



Figure 48. Overview of Ashford Avenue looking north. *Source*: Extent Heritage 2024.



Figure 49. Overview of Ashford Avenue looking south from the junction with Zonnebeke Crescent. *Source*: Extent Heritage 2024.



Figure 50. Overview of the southern extent of Ashford Avenue at the junction with Flanders Avenue. *Source*: Extent Heritage 2024.

1.3.3. Settings and views

The site is surrounded by low scale suburban development to its west and southeast, and industrial development to its east and north. The area to its immediate south, across from the M5 Motorway comprises undeveloped areas and a series of open sports field which connects to the Georges River towards the southwest.

The site is bordered by a council-owned sports field to the north-west of the site, and the Mount St Joseph Catholic College Milperra to the east. In addition, the site is bounded to the north-east by a sizeable tract of protected remnant Cumberland Plain Woodland. These areas are not included within the site boundary.

The present scale of the campus is consistent with that of the surrounding modern residential and industrial development. Given the extensive frontage of the campus with the main suburban road network, it is highly visible along the adjacent streetscape, particularly along its frontages with Bullecourt Avenue and Ashford Avenue (Figure 51 to Figure 56). However, wider views of the campus from the public domain are largely screened by tree plantings and buildings. Secondary views to the

site can be obtained from Horsley Road to the east. Views from the south along the M5 Motorway to the site cannot be obtained due to highway noise barriers.



Figure 51. Overview of the suburban setting surrounding the site. *Source*: Extent Heritage 2024.



Figure 52. Overview of the suburban setting surrounding the site. *Source*: Extent Heritage 2024.



Figure 53. Overview of the Council sports field adjacent to the campus. *Source*: Extent Heritage 2024.



Figure 54. View to the campus from Ashford Avenue. *Source*: Extent Heritage 2024.



Figure 55. View of the commercial development at the junction of Bullecourt and Ashford Avenues. *Source*: Extent Heritage 2024.



Figure 56. Overview of the adjacent industrial development along Bullecourt Avenue. *Source*: Extent Heritage 2024.

2. SIGNIFICANCE ASSESSMENT

This chapter provides the basis for assessing heritage significance in New South Wales as outlined in the *Guidelines for preparing a statement of heritage impact* (Department of Planning and Environment 2023b, 16-18).

2.1. Statement of significance

The following statement of significance is quoted from the State Heritage Inventory (SHI) inventory sheet for the *Milperra Soldier Settlement (former)* (LEP I218):

> The Milperra Soldiers Settlement is historically significant because it was part of a national scheme that was intended to repatriate returning servicemen during and after World War I. It reflects then-current attitudes towards the appropriate ways to develop the country and ensure its growth and prosperity. The Settlement was a rare event in the history of Bankstown and was a relatively late and unusual form of agricultural development in the Bankstown area. Apart from this, it represents very early settlement within the area and resulted in the locality being named Milperra.
>
> The road layout of the principal streets provides the only tangible evidence of the subdivision that was formed to accommodate the Settlement.

2.2. Significance of the site

The subject site comprising part of the former WSU Milperra campus has undergone considerable changes in terms of its built fabric from its early agricultural landscape associated with the early land tenure and the former Milperra Soldier Settlement to its present use as a campus of higher education from the mid-1970s.

Historical aerials also indicate that structure associated with the Milperra Soldier Settlement were mostly demolished by the c.1970s in place of the redevelopment of the area for educational purposes. It is unlikely that any former structures associated with the settlement remain extant at the site and that the only known extant feature of the settlement comprises the now-heritage listed road alignment (with Bullecourt Avenue and Ashford Avenue respectively forming the northern and western boundaries of the campus and site).

The site also contains the grounds of the former Milperra Public School which was established in 1918 as part of the settlement development. It operated within the grounds until 1975 when it was relocated to its present location southwest of the campus. Historical aerials indicate that the original 1918 Milperra Public School building was demolished between 1955-1965. Other school buildings generally date from c.1955 and was integrated for use as part of the CAE and subsequent institutions. However, these buildings were progressively demolished in place of more modern educational facilities and updated campus landscaping throughout the late twentieth century. However, two structures which date from c.1955-1965 were possibly integrated into the existing

campus facilities based on a comparison of historical aerials provided in the historical analysis above (Figure 12 and Figure 15 to Figure 19). The existing campus map identifies the structures as Building 10 and 11. However, due to internal site access limitations, the possibility that Building 10 and 11 is associated with the former Milperra Public School is uncertain.

The earliest known existing campus building (Building 1) dates from 1976 and was originally constructed as part of the CAE, later forming part of the Macarthur Institute of Higher Education then the University of Western Sydney (now WSU). Building 1 and other existing campus structures are modern examples of higher education buildings and are not considered to be of heritage significance. The campus landscape is also highly altered and contemporary in setting and apart from the remnant Cumberland Plains Woodland (located outside the site boundary), do not include any landscape items of note.

3. PROPOSED WORKS

3.1. The proposal

Mirvac is partnering with Western Syndey University to develop a proposal for a low-rise medium density master planned neighbourhood incorporating a range of attached, semi-detached and free-standing homes. The proposal is intended to sensitively integrate with the surrounding neighbourhood, enhancing the area for future residents and the wider Milperra community.

This feeds into the wider evolution of WSU's aim to transform the current 'suburban' campus network into a hybrid campus model which includes both suburban and consolidated city centre vertical campuses. The facilities, staff, and students formerly located at the Milperra Campus have been transitioned to the new Liverpool Central Business District (CBD) and Bankstown CBD WSU campuses.

To achieve this vision, the proposed works seeks to subdivide the site through a seven (7) staged program to facilitate the redevelopment of the former Western Sydney University (WSU) Milperra Campus. The subdivision pattern proposed is consistent with the Structure Plan identified in the Draft Site-Specific Development Control Plan and is shown in Figure 57 below.

Stage	No. of residential lots
Stage 1	16
Stage 2	11
Stage 3	135
Stage 4	19
Stage 5	96
Stage 6	105
Commercial	0



Figure 57. Staging Plan showing for the proposed subdivision of the site. *Source*: Mirvac, DRG No. 010

4. HERITAGE IMPACT ASSESSMENT

This chapter assesses the impacts of the proposed works on the heritage significance of the heritage item in accordance with the *Guidelines for preparing a statement of heritage impact* (Department of Planning and Environment 2023b, 18-20).

4.1. Matters for consideration

This Statement of Heritage Impact has established the subject site and the associated buildings contained within are of no heritage significance. This site is however located in the vicinity of one local heritage item, *Milperra Soldiers Settlement*, listed on Schedule 5 of the Canterbury-Bankstown LEP 2023. The roads – Bullecourt Avenue and Ashford Avenue – to the north and western edges of the site form part of the curtilage of the item. The road layout is significant as it provides the only tangible evidence of the subdivision pattern that was formed to accommodate the Settlement to accommodate repatriated soldiers after World War I, later contributing to the residential development of the suburb of Milperra.

The proposed subdivision will facilitate the proposed redevelopment of the former campus into a low-rise medium density residential development. The subdivision of the site will have a minor and inconsequential impact on the road alignments themselves, with the creation of new roads and sixteen (16) driveways adjoining the heritage listed streets.

4.1.1. Fabric and spatial arrangements

The proposed subdivision will be wholly contained within the former campus boundary to a pattern that is consistent with the draft Site-Specific DCP for the former Western Sydney University, Milperra Campus. While the proposed activity will have some interface with the historic subdivision pattern, this is limited to the creation of new linking roads and a total of sixteen (16) driveways off Ashford Avenue. This is consistent with the existing pattern of development along Ashford Avenue and a necessary change required to facilitate the development outcomes for the area.

While the proposal will alter the urban streetscape pattern, Bullecourt and Ashford Avenues will retain their prominent alignment within the streetscape and remain legible in the wider landscape. The proposed subdivision will see a minor and inconsequential impact to the spatial arrangement *Milperra Soldier Settlement (former)* and no impact to significant fabric that contributes to the heritage values of the item. Impacts to the spatial arrangement of Bullecourt and Ashford Avenues could be mitigated through the introduction of formalised landscaping to reinforce the axis of the historic streetscape pattern.

4.1.2. Setting, views and vistas

Views to Bullecourt Avenue and Ashford Avenue have changed considerably since the establishment of the Milperra Soldier Settlement, with large industrial warehouses along Bullecourt Avenue and one to two storey residential and retail developments along Ashford Avenue.

The proposed development will not affect these existing views but reflect the changing character of the area. The residential nature of the proposed development will help retain the largely residential character of Ashford Avenue and the wider area by providing much needed housing in the area with increased residential amenity. The views and settings will generally remain unchanged as the subdivision proposed is similar to that which currently exists within the adjoining neighbourhoods.

4.1.3. Use

The proposed subdivision is consistent with the existing use of the wider landscape, which is characterised as a residential landscape.

4.1.4. Demolition

The demolition of existing buildings formed part of the impact assessment in the rezoning application. As noted in the previous impact statement, the demolition of existing buildings on the subject site will not impact the road alignments themselves, which will be retained as part of the new development, nor will it impact on the heritage significance of the item.

4.1.5. Curtilage

The proposed works are wholly contained within the former campus. Where the subdivision will create new driveways off Ashford Avenue and new linking roads, this will have a minor and inconsequential impact on the heritage curtilage of *Milperra Soldier Settlement (former)*.

4.1.6. Aboriginal cultural heritage

An Aboriginal Archaeological Due Diligence report was prepared for the site in 2017. The report established the following with regards to Aboriginal cultural heritage:

- With the exception of the area identified as a remnant Cumberland Plain Woodland to the northeast of the site (outside of the study area), development work for the majority of the subject area may proceed with caution.
- It is considered that there is a low risk of Aboriginal objects being present within the subject area. However, the nature of disturbance does not preclude the potential for isolated finds, which is a common site type across the region, even in disturbed contexts.
- In the event of unexpected Aboriginal objects, sites or places (or potential Aboriginal objects, site or places) are discovered during the subdivision and later construction, all works in the vicinity should cease and the contractor should determine the subsequent course of action in

consultation with a heritage professional and/or Heritage NSW as appropriate. A process of consultation with Aboriginal community representatives would also be required in this event.

- This document may be summarised within and/or appended to a Development Application, Statement of Environmental Effects (SEE) or Review of Environment Factors (REF). If any Aboriginal objects are later identified within the proposed activity area, this report cannot however be used to support an application for an Aboriginal Heritage Impact Permit (AHIP). Such an application would require more detailed investigation involving a formal process of Aboriginal community consultation and the preparation of an Aboriginal Cultural Heritage Assessment Report (ACHA).

4.1.7. Historical archaeology

Following the major University developments in 1973 for buildings, sports fields, parking and associated services, it is unlikely that substantial archaeological evidence has been preserved. The topography of the site has been modified through both cutting and filling to meet the functions of the university. This activity is likely to have reduced the integrity and survival of physical remains including structural remains, landscape elements, archaeological deposits and 'relics'.

There is no documented evidence for developments within the site during the eighteenth and nineteenth centuries that are likely to have left significant physical remains. Archaeological evidence of buildings associated with the soldier settlement are likely to be restricted to building piers and foundations associated with housing, poultry-shed footings, postholes and fence lines. If such remains survive, they are likely to be of local significance with a low research potential. Physical remains associated with the post-1920 development of the site is unlikely to provide any substantive information that would contribute to our understanding of the historical development of the site.

The presence of historical archaeological remains of local significance is considered to be low. Any remains that do survive are likely to have a low research potential.

4.1.8. Natural heritage

A remnant portion of Cumberland Plain Woodland is conserved to the northeast of the site, outside the site boundary. The area is to be retained and zoned Woodland Conservation. The proposed subdivision will have no impact on the natural heritage values of this area.

4.1.9. Conservation areas

There are no heritage conservation areas within the vicinity of the subject site.

4.1.10. Cumulative impacts

The subdivision forms part of a wider plan to redevelop the subject site for additional residential dwellings in accordance with objectives outlined in the Draft site-specific DCP for Milperra Campus

and master plan prepared for the site. The subdivision will have no cumulative impacts to the heritage significance of the *Milperra Soldiers Settlement (former)*.

4.1.11. Other heritage items in the vicinity

The site is in the vicinity of one local heritage item, the *Milperra Soldier Settlement (former)*. As previously stated, it is the alignment of the streets Bullecourt Avenue and Ashford Avenue, which directly abut the subject site to the north and west, that contribute to the heritage significance of the former settlement. The street alignment will not be altered by the proposed subdivision, and thus the proposed works will have no impact to this heritage item.

4.2. Assessment against statutory and non-statutory controls

4.2.1. Canterbury Bankstown Local Environmental Plan 2023

Clause 5.10 of the Canterbury Bankstown LEP 2023 applies to heritage conservation and 5.10(4) requires, among other things, that before granting consent under clause, Council must assess the effect of a proposed development on the heritage significance of the item or conservation area and concerned. Clause 10(5) specifies that Council, before granting consent, may require a heritage management document to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area. This applies to land in the vicinity of a heritage item or heritage conservation area.

Extent Heritage comment

The subject site is not listed as local heritage item on schedule 5 of the Canterbury Bankstown LEP, nor is it located within a heritage conservation area. However, the site is located within the vicinity of one (1) local heritage item, *Milperra Soldier Settlement (former)*. Clause 5.10 requires a heritage management document and an assessment of the heritage impacts of the proposal. This Statement of Heritage Impact fulfils that requirement.

4.2.2. Canterbury Bankstown Development Control Plan 2023

The Canterbury Bankstown LEP 2023 is supplemented by the Canterbury Bankstown Development Control Plan (DCP) 2023. The DCP provides a unified set of controls that provides detailed planning and design guidelines to support the planning controls in the LEP. It is important the controls are adhered to as the Consent Authority is required to take into consideration the relevant provisions of the DCP in determining an application for development affecting a locally listed heritage item.

The draft WSU Milperra Site Specific Development Control Plan 2023 (DCP) was adopted by Council on 2 November 2023. It provides a site-specific framework and supporting guidelines for the future redevelopment of the site and is applicable to land which comprises the site assessed in this report.

The following general controls relevant to the proposed subdivision of the site and guidelines related to heritage outlined in the DCP are listed in the table below.

DCP Controls
Heritage
4.4 Heritage in the vicinity of a heritage item
Objectives
O1. To ensure that adjacent development does not detrimentally impact upon the heritage significance of places of heritage significance or their settings.
O2. To ensure that new development is compatible with the heritage values of adjacent places of heritage significance.
Development controls
1.1 The design of development must:
(a) respond to the setting, setbacks, form, scale and style of nearby places of heritage significance;
(b) maintain significant views to and from the place of heritage significance;
(c) ensure adequate setbacks from the site of the place of heritage significance to retain its visual setting;
(d) retain original or significant landscape features that are associated with the place of heritage significance or that contribute to its setting;
(e) use materials, finishes and colours selected to avoid strong contrast with the place of heritage significance in order to retain its visual importance or significance.
Extent Heritage assessment
The proposed subdivision and redevelopment will improve the amenity of the area with the inclusion of low-rise medium residential development. This is a compatible use that will see no impact to the heritage significance of the locally listed item, *Milperra Soldier Settlement (former),* an item consisting of a series of road alignments surrounding the site to the north and west. While the subdivision will see the creation new roads and driveways intersecting the Bullecourt and Ashford Avenues, this will not detract from the heritage values of the item.
Draft WSU Milperra Site Specific
3.9 Heritage
Objectives
O1. To preserve the significant historical form of road corridors contributing to the character of the precinct, specifically along Bullecourt and Ashford Avenue.
Controls
C1. A Heritage Interpretation Plan must be provided as part of any future Development Application or Subdivision that highlights the historical and cultural significance of the subject site.
C2. For all residential subdivisions or developments on lands adjacent to or lands containing a C2 Environmental Conservation zone, an Aboriginal Cultural Heritage Assessment (ACHA) must be prepared prior to any ground disturbances in the area.
C3. An Unexpected Finds Protocol is required to be issued prior to any remediation, earthworks or construction is undertaken on any lands identified in the Heritage Interpretation Map.

DCP Controls

Extent Heritage comments

The proposed subdivision has made a considered effort to ensure the new pattern of development has a minimal impact on the existing road corridors that contribute to the heritage significance of the *Milperra Soldiers Settlement (former)* retained and conserved in Bullecourt and Ashford Avenues. This could be enhanced by additional placemaking initiatives explored in a Heritage Interpretation Plan.

5. SUMMARY AND RECOMMENDATIONS

5.1. Summary

This report seeks to address the impacts of the proposed subdivision of the former Western Sydney University Milperra Campus. While the subject site is not a heritage listed item, it is bordered by Bullecourt Avenue to its north and Ashford Avenue to its west, roads that form part of the locally listed heritage item *Milperra Soldier Settlement (former)* on the *Canterbury Bankstown LEP 2023*. This report concludes that the proposed development will not have any impact on these roads as all works proposed are to be contained within the subject site, and as such will not affect the alignment of the roads which is key to the item's significance. The subdivision will facilitate the suburban redevelopment of the area, which seeks to improve the residential amenity of the wider area, as it will provide much needed housing in the area and its surrounds.

This report has assessed the heritage impacts of the proposed works against the relevant objectives and development controls within the Canterbury Bankstown LEP 2023 and Canterbury Bankstown DCP 2023. The proposed subdivision generally comply with the relevant heritage controls within the LEP and DCP to result in an improved outcome for the heritage items in the vicinity. The proposed subdivision will not result in any adverse impacts on the significance or character of the heritage item in the vicinity or on the identified heritage values of the *Milperra Soldier Settlement (former)*.

5.2. Recommendations

In recognition of the historical associations of the site with the *Milperra Soldier Settlement (former*), the following recommendations are provided to inform the proposed development.

- It is recommended that all future development proposals should give regard to the heritage controls outlined in Chapter 4 of Canterbury Bankstown Development Control Plan (DCP) and Section 3.9 of the draft Site-Specific DCP for Western Sydney University Milperra Former Campus. Broadly, the objectives outlined in the DCP seek to ensure that adjacent development does not have a detrimental impact on the identified heritage values, is a compatible development, and retains key features that contribute to the character of the area. For the subject site, retaining the historical form of the road corridors of Bullecourt and Ashford Avenues will be integral to the conservation of heritage values.

- Under Clause 5.10(5) of the *Canterbury Bankstown Local Environmental Plan 2023*, subsequent Development Applications for construction may require a Statement of Heritage Impact (SOHI) to assess the potential impacts to the heritage significance of the *Milperra Soldier Settlement (former)*. Given the significance of the heritage item is embodied in the layout of the Bullecourt and Ashford Avenues, it is considered unlikely that built form in the adjacent lot would adversely impact the identified heritage values of the item, however, pre-DA advice from Canterbury Bankstown's Council heritage officer should be sought.

- Section 3.9 of the DCP stipulates that a Heritage Interpretation Plan should be provided as part of any future Development Application or subdivision of the former Western Sydney University Milperra Campus. It is recommended that an Interpretation Plan is prepared following the subdivision, in line with the controls provided in Section 3.9 of the DCP cited above. The Heritage Interpretation Plan would establish a thematic framework to interpret the Milperra Soldier Settlement by exploring the historical and social values associated with the site. The interpretation plan would identify suitable interpretative devices for implementation based on a thorough site analysis.

- The site, like all places in NSW, is subject to the general conditions of the *Heritage Act 1977*, there are however no specific permitting or consent requirements under the Act for this site. As part of the on-site environmental management process, an unexpected finds procedure should be put in place, developed by an archaeologist with demonstrated experience and understanding of the required obligations in accordance with the *Act*. This protocol would include a pre-start briefing of contractors regarding the type of material that may be uncovered during works and their obligations under the *Act*. The procedure should also outline a process for protecting and identifying unexpected archaeological material, if uncovered during works.

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List of definitions

Term	Meaning
Consent authority	The person or body with whose approval that act, matter or thing may be done or without whose approval that act, matter or thing may not be done.
Conservation	Conservation means all the processes of looking after a place so as to retain its cultural significance (as defined in *The Burra Charter*).
Development	The erection of a building, carrying out work, use of or subdivision of land.
Heritage significance	Term used in the assessment and understanding of heritage items that have significance in relation to their historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value.
Moveable heritage	A moveable object that is not a relic.
National construction code	A code that sets minimum requirements for design, construction and performance of buildings, as well as plumbing and drainage systems throughout Australia.
Relic	Any deposit, artefact, object or material evidence that is of state or local heritage significance.
Setting	The area around an item, which may include the visual catchment.
State Heritage Inventory	An online database containing heritage items and conservation areas on statutory lists in NSW. This includes the State Heritage Register and local government items.
State Heritage Register	The NSW State Heritage Register. A list of places and items of importance to the people of NSW. Only places of state heritage significance are listed on the State Heritage Register. The State Heritage Register protects these items and their significance.
State Heritage Register item	A term to describe a heritage item that is of state heritage significance and is listed on the State Heritage Register.

List of abbreviations

Abbreviation	Meaning
CMP	Conservation Management Plan
DA	Development application
DCP	Development Control Plan
DP&E	Department of Planning and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979*
HCA	Heritage Conservation Area
Heritage Act	*Heritage Act 1977* (NSW)
LEP	Local Environmental Plan
LGA	Local Government Area
NSW	New South Wales
S170 Register	Section 170 State Agency Heritage and Conservation Register
SEPP	State Environmental Planning Policies
SHI	State Heritage Inventory, NSW
SHR	State Heritage Register
SOHI	Statement of Heritage Impact

APPENDIX H: HERITAGE INTERPRETATION APPROACH

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Urbis Ltd
ABN 50 105 256 228

3 October 2024

Renee Barilla
Assistant Development Manager
Mirvac
Via email: renee.barilla@mirvac.com

Dear Renee,

STAGE 1 AND 2 CIVIL DA | PRELIMINARY HERITAGE INTERPRETATION APPROACH | 2 & 2A BULLECOURT ROAD, MILPERRA (FORMER WSU MILPERRA)

BACKGROUND

Urbis have been engaged by Mirvac Residential (NSW) Development Pty Ltd (Mirvac) to prepare the following Preliminary Heritage Interpretation Approach for the proposed development at 2 & 2A Bullecourt Road (former Western Sydney University [WSU] Milperra campus) (hereafter referred to as 'the site' or 'the subject site').

In 2019, Mirvac and WSU developed a concept scheme to re-zone the subject site from educational uses to low rise residential uses associated with a series of open spaces and communal and retail facilities. A Planning Proposal (PP/2021/5837) to rezone the subject site was determined by the South Sydney Planning Panel in July 2023.

A site-specific Development Control Plan (DCP) for the subject site was adopted by Canterbury-Bankstown Council on 24 October 2023. Section 5.6 Heritage of the WSU Milperra Site Specific DCP includes a control specifically requiring heritage interpretation, as follows:

> *C1 A Heritage Interpretation Plan must be provided as part of any future Development Application or Subdivision that highlights the historical and cultural significance of the subject site.*

Mirvac have adopted a staged delivery of Development Applications (DAs) to deliver the proposed development, with the first stage comprising the Stage 1 and 2: Civil Works DA. In light of this staged delivery, Urbis has advised a strategic approach to heritage interpretation in order to satisfy Control C1 in the WSU Site Specific DCP. This letter outlines the strategic approach to heritage interpretation for the project and has been prepared to accompany the Stage 1 and 2: Civil Works DA.

SITE LOCATION

The subject site comprises the former Western Sydney University (WSU) campus at 2 & 2A Bullecourt Road, Milperra. Legally described as Lot 105 of Deposited Plan (DP) 1268911 and Lot 1 DP 101147, the site was occupied by WSU until late 2023.

The area of works subject to the Stage 1 and 2: Civil Works DA is limited to the area marked in teal (shown approximately).

The location of the subject site is shown below.



Figure 1 – Location of the subject site marked in red, location of Stage 1: Civil DA works marked in teal.

Source: NearMaps, 2024

HERITAGE CONTEXT

The subject site is not a listed heritage item and is not located within a heritage conservation area under any statutory heritage registers. However, the site is adjacent to, and bounded by, Ashford and Bullecourt Avenues, both of which are listed as part of the 'Milperra Solder Settlement (Roads)' (LEP Item No. I218) under Schedule 5, Part 1 of the *Canterbury-Bankstown Local Environmental Plan (LEP) 2023.*

The heritage context of the site is shown below.

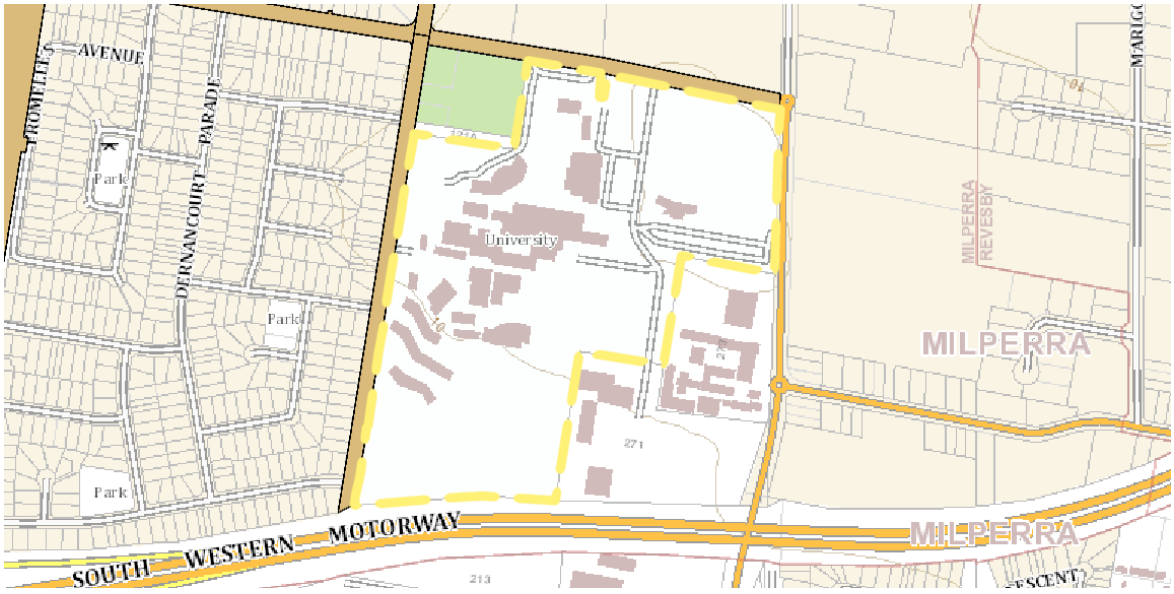


Figure 2 – Extract of heritage map showing the subject site outlined in yellow.

Source: NSW Planning Portal eSpatial Viewer

STAGE 1 AND 2: CIVIL WORKS DA

The proposed Stage 1and 2: Civil Works DA seeks consent to create 27 Torrens Title lots, all with a frontage to the existing Ashford Avenue. This includes associated earthworks, stormwater & utilities such as electricity, potable water, sewer and telecommunications.

Please refer to the drawing documentation accompanying this DA package for further information regarding the proposed works.

The Stage 1: Civil Works DA is the first in a staged delivery plan of multiple DAs, aiming to produce a high-quality residential development in the heart of Milperra. The staged DAs, (notably Stage 4 and 6) will include public domain designs in line with the principles of PP/2021/5837 and the WSU Site Specific DCP. There is no inclusion of any public domain or urban design works in the Stage 1 and 2: Civil Works DA.

The approximate areas of the staged DAs are provided below in Figure 3.

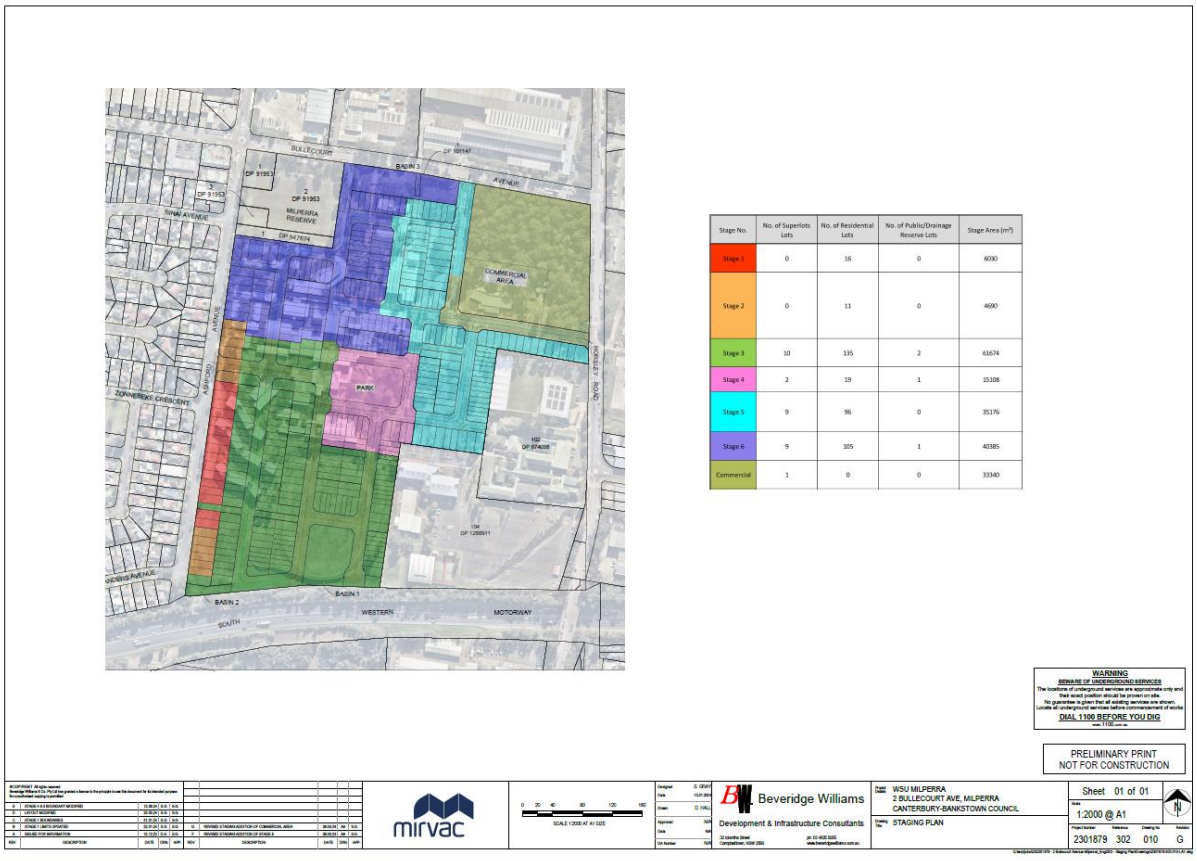


Figure 3 – Mapping of approximate areas of works for the staged DA delivery. The area of works for the Stage 1: Civil DA is marked in red.

Source: Mirvac, 29.08.2024

ABOUT HERITAGE INTERPRETATION

Heritage interpretation is the process of celebrating, acknowledging and revealing the layered stories of places, and communicating the significance of a place to those who use it. Through engaging, well-researched content delivered in creative and innovative ways, heritage interpretation can add meaning to new places, revitalise old places and contribute to a memorable visitor experience. This is especially important in placemaking projects with substantial public domain such as the WSU Milperra site.

A Heritage Interpretation Plan provides detailed guidance on how the history, significance and meaning of a place can best be presented to future site-users. Locations and recommendations for types of interpretive elements suitable for the public domain are included. Following the approval of the final Heritage Interpretation Plan by Council, the finalised content, designs, materiality and locations for the interpretation elements would be provided as part of a Detailed Design Package. Interpretive elements are then manufactured and installed onsite.

PRELIMINARY HERITAGE INTERPRETATION APPROACH

The proposed Stage 1 and 2: Civil Works DA is limited in both scope and area, with no public domain or urban design works included within this application. Due to these limitations, it is neither practical nor appropriate to prepare a Heritage Interpretation Plan for this constrained area of works. Therefore, the delivery of a Heritage Interpretation Plan for the Stage 1 and 2: Civil Works DA is not recommended by Urbis.

Rather, a Heritage Interpretation Plan will be prepared for a future DA which will incorporate public domain works (e.g. new roads, parks, open spaces and planned commercial hub) for the WSU Milperra site. We anticipate that this will be provided during the Stage 3 DA, which includes the central public domain for the new residential development which we anticipate will be the focal point for heritage interpretation at the site. This report will recommend interpretation for future staging.

This Interpretation Plan will be developed by Urbis in close collaboration with the urban design team, to ensure that the proposed designs for the public domain in the Stage 3 DA include engaging and integrated heritage interpretation. This comprehensive Heritage Interpretation Plan will satisfy C1 'Heritage Interpretation' in the WSU Site Specific DCP.

CONCLUSION AND NEXT STEPS

In consideration of the limited scope of the Stage 1 and 2: Civil Works DA for the WSU Milperra site, Urbis concludes that a Heritage Interpretation Plan is not required to accompany this application. We trust that this letter, outlining our strategic approach to heritage interpretation at the site, will satisfy Control C1 'Heritage Interpretation' for the purposes of this DA. Mirvac and Urbis are committed to delivering a high-quality heritage interpretation outcome for the public domain of the WSU Milperra site.

If you have any queries or would like to discuss any aspect of this letter, please don't hesitate to contact the undersigned.

Kind regards,



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APPENDIX I: TRAFFIC IMPACT ASSESSMENT



WSU Milperra – Stage 1 Subdivision
Traffic Impact Assessment

Prepared for:

Mirvac

20 September 2024

The Transport Planning Partnership

WSU Milperra – Stage 1 Subdivision
Traffic Impact Assessment

Client: Mirvac

Version: V03

Date: 20 September 2024

TTPP Reference: 19334

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	01/03/2024	Paul Cai	Jessica Ng	Wayne Johnson	-
V02	13/03/2024	Paul Cai	Jessica Ng	Wayne Johnson	-
V03	20/09/2024	Hang Tran	Paul Cai	Wayne Johnson	

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1 Introduction

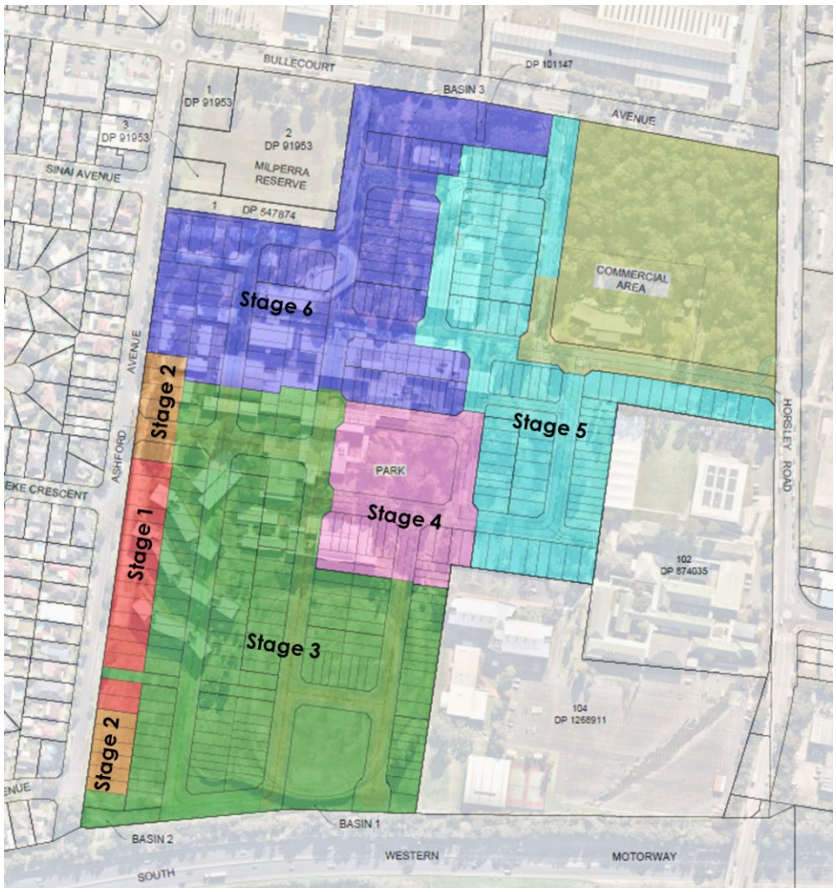
The Transport Planning Partnership Pty Ltd (TTPP) has prepared this Traffic Impact Assessment report on behalf of Mirvac Residential (NSW) Developments Pty Ltd, to accompany the Development Application (DA) to be lodged with City of Canterbury Bankstown Council (Council) for the subdivision of Stage 1 on the former WSU Milperra site located at 2 Bullecourt Avenue, Milperra.

1.1 Project Background

On 1 June 2022, a Gateway determination was issued by the Department of Planning and Environment to endorse the planning proposal to rezone the site to provide residential dwellings, a new commercial centre and public open spaces (Ref: PP-2021-5837).

The subdivision is being proposed to be undertaken in six stages for the residential component, as shown in Figure 1.1.

Figure 1.1: Subdivision Staging Plan



This report relates to the Stage 1 subdivision DA which involves 16 'Premium Housing' lots fronting Ashford Avenue (as shown in red in Figure 1.1). All other stages would be subject to a separate approval.

In preparation of this report, reference to the adopted Former WSU Campus, Milperra site specific Development Control Plan (site specific DCP, amended August 2024) and Planning Agreement which was accepted by Council at its Ordinary Meeting on 24 October 2023 has been included in this assessment. It is noted that the site specific DCP is included in Chapter 11.13 of Canterbury-Bankstown Development Control Plan 2023.

The intended outcomes of the adopted Planning Agreement are as follows:

- Dedication of 14,400m^2 of land as RE1 Public Recreation Zoned land
- Construction and dedication of local roads incl. shared cycleway and 668m^2 SP2 Zoned stormwater detention drainage land
- Open space embellishment within the site (valued $1.5 million)
- Milperra Reserve embellishment (valued $1.04 million)
- Discussions with Mount St Josephs College for shared use of playgrounds
- Repair and renovate Milperra Community Centre (valued $393,000)
- Affordable housing contribution (monetary contribution of $5.3 million)
- Undergrounding powerlines along Ashford Avenue being added, subject to any relevant Ausgrid approval
- Construction of a footpath and landscaping along the eastern side of Ashford Avenue being added
- The applicant contribution toward cycleway connection to Panania Station to promote the use of active and public transport for future residents and the broader Milperra community.

This report relates to the Stage 1 subdivision DA only.

The above adopted Planning Agreement is envisaged to be delivered at the later stages of the project.

1.2 References

In preparing this report, reference has been made to the following:

- Canterbury-Bankstown Development Control Plan 2023
- Roads and Maritime Services Guide to Traffic Generating Development, updated technical direction TDT 2013/04a
- Adopted Planning Agreement

- Other documents referenced in this report.

1.3 Report Structure

This report assesses the traffic and transport implications of the proposed development and is set out as follows:

- Chapter 2 discusses the existing conditions including a description of the subject site.
- Chapter 3 provides a brief description of the proposed development.
- Chapter 4 assesses the future parking requirement of the site.
- Chapter 5 examines the traffic generation and its impacts.
- Chapter 6 presents the conclusions of the assessment.

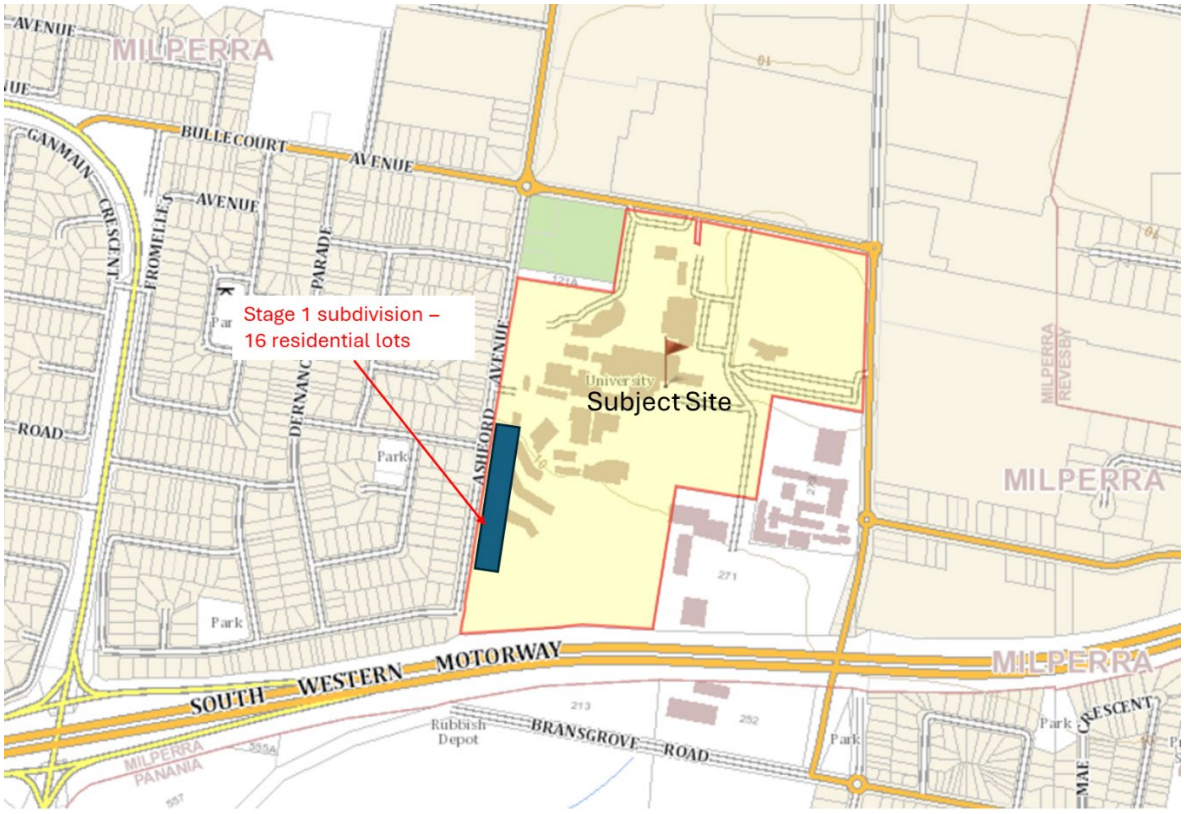
2 Existing Conditions

2.1 Site Description

The site is located in Milperra and falls within the Canterbury-Bankstown local government area. The site is known as the former Western Sydney University Milperra Campus which would be redeveloped for residential, business, recreation and conservation uses. The Stage 1 subdivision DA relates to a site area of 6,030m^2 along the Ashford Avenue site frontage.

The location of Stage 1 subdivision site is shown in blue in Figure 2.1, with the overall site outlined in red.

Figure 2.1: Locality Map



Source: SIX Maps

Surrounding land uses in the area are predominantly light industrial to the north and east, including the Milperra Industrial Precinct, and low density residential to the west and south-east of the site. Of note, Mount St Joseph Catholic College Milperra is located directly adjacent to the site and has recently purchased Building 17 to 19 within the campus.

2.2 Abutting Road Network

The site is surrounded by a network of local roads, including Bullecourt Avenue to the north, Horsley Road to the east and Ashford Avenue to the west of the site. A brief description of these roads is provided below.

2.2.1 Bullecourt Avenue

Bullecourt Avenue functions as a two-way, two-lane primary collector road, generally aligned in an east-west direction between Horsley Road and Ashford Avenue. The road carriageway is approximately 12.5m wide (kerb to kerb), with unrestricted kerbside parking generally provided on both sides of the road. Bullecourt Avenue has a posted speed limit of 60 km/hr. This road provides good connectivity between Henry Lawson Drive and Horsley Drive to the west and east ends respectively.

2.2.2 Horsley Road

Horsley Road functions as a two-way, two-lane primary collector road and is generally aligned in a north-south direction between Ladbroke Street and Bransgrove Road. The road carriageway is approximately 12.0m wide (kerb to kerb), with unrestricted kerbside parking generally provided on both sides of the road. This road provides good connectivity to/from the wider arterial road network via Bullecourt Avenue, Beaconsfield Street and Bransgrove Road.

The posted speed limit is 60km/hr, with 40 km/hr school zone restrictions in operation during school hours to the south of the Horsley Road-Bullecourt Avenue intersection.

2.2.3 Ashford Avenue

Ashford Avenue functions as a two-way, two-lane local collector road, generally aligned in a north-south direction between Milperra Road and Flanders Avenue to the north and south ends respectively. The road carriageway is approximately 12.0m wide (kerb to kerb), with unrestricted kerbside parking provided on the east side and restricted kerbside parking on the west side of the road.

The posted speed limit is 50 km/hr within the vicinity of the site.

2.3 Pedestrian and Cyclist Infrastructure

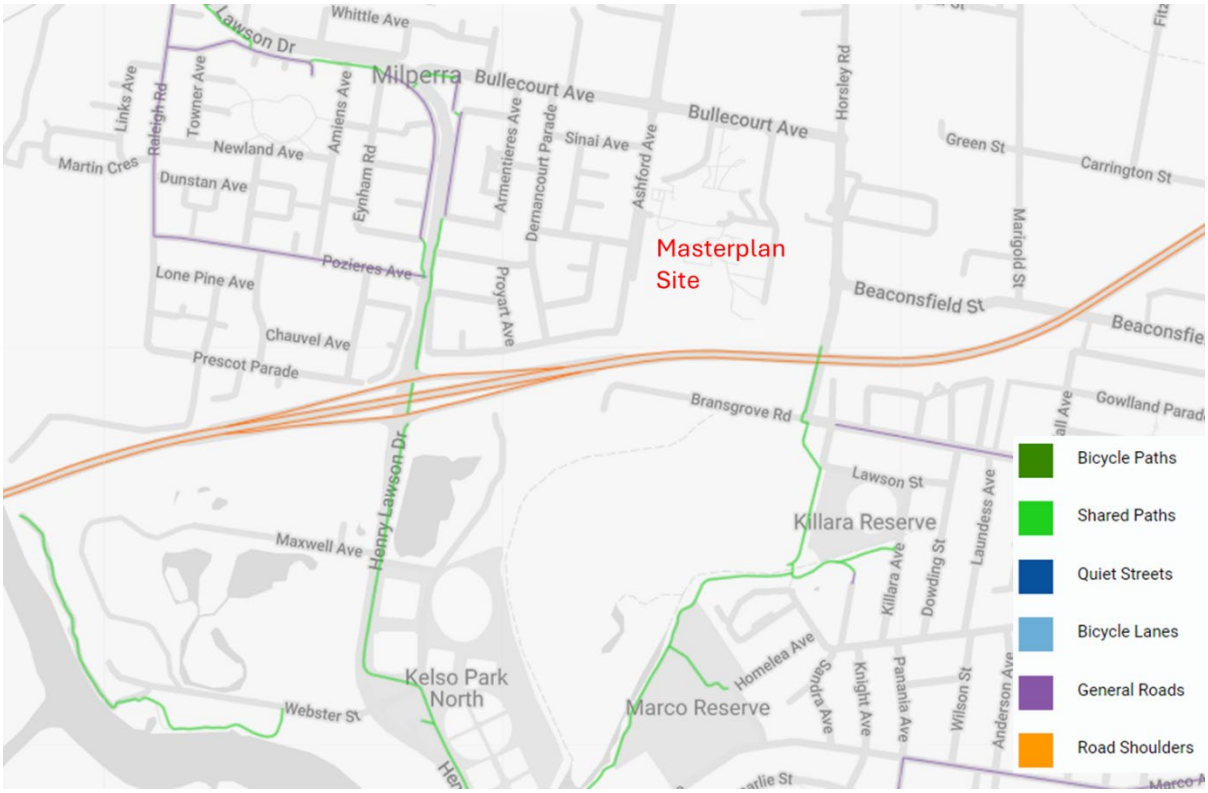
Paved pedestrian footpaths are generally provided on both sides of Bullecourt Avenue and Horsley Road, which provides good access to the surrounding areas and public transport facilities. In addition to this, formal pedestrian footpaths are only provided on some sections

of Ashford Avenue, near the retail shop frontages at the corner of Ashford Avenue and Bullecourt Avenue. No formal pedestrian footpaths are provided along the site frontage on Ashford Avenue or along the frontage of the residential dwelling houses on the west side of Ashford Avenue between Sinai Avenue and Flanders Avenue.

There is a good provision of cycle infrastructure in the local area. To the west of the site, a shared path is provided along Henry Lawson Drive, providing connectivity in a generally north-south direction between Landsdowne and East Hills. In addition to this, there is a cycleway provided to the south of the site traversing the sports fields which provides good connectivity to/from Panania.

A map showing existing cycling facilities within the site vicinity is shown in Figure 2.2.

Figure 2.2: Cycleway Map



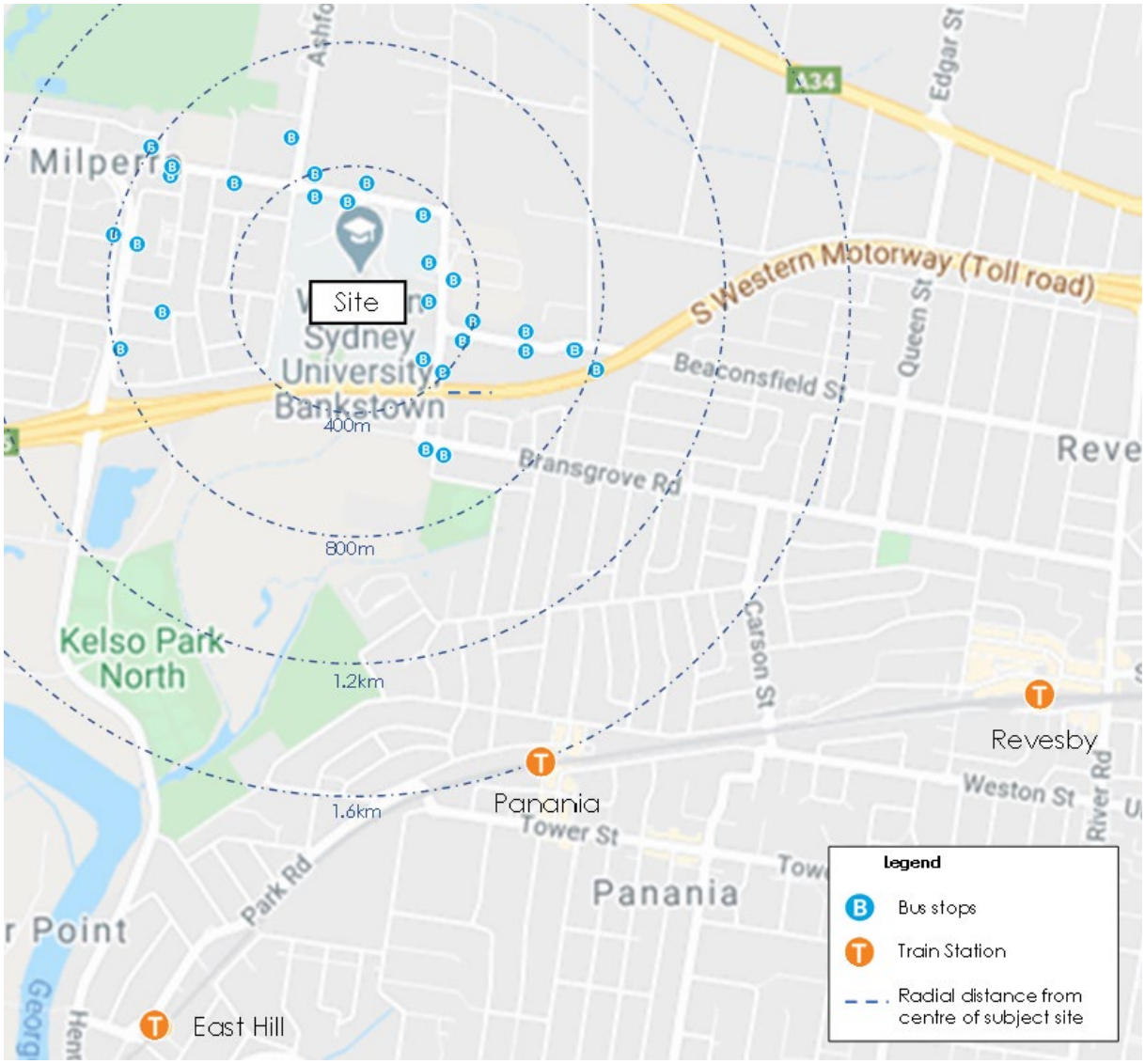
Source: Roads and Maritime Services Cycleway Finder

2.4 Public Transport Facilities

The site is accessible by public transport, with a number of bus services operating within a 400m catchment radius of the centre of the site. It is however noted that there are no nearby railway stations within the immediate local area. The nearest railway station is Panania Station, which is approximately 1.5km from the site.

The site's proximity to nearby public transport facilities is shown in Figure 2.3.

Figure 2.3: Site Proximity to Nearby Public Transport Facilities



Base Map Source: Google Maps Australia

A summary of the existing bus services within a 400m radius catchment of the centre of the site, as well as their associated frequencies, is provided in Table 2.1.

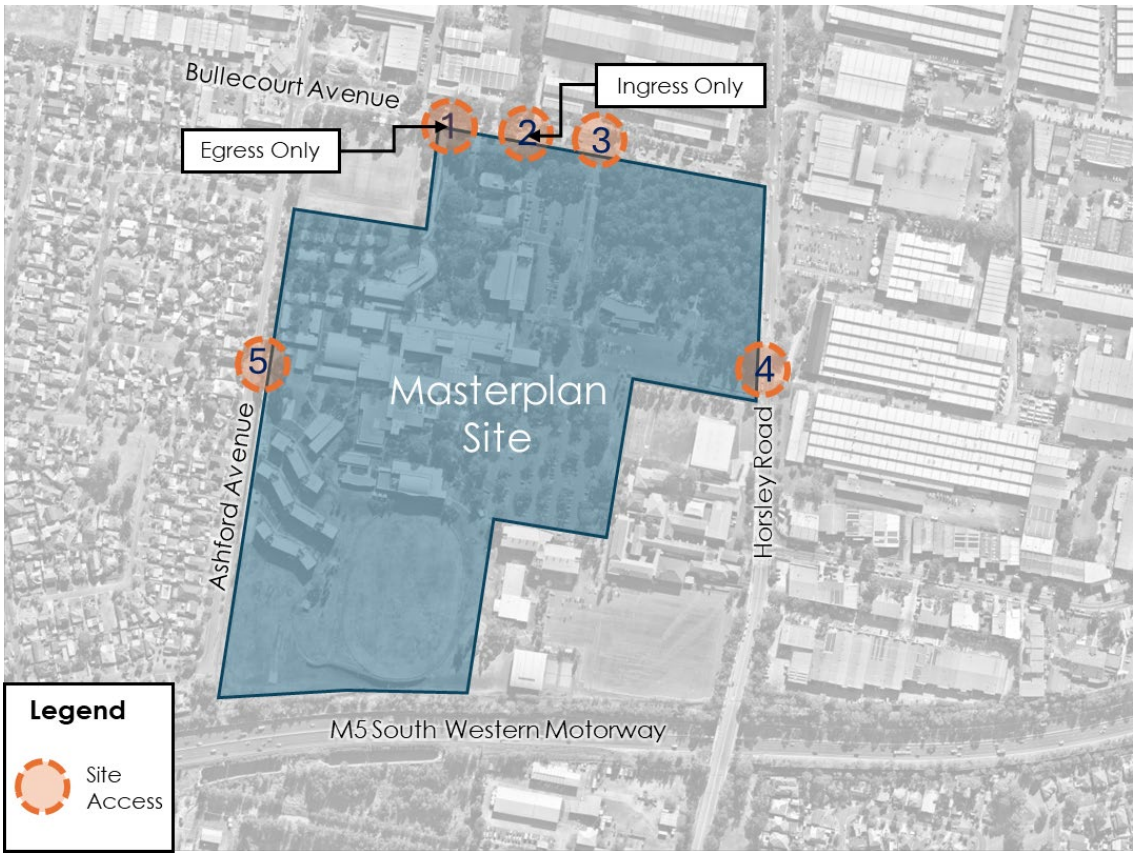
Table 2.1: Bus Service Summary

Service No.	Route Description	Approximate Frequency (Each Direction)	
		Peak	Off-Peak
922	Between East Hills and Bankstown	Every 30 mins	
962	Between East Hills and Miranda	Every 15-20 mins	Every 30 mins
M90	Between Burwood and Liverpool	Every 10 mins	Every 15 mins
S5	Between Milperra and Padstow	Five services per day	

2.5 Existing Vehicle Access

The subject site was formally occupied by the Western Sydney University Milperra campus, which has been relocated to a new location in Bankstown. Whilst the site is not currently operational, there are several vehicle access points provided along Ashford Avenue, Bullecourt Avenue and Horsley Road frontages as shown in Figure 2.4.

Figure 2.4: Existing Vehicle Access Locations



3 Proposed Development

3.1 Project Background

On 1 June 2022, a Gateway determination was issued by the Department of Planning and Environment to endorse the planning proposal to rezone the site to provide residential dwellings, a new commercial centre and public open spaces (Ref: PP-2021-5837).

As part of the previous traffic assessment[1], the indicative masterplan assessed was as follows:

- 441 low rise residential dwellings (197 free standing and 244 attached and semi-detached dwellings)
- 136m^2 GFA of shared community/meeting office space
- 250m^2 GFA of restaurant/café use
- 250m^2 GFA of convenience retail use
- The existing child care centre is proposed to reduce its capacity from 67 to 40 children

It is however noted that the planning proposal was approved for a total number of 430 low density residential dwellings (which is slightly lower than the above 441 residential dwellings assessed as part of the planning proposal traffic report).

The proposed development is proposed to be provided in accordance with the Concept Masterplan in the adopted Site Specific DCP, as shown in Figure 3.1.

[1] *TTPP Transport Assessment Version 05 dated 2 June 2020 (TTPP Ref: 19334-R01V05-200602-TIA)*

Figure 3.1: Concept Master Plan



Source: Figure 2 of Canterbury-Bankstown Development Control Plan 2023 – Chapter 11.13 Former WSU Campus, Milperra

3.2 Proposed Residential Staging

The proposed indicative residential development would be staged across six (6) stages, being:

- **Stage 1** – 16 residential lots
- **Stage 2** – 11 residential lots
- **Stage 3** – 135 residential lots, plus internal access roads and public open space
- **Stage 4** – 19 residential lots, plus internal access roads and public open space
- **Stage 5** – 96 residential lots, plus internal access roads
- **Stage 6** – 105 residential lots, plus internal access roads and public open space

Please note, the above Stages 2 to 6 may be subject to change based on upcoming planning process and market demand.

This assessment seeks approval for the Stage 1 subdivision DA only.

The development yields for future stages are indicative only and shall be subject to separate approvals, along with the proposed non-residential uses.

The proposed residential subdivision staging plan is shown in Figure 3.2, with the residential breakdown outlined in Table 3.1.

Figure 3.2: Proposed Subdivision Staging Plan

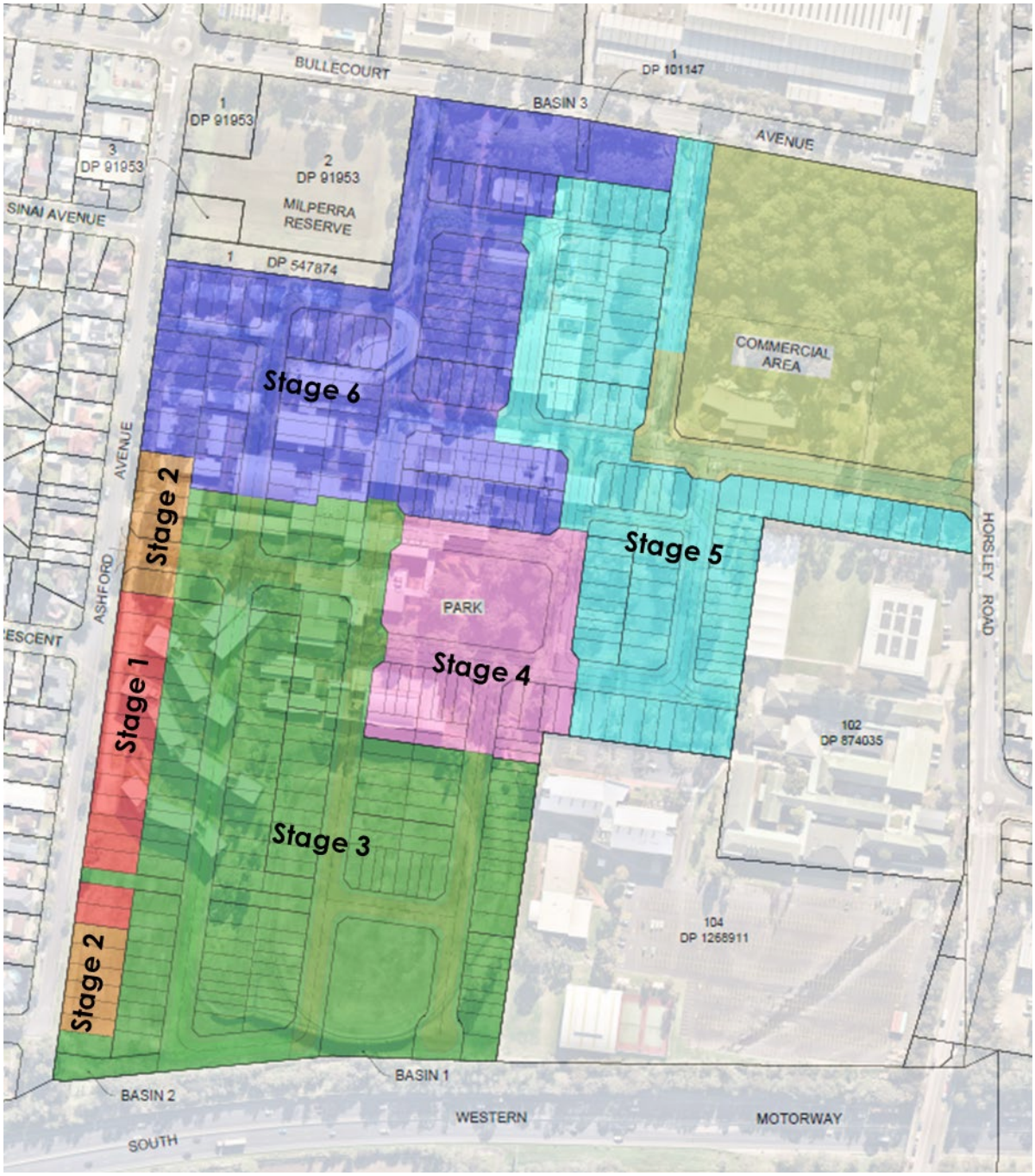


Table 3.1: Proposed Indicative Subdivision Development Yields

Stage	Number of Residential Lots (no. of dwellings)	Number of Public/Draining Reserve Lots	Stage Area (m^2)
1	16	0	6,030
2	11	0	4,690
3	135	2	61,674
4	19	1	15,108
5	96	0	35,176
6	105	1	40,385

**This assessment relates to Stage 1 only. The remaining stages would be subject to a separate DA.*

The Stage 1 subdivision DA (of which this report relates to) involves the construction of 16 residential lots fronting Ashford Avenue along the western boundary.

The proposed residential dwellings would be provided as 'premium housing' with a minimum 10m lot width in accordance with the Concept Masterplan in the Site Specific DCP in Figure 3.2. Each dwelling shall have individual access off Ashford Avenue and therefore, no internal road infrastructure or public open spaces will be constructed as part of Stage 1 works. A 1.2m wide footpath on the existing verge will however be delivered along the property frontage on Ashford Avenue to facilitate pedestrians.

The proposed Stage 1 subdivision DA is considered consistent with the Concept Masterplan for the site under the adopted Site Specific DCP.

4 Parking Assessment

4.1 Car Parking Assessment

The Canterbury-Bankstown DCP 2023 stipulates a car parking rate of 2 car spaces per dwelling house for residential dwellings. It is proposed to comply with this requirement and provide each dwelling with 2 car parking spaces. Vehicle access to these spaces would be provided for each dwelling directly off Ashford Avenue. The car park and associated elements would also be proposed to be designed in accordance with relevant Australian Standard, namely AS2890.1:2004.

4.2 Waste Collection Arrangements

Waste is proposed to be collected kerbside on Ashford Avenue. This is consistent with existing residential dwellings located on Ashford Avenue. The existing road network will allow Council waste vehicles to travel along the eastern side of Ashford Avenue to serve the proposed residential lots without the need for any new turnaround facilities or amendment to the existing road network.

5 Traffic Assessment

The Stage 1 subdivision DA is consistent with the previous scheme which was assessed as part of TTPP's Transport Assessment (Version 05 dated 2 June 2020) of the planning proposal to rezone the site (TTPP Ref: 19334-R01V05-200602-TIA).

Transport for NSW's Guide to Traffic Generating Development (2002) and Technical Direction TDT 2013/04a (2-13) stipulates the following traffic generation rate for low density residential dwellings:

- Weekday morning peak hour vehicle trips: 0.95 veh/hr per dwelling in Sydney
- Weekday evening peak hour vehicle trips: 0.99 veh/hr per dwelling in Sydney

The above rates are consistent for the low density residential component as part of the previous traffic assessment for the planning proposal of the site.

By applying the above trip generation rates to the proposed 16 dwelling houses as part of Stage 1 works, the expected traffic generation would be in the order of 15 veh/hr in the morning peak hour (1 hour) and 16 veh/hr in the evening peak hour (1 hour). This level of traffic generation equates to about 1 vehicle every 4 minutes, which is low and could not be expected to result in any noticeable traffic impacts on Ashford Avenue or the surrounding road network.

Notwithstanding this, the proposal is consistent with the overall masterplan for the site, which was assessed as part of TTPP's Transport Assessment (Version 05 dated 2 June 2020) as part of the planning proposal to rezone the site.

The previous study which assessed the full masterplan of the site concluded that:

- *The surrounding key intersections are expected to continue to operate satisfactorily at LoS B or better during both AM and PM peak periods. On this basis, the proposed development is not expected to compromise the existing intersection performance on the surrounding road network, nor result in any safety or operational issues. Therefore, the proposal is considered acceptable from a traffic capacity perspective.*

In summary, the traffic impacts arising from the proposed Stage 1 subdivision DA is considered negligible from a traffic capacity perspective. Further, the proposal is consistent with the ultimate masterplan for the site which was previously assessed as part of the planning proposal which concluded that the full development when built was not expected to compromise existing intersection performance on the surrounding road network.

6 Conclusion

This report examines the traffic and parking implications of the Stage 1 subdivision development of the former Western Sydney University (WSU) campus, which forms part of the wider rezoning masterplan of the site.

The key findings of the assessment are presented as follows:

- The Stage 1 subdivision development application seeks approval to provide 16 free standing residential dwelling houses along the frontage of Ashford Avenue. A 3.5m wide verge including a 1.2m wide footpath will also be delivered along the property frontage on Ashford Avenue as per the Concept Masterplan in the adopted Site Specific DCP.
- This work forms part of the overall masterplan of the site which obtained approval from the South District Planning Panel in July 2023 to rezone the site to provide residential dwellings, a new commercial centre and public open spaces (Ref: PP-2021-5837).
- This assessment seeks approval for the Stage 1 subdivision DA only. All future stages would be subject to a separate DA for approval.
- The proposed Stage 1 development will provide sufficient off-street parking spaces with 2 car spaces provided for each dwelling as per Council DCP requirements. These spaces are proposed to be designed in accordance with AS2890.1:2004 design requirements.
- The Stage 1 subdivision is expected to generate about 15/16 vehicles per hour during the peak hour, which is low. This level of development could not be expected to result in any noticeable traffic impact on Ashford Avenue or the surrounding road network.
- The Stage 1 subdivision DA is consistent with the previous scheme which was assessed as part of TTPP's Transport Assessment (Version 05 dated 2 June 2020) as part of the planning proposal to rezone the site, which concluded that the masterplan could not be expected to compromise the existing intersection performance on the surrounding road network.

Overall, the traffic and parking aspects of the Stage 1 development are considered to be satisfactory. The proposal is consistent with the previous scheme assessed as part of the planning proposal for the site, which would be delivered across five (5) stages (Ref: PP-2021-5837). Future stages of the development would be subject to separate DA approvals.

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

www.ttpp.net.au

APPENDIX J: WASTE MANAGEMENT PLAN

CANTERBURY BANKSTOWN

Waste Management Plan – Demolition and Constuction Waste



The applicable sections of this Waste Management Plan (WMP) must be completed and submitted with your Development Application.

Completing this Plan will assist you in identifying the type(s) of demolition and construction waste that will be generated and will inform Council how you intend to reuse, recycle or dispose of this waste. The more detail you provide with your application will assist Council in reviewing your application. The amount of detail you provide with your application impacts the number of revisions and time taken with processing the DA.

The information you provide will be assessed against the objectives of the Development Control Plan 2021.

If you require assistance completing your WMP, please contact Council's Waste Assessment Officers in the Resource Recovery Team on **9707 9000**.

If there is insufficient space within this template, please provide attachments.

Site address: 2 & 2A Bullecourt Avenue	
Suburb: Milperra	Postcode: 2214

Applicant's name: Stanley Lu	
Company name: Mirvac Residential (NSW) Developments Pty Limited	
Applicant's address: Level 28, 200 George Street	
Suburb: Sydney	Postcode: 2000
Phone: N/A	Mobile: 0426 885 668
Email: stanley.lu@mirvac.com	

Are there buildings or structures currently on the site?	
No	Yes – provide description Yes - there are approximately 43 buildings/structures on site. These are being demolished under DA1512/ 2023 and are not part of this DA application. The proposed development does **not** request approval to demolish any structures.
If the application involves the demolition of a residential property, has a Vacant Land Charge Application been submitted? https://www.cbcity.nsw.gov.au/council/forms/waste-recycling	
No N/A	Yes

Applicant's Signature:	
Date:	
If proposal has been discussed with Council's Waste Assessment Officers provide details.	

DEMOLITION WASTE (Complete if there are existing structures on site that require removal)

Do the works involve asbestos removal?	Yes – less than 10m²		Yes – more than 10m²	X	No	
Work Cover License number: To be provided by the successful contractor following the approval of the Stage 1 DA						

GENERAL DEMOLITION WASTE

Has a demolition contractor been appointed?	Yes		No X	
If yes, demolition contractor details:				
If no and if DA is approved, a condition of consent may be placed on the DA requiring the above details prior to works commencing on-site. Yes this is understood				

	Estimated Amount	Destination		
		Reuse and recycling		Disposal
Type of material	m^2 or m^3	ON-SITE Specify proposed reuse	OFF-SITE Specify contractor and recycling facility	Specify contractor and landfill site
Excavation (e.g. soil, rock)	2626m^3	Clean material will be stockpiled on site for reuse in future stages.		Contaminated materials will exported offsite to Elizabeth Drive Landfill Kemps Creek - 1725 Elizabeth Drive, Kemps Creek, NSW, 2178
Bricks/Pavers	N/A			
Concrete	8.5m^3		Concrete from kerb cut outs will be taken to Benedict Recycling Chipping Norton - 33-39 Riverside Rd, Chipping Norton NSW 2170	
Tiles	N/A			
Timber (clean)	N/A			
Timber (treated)	16m^3		timber from service pole adjustments will be taken to Benedict Recycling Chipping Norton - 33-39 Riverside Rd, Chipping Norton NSW 2170	
Asphalt	N/A			
Metals	0.5m^3		steel & cable service adjustments will be taken to Benedict Recycling Chipping Norton - 33-39 Riverside Rd, Chipping Norton NSW 2170	
Plasterboard	N/A			
Green waste	14m^3	Timber from tree removal will be chipped and mulched on site.		
Glass	N/A			
Furniture/Fittings/Carpet	N/A			
Other - specify	10m^3		plastic pipe/conduits to be taken to Benedict Recycling Chipping Norton - 33-39 Riverside Rd, Chipping Norton NSW 2170	
Percentage of material diverted from landfill: 80%				
If this figure is below 80%, you must explain why. * The Final percentage is subject to final amount of asbestos contaminated material that must leave the site. Where hen picking is practical and supported by the Site Auditor hen picking will occur to reduce the amount of material going to landfill.				

CONSTRUCTION WASTE

	Estimated amount	Destination		
		Reuse and recycling		Disposal
Type of material	m^2 or m^3	ON-SITE Specify proposed reuse	OFF-SITE Specify contractor and recycling facility	Specify contractor and landfill site
Excavation (e.g. soil, rock)	N/A	Addressed under demolition above		
Bricks/Pavers	N/A			
Concrete	2 m^3		Excess Concrete during construction will be taken to Benedict Recycling Chipping Norton - 33-39 Riverside Rd, Chipping Norton NSW 2170	
Tiles	N/A			
Timber (clean)	0.5 m^3		Offcuts from formwork will be taken to Benedict Recycling Chipping Norton - 33-39 Riverside Rd, Chipping Norton NSW 2170	
Timber (treated)	N/A			
Asphalt	N/A			
Metals	0.3 m^3		Offcuts during services installation will be taken to Benedict Recycling Chipping Norton - 33-39 Riverside Rd, Chipping Norton NSW 2170	
Plasterboard	N/A			
Green waste	N/A			
Glass	N/A			
Furniture/Fittings/Carpet	N/A			
Other - specify	0.3 m^3		plastic pipe offcuts & packaging during construction will be taken to Benedict Recycling Chipping Norton - 33-39 Riverside Rd, Chipping Norton NSW 2170	
Percentage of material diverted from landfill:	80%			
If this figure is below 80%, you must explain why.* N/A				

* Council has a target of diverting 80% of waste from landfill. To contribute to this target, all developments are required to achieve best practise in the design, construction and maintenance of waste management facilities and infrastructure.

I certify that:

(a) Any material moved off-site will be transported in accordance with the requirements of the *Protection of the Environment Operations Act 1997*;
(b) Waste will only be transported to a place that can lawfully be used as a waste facility;
(c) Generation, storage, treatment and disposal of hazardous waste and special waste (including asbestos) will be conducted in accordance with relevant waste legislation administered by the EPA and relevant Work Health and Safety legislation administered by WorkCover NSW; and
(d) All records demonstrating lawful disposal of waste and evidence such as weighbridge dockets and invoices for waste disposal or recycling services will be retained and kept readily accessible for inspection by regulatory authorities such as Council, NSW EPA or WorkCover NSW.



Signature

24/05/2024

Date

APPENDIX K: DETAILED SITE INVESITGATION

Manage the earth, eliminate the risk

Alliance Geotechnical

Engineering | Environmental | Testing

DRAFT

Report Type:

Detailed Site Investigation

Project Address:

Western Sydney University – Milperra Campus,
Bullecourt Avenue, Milperra, NSW 2214
Lot 103 DP874035

Client Name:

Mirvac Residential (NSW) Developments Pty Ltd

30 January 2020
Report No: 9996-ER-1-1

We give you the right information to make the right decisions

Alliance Geotechnical Pty Ltd | ABN: 62 106 885 214

PO Box 275, Seven Hills NSW 1730 - 10 Welder Road, Seven Hills, NSW

Phone: 1800 288 188 - Office Email: office@allgeo.com.au - Web: allgeo.com.au

DOCUMENT CONTROL

Revision Status	Date	Author	Reviewer	Comments
Draft	30 January 2020	Sam Scully	Aidan Rooney	Issued for client comment

Author Signature		**Reviewer Signature**	
Name	Sam Scully	**Name**	Aidan Rooney
Title	Environmental Scientist	**Title**	Principal Environmental Scientist

DRAFT

EXECUTIVE SUMMARY

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Homes NSW Pty Ltd, to undertake a Stage 2 Detailed Site Investigation for a site located at Western Sydney University – Milperra Campus Bullecourt Avenue, Milperra, NSW 2214 (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG had the following project appreciation:

- the site is an active campus of Western Sydney University;
- the investigation is to be limited to areas outside of building structures and discretion is required in active areas of the site (roads, ovals and carparking areas);
- the site is proposed for rezoning and subdivision to facilitate residential development. It is understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and
- a Detailed Site Investigation is required, in accordance with *State Environmental Planning Policy No. 55 – Remediation of Land,* to accompany the development application.

It is the intention of the client to redevelop the site into a low-density residential development. This is deemed as a change of land-use from commercial / industrial to a residential land use scenario. The site current falls within a Infrastructure (SP2) in accordance with Canterbury Bankstown Local Environment Plan (2015). Currently under the State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55), a consent authority must not consent to the carrying out of any development unless it has considered whether the land is contaminated. This report has been prepared to satisfy Clause 7 (2) and (3) of SEPP 55 and Canterbury Bankstown Council planning policies.

The objectives of this project were to:

- assess the potential for contamination to be present on the site in available/ accessible areas as a result of past and current land use activities;
- provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- provide recommendations for further investigation, management and/or remediation (if warranted).

AG undertook the following scope of works to address the project objectives:

- A desktop review of the previous investigation reports and other relevant information relating to the site;
- A site walkover to understand current site conditions and conduct underground utility locating;
- Conduct an intrusive site investigation using a track-mounted hydraulic drill rig, hand auger and/or track-mounted excavator to assess subsurface ground conditions and install groundwater monitoring wells;
- Collect representative soil and groundwater samples;
- Facilitate laboratory analysis of selected soil and groundwater samples for contaminates of potential concern (CoPC);
- Assess the results in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013* (NEPM 2013); and

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- Prepare a SDSI in accordance with the *Guidelines for Consultants Reporting on Contaminated Sites, 2011.*

Conclusions and Recommendations

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical results, in the context of the proposed redevelopment scenario, AG makes the following conclusions:

Soil Assessment

- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable direct contact human health exposure risk;
- the detected concentrations of asbestos fines/ friable asbestos and non-friable asbestos containing material in the soil samples analysed are considered likely to present an unacceptable human health exposure risk;
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable inhalation / vapour intrusion exposure risk;
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable TPH management limit exposure risk; and
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable aesthetics risk;

Groundwater Assessment

- the detected concentrations of contaminants of potential concern in groundwater are considered unlikely to present a risk to surrounding aquatic environments;
- All groundwater samples returned concentrations less than the adopted Groundwater Health Screening Levels for vapour intrusion (clay 2 - 4m) for a residential land use setting as per Table 1A (4) of NEPM 2013
- the detected concentrations of contaminants of potential concern in the groundwater samples analysed is considered unsuitable for discharge to municipal stormwater without further assessment/treatment due to the detected concentrations of the contaminants of concern analysed.

Based on these conclusions, AG makes the following recommendations:

- Consideration should be given to the preparation of a supplementary contamination assessment, to further understand the nature and extent of contamination identified onsite and address data gaps presented by building footprints, previous contamination assessments and inaccessible areas of environmental concern;
- Preparation of a remedial action plan (RAP) will be required to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination risk;
- groundwater assessed at the site is unsuitable for discharge to municipal stormwater without further assessment/treatment due to the detected concentrations of the contaminants of concern tested. If groundwater is expected to be encountered during the proposed development, a groundwater management plan would be required;

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- the preparation of any supplementary contamination assessments, remedial action plans and/or groundwater management plans should be completed by an appropriately experienced environmental consultant;
- As per NSW WHS Regulations, any removal of friable asbestos requires the engagement of a Class A licensed asbestos removalist and a pre-notification to SafeWork NSW, with accompanying air monitoring during the works and clearances post completion to be conducted by a licensed asbestos assessor (LAA);
- Following remediation of the identified contamination, validation sampling and a site validation report will be required to confirm the effectiveness of the remedial works; and
- Any soil proposed for disposal should be classified and disposed of as per the NSW EPA *Waste Classification Guidelines*, 2014 with all disposal documentation retained by the client for inclusion within the site validation report.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 14**.

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LIST OF ABBREVIATIONS

A list of the common abbreviations used throughout this report is provided below:

ACM	Asbestos Containing Material
AF/FA	Asbestos Fines / Fibrous Asbestos
AEC	Area of Environmental Concern
AG	Alliance Geotechnical Pty Ltd
AHD	Australian Height Datum
B(a)P TEQ	Benzo(a)pyrene Toxic Equivalence Quotient
BTEX	Benzene, toluene, ethyl benzene and xylenes
COPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
DP	Deposited Plan
EPA	NSW Environment Protection Authority
m	metres
m^2	square metres
m bgl	metres below ground level
mg/kg	milligrams per kilogram
OCP	Organochlorine pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PSI	Preliminary Site Investigation
RAP	Remedial Action Plan
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit

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1. INTRODUCTION

1.1. Background

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Homes NSW Pty Ltd, to undertake a Stage 2 Detailed Site Investigation for the site located at Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214 (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG had the following project appreciation:

- the site is an active campus of Western Sydney University;
- the investigation is to be limited to areas outside of building structures and discretion is required in active areas of the site (roads, ovals and carparking areas);
- the site is proposed for rezoning and subdivision to facilitate residential development. It is understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and
- a Detailed Site Investigation is required, in accordance with *State Environmental Planning Policy No. 55 – Remediation of Land,* to accompany the development application.

1.2. Proposed development

It is the ultimate intention of the client to redevelop the site into a low-density residential development. This is deemed as a change of land-use from "SP2 Infrastructure" to a residential land use scenario. The site current falls within a Infrastructure (SP2) in accordance with Bankstown *Local Environment Plan* (2015). Currently under the *State Environmental Planning Policy No. 55 – Remediation of Land* (SEPP 55), a consent authority must not consent to the carrying out of any development unless it has considered whether the land is contaminated. This report has been prepared to satisfy Clause 7 (2) and (3) of SEPP 55 and Canterbury Bankstown Council planning policies. Development plans for the proposed development are appended to this report as **Appendix A.**

1.3. Objectives

The objectives of this project were to:

- assess the potential for contamination to be present on the site in available/ accessible areas as a result of past and current land use activities;
- provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- provide recommendations for further investigation, management and/or remediation (if warranted).

1.4. Scope of Work

AG undertook the following scope of works to address the project objectives:

- A desktop review of the previous investigation reports and other relevant information relating to the site;

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- A site walkover to understand current site conditions and conduct underground utility locating;
- Conduct an intrusive site investigation using a track-mounted hydraulic drill rig, hand auger and/or track-mounted excavator to assess subsurface ground conditions and install groundwater monitoring wells;
- Collect representative soil and groundwater samples;
- Facilitate laboratory analysis of selected soil and groundwater samples for contaminates of potential concern (CoPC);
- Assess the results in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013* (NEPM 2013); and
- Prepare a SDSI in accordance with the *Guidelines for Consultants Reporting on Contaminated Sites, 2011.*

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2. SITE IDENTIFICATION

The site is identified as Lot 103 DP874035 and is within the local government authority of Canterbury Bankstown. The local government authority zoning to this site is Infrastructure (SP2).

The approximate geographic coordinates of the middle of the site, inferred from Google Earth were 33°56'25" S and 150°59'27" E.

The locality of the site is set out in **Figure 1** with the general layout and boundary of the site is set out in **Figure 2**.

The site footprint covers an area of approximately 20 ha. Due to existing building footprints and inaccessible areas, this contamination assessment will be carried out within the accessible areas onsite comprising approximately 13ha.

A copy of a level survey is presented as **Appendix B.**

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3. SITE CONDITIONS AND SURROUNDING ENVIRONMENT

3.1. Geology

A review of the Sydney 1:250,000 Geological Series Sheet (3rd Edition) 1966, indicated that the site is likely to be underlain by a combination of:

- *'Triassic, Wiannamatta Group, Liverpool Sub-group (Rwl), defined as shale with some sandstone beds'*; and
- *Quaternary (Qa), characterised as alluvium, gravel, sand, silt and clay'*.

3.2. Acid Sulfate Soils

A review of the Department of Land and Water Conservation NSW Acid Sulfate Soil Risk Map for Liverpool (1997) indicated that the site lies in an area mapped as '*No Known Occurrence'* for which Acid sulfate soils are not known or expected to occur in these environments. Land management activities are not likely to be affected by acid sulfate soil materials. The typical landform types include bedrock slopes, elevated Pleistocene and Holocene dunes, and elevated alluvial plains.

3.3. Topography

The site topography was observed to be undulating and sloped downwards towards the south southwest. Google Earth indicated the site resides at an elevation ranging between approximately 5m to 23m AHD.

The detail and level survey presented as **Appendix B** provides further information on surface contours and elevations.

3.4. Hydrology

Surface water courses proximal to the site included the Georges River, located approximately:

- 1.3km to the northwest;
- 1.7km to the west; and
- 1.3km to the south southwest.

3.5. Hydrogeology

Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the site is considered likely to be towards the south southwest. A comprehensive assessment of groundwater conditions and flow direction was carried out at the site (refer to **Section 7)**.

3.6. Surrounding Environment

Observations made during site works indicated the following land use activities adjacent to the site:

- North: Bullecourt Avenue with commercial / industrial land-use beyond including a service station to the north-west;

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- East: Mount Saint Joseph's High School and Horsley Road with commercial / industrial land-use beyond;
- South: The South Western Motorway (M5) with Kelso Landfill beyond; and
- West: Ashford Avenue with residential land-use beyond.

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4. PREVIOUS CONTAMINATION ASSESSMENTS

The following reports were considered during the undertaking of this project:

- Coffey, 25 August 2011 (Coffey 2011) '*Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus'*, Report ref: GEOTLCOV24163AG-AB;
- Noel Arnolds and Associates, October 2011(NAA 2011), '*Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW'*, Report Ref: SJ0085:95458.
- Environmental Investigation Services, 7 April 2016 (EIS 2016), '*Preliminary Contamination Screening and Waste Classification, Proposed Oval Facilities, UWS Bankstown Campus, 2 Bullecourt Avenue, Milperra'.*
- JBS&G Australia Pty Ltd, 7 February 2018 (JBS&G 2018) '*Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW',* Report ref: 54086-110124 (Rev 1);

A summary of these reports is presented in **Section 4.1 to 4.4**.

4.1. Coffey 2011

For the purposes of this Phase 2 Environmental Site Assessment (P2 ESA), Coffey assumed the site boundary comprised approximately 1.5ha. At the time of reporting, it was subsequently understood that the proposed student residence development was to extend further to the east and cover an area of approximately 3ha. Coffey understood that UWS required a P2 ESA to support a development application (DA) to Bankstown City Council.

The objectives of the assessment were to:

- Assess the acid sulfate soil status of the site based on a review of risk map and field
- observations;
- Assess the contamination status of the site by undertaking sampling and testing of soil; and
- Provide recommendations for further investigation/remediation requirements (if any) for the site
- to be suitable for the proposed student accommodation development.

The scope of work undertaken included:

- Fieldwork including soil sampling;
- Laboratory testing; and
- Data assessment and reporting.

Based on the site history information and visual observations, a number of Areas of Environmental Concern (AECs) and Chemicals of Potential Concern (COPCs) were identified. The identified AECs and associated CoPCs are presented in **Table 4.1**

Table 4.1 - AECs and associated CoPC

Potential Areas of Concern	Chemicals of Potential Concern	Chemicals of Potential Concern
Southern end of the site – building rubble burial	TPH, PAH, Metals, Asbestos	Building rubble was buried up to 3m to 4m below the site surface.

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Former farm dam – potential contaminated fill	TPH, BTEX, PAH, OCP, Metals, Asbestos	Potentially contaminated fill could have been used to backfill the dam.
Whole site – use of pesticides for pest/weed control	OCP, Metals	Chemical application (such as pesticides) was commonly used in historical farming activities. Contamination, if present, is likely to be localised near the surface and minor.
Whole site – hazardous building materials	Asbestos, Lead	Historical farm sheds/houses could contain asbestos and lead paint. Weathering, leaching and spreading (during demolition) of material would likely to be localised in the near surface.

A total of 25 borehole were cored across the site on 11 and 12 July 2011and submitted the samples to a NATA accredited laboratory for analysis of CoPC.

Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- Asbestos was detected at six locations across the site.

Coffey recommended additional assessment to be undertaken to further characterise the asbestos impact and to assist in the selection of remedial/management options.

4.2. NAA 2011

NAA 2011 was commissioned by JDH Architects to undertake a Soil Contamination Investigation (SCI) in an area in the northeast of the Bankstown Campus at the University of Western Sydney - Bankstown Campus located at Bullecourt Avenue, Milperra NSW (the site). The portion of the site investigated by NAA 2011 was approximately 2,500m^2 in area and resided to the north of the existing P2 car park at the Bankstown Campus. The proposed redevelopment comprised construction of a single storey childcare facility with adjacent car parking facilities.

The objectives of the SCI was to provide information on the extent and nature of contamination (if any) within the fill/soil material at the site and to assess the suitability of the site for the proposed land-use as a childcare facility.

NAA 2011 undertook the following scope of works to achieve the project objectives:

- Prepare a safe work method statement for works to be conducted at the site;
- Complete a site inspection and a comprehensive site walkover;
- Conduct grid-based sampling pattern by the hand auguring of eight locations within the boundaries of the site. Hand auguring was undertaken to a maximum depth of approximately 1.2m below ground surface with sampling conducted at varying depths through the fill/soil profile;
- Collect seventeen soil samples;
- Conduct NATA-certified laboratory-based analysis of soil; and
- Prepare a SCI report.

Based on the findings of this investigation, NAA 2011 concluded the following:

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- Hotspots of lead contamination have been identified at locations BH3 0.0-0.2m and S2 0.0-0.1m where identified during an intrusive investigation previously undertaken by Coffey (AG were not provided this report);
- Concentrations of cadmium (BH3 0.0-0.2m) and zinc (BH3 0.0-0.2m, S2 0.0-0.1m and S7 0.0-0.1m) have been found to exceed the adopted Provisional Phytotoxicity Investigation Levels (PPIL);
- The site was unsuitable for the proposed land use as a childcare facility due to the presence of hotspots of lead contamination which may present a risk to human health if not appropriately managed;
- Exceedances of PPILs have also been reported at these locations and can be addressed as part of the management of the lead hotspots; and
- A marginal exceedance of zinc concentrations when compared with the PPIL was recorded at S7 0.0-0.1m. Given the marginal nature of this exceedance, it does not impact upon the suitability of the site for the proposal land use as a childcare facility.

Based on these conclusions, NAA 2011 made the following recommendations:

- Given the shallow nature of the impacted material, it was assumed that this material will be excavated and removed from site during the course of site preparation works (e.g. stripping back of topsoil material) for the purposes of redevelopment;
- Fill/soils to be removed offsite for disposal should be classified in accordance with NSW EPA Waste Classification Guidelines (2014) and should be disposed of at an appropriately licenced landfill facility;
- Following site preparation works, a suitably qualified Environmental Consultant should return to site to collect validation samples of the area of concern (in vicinity of BH3, S2 and S7) in order to confirm acceptable residual concentrations of heavy metals are present with respect to the adopted HIL and PPIL and that the site is suitable for the intended land use; and
- If it is determined that site preparation works will not result in the excavation and removal of the shallow material at BH3 0.0-0.2m and S2 0.0-0.1m, remediation works will be required. In this event, it is recommended that a Remedial Action Plan (RAP) be developed to address remediation of the hotspots of contamination identified.

4.3. EIS 2016

Burtenshaw Scoufis Architecture + Interiors commissioned Environmental Investigation Services (EIS) to assign a waste classification to in-situ soil adjacent to the west of the athletics track located at 2 Bullecourt Avenue, Milperra NSW.

The aim of the investigation was to assess soil contamination issues at the site and to provide a waste classification for the material to be excavated for the proposed oval development.

The scope of work included the following:

- Review of available geological information;
- Soil sampling from three boreholes;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC); and
- Preparation of a letter report presenting the results of the investigation.

All results were below the site assessment criteria (SAC) adopted for the site. Overlying fill soils were classified as General Solid Waste (Non-putrescible) and underlying natural soils were classified as

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Virgin Excavated Natural Material (VENM). Based on this data EIS concluded that the risk of widespread significant soil contamination in the development area was relatively low. The fill and natural soil material assessed was considered by EIS to be suitable for re-use on the subject site, provided it meets geotechnical and earthwork requirements.

4.4. JBS&G 2018

JBS&G Australia Pty Ltd (JBS&G) were engaged by Western Sydney University (WSU) (the client) to prepare a Phase 1 Environmental Assessment Report for the WSU Milperra Campus located off Bullecourt Avenue, Milperra NSW (the site). Based on current Master Plan concepts for the Milperra Campus, JBS&G understood WSU intends to create an integrated living and working precinct with a range of land uses including medium to high density residential, mixed use, retail, community, open space and conservation areas at the site.

The objective of the investigation was to assess the potential for contamination relating to historical and current land use activities at the site to constrain the intended development objectives, and to make recommendations for further investigations and or remediation to achieve intended land uses of the development.

To meet the project objectives, JBS&G carried out the following scope of works:

- Review of available council documentation, aerial photographs, legal title information, EPA records and heritage records to identify areas of environmental concern (AECs) and associated contaminants of potential concern (CoPC)
- Review of site setting including topography, hydrology, hydrogeology and geology;
- Review of records of environmental incidents or former environmental licenses held by the NSW EPA;
- A detailed site inspection of accessible areas to identify potential AECs and CoPC not identified in the historical record review;
- Development and documentation of a conceptual site model (CSM);
- Limited soil sampling and analysis of soil samples for a range of CoPC;
- Assessment of soil sampling and analysis results against EPA endorsed guideline criteria for residential land use; and
- Preparation of the Phase 1 Environmental Site Assessment report in general accordance with guidelines made or approved by the NSW EPA.

Surrounding land use at the time of JBS&Gs site walk over was comprised:

- North: Bullecourt Avenue with commercial / industrial land-use beyond including a service station to the north-west;
- East: Mount Saint Joseph's High School and Horsley Road with commercial / industrial land-use beyond;
- South: The South Western Motorway (M5) with Kelso Landfill beyond; and
- West: Ashford Avenue with residential land-use beyond.

A SafeWork NSW search of the Stored Chemical Information Database (SCID) and the microfiche records held by SafeWork was requested. Information provided by SafeWork NSW included details on a number of abandoned (2) underground storage tanks (USTs) formerly located in the central eastern section of the site. Review of the SafeWork NSW documentation indicated the 2 x 2,500L USTs were removed on Friday 19 December 1997 by Email Petroleum Systems.

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Based on site history review and observations during the site walkover, JBS&G identified the following AEC and associated CoPC presented in **Table 4.4**

Table 4.4- AECs and associated CoPCs

Areas of Environmental Concern (AECs)	Contaminants of Potential Concern (CoPCs)
Demolition of historical site structure that may have contained hazardous building materials	Heavy metals, lead and asbestos
Surface soils impacted with herbicides/pesticides due to the maintenance of site from noxious weeds/pests	OCPs
Fill materials across the site, potential imported to site	Heavy metals, TRH, BTEX, PAH, OCPs, PCBs and asbestos
Burial Area (fill material)	Heavy Metals, PAH, OCPs and asbestos
Groundwater along the northern and eastern boundaries adjacent commercial / industrial properties	Heavy metals, TRH, BTEX, PAH, VOCs
Landfill gas along the southern boundary adjacent the Kelso Landfill	Methane and other landfill gases (LFG)

Based on the unidentified sources of fill material potential imported to the site to backfill/raise topographic features and the potential for fill material at the site to contain waste materials associated with demolition of historical buildings potential containing asbestos and/or lead paint, fill materials must be considered a potential contaminated medium. Due to the age of some existing site structures, it is possible that they may contain hazardous building materials including asbestos and lead based paints. Soils immediately surrounding buildings are considered as potentially contaminated medium.

In addition, buildings containing asbestos and / or lead paint which may have been demolished without appropriate controls may have also impacted surface soils. Surface soils must also therefore be considered a potential contaminated medium.

Based on the suspected depth of groundwater >8 m bgs, the likelihood of contamination of groundwater as a result of activities at the site is considered to be low. Based on the presence of the landfill site to the south and the nearby commercial/industrial properties to the north and east, there is potential for groundwater to be impacted as a result of offsite activities.

Given the relatively close proximity of the landfill to the south of the site, landfill gas has the potential to be a contaminatr3ed medium in the southern portion of the site.

JBS&G carried out a limited detailed site inspection and investigation. During the detailed site inspection JBS&G noted the observation of topography for potential adjustments in ground levels due to filling, presence of waste material such as asbestos containing material (ACM) on the ground surface and on external surfaces of structures and potential chemical/fuel storage, use or spillage.

On 23 August 2017, ten surface samples were collected from the site using a hand auger and forward to a NATA accredited laboratory for analysis of heavy metals, PAH, asbestos (NEPM 500ml) and OCPs. During soil sampling, a geotechnical fabric layer was identified below the ground surface at

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sampling point SS10. Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- SS10 – asbestos fibres/fibrous asbestos (AF/FA) detected at 0.02% w/w above the adopted HSL site criteria 0.001% w/w.

Based on the findings of this investigation, JBS&G made the following conclusions:

- The site has historically been used for a combination of agricultural and residential uses prior to development of the university;
- There is the potential for impacts to soil as a result of the demolition of former building structures potentially containing hazardous building materials, including asbestos and lead paint. This was confirmed by the identification of asbestos at sampling point SS10 and review of the Coffey 2011 Phase 2 Environmental Site Assessment Report, which also identified and recommended management of asbestos in soil;
- There is the potential for presence of imported fill material of unknown origin to have been used during historical construction activities at the site; and
- Based on the presence of the landfill site to the south and the nearby commercial industrial properties to the north, northwest and east, there is considered to be a potential for contaminated groundwater and landfill gas migration to have impacted the site.

Based on these conclusions, JBS&G recommended a detailed site investigation (DSI) is undertaken for the site in order to assess the extent and degree of contamination at the site and to provide an assessment of risk posed by site contaminants to human and environmental health. In addition to the DSI, JBS&G recommended a hazardous building material survey be completed prior to commencement of redevelopment works such that materials identified as comprising lead paint and or asbestos may be appropriately managed with regard to exposure risks to site workers and future building occupants.

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5. CONCEPTUAL SITE MODEL

5.1. Sources of Contamination and Contaminants of Concern

A conceptual site model (CSM) is a representation of site-related information regarding contamination source, receptors and exposure pathways between identified sources and receptors. The CSM has been completed using the available data and completed on-site works. The methods used in the CSM are in general accordance with Section 4 of the NEPM (2013) Schedule B2 guideline. For a site to be designated as Contaminated Land, a plausible linkage between the identified Sources, Pathways and Receptors must be demonstrated. **Table 5.1** and associated **Figure 3,** outlines the identified areas of environmental concern (AECs), known and potential sources of contamination, corresponding contaminants of potential concern and the associated mechanism(s) of contamination identified for the site .

Table 5.1 Conceptual Site Model

Area of Environmental Concern (AEC)	Sources of Contamination	Contaminants of Potential Concern (CoPC)	Likely Mechanism(s) of Contamination
AEC01	Whole site – historical uncontrolled demolition, uncontrolled filling and regrading, historical farming practices.	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).	Top down
AEC02	Building Rubble Burial Area (refer Coffey 2011 & JBS&G 2018)	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).	Top down
AEC03	Uncontrolled large-scale filling/ bulk soil storage.	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).	Top down
AEC04	Underground storage or petroleum-based product onsite (refer JBS&G 2018).	Metals, PAH, BTEX, TRH.	Sub-surface release

5.2. Potentially Affected Media

Recognizing the potentially affected media is key to identifying the potential pathways between contaminant sources and receptors. Where the pathway between a source and a receptor is incomplete, the exposure to chemical substances via that pathway cannot occur. **Table 5.2** outlines the known and potential sources of contamination and associated potentially affected media identified for the site.

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Table 5.2 – Potentially affected media

Area of Environmental Concern (AEC)	Sources of Contamination	Contaminants of Potential Concern (CoPC)
AEC01	Whole site – historical uncontrolled demolition, uncontrolled filling and regrading, historical farming practices.	Soil
AEC02	Building Rubble Burial Area (refer Coffey 2011 & JBS&G 2018)	Soil
AEC03	Uncontrolled large-scale filling/ bulk soil storage.	Soil
AEC04	Underground storage or petroleum-based product onsite (refer JBS&G 2018).	Soil and Groundwater

5.3. Human and Ecological Receptors

The site is proposed for redevelopment, comprising a low density residential development. Based on the proposed land use scenario, previously completed contamination reports and guidance provided in Section 2.2 of NEPM (2013), AG considers it reasonable to adopt the 'HIL A – Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools.

Based on the existing and proposed land-use setting, the need for further ecological assessment is considered warranted using ecological investigation levels (EILs) and ecological screening levels (ESLs) outlined in NEPM (2013).

5.4. Potential and Complete Exposure Pathways

Potential and complete exposure pathways refer to the way in which potential contamination makes contact with the receptor. There are three primary exposure pathways:

- Direct contact;
- Inhalation/vapor intrusion; and
- Ingestion.

These key exposure pathways have been considered in **Sections 5.4.1** to **Section 5.4.4** in accordance with Section 4 of the NEPM (2013) Schedule B2 guideline.

5.4.1. Direct Contact – Human Health

AG notes that the proposed development includes building footprints and hardstand pavement areas across large portions of the site, which would act as a direct contact barrier between potential land contamination and onsite receptors during operation of the site.

However, within soft scaped/bush areas and during construction, future residents, the public and construction employees may complete the direct contact exposure pathway between potential contamination and receptors.

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5.4.2. Inhalation / Vapour Intrusion – Human Health

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) is required.

The review of historical evidence and previously completed contamination assessments indicated a moderate likelihood for a potential primary source to be present in soil and groundwater onsite (historical USTs (JBS&G 2018) – AEC04) and secondary vapour source migrating onto site in groundwater from surrounding land-use activities (commercial/industrial properties including service station (north & east) and landfill gas (south) (JBS&G 2018)).

Site walkover observations and previously completed contamination assessments indicated a potential land use activity to be uncontrolled demolition and filling. The excavation, transport, placement and spreading of imported (uncontrolled) fill material involves significant disturbance of soils which typically results in volatilisation of vapour producing contaminants. On that basis, the potential for vapours to be present in fill soils on site at concentrations which might present an unacceptable exposure risk, is considered to be low to negligible.

AG will consider data obtained during fieldwork in the context of inhalation / vapour intrusion risk.

5.4.3. Aesthetics – Human Health

Section 3.6.3 of NEPC (1999a) advises that there are no specific numeric aesthetic guidelines, however site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

As a conservative measure, AG will consider data obtained during fieldwork in the context of aesthetics risk.

5.4.4. Terrestrial Ecosystems – Ecological Health

Section 3.4.2 of NEPM (ASC) 2013 advises that the protection of the environment (terrestrial and aquatic) should be a consideration for all site assessments.

Based on the field observations, review of previous completed contamination assessment reports, advice in NEPM ASC (2013) and the nature and extent of the proposed development concept, the need for further ecological assessment is considered warranted.

5.4.5. Management Limits for Petroleum Hydrocarbon Compounds

NEPM (2013) notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosive hazards; and
- Effects on buried infrastructure (e.g. penetration of or damage to, in-ground services by hydrocarbons).

NEPM (2013) includes ‘management limits’ to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum depth to which the limits should apply. NEPM (2013) also notes that management limits may have less relevance at

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operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

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6. DETAILED SITE INVESTIGATION METHODOLOGY

Soil and groundwater sampling and analysis were undertaken with reference to the following documents:

- NSW EPA 1995. *Contaminated Sites Sampling Design Guidelines,* NSW Environment Protection Authority, Sydney South;
- NEPC. 1999. *'National Environment Protection (Assessment of Site Contamination) Measure. Schedule B (2) Guideline on Data Collection, Sample Design and Reporting.'* National Environmental Protection Council, Adelaide;
- Standards Australia. 2005*.' AS 4482.1. Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds.'* www.standards.com.au*;*
- Standards Australia. 1999. *'AS 4482.2. Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 2: Volatile Compounds'.* www.standards.com.au*;*
- Standards Australia. 1998. *'AS/NZS 5667.11:1998. Water Quality – Sampling. Part 11: Guidance on Sampling of Groundwater.'* www.standards.com.au*;*
- Standards Australia. 1998. *'AS/NZS 5667.1:1998. Water Quality – Sampling. Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples'.* www.standards.com.au*; and*
- ACS NEPM. 2013 *National Environment Protection (Assessment of Site Contamination) Measure 1999 Schedule B (1) Investigation Levels for Soil and Groundwater.*

6.1. Scope of Fieldworks

Due to site constraints, the Stage 2 Detailed Site Investigation will only account for approximately 65% of the site in terms of intrusive sampling. Consequentially, the nature, extent and degree of potential contamination will not be adequately assessed on the entirety on the site. Therefore, the fieldwork component of this detailed site investigation has been designed to target soil and groundwater locations in accessible areas that will cause minimal disturbance to the operating university.

All site investigation works will be supervised by an experienced AG Environmental Scientist.

The scope of the investigation was developed based upon the findings of previous contamination assessment, site walkovers and survey findings. Based upon this approach, the following scope of works will be carried out:

- Completion of a site-specific Safe Work Method Statement in accordance with AG Work Health and Safety policies;
- Completion of one hundred and two (102) borehole/ test pit/ hand augur locations;
- Collection of soil samples from each of the 102 borehole/ test pit/ hand augur locations;
- Construction and development of eight (8) groundwater monitoring wells;
- Collection of groundwater samples from the eight (8) groundwater monitoring wells;
- Collection and analysis of quality assurance/quality control (QA/QC) samples in accordance with NEPM requirements; and
- Analysis of a selection of primary soil and groundwater samples and 10% quality control samples.

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6.2. Fieldworks Methodology

6.2.1. Soil Sampling Methodology

Discrete soil samples will be recovered from 102 boreholes/ test pits/ hand augur locations. Each soil sample will be collected using a new clean pair of nitrile gloves and placed in the appropriate sample containers provided by the laboratory.

The soil bores will be drilled to a maximum depth of 4.0m bgl or refusal. Samples for potential analysis will be collected from the near surface, at ~0.5 m interval within the soil profile or with change of strata.

The soil jars were labelled with sample identification (sample location and depth), date and name of sampler.

Upon completion of the soil boring, where applicable, the boreholes will be backfilled and the surface will be concreted using asphalt.

Soil bore logs will be maintained in the field by an experienced AG environmental scientist for all exploratory holes. Field observations such as lithology, odours, staining, depth of water etc. will be noted on the logs. The logs are presented within **Appendix C.**

6.2.2. Groundwater Monitoring Well Installation

Eight (8) groundwater monitoring wells will be installed within predetermined accessible areas surrounding the site.

The groundwater monitoring wells will be installed using slotted 50 mm Class 18 PVC fitted with an end cap. The screen will be packed with acid washed 1–3 mm gravel. Bores will be extended to at least 2m below the static water level, with the screen located approximately 0.5m above static water level to the base of the bore. A bentonite seal will be placed above the screen with the remainder of the annulus above the seal backfilled with clean washed sand and concrete. The bores will be finished with a flush lockable gatic cover.

Groundwater monitoring well logs are included in borehole logs **Appendix C.**

The above methodologies reflect the requirements of the NSW EPA and Australian Standards.

6.2.3. Groundwater Sampling and Monitoring Methodology

Following the groundwater monitoring well installation activity, all site groundwater monitoring wells (MW01 to MW08) will be then purged, tested and sampled in accordance with Australian Standards, NSW EPA and NEPM 2013 Guidelines.

Prior to groundwater sampling, the groundwater level in each monitoring well will be measured using an oil / water interface meter. This will adequately assess the depth to groundwater and whether light non-aqueous phase liquids (LNAPL) are present in the water column.

A YSI multiparameter meter will be used to measure pH, electrical conductivity (EC), redox potential, dissolved oxygen (DO) and temperature (groundwater indicators). Purging will be undertaken until the field parameters were stable (generally within 10% or 0.1 for pH) for three consecutive readings taken 5 minutes apart.

The groundwater stabilisation data will be recorded on groundwater sampling logs provided in **Section 8.8** with the calibration certificate presented in **Appendix F**.

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6.3. Laboratory Analysis

A selection of soil and all groundwater samples will be forwarded to a NATA accredited laboratory for analysis of a range of the analytes listed below. Eurofins | Mgt will be used for analysis of primary samples. ALS Environmental will be used for the analysis of interlaboratory samples.

A selection of primary soil samples will be submitted for analysis for a range of the following analytes:

- TRH;
- BTEX;
- PAHs;
- OCPs / OPPs;
- PCBs;
- Phenols;
- Metals (As, Cd, Cr, Cr (VI), Cu, Ni, Pb, Zn);
- Asbestos ID; and
- Asbestos 0.001%;

Primary groundwater samples will be analysed for a selection of the following analytes:

- TRH;
- BTEX;
- PAH;
- Phenols;
- Trace metals (As, Cd, Cr, Cr (VI), Cu, Ni, Pb, Zn);
- Nitrogen & phosphorus species; and
- Anions and cations.

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7. DATA QUALITY OBJECTIVES

Appendix B of NEPC (2013b) provides guidance on the development of data quality objectives (DQO) using a seven-step process.

7.1. Step 1: State the problem

The first step involves summarising the contamination problem that will require new data and identifying the resources available to resolve the problem.

The key objectives of this project are to:

- assess the potential for contamination to be present on the site in available/accessible areas as a result of past and current land use activities;
- provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- provide recommendations for further investigation, management and/or remediation (if warranted).

This project is being undertaken because:

- the site is the subject of redevelopment works; and
- Areas of environmental concern identified onsite, have the potential to present an unacceptable human health exposure risk in the context of the proposed land use setting.

The project team identified for this project includes Alliance Geotechnical Pty Ltd, the developer and the planning consent authority.

The regulatory authorities identified for this investigation include NSW EPA and Canterbury Bankstown Council.

7.2. Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this investigation include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- Do the concentrations of contaminants of potential concern (COPC) present an unacceptable exposure risk to identified receptors, for the proposed land use setting?
- Is the site suitable or can the site be deemed suitable for the proposed land use setting, in the context of land contamination?

7.3. Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions for this investigation, will include:

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- data obtained during searches of the site's history;
- review of previously completed contamination assessment reports
- the nature and extent of sampling at the site, including both density and distribution;
- samples of relevant site media;
- the NATA accredited analysis of physical and/or chemical parameters of the relevant site media samples; and
- assessment criteria adopted for each of the media sampled.

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 5** of this project, the assessment criteria relevant to the proposed land use setting adopted for this investigation include:

- Human health direct contact – HILs in Table 1A (1) in NEPC (2013a) and HSLs in Table B4 of Friebel, E & Nadebaum, P (2011);
- Human health inhalation/vapour intrusion – HSLs in Table 1 (A) in NEPC (2013a);
- Petroleum hydrocarbon compounds (management limits) – Table 1 B(7) of NEPC (2013a);
- Ecological Assessment - Site specific ecological investigation levels (EILs) will be generated based on pH and cation exchange capacity data obtained from the site soils. Ecological screening levels (ESLs) will be derived from Table 1B(1), (2) (3), (4), (5) and (6) in NEPM (ASC) 2013; and
- Aesthetics – no highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds), no hydrocarbon sheen on surface water, no discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature, no large monolithic deposits of otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust), no presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste, and no soils containing residue from animal burial (e.g. former abattoir sites).

7.4. Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the site as defined by its boundaries.

The temporal boundaries of the project include:

- the project timeframes presented in AG's proposal for this project, and subsequent remediation contractor works program (if required);
- unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- access availability of the site; and
- availability of AG field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination will be based on the conceptual site model and determined by NATA accredited laboratory analytical results.

The vertical extent that contamination will be based on the conceptual site model and determined by NATA accredited laboratory analytical results.

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The scale of the decisions required will be based on the entire site.

Constraints which may affect the carrying out of this investigation may include access limitations, presence of above and below ground infrastructure, and hazards creating health and safety risks.

7.5. Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

7.5.1. Rinsate Blanks

One rinsate blank will be collected and scheduled for analysis, for each day of sampling undertaken, if non-disposable sampling equipment was used on that day. The rinsate blank will be analysed for at least one of the analytes the sample/s collected that day are being scheduled for analysis for (with the exception of asbestos).

7.5.2. Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, for each day of sampling undertaken, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH C_6-C_{10}).

7.5.3. Field Duplicates and Field Triplicates

Field duplicate and Field triplicates will be collected at a rate of one per twenty (5%) site samples collected. The duplicates and triplicates collected will be analysed for at least one of the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relevant percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate/triplicate will be calculated.

7.5.4. Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

7.5.5. If/Then Decision Rules

AG has adopted the following ‘if/then’ decision rules for this investigation:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this investigation; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this investigation (refer Section 7.3), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then AG will determine if additional data is required to allow interpretation to be undertaken.

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In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this investigation, AG will undertake an assessment of the exceedance in the context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

7.6. Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

AG will mitigate the risk of decision error by:

- Calculation of the 95% upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern;
- Assignment of fieldwork tasks to suitably experienced AG consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories;
- Assignment of data interpretation tasks to suitably experienced AG consulting staff, and outsourcing to technical experts where required.

AG will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Table 7.6 - Data Quality Indicators

COMPLETENESS			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Critical locations sampled	Refer **Section 6.1.6**	Critical samples analysed according to DQO	Refer **Section 6.1.6**
Critical samples collected	Refer **Section 6.1.6**	Analytes analysed according to DQO	Refer **Section 6.1.6**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 6.1.6**
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis
		Sample extraction and holding times complied with	Refer **Section 6.1.11**

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COMPARABILITY			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer **Section 6.1.6**
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	Same LORs at primary laboratory	Refer **Section 6.1.6**
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	Same laboratory for primary sample analysis	All primary samples to Eurofins MGT
		Same analytical measurement units	Refer **Section 6.1.11**
REPRESENTATIVENESS			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to SAQP	Refer **Section 6.1.6**	Samples analysed according to SAQP	Refer **Section 6.1.6**
Media identified in SAQP sampled	Refer **Section 6.1.6**		
PRECISION			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates No limit for analytical results <10 times LOR 50% for analytical results 10-20 times LOR 30% for analytical results >20 times LOR	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%		
ACCURACY (BIAS)			

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Field Considerations	Assessment Criterion	Laboratory Considerations	Assessment Criterion
Rinsate blanks	Less than laboratory limit of reporting	Laboratory method blank	No exceedances of laboratory acceptance criteria
Field trip spikes	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of laboratory acceptance criteria
Field trip blanks	Analyte concentration <LOR	Surrogate spike recovery	No exceedances of laboratory acceptance criteria
		Laboratory control sample recovery	No exceedances of laboratory acceptance criteria

7.7. Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

7.7.1. Sampling Point Layout Plan

Table A in NSW EPA *Sampling Design Guidelines* (1995) provides guidance on minimum sampling point densities required for site characterisation, based on detecting circular hot spots by using a systematic sampling pattern. This guidance assumes the investigator has little knowledge about the probable locations of the contamination, the distribution of the contamination is expected to be random (e.g. land fill sites) or the distribution of the contamination is expected to be fairly homogenous (e.g. agricultural lands).

However, Section 3.1 of NSW EPA (1995) states that a judgemental sampling pattern can be used where there is enough information on the probable locations of contamination. Further to this, Section 6.2.1 of NEPC (2013b) states that the number and location of sampling points is based on knowledge of the site and professional judgement. Sampling should be localised to known or potentially contaminated areas identified from knowledge of the site either from site history or previously completed site contamination assessments. Judgemental sampling can be used to investigation sub-surface contamination issues in site assessments.

As this investigation follows previously completed contamination assessments that provided a limited understanding of site contamination within localised areas onsite, it is considered reasonable to carry out a combination of both suggested sampling patterns and conduct both systematic and targeting sampling points.

The proposed sampling point layout arrangement for this project is presented in **Table 7.7.1**. The locations of the proposed sampling points are set out in **Figure 4**.

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Table 7.7.1 Sampling Point Layout Arrangement

Area of Environmental Concern	Sampling Point ID	Method	Target Depth of Sampling Point (m bgs)
AEC01	BH01 to BH08, BH10, BH11, BH14, BH15, BH19, BH20, BH23 to BH52, BH54, BH57 to BH84 and BH86 to BH100	Mechanical push tube and solid flight auger.	Targeting natural material and inferred groundwater table (BH01 to BH08).
AEC02	BH18 to BH21	Mechanical push tube and solid flight auger	Targeting natural material
AEC03	TP09, TP12, TP13, TP16, TP17, TP22, TP53, TP55, TP56, TP85 and TP101	Excavator	Targeting natural material
AEC04	Inaccessible	N/A	N/A

If visual or olfactory observations indicated a potential for soil contamination to be present, then collection of additional samples will be considered.

The location of each sampling point will be marked on a site plan with GPS co-ordinates recorded on borehole logs.

7.7.2. Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the sampling point number and the depth/interval the sample was collected from, e.g. a sample collected from borehole BH08 at a depth of 0.2m to 0.4m below ground level, would be identified as BH08/0.2-0.4.

Project samples will be stored in laboratory prepared glass jars and placed in insulated container/s with ice.

Samples will be transported to the relevant NATA accredited analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- AG project identification number;
- Each sample identifier;
- Date each sample was collected;
- Sample type (e.g. soil or water);
- Container type/s for each sample collected;
- Preservation method used for each sample (e.g. ice);
- Analytical requirements for each sample and turnaround times; and
- Date and time of dispatch and receipt of samples (including signatures).

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7.7.3. Decontamination

In the event that non-disposable sampling equipment is used, that equipment will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

7.7.4. Laboratory Selection

The analytical laboratories used for this project will be NATA accredited for the analysis undertaken.

7.7.5. Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled;
- Headspace screening results (where applicable); and
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on site history and previously completed contamination assessments, AG has adopted the laboratory analytical schedule presented in **Table 7.7.5.1 and Table 7.7.5.2 for** this project.

Table 7.7.5.1 Laboratory Analytical Schedule – Soil

Sampling Point ID	Analytical Schedule
BH01 to BH08, BH10, BH11, BH14, BH15, BH18 to BH21, BH23 to BH52, BH54, BH57 to BH84 and BH86 to BH100 TP09, TP12, TP13, TP16, TP17, TP22, TP53, TP55, TP56, TP85 and TP101	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).

Table 7.7.5.2 Laboratory Analytical Schedule – Groundwater

Sampling Point ID	Analytical Schedule
MW01 to MW08	Inorganic Compounds, BTEX, PAH, Metals, VOCs, OCP/OPP, PCB, TRH.

7.7.6. Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 7.7.6**

Table 7.7.6 Laboratory Holding Times, Analytical Methods and Limits of Reporting

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
BTEX and TRH C_6-C_{10}	14 days	USEPA 5030, 8260B and 8020	0.2-0.5
TRH >C_{10}-C_{40}	14 days	USEPA 8015B & C	20-100
VOC	14 days	USEPA 8260	0.1-0.5
PAH	14 days	USEPA 8270	0.1-0.5
OCP	14 days	USEPA 8081	0.2
PCB	14 days	USEPA 8270	0.2
Metals	14 days	USEPA 8015B & C	0.05 – 2
Asbestos	No limit	Inhouse Method	0.001% w/w

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8. FIELDWORK

8.1. Soil Sampling

Soil sampling was undertaken by AG on 16, 17, 18 & 19 December 2019 and 8, 9 &15 January 2020. An underground utility locating contractor was engaged to survey each sampling point for the presence of underground services.

A total of 102 sampling points were established onsite using a combination of track-mounted drill rig fitted with push tube and solid flight augers, 5 tonne excavator, mechanically operated push tube and hand auger equipment.

The locations of the sampling points established onsite are presented in **Figure 4.**

Image 8.1.1 View of excavation works at sampling point TP56



Image 8.1.2 View of drilling works at sampling point BH08



Samples were collected at each sampling point and placed in laboratory supplied acid-rinsed glass jars (with Teflon lined lids) and 500 mg zip-lock bags. The jars and bags were labelled with the project number, sample identifier and date the samples were collected on.

At the completion of soil sampling, boreholes (BH01 to BH08) were preserved for groundwater well installation while all other sampling point locations were backfilled.

Each sampling point established was marked on a site plan. The locations of these sampling points are presented in **Figure 4**.

8.2. Site Geology

Observations were made of soils encountered during sampling work. These observations were recorded on borehole logs. A copy of these logs is presented as **Appendix C**. Anthropogenic materials such as concrete and asphalt gravels, glass, PVC piping and brick were observed within the fill profile onsite.

8.3. Headspace Screening

Samples collected were subjected to headspace screening. A sub sample from each sampling point was placed in a zip lock bag, sealed and shaken. Each bag was then pierced with the probe tip of a calibrated photoionisation detector (PID) and the screening results recorded. These results are recorded on the borehole logs presented in **Appendix C**.

The results of the headspace screening indicated the potential for ionisable volatile organic compounds (VOC) to be present in the samples, was low.

A copy of the calibration record for the PID is presented in **Appendix D.**

8.4. Odours

Olfactory evidence of odours in the soil samples collected, was not detected.

8.5. Staining

Visual evidence of staining in the soil samples collected, was not detected.

8.6. Potential Asbestos Containing Materials

Visual evidence of potential asbestos containing materials (ACM) in the soil samples collected, was detected at sampling points:

- TP09;
- TP53;
- TP56;
- BH59; and
- TP101;

8.7. Groundwater Monitoring Well Installation

A total of eight (8) groundwater monitoring wells were installed on 16, 17 and 18 December 2019 by Epoca Environmental Drilling, under the supervision of AG, at sampling points BH01/MW01 to BH08/MW08. Each well location was drilled using a track mounted drilling rig fitted with push tube and solid stem rotary augers.

Drilling depths were extended to a nominal depth ranging between 5m to 10m bgl. A monitoring well was then constructed using 50mm uPVC Class 18 screen and casing, PVC end cap, gravel pack, hydrated bentonite seal, lockable torque cap and a cast iron gatic lid.

Monitoring well construction details (MW01 to MW08) are included in the borehole logs presented in **Appendix C**.

On 18 December 2019, each monitoring well was developed using a battery-operated submersible pump or bailer, with groundwater removed from each well until dry.

Surveying points were established by Affinity Survey from the top of each monitoring well casing, to provide a comprehensive understanding of groundwater movement onsite (refer to **Appendix E)**. Following the survey evaluation, AG assessed each monitoring well using an interface probe to measure the depth to standing water level (SWL) from the top of casing (TOC). The depth to groundwater measured during the well gauging task, is presented in **Table 7.7.1** with inferred groundwater flow direction depicted in **Figure 5.**

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Table 8.7.1. Monitoring Well Gauging Results

Sampling Point	Top of Casing (TOC) Level (m AHD)	Gauged Depth to Groundwater (m) from (TOC)	Standing Water Level (m AHD)
MW01	7.374	0.875	6.499
MW02	5.475	3.800	1.675
MW03	7.494	5.960	1.534
MW04	16.672	4.503	12.169
MW05	21.697	5.385	16.312
MW06	18.711	Well Dry	Not Applicable
MW07	20.557	Well Dry	Not Applicable
MW08	16.641	4.335	12.306

Based on the survey results and gauged depth to groundwater, it is considered reasonable to assume groundwater onsite is flowing from the northeast corner to the west and south.

The locations of the monitoring well sampling points (MW01 to MW08) established on site, are presented in **Figure 4.**

8.8. Groundwater Monitoring Event

A groundwater monitoring event (GME) was undertaken at all monitoring wells located onsite (MW01 to MW08) on 8 January 2020 by AG.

A bailer was used at each groundwater monitoring well to initially conduct a visual and olfactory investigation for the potential presence of LNAPL onsite. No visual or olfactory evidence of LNAPL was detected at each groundwater monitoring well (MW01 to MW08).

Subsequently, monitoring wells were purged using a low-flow peristaltic pump and field water quality parameters were measured using a calibrated water quality meter and flow cell (where possible). Measured field water quality parameters at the completion of purging each well, are presented in **Table 8.8.1**.

Table 8.8.1 Field Water Quality Parameters

Sampling Point	Dissolved Oxygen (ppm)	Electrical Conductivity (µs/cm)	pH	Redox (mV)	Temperature (^{o}C)
MW01	0.75	25151	6.32	60.5	22.6

Sampling Point	Dissolved Oxygen (ppm)	Electrical Conductivity (µs/cm)	pH	Redox (mV)	Temperature (°C)
MW02	1.86	8962	5.50	72.2	21.1
MW03	3.12	17277	5.28	134.8	22.5
MW04	3.44	17566	6.59	132.4	23.3
MW05	1.22	26261	6.16	157.7	24.9
MW06	Groundwater Well Dry				
MW07	Groundwater Well Dry				
MW08	0.67	24360	5.69	94.6	21.4

Once the field water quality parameters had equalised at the completion of purging each monitoring well, laboratory supplied groundwater sampling containers were filled with the extracted groundwater from each groundwater monitoring well (MW01 to MW08). The containers were labelled with the project number, sample identifier and date the samples were collected on and forwarded to a NATA accredited laboratory for analysis of CoPC.

A copy of the calibration record for the water quality meter is presented in **Appendix F**.

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9. LABORATORY ANALYSIS

The samples collected were transported to the analytical laboratory, using chain of custody (COC) protocols. A selection of these samples was scheduled for analysis, with reference to the relevant COPC identified for the AEC that the samples were collected from.

A copy of the analytical laboratory certificates of analysis, is presented in **Appendix G**.

The sample analytical results were tabulated and presented in the attached **Table LAR1** and **Table LAR2** with relative percent difference calculations presented in **Table LAR3**.

Laboratories engaged for analytical testing purposes were all NATA accredited.

Laboratory procedures to ensure samples are representative include the reporting of holding times, sample conditions upon receipt and the analysis of several QC samples. QC samples generally reported include duplicates, blanks, matrix spikes, and laboratory control samples (LCS).

These QC samples are reported within the laboratory reports in **Appendix G**, and any outliers are discussed below.

9.1. Holding Times

All sample analysis was conducted within the acceptable holding times.

9.2. Sample Condition

Sample condition upon arrival at the laboratory is documented on the sample receipt provided by the laboratory and provided in **Appendix G**.

All samples were reported to arrive at the laboratory in appropriate containers, packaged in a chilled cool box.

9.3. Blanks

Blanks are analysed to determine if laboratory processes are impacting results. Solvents are processed in the same manner as the primary samples.

Blanks are analysed at a rate of one per ≤20 samples and should be reported at below the PQL.

No detects were reported in the laboratory blanks.

9.4. Laboratory Control Samples

Laboratory Control Samples (LCS) are a standard reference material to which representative analytes are added. LCS are used to check the accuracy of laboratory testing procedures. LCS are analysed at a rate of one per ≤20 samples. Reported percentages are expected to be generally ±20% with higher percentages being acceptable for some organics and inorganics in soils.

All LCS samples reported as acceptable.

9.5. Duplicates

Duplicates refer to the process of running the same sample twice. Duplicates check the precision of the laboratory testing techniques. Duplicates are analysed at a rate of one per ≤10 samples.

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Duplicates values are judged based on RPD calculations using the following formula:

RPD = (a-b)/ ((a+b)/2)*100

*a is the primary value

*b is the duplicate or interlaboratory value

RPD values are generally expected to be below 50 however values determined using results below five times the PQL may be higher while RPD calculated from values greater than ten times the PQL should be lower.

No laboratory RPD values are reported as exceeding the laboratory levels.

9.6. Matrix Spikes

Matrix spikes have a known concentration of a target analyte added to the sample to determine if the physical properties of the sample are interfering with the reported results.

Matrix spikes are not carried out for all analytes and are expected to fall within the range 60-140%.

No matrix spikes were reported outside of acceptable levels

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10. DATA QUALITY INDICATOR ASSESSMENT

10.1. Completeness

An assessment of the completeness of data collected was undertaken, and the results presented in **Table 10.1**.

Table 10.1 Completeness DQI

Field Considerations	**Target**	**Actual**	**Comment**
Critical locations sampled	102 soil and 8 groundwater	102 soil and 8 groundwater	Performance against indicator considered acceptable.
Critical samples collected	Refer **Section 7**	Refer **Section 7**	Performance against indicator considered acceptable.
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	All sampling point logs, calibration logs and chain of custody forms	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Critical samples analysed according to DQO	Refer **Section 7**	Refer **Section 7**	Performance against indicator considered acceptable.
Analytes analysed according to DQO	Refer **Section 7**	Refer **Section 7**	Performance against indicator considered acceptable.
Appropriate laboratory analytical methods and LORs	Refer **Section 7**	Refer **Section 7**	Performance against indicator considered acceptable.
Sample documentation complete	All sample receipt advices, all certificates of analysis	100%	Performance against indicator considered acceptable.
Sample extraction and holding times complied with	Refer **Section 7**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

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10.2. Comparability

An assessment of the comparability of data collected was undertaken, and the results presented in **Table 10.2**.

Table 10.2 Comparability DQI

Field Considerations	**Target**	**Actual**	**Comment**
Same SOPs used on each occasion	100%	100%	Performance against indicator considered acceptable.
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	100%	Performance against indicator considered acceptable.
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Same analytical methods used by primary laboratory	Refer **Section 7**	100%	Performance against indicator considered acceptable.
Same LORs at primary laboratory	Refer **Section 7**	100%	Performance against indicator considered acceptable.
Same laboratory for primary sample analysis	All primary samples to Eurofins MGT	100%	Performance against indicator considered acceptable.
Same analytical measurement units	Refer **Section 7**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately comparable.

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10.3. Representativeness

An assessment of the representativeness of data collected was undertaken, and the results presented in **Table 10.3**.

Table 10.3 Representativeness DQI

Field Considerations	**Target**	**Actual**	**Comment**
Appropriate media sampled according to DQO	Refer **Section 7**	100%	Performance against indicator considered acceptable.
Media identified in DQO sampled	Refer **Section 7**	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Samples analysed according to DQO	Refer **Section 7**	Refer comments	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

10.4. Precision

An assessment of the precision of data collected was undertaken, and the results presented in **Table 10.4**.

Table 10.4 Precision DQI

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Field Considerations	Target	Actual	Comment
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates	Soil 6.25 % duplicates and 6.25 % triplicates Groundwater 12.5 % duplicates and 12.5 % triplicates	**Parent duplicate/triplicate relationships are as follows**: Soil DUP01/1A – BH01-0.0-0.2 DUP02/2A – BH31-0.0-0.2 DUP03/3A – BH07-0.0-0.2 DUP04/4A – BH08-0.0-0.2 DUP05/5A – BH54-0.0-0.2 DUP06/6A – BH98-0.0-0.2 DUP07/7A – TP09-0.0-0.2 DUP08/8A – TP16-0.0-0.2 DUP09/9A – TP12-0.0-0.2 DUP10/10A – BH79-0.0-0.2 DUP11/11A – BH62-0.0-0.15 DUP12/12A – BH64-0.0-0.1 DUP13/13A – BH68-0.0-0.1 DUP14/14A – BH97-0.0-0.2 Groundwater DUP01/1A – MW01 **Exceedances of criteria included:** No exceedances in soil Groundwater Nickel - DUP-1A/MW01. The difference in nickel concentration between the primary and triplicate groundwater sample was 0.08mg/L. Both contaminant concentrations were detected by the laboratory to be within the same order of magnitude as nickel concentrations detected within the other groundwater samples across the site. Therefore, the detected concentrations of nickel in groundwater samples DUP-1A/MW01 are considered representative background concentrations. As a conservative approach, AG will consider the highest concentration when determining contamination concentrations at the site. Performance against indicator considered acceptable. Refer to **Table LAR3**
	No limit for analytical results <10 times LOR	Nil	
	50% for analytical results 10-20 times LOR	Nil	
	30% for analytical results >20 times LOR	Nil	

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SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Laboratory duplicates	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.

The data collected is considered to be adequately precise.

10.5. Accuracy

An assessment of accuracy of data collected was undertaken, and the results presented in **Table 10.5**

Table 10.5 Accuracy DQI

Field Considerations	**Target**	**Actual**	**Comment**
Rinsate blanks	Less than laboratory limit of reporting	Not applicable	Not applicable
Field trip spikes	Recoveries between 60% and 140%	Recoveries were between 96% and 110%	Performance against indicator considered acceptable.
Field trip blanks	Analyte concentration <LOR	Analyte concentrations were <LOR	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Laboratory method blank	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Matrix spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Surrogate spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Laboratory control sample recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.

The data collected is considered to be adequately accurate.

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11. DISCUSSION

11.1. Laboratory Analytical Results – Soil

11.1.1. Human Health - Direct Contact

Metals

The concentrations of arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

Duplicate soil sample DUP-07 returned laboratory analytical results for copper and nickel that exceeded the applicable adopted direct contact human health exposure criteria with extremely high concentrations (copper = 110,000mg/kg and nickel = 1,600mg/kg). The primary soil sample TP09-0.0-0.2 and the triplicate soil sample DUP-7A collected from the same sampling point (TP09), returned analytical results for copper and nickel that do not exceed the applicable adopted direct contact human health exposure criteria. As such, AG requested the NATA accredited laboratory retest soil sample DUP-07 for heavy metals, to ensure the exceedances are credible.

The concentrations of copper and nickel in the soil sample reanalysed (DUP-07), were less than the applicable adopted direct contact human health exposure criteria. Therefore, three soil samples collected from sampling point (TP09-0.0-0.2) returned contaminant concentrations for copper and nickel below the applicable adopted site criteria, indicating the soil is suitable for reuse onsite under the proposed land use criteria.

PAHs

The concentrations of naphthalene detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

The concentrations of benzo(a)pyrene TEQ detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

The concentration of total PAH detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

TRH

The concentrations of TRH C_6-C_{10}, >C_{10}-C_{16}, >C_{16}-C_{34} and >C_{34}-C_{40} detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria or less than the applicable adopted concentration criteria.

BTEX

The concentrations of benzene, toluene, ethyl benzene and xylenes detected in the soil samples analysed, were less than the laboratory limits of reporting or less than the applicable adopted concentration criteria.

OCP & OPP

The concentration of relevant OCP & OPP compounds detected in the soil samples analysed, were less than the laboratory limits of reporting or less than the applicable adopted concentration criteria.

PCB

The concentration of relevant PCB compounds detected in the soil samples analysed, were less than the laboratory limits of reporting or less than the applicable adopted concentration criteria.

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Phenols

The concentrations of halogenated and non-halogenated phenols detected in the soil samples analysed, were less than the laboratory limit of reporting or less than the applicable adopted concentration criteria.

Non-Friable Asbestos Containing Material

Non-friable asbestos containing material was not detected within the soil samples analysed, with the exception of:

- TP09–FCS: chrysotile asbestos detected on site surface;
- TP53–FCS: chrysotile and amosite asbestos detected in fill soils;
- TP56–FCS: chrysotile asbestos detected in fill soils;
- FCS–BH59: chrysotile asbestos detected on site surface;
- FCS–BH101: chrysotile asbestos detected on site surface; and
- TP101–FCS: chrysotile asbestos detected on site surface.

Asbestos Fines / Friable Asbestos

The concentration of friable asbestos and asbestos fines (FA and AF) detected in the relevant soil samples analysed were less than the applicable adopted health screening level (0.001 % w/w), with the exception of:

- BH39-0.0-0.2 – FA: chrysotile asbestos detected in weathered fibre cement fragment. Total estimated asbestos concentration in FA = 0.043%;

Friable asbestos was detected in weathered fibre cement material at concentrations below the laboratory limit of reporting (LOR) and applicable adopted health screening level (0.001% w/w) within the following sample:

- BH21-0.1-0.3.

11.1.2. Human Health – Inhalation / Vapour Intrusion

TRH

The concentrations of TRH C_6-C_{10} (minus BTEX) and >C_{10}-C_{16} (minus naphthalene) detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

BTEX

The concentrations of benzene, toluene, ethyl benzene and xylenes detected in the soil samples analysed, were less than the laboratory limits of reporting.

PAHs

The concentrations of naphthalene detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

11.1.3. Aesthetics

There were no highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds), no hydrocarbon sheen on surface water, no discoloured chemical deposits or soil staining with chemical waste, no large monolithic deposits of

otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust), no presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste, and no soils containing residue from animal burial (e.g. former abattoir sites) noted onsite.

11.1.4. Terrestrial ecosystem / Ecological health

Ecological Screening Levels (ESLs)

The concentrations of relevant contaminants of concern detected in the soil samples analysed were less than the applicable adopted ecological screening levels (ESL) with the exception of:

- TRH >C10-C16 (F2) in soil samples (BH62_0.0-0.15, BH64_0.0-0.1, BH78_0.0-0.2 and BH86_0.0-0.2); and
- TRH >C16-C34 (F3) in soil sample (BH62_0.0-0.15).

The detected concentrations of TRH >C10-C16 (F2) in the soil samples analysed were subjected to a statistical analysis using ProUCL 5.1. The maximum value of the data set was 210 mg/kg, the standard deviation of the data set was 19.37, while the 95% upper confidence limit was 56.28, which is less than the adopted ESL criteria for TRH >C10-C16 (F2). A copy of the TRH >C10-C16 (F2) ProUCL output is presented in **Appendix H.**

The detected concentrations of TRH >C16-C34 (F3) in the soil samples analysed were subjected to a statistical analysis using ProUCL 5.1. The maximum value of the data set was 1,800 mg/kg, the standard deviation of the data set was 188.3, while the 95% upper confidence limit was 179, which is less than the adopted ESL criteria for TRH >C16-C34 (F3). A copy of the TRH >C16-C34 (F3) ProUCL output is presented in **Appendix H.**

Ecological Investigations Levels (EILs)

The concentrations of relevant contaminants of concern detected in the soil samples analysed were less than the applicable adopted site-specific ecological investigation levels (EIL), with the exception of:

- Nickel in soil samples (TP12-2.6-2.8 and BH22_0.8-1.0).

The detected concentrations of nickel in the soil samples analysed were subjected to a statistical analysis using ProUCL 5.1. The maximum value of the data set was 73 mg/kg, the standard deviation of the data set was 8.257, while the 95% upper confidence limit was 11.88, which is less than the adopted EIL criteria for nickel. A copy of the nickel ProUCL output is presented in **Appendix H.**

11.1.5. TPH Management Limits

The concentrations of TRH C_6-C_{10}, >C_{10}-C_{16}, >C_{16}-C_{34} and >C_{34}-C_{40} detected in the soil samples analysed, were less than the applicable adopted TPH management limits or less than laboratory limits of reporting.

11.2. Laboratory Analytical Results – Groundwater

The laboratory analytical results for the groundwater samples were compared to relevant fresh and marine water quality guidelines in ANZECC & ARMCANZ (2000). The concentrations of the contaminants of potential concern analysed were less than the applicable ANZECC & ARMCANZ (2000) trigger values (95% species protection level), with the exception of the following:

- Cadmium – MW01 (0.0017 mg/L), MW02 (0.0003 mg/L), MW03 (0.0005 mg/L), MW05 (0.013 mg/L) and MW08 0.016 mg/L);

- Copper – MW02 (0.03 mg/L), MW03 (0.007 mg/L), MW04 (0.022 mg/L), MW05 (0.003 mg/L) and MW08 0.002 mg/L);
- Nickel – MW01 (0.022mg/L), MW02 (0.012 mg/L), MW03 (0.067 mg/L), MW04 (0.062 mg/L), MW05 (0.021 mg/L) and MW08 (0.034 mg/L);
- Zinc – MW01 (0.048 mg/L), MW02 (0.076 mg/L), MW03 (0.21 mg/L), MW04 (0.023 mg/L), MW05 (0.089 mg/L) and MW08 (0.77 mg/L); and
- Ammonia – MW04 (1.2 mg/L).

As contaminant concentrations were detected by the laboratory to be within the same order of magnitude as groundwater migrates across the site, no significant contribution to the CoPC are attributed to historic or on-going land-use activities. Therefore, the detected concentrations of CoPC in groundwater at the site are considered representative background concentrations of surrounding commercialised environments.

The samples were also compared to the Groundwater Health Screening Levels for vapour intrusion (clay 2 - 4m) for a residential land use. All groundwater samples returned concentrations lower than the adopted criteria as per Table 1A (4) of ASC NEPM 2013.

MAHs

The samples collected from groundwater monitoring wells MW01, MW02, MW03, MW04, MW05 and MW08 returned laboratory analytical results for MAHs less than the laboratory limit of reporting.

PAHs

The samples collected from groundwater monitoring wells MW01, MW02, MW03, MW04, MW05 and MW08 returned laboratory analytical results for naphthalene and benzo(a)pyrene less than the laboratory limit of reporting.

TRHs

The samples collected from groundwater monitoring wells MW01, MW02, MW03, MW04, MW05 and MW08 returned laboratory analytical results for TRHs above the laboratory limit of reporting.

VOCs

The samples collected from groundwater monitoring wells MW01, MW02, MW03, MW04, MW05 and MW08 returned laboratory analytical results for VOCs less than the laboratory limit of reporting.

PCBs

The samples collected from groundwater monitoring wells MW01, MW02, MW03, MW04, MW05 and MW08 returned laboratory analytical results for PCBs less than the laboratory limit of reporting.

OCPs

The samples collected from groundwater monitoring wells MW01, MW02, MW03, MW04, MW05 and MW08 returned laboratory analytical results for OCPs less than the laboratory limit of reporting.

OPPs

The samples collected from groundwater monitoring wells MW01, MW02, MW03, MW04, MW05 and MW08 returned laboratory analytical results for OPPs less than the laboratory limit of reporting.

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12. REVISED CONCEPTUAL SITE MODEL

Following a review of previous contaminations assessment reports and subsequent intrusive fieldwork carried out by AG, the areas of environmental concern (AEC) and contaminants of potential concern (COPC) have been revised and updated. The current AEC identified and associated COPC are presented in **Table 12.1.**

Table 12.1: Revised AEC and COPC

Area of Environmental Concern	Sampling Points	Contaminants of Concern	Potentially Affected mediums	Exposure risk
AEC01	BH39, EBH1, EBH2, EBH3, EBH5 and BH59	Friable asbestos within fill soils and ACM on surface.	Soil	Human health – direct contact
	BH03 and S2	Lead, cadmium and zinc	Soil	Human health – direct contact
AEC02	BH21, EBH24 and EBH25	Friable asbestos within fill soils	Soil	Human health – direct contact
AEC03	BH/TP101, TP09, TP53, TP56	ACM on surface and within fill soils.	Soil	Human health – direct contact
AEC04	Potential Underground storage or petroleum-based product onsite (refer JBS&G 2018).	Metals, PAH, BTEX, TRH.	Soil and groundwater	Human health – direct contact and inhalation vapour intrusion
AEC05	Existing Building Footprints (inaccessible)	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).	Soil	Human health – direct contact

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during redevelopment by site workers; and
- Direct contact with airborne fibres or CoPC following disturbance of soil.

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Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Future residents/end users; and
- Neighbouring residential land users.

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13. CONCLUSIONS AND RECOMMENDATIONS

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical results, in the context of the proposed redevelopment scenario, AG makes the following conclusions:

Soil Assessment

- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable direct contact human health exposure risk;
- the detected concentrations of asbestos fines/ friable asbestos and non-friable asbestos containing material in the soil samples analysed are considered likely to present an unacceptable human health exposure risk;
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable inhalation / vapour intrusion exposure risk;
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable TPH management limit exposure risk; and
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable aesthetics risk;

Groundwater Assessment

- the detected concentrations of contaminants of potential concern in groundwater are considered unlikely to present a risk to surrounding aquatic environments;
- All groundwater samples returned concentrations less than the adopted Groundwater Health Screening Levels for vapour intrusion (clay 2 - 4m) for a residential land use setting as per Table 1A (4) of NEPM 2013; and
- the detected concentrations of contaminants of potential concern in the groundwater samples analysed are considered unsuitable for discharge to municipal stormwater without further assessment/treatment due to the detected concentrations of the contaminants of concern analysed.

Based on these conclusions, AG makes the following recommendations:

- Consideration should be given to the preparation of a supplementary contamination assessment, to further understand the nature and extent of contamination identified onsite and address data gaps presented by building footprints, previous contamination assessments and inaccessible areas of environmental concern;
- Preparation of a remedial action plan (RAP) will be required to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination risk;
- groundwater assessed at the site is unsuitable for discharge to municipal stormwater without further assessment/treatment due to the detected concentrations of the contaminants of concern tested. If groundwater is expected to be encountered during the proposed development, a groundwater management plan would be required;
- the preparation of any supplementary contamination assessments, remedial action plans and/or groundwater management plans should be completed by an appropriately experienced environmental consultant;

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- As per NSW WHS Regulations, any removal of friable asbestos requires the engagement of a Class A licensed asbestos removalist and a pre-notification to SafeWork NSW, with accompanying air monitoring during the works and clearances post completion to be conducted by a licensed asbestos assessor (LAA);
- Following remediation of the identified contamination, validation sampling and a site validation report will be required to confirm the effectiveness of the remedial works; and
- Any soil proposed for disposal should be classified and disposed of as per the NSW EPA *Waste Classification Guidelines*, 2014 with all disposal documentation retained by the client for inclusion within the site validation report.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 144**.

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14. STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Alliance Geotechnical Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, AG reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to AG's engagement. The report must not be used for any purpose other than the purpose specified at the time AG was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual AG consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, AG reserves the right to review and amend this report.

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15. REFERENCES

National Environment Protection Council (NEPC) 1999a, '*Schedule B (1) Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure (NEPM)* as amended in May 2013'.

National Environment Protection Council (NEPC) 1999b, '*Schedule B (2) Guideline on Site Characterisation, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as* amended in May 2013'.

NSW DEC 2006, *'Contaminated Sites: Guidelines for the NSW Site Auditor Scheme* (2nd edition)'.

NSW EPA 1995, '*Contaminated Sites: Sampling Design Guidelines'.*

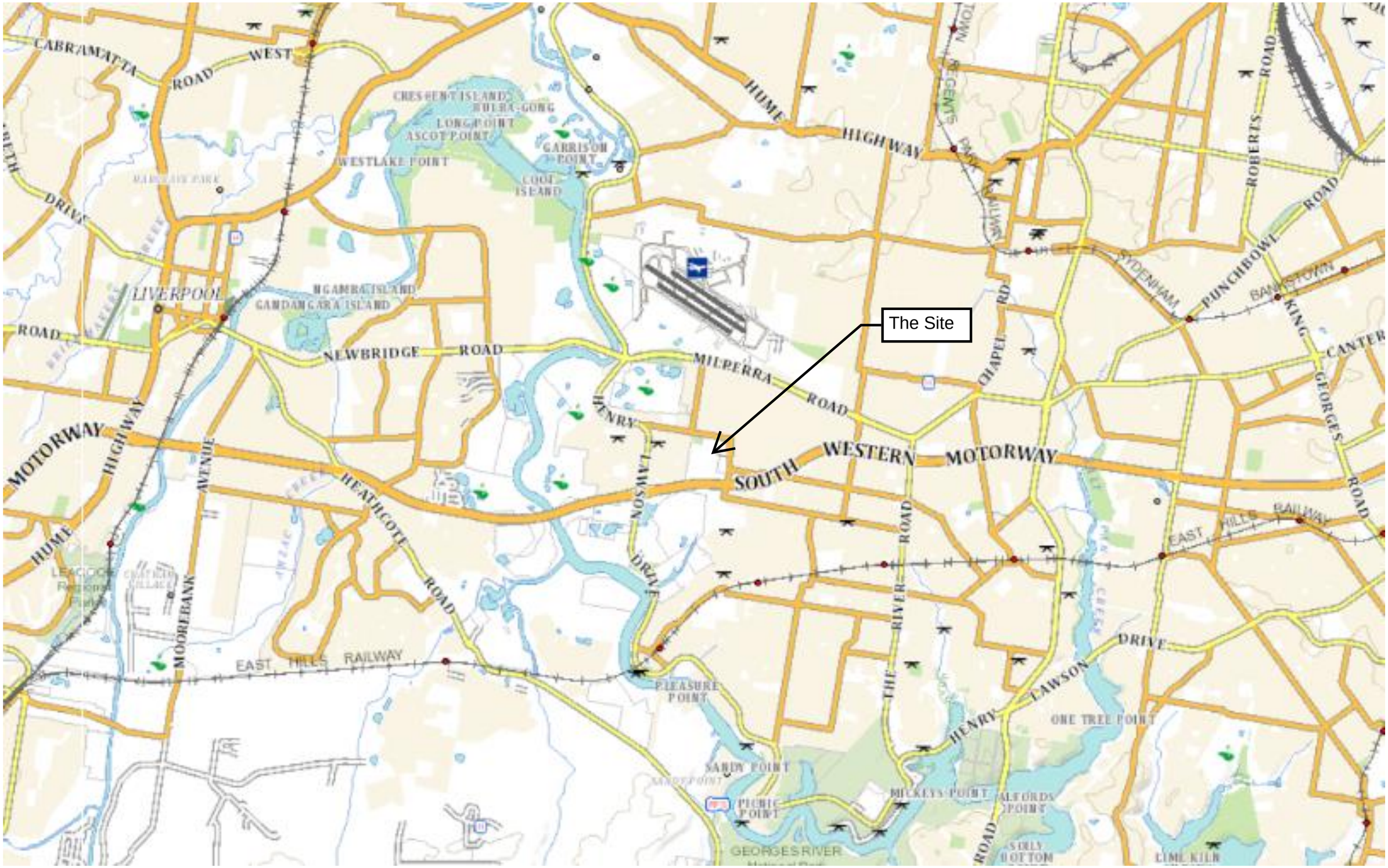
NSW OEH 2011, 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'.

WA DOH 2009, '*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia'* dated May 2009.

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SITE FIGURES

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Alliance Geotechnical ENGINEERING | ENVIRONMENTAL | TESTING Manage the earth, eliminate the risk	**Site Locality**			
	Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	1
	Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	10 December 2019
	Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-1-1



Scale: 100.00 m

Alliance Geotechnical ENGINEERING | ENVIRONMENTAL | TESTING Manage the earth, eliminate the risk	Site Layout Plan				
	Client Name:	Mirvac Homes NSW PTY Ltd	N	Figure Number:	2
	Project Name:	Stage 2 Detailed Site Investigation		Figure Date:	10 December 2019
	Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW		Report Number:	9996-ER-1-1



Scale: 100.00 m

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Areas of Environmental Concern

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	3
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	10 December 2019
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-1-1

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Sampling Point Layout Plan

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	4
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	10 December 2019
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-1-1



Scale: 100.00 m

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Inferred Groundwater Flow Direction

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	5
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	30 January 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-1-1



Scale: 100.00 m

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Exceedances of Criteria

Client Name:	Mirvac Homes NSW PTY Ltd	N	Figure Number:	6
Project Name:	Stage 2 Detailed Site Investigation		Figure Date:	30 January 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW		Report Number:	9996-ER-1-1

LABORATORY ANALYTICAL RESULTS SUMMARY TABLES

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Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 F4 in soil (mg/Kg) - NEPC 2013	ESLs and EILs - NEPC 2013	Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum	Data Set Maximum
					HSL A & HSL B - Low - High density Residential					Residential, Parkland and Public Open Space	Urban Residential and Public Open Space			
				HSL - A Residential (Low Density)	0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+	Soil Saturation Concentration (Csat)	Fine Soil Texture	Fine Soil Texture	Residential A		
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2	72
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5	51
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5	47
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6	73
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1	0.2
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5	73
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6	240
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	0.6
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	0.8
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5	2.2
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22	170
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55	2240
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50	1400
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51	720
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52	210
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	-	-	-	-	-	-	-	-	52	210
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110	2550
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110	1800
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100	610
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	-	-	-	-	< 20	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	0.30
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	180	-	< 0.05	0.23
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	6	-	< 0.05	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	50	-	< 0.1	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05	0.41
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1	< 1
	Vic EPA IWRG 621 OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2	0.41
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 1	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 1	< 1
	2,4-Dichlorophenol	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	2-Chlorophenol	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1	< 1
	Pentachlorophenol	mg/kg	1.0	-	-	-	-	-	-	-	-	100	< 1	< 1
	Tetrachlorophenols - Total	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 10	< 10
	Total Halogenated Phenol*	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0	-	-	-	-	-	-	-	-	-	< 0.5	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0	-	-	-	-	-	-	-	-	-	< 5	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 20	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 5	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5	-	-	-	-	-	-	-	-	400	< 0.2	< 0.2
	2-Nitrophenol	mg/kg	5.0	-	-	-	-	-	-	-	-	-	< 1	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4	-	-	-	-	-	-	-	-	400	< 0.4	< 0.4
	4-Nitrophenol	mg/kg	5.0	-	-	-	-	-	-	-	-	-	< 5	< 5
	Dinoseb	mg/kg	20.0	-	-	-	-	-	-	-	-	-	< 20	< 20
	Phenol	mg/kg	0.5	-	-	-	-	-	-	-	-	3000	< 0.5	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0	-	-	-	-	-	-	-	-	-	< 20	< 20

Sample ID	BH01_0.0-0.2	BH01_1.2-1.4	BH02_0.0-0.2	BH02_1.4-1.6	BH03_0.0-0.2	BH03_1.5-1.7	BH04_0.2-0.4	BH04_0.8-1.0	BH05_0.2-0.4	BH05_0.8-1.0	BH06_0.0-0.2	BH06_0.5-0.7	BH07_0.0-0.2	BH08_0.0-0.2	BH08_0.5-0.7	TP09-0.0-0.2	TP09-0.7-0.9	TP09-1.1-1.3	BH10_0.1-0.3	BH11_0.0-0.2	TP12-0.0-0.2	TP12-0.9-1.1	TP12-2.6-2.8	TP13-0.0-0.2	TP13-1.9-2.1	BH14_0.0-0.2	BH15_0.0-0.2	BH16_0.0-0.2	TP16-0.0-0.2	TP16-0.9-1.1
Reference	S19-De29140	S19-De29141	S19-De29142	S19-De29143	S19-De29144	S19-De29145	S19-De29146	S19-De29147	S19-De29148	S19-De29149	S19-De29150	S19-De29151	S19-De29152	S19-De29154	S19-De29155	S20-Ja12898	S20-Ja12899	S20-Ja12900	S19-De29156	S19-De29157	S20-Ja12935	S20-Ja12901	S20-Ja12902	S20-Ja12903	S20-Ja12904	S19-De29158	S19-De29159	S19-De29160	S20-Ja12938	S20-Ja12905
Date Sampled	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	18/12/2019	18/12/2019	15/01/2020	15/01/2020	15/01/2020	16/12/2019	16/12/2019	15/01/2020	15/01/2020	15/01/2020	15/01/2020	15/01/2020	16/12/2019	16/12/2019	16/12/2019	15/01/2020	15/01/2020
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Arsenic, As	6.3	4.5	6.1	9.6	11	6.6	8.9	4.7	9.8	7.1	5.2	9.5	11	3	11	12	5.8	6.5	< 2	72	8.4	< 2	4.2	5.8	3.9	7.9	8.8	11	5.4	4
Cadmium, Cd	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium, Cr	17	16	6.9	13	13	19	20	8.5	22	14	12	28	20	6.4	30	16	11	21	< 5	7	18	5.1	9.4	12	8.2	13	8.4	10	9	9.1
Copper, Cu	14	12	10	20	13	15	24	27	19	14	18	12	16	23	23	20	40	9	23	9.3	26	14	34	37	34	8.5	11	11	22	41
Lead, Pb	16	13	28	17	23	15	19	16	24	15	73	15	25	31	15	25	26	13	27	14	30	6.1	22	27	23	16	22	15	19	29
Mercury (inorganic)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 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	< 0.1	< 0.1	< 0.1	< 0.1
Nickel, Ni	5	3	5.4	< 5	9.2	< 5	< 5	< 5	< 5	5.6	< 5	12	< 5	7.7	23	< 5	< 5	< 5	5.9	8.8	8.3	73	27	18	< 5	< 5	< 5	17	28	
Zinc, Zn	6	240	43	13	55	43	50	9.7	14	20	27	7	58	13	32	91	24	51	120	9.7	85	34	79	54	240	97	82	17	41	47	79	160
Acenaphthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=LOR	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(b&j)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(ah)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	< 0.5	2.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH C10-C36 Total	< 20	170	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	80	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
TRH C10-C14	< 50	< 50	< 50	250	< 50	< 50	< 50	< 50	< 50	< 50	800	69	67	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	94	< 50	< 50	< 50
TRH C15-C28	< 50	< 50	< 50	60	< 50	< 50	< 50	< 50	< 50	< 50	270	69	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH C29-C36	< 50	< 50	< 50	190	< 50	< 50	< 50	< 50	< 50	< 50	450	< 50	67	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	94	< 50	< 50	< 50
TRH C6-C9	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 F4 in soil (mg/Kg) - NEPC 2013	ESLs and EILs - NEPC 2013	Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential				Soil Saturation Concentration (Csat)	Residential, Parkland and Public Open Space	Urban Residential and Public Open Space	Residential A	
					0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+		Fine Soil Texture	Fine Soil Texture		
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benz(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50									-	52
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	-	-	-	-	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	180	-	< 0.05
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	50	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1
	Vic EPA IWRG 621 OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2-Chlorophenol	mg/kg	0.5									-	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0									-	< 1
	Pentachlorophenol	mg/kg	1.0									100	< 1
	Tetrachlorophenols - Total	mg/kg	1.0									-	< 10
	Total Halogenated Phenol*	mg/kg	1.0									-	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0									-	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0									-	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2									-	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0									-	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5									400	< 0.2
	2-Nitrophenol	mg/kg	5.0									-	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4									400	< 0.4
	4-Nitrophenol	mg/kg	5.0									-	< 5
	Dinoseb	mg/kg	20.0									-	< 20
	Phenol	mg/kg	0.5									3000	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0									-	< 20

Sample ID	TP16-1.9-2.1	TP17-0.9-1.1	TP17-1.9-2.1	BH17_0.0-0.2	BH18_0.2-0.4	BH19_0.0-0.2	BH20_0.0-0.15	BH21_0.1-0.3	BH22_0.8-1.0	TP22-0.0-0.2	TP22-1.9-2.1	BH23_0.0-0.2	BH24-0.0-0.2	BH25_0.0-0.2	BH26_0.0-0.2	BH27-0.0-0.2	BH28_0.0-0.2	BH28_0.8-1.0	BH29_0.0-0.2	BH30_0.0-0.2	BH31_0.0-0.2	BH32_0.0-0.2	BH33_0.0-0.2	BH34_0.0-0.2	BH35_0.0-0.2	BH36_0.0-0.2	BH36_1.0-1.2	BH36_2.0-2.2	BH37_0.3-0.5	BH38_0.0-0.2	BH39-0.0-0.2
Reference	S20-Ja12906	S20-Ja12907	S20-Ja12908	S19-De29161	S19-De29162	S19-De29163	S19-De29164	S19-De29165	S19-De29166	S20-Ja12909	S20-Ja12910	S19-De29167	S20-Ja80478	S19-De29168	S19-De29169	S20-Ja80479	S19-De29170	S19-De29171	S19-De29172	S19-De29173	S19-De29174	S19-De29175	S19-De29176	S19-De29177	S19-De29178	S19-De29179	S19-De29180	S19-De29181	S19-De29182	S19-De29183	S20-Ja80480
Date Sampled	15/01/2020	15/01/2020	15/01/2020	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	15/01/2020	15/01/2020	16/12/2019	9/01/2020	16/12/2019	18/12/2019	9/01/2020	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	9/01/2020
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Arsenic, As	4.8	3.5	2.9	16	6.6	10	5.2	15	6.6	10	11	< 2	4.4	2.1	3.6	6.8	2.9	4.3	19	15	4.8	6.3	14	12	11	10	13	12	8.3	2.7	7.2
Cadmium, Cd	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium, Cr	6.7	7.9	5.8	19	9.1	16	6.5	7.5	11	14	7.7	< 5	11	6.2	8.2	11	7.1	27	10	8.3	9.8	17	14	17	22	15	22	27	17	7.2	17
Copper, Cu	16	30	13	9.7	12	15	38	19	47	16	35	5.3	18	6.5	11	14	5.5	< 5	8.8	12	8.6	9.9	16	13	16	22	17	24	14	29	22
Lead, Pb	11	24	19	18	18	31	66	40	24	20	25	6.8	29	14	20	16	7.9	8.9	18	39	18	14	16	19	20	41	43	20	19	44	30
Mercury (inorganic)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel, Ni	8	19	< 5	< 5	< 5	7.2	< 5	< 5	38	9.5	22	< 5	8.5	< 5	< 5	6.9	< 5	< 5	< 5	< 5	6.3	16	< 5	5.8	6.6	6.2	< 5	< 5	6.5	7.9
Zinc, Zn	36	100	18	36	72	72	160	56	180	52	100	19	75	32	61	44	27	6.1	40	30	27	16	67	42	43	84	51	23	38	120	97
Acenaphthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=LOR	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(b&j)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(ah)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5
Fluorene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH C10-C36 Total	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
TRH C10-C14	< 50	< 50	< 50	< 50	< 50	290	< 50	66	144	< 50	< 50	< 50	< 50	168	65	63	< 50	< 50	< 50	58	< 50	57	< 50	< 50	< 50	106	< 50	< 50	< 50	< 50	112	< 50
TRH C15-C28	< 50	< 50	< 50	< 50	< 50	130	< 50	< 50	72	< 50	< 50	< 50	< 50	82	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH C29-C36	< 50	< 50	< 50	< 50	< 50	160	< 50	66	72	< 50	< 50	< 50	< 50	86	65	63	< 50	< 50	< 50	58	< 50	57	< 50	< 50	< 50	56	< 50	< 50	< 50	58	< 50	< 50
TRH C6-C9	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 (F2)	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH >C10-C16 (F2) - Naphthalene	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH C10-C40 Total (F bands)	< 100	< 100	< 100	< 100	< 100	320	< 100	< 100	120	< 100	< 100	< 100	< 100	130	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
TRH >C16-C34 (F3)	< 100	< 100	< 100	< 100	< 100

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 F4 in soil (mg/Kg) - NEPC 2013		Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum
					HSL A & HSL B - Low - High density Residential					Residential, Parkland and Public Open Space	Urban Residential and Public Open Space		
				HSL - A Residential (Low Density)	0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+	Soil Saturation Concentration (Csat)	Fine Soil Texture	Fine Soil Texture	Residential A	
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	-	-	-	-	-	-	-	-	52
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	-	-	-	-	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	-	180	< 0.05
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	50	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1
	Vic EPA IWRG 621 OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	1	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2-Chlorophenol	mg/kg	0.5									-	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0									-	< 1
	Pentachlorophenol	mg/kg	1.0									100	< 1
	Tetrachlorophenols - Total	mg/kg	1.0									-	< 10
	Total Halogenated Phenol*	mg/kg	1.0									-	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0									-	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0									-	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2									-	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0									-	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5									400	< 0.2
	2-Nitrophenol	mg/kg	5.0									-	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4									400	< 0.4
	4-Nitrophenol	mg/kg	5.0									-	< 5
	Dinoseb	mg/kg	20.0									-	< 20
	Phenol	mg/kg	0.5									3000	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0									-	< 20

Sample ID	BH40-0.0-0.2	BH41-0.0-0.2	BH42-0.0-0.2	BH43-0.0-0.2	BH44-0.0-0.2	BH45-0.0-0.2	BH45-0.2-0.4	BH46-0.0-0.2	BH47-0.0-0.2	BH48-0.0-0.2	BH48-0.5-0.7	BH49-0.0-0.2	BH50_0.2-0.4	BH51_0.2-0.4	BH52_0.2-0.4	TP53-0.0-0.2	TP53-1.7-1.9	TP54-0.0-0.2	TP55-0.0-0.2	TP55-0.8-1.0	TP56-0.0-0.2	TP56-0.9-1.1	TP56-1.8-2.0	BH57_0.2-0.4	BH58_0.2-0.4	BH59_0.0-0.05	BH60_0.0-0.2	BH61_0.15-0.3	BH62_0.0-0.15	BH63-0.0-0.2	BH64_0.0-0.1
Reference	S20-Ja44481	S20-Ja44482	S20-Ja44483	S20-Ja44484	S20-Ja44485	S20-Ja44486	S20-Ja44487	S20-Ja44488	S20-Ja44489	S20-Ja44490	S20-Ja44491	S20-Ja44492	S19-De29184	S19-De29185	S19-De29186	S20-Ja12911	S20-Ja12912	S20-Ja44493	S20-Ja12913	S20-Ja12914	S20-Ja12915	S20-Ja12916	S20-Ja12917	S19-De29188	S19-De29189	S19-De29190	S19-De29191	S19-De29192	S19-De29193	S20-Ja44494	S19-De29194
Date Sampled	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	17/12/2019	17/12/2019	17/12/2019	15/01/2020	15/01/2020	9/01/2020	15/01/2020	15/01/2020	15/01/2020	15/01/2020	15/01/2020	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	9/01/2020	17/12/2019
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Arsenic, As	4.9	4.8	5.6	9	6.5	8.4	16	9.5	6.9	7.5	7.3	12	14	13	7.3	4.5	6.5	2.5	7.3	8	6	12	8.9	9.1	8.4	2.3	14	6	< 2	5.9	2.4
Cadmium, Cd	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium, Cr	16	13	13	18	40	17	27	12	11	16	16	51	27	30	13	9.3	13	6.8	15	9.4	13	24	25	16	29	8.7	19	17	< 5	16	7.4
Copper, Cu	31	21	21	20	20	11	8.4	15	15	17	9.6	21	32	25	20	11	14	11	8.4	15	19	20	24	41	24	6.1	21	17	15	7.3	23
Lead, Pb	35	26	17	24	23	18	20	18	18	26	17	20	17	14	16	14	22	8.4	13	25	18	27	27	22	13	8.7	15	15	13	23	21
Mercury (inorganic)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel, Ni	5.2	12	13	5.9	34	6.6	< 5	< 5	< 5	8.5	6.1	24	15	18	< 5	< 5	< 5	< 5	< 5	< 5	13	11	< 5	25	5.5	< 5	12	< 5	< 5	5.9	
Zinc, Zn	110	72	51	68	76	40	62	65	36	39	25	39	27	22	11	39	28	39	35	49	30	45	34	23	29	19	16	28	50	26	96
Acenaphthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=LOR	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(b&j)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(ah)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH C10-C36 Total	< 20	< 20	< 20	22	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	120	< 20	170	
TRH C10-C14	< 50	165	142	179	197	183	< 50	133	< 50	132	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	70	134	< 50	< 50	< 50	< 50	159	< 50	< 50	2240	< 50	1440	
TRH C15-C28	< 50	67	62	77	98	83	< 50	68	< 50	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	71	< 50	< 50	< 50	< 50	85	< 50	< 50	1400	< 50	660	
TRH C29-C36	< 50	98	80	99	100	< 50	65	< 50	80	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	70	63	< 50	< 50	< 50	< 50	74	< 50	< 50	720	< 50	610	
TRH C6-C9	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 40	< 20	< 40
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1
TRH >C10-C16 (F2)	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	140	< 50	210
TRH >C10-C16 (F2) - Naphthalene	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	140	< 50	210
TRH C10-C40 Total (F bands)	110	< 100	130	110	130	160	150	< 100	110	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	110	< 100	< 100	< 100	< 100	< 100	120	< 100	2550	< 100	1690	
TRH >C16-C34 (F3)	110	< 100	130	110	130	160	150	< 100	110	< 100	< 100	< 100	< 100

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 F4 in soil (mg/Kg) - NEPC 2013	ESLs and EILs NEPC 2013	Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential				Soil Saturation Concentration (Csat)	Residential, Parkland and Public Open Space	Urban Residential and Public Open Space	Residential A	
					0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+		Fine Soil Texture	Fine Soil Texture		
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benz(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	-	-	-	-	-	-	-	-	52
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	-	-	-	-	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	180	-	< 0.05
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	50	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	1	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2-Chlorophenol	mg/kg	0.5									-	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0									-	< 1
	Pentachlorophenol	mg/kg	1.0									100	< 1
	Tetrachlorophenols - Total	mg/kg	1.0									-	< 10
	Total Halogenated Phenol*	mg/kg	1.0									-	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0									-	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0									-	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2									-	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0									-	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5									400	< 0.2
	2-Nitrophenol	mg/kg	5.0									-	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4									400	< 0.4
	4-Nitrophenol	mg/kg	5.0									-	< 5
	Dinoseb	mg/kg	20.0									-	< 20
	Phenol	mg/kg	0.5									3000	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0									-	< 20

Sample ID	BH65_0.0-0.1	BH66_0.0-0.1	BH66_0.3-0.5	BH66_1.0-1.2	BH67_0.0-0.05	BH68_0.0-0.1	BH69_0.05-0.2	BH71_0.0-0.2	BH72_0.0-0.2	BH73_0.0-0.2	BH74_0.0-0.2	BH75_0.0-0.2	BH76_0.0-0.2	BH77_0.0-0.2	BH78_0.0-0.2	BH79_0.0-0.2	BH80_0.0-0.2	BH81_0.2-0.4	BH82_0.05-0.2	BH83_0.05-0.2	BH84_0.05-0.2	TP85-0.0-0.2	TP85-1.7-1.9	TP85-2.5-2.7	BH86_0.0-0.2	BH87_0.0-0.2	BH88_0.0-0.2	BH89_0.0-0.2	BH90-0.0-0.1	BH91-0.0-0.1
Reference	S19-De29195	S19-De29196	S19-De29197	S19-De29198	S19-De29199	S19-De29200	S19-De29201	S19-De29202	S19-De29203	S19-De29204	S19-De29205	S19-De29206	S19-De29207	S19-De29208	S19-De29209	S19-De29210	S19-De29211	S19-De29212	S19-De29213	S19-De29214	S19-De29215	S20-Ja12918	S20-Ja12920	S20-Ja12921	S19-De29216	S19-De29217	S19-De29218	S19-De29219	S20-Ja40513	S20-Ja40515
Date Sampled	18/12/2019	18/12/2019	18/12/2019	18/12/2019	18/12/2019	18/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	15/01/2020	15/01/2020	15/01/2020	18/12/2019	18/12/2019	18/12/2019	18/12/2019	8/01/2020	8/01/2020
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Metals	11	14	5.7	15	9.6	18	12	6	11	11	7	6.6
	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	21	21	26	27	10	9.7	20	15	16	19	21	18	20	16	13	14	20	15	32	28	41	21	28	27	13	12	15	15	11	6.6
	24	42	21	28	14	9	7.1	28	17	25	15	13	18	16	11	18	20	14	19	< 5	12	18	15	15	18	13	19	11	11	12
	28	45	59	31	14	12	15	65	41	22	71	45	47	33	24	55	72	18	14	12	11	29	23	16	28	25	37	27	14	10
	< 0.1	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	14	10	7.5	9.5	5.7	6.9	8.8	6.6	5.1	9.7	6.4	5.1	7.5	5.9	< 5	5.5	7	7.4	15	< 5	29	8.7	9.5	8.1	< 5	5.5	8.8	< 5	< 5	< 5
	72	83	140	58	47	34	13	110	70	70	46	31	40	31	25	42	53	25	19	< 5	25	38	29	23	56	57	120	40	40	30
PAH	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 - F4 in soil (mg/Kg) - NEPC 2013	ESLs and EILs NEPC 2013	Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential				Soil Saturation Concentration (Csat)	Residential, Parkland and Public Open Space	Urban Residential and Public Open Space	Residential A	
					0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+		Fine Soil Texture	Fine Soil Texture		
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	-	-	-	-	-	-	-	-	52
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	-	-	-	-	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	180	-	< 0.05
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	50	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1
	Vic EPA IWRG 621 OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	1	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2-Chlorophenol	mg/kg	0.5									-	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0									-	< 1
	Pentachlorophenol	mg/kg	1.0									100	< 1
	Tetrachlorophenols - Total	mg/kg	1.0									-	< 10
	Total Halogenated Phenol*	mg/kg	1.0									-	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0									-	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0									-	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2									-	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0									-	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5									400	< 0.2
	2-Nitrophenol	mg/kg	5.0									-	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4									400	< 0.4
	4-Nitrophenol	mg/kg	5.0									-	< 5
	Dinoseb	mg/kg	20.0									-	< 20
	Phenol	mg/kg	0.5									3000	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0									-	< 20

Sample ID	BH92_0.0-0.2	BH93_0.0-0.2	BH94_0.0-0.2	BH95-0.0-0.2	BH96-0.0-0.1	BH97_0.0-0.2	BH98-0.0-0.2	BH99-0.0-0.2	BH99-0.2-0.4	BH100_0.2-0.4	BH101_0.0-0.2	TP101-0.0-0.2	TP101-0.8-1.0	TP101-1.3-1.5	BH102-0.0-0.2
Reference	S19-De29220	S19-De29221	S19-De29446	S20-Ja04517	S20-Ja04519	S19-De29222	S20-Ja04495	S20-Ja04496	S20-Ja04497	S19-De29223	S19-De29224	S20-Ja12922	S20-Ja12923	S20-Ja12924	S20-Ja04498
Date Sampled	18/12/2029	18/12/2029	18/12/2029	8/01/2020	8/01/2020	18/12/2019	9/01/2020	9/01/2020	9/01/2020	17/12/2019	18/12/2019	15/01/2020	15/01/2020	15/01/2020	9/01/2020
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	19	8.5	7.3	6.2	4.7	5	< 2	3.1	2.5	14	14	11	7.4	8.5	5.5
	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.5	< 0.4	< 0.4	< 0.4	< 0.4
	18	7.7	9.1	< 5	11	7.3	< 5	7.2	6.9	17	20	18	16	21	9.2
	10	13	14	7.4	9.6	14	8.8	16	< 5	16	23	20	19	11	10
	13	21	18	9.7	15	19	11	61	< 5	16	62	44	25	18	15
	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
	< 5	< 5	< 5	< 5	6	< 5	< 5	7.6	< 5	< 5	9.2	7.2	7.9	< 5	< 5
	15	40	38	26	50	71	41	67	5.7	8.6	140	120	45	5.6	35
	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Table LAR2
Bullecourt Road, Milperra, NSW
Groundwater Results Summary Table
9996-ER-1-1

Sample ID				MW01	MW02	MW03	MW04	MW05	MW08
Reference				S20-Ja04468	S20-Ja04469	S20-Ja04470	S20-Ja04471	S20-Ja04472	S20-Ja04473
Date Sampled				8/01/2020	8/01/2020	8/01/2020	8/01/2020	8/01/2020	8/01/2020
Sample Matrix				Water	Water	Water	Water	Water	Water
	NEPM (2013) - Table 1A(4)	**ANZECC & ARMCANZ (2000)**							
	Groundwater HSL's for Vapour Intrusion (SAND) - HSL D Commercial/Industrial 2m - <4m	**Fresh Waters**	**Marine Waters**						
	(mg/L)	**(mg/L)**	**(mg/L)**						
Metals/Metalloids									
Arsenic, As (V)	-	**0.013**	**-**	0.001	< 0.001	< 0.001	0.013	0.004	0.001
Cadmium, Cd	-	**0.0002**	**0.0007**	0.0017	0.0003	0.0005	< 0.0002	0.013	0.016
Chromium, Cr	-	**-**	**0.0270**	< 0.001	0.001	0.002	0.003	0.015	0.003
Copper, Cu	-	**0.0014**	**0.0013**	< 0.001	0.03	0.007	0.022	0.003	0.002
Lead, Pb	-	**0.0034**	**0.0044**	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001
Mercury (Total), Hg	-	**0.00006**	**0.0001**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel, Ni	-	**0.011**	**0.007**	0.03	0.012	0.067	0.062	0.21	0.34
Zinc, Zn	-	**0.008**	**0.015**	0.048	0.076	0.21	0.023	0.089	0.77
Alkali Metals									
Calcium	-			220	43	74	250	340	150
Magnesium	-			850	140	380	380	770	700
Potassium	-			26	4.2	14	53	53	32
Sodium	-			4800	1800	3200	3300	4900	4700
Alkalinity (speciated)									
Bicarbonate Alkalinity (as CaCO3)	-			430	< 20	23	1100	320	110
Carbonate Alkalinity (as CaCO3)	-			< 10	< 10	< 10	< 10	< 10	< 10
Hydroxide Alkalinity (as CaCO3)	-			< 20	< 20	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	-			430	< 20	23	1100	320	110
Other Inorganics									
Ammonia as NH3	-	**0.9**	**0.91**	0.53	0.23	0.41	1.2	0.47	0.42
Chloride	-			10000	3200	6100	5400	10000	9600
Conductivity (at 25Â°C)	-			14000	4900	11000	9100	14000	23000
Nitrate (as N)	-			5.7	0.35	0.18	0.07	< 0.02	0.17
pH (at 25Â°C)				6.9	5.7	5.7	7.1	6.7	5.9
Sulphate (as SO4)	-			920	710	960	740	960	730
Total Dissolved Solids Dried at 180Â°C Â±	-			17000	5300	9900	10000	16000	17000
Monocyclic Aromatic Hydrocarbons									
Benzene	**5**	**1**	**0.5**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	**Not Limiting**	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	**Not Limiting**	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes	**Not Limiting**	**0.35 (as o-xylene)**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes	**Not Limiting**	**0.2 (as p-xylene)**	**-**	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	**Not Limiting**	**0.016**	**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo[a]pyrene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Total Recoverable Hydrocarbons									
TRH C10-36 (Total)	-	**-**	**-**	0.15	0.13	0.17	0.09	0.06	0.13
TRH C10-C14	-	**-**	**-**	0.35	0.33	0.17	0.29	< 0.1	0.13
TRH C15-C28	-	**-**	**-**	0.2	0.2	< 0.1	0.2	< 0.1	< 0.1
TRH C29-C36	-	**-**	**-**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C9	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Naphthalene	-	**-**	**-**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16	-	**-**	**-**	0.07	0.05	0.08	< 0.05	< 0.05	0.05
TRH >C10-C16 less Naphthalene (F2)	-	**-**	**-**	0.07	0.05	0.08	< 0.05	< 0.05	0.05
TRH >C10-C40 (total)*	-	**-**	**-**	0.27	0.25	< 0.1	0.2	< 0.1	< 0.1
TRH >C16-C34	-	**-**	**-**	0.2	0.2	< 0.1	0.2	< 0.1	< 0.1
TRH >C34-C40	-	**-**	**-**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C10	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Volatile Organic Compounds									
1.1.1.2-Tetrachloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	-	**0.16**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	-	**0.26**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	-	**0.06**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Total MAH*	-	**-**	**-**	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
trans-1.2-Dichloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 CHC (Total)*	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl chloride	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	-	**-**	**-**	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Polychlorinated Biphenyls									
Aroclor-1016	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1221	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table LAR2
Bullecourt Road, Milperra, NSW
Groundwater Results Summary Table
9996-ER-1-1

Sample ID				MW01	MW02	MW03	MW04	MW05	MW08
Reference				S20-Ja04468	S20-Ja04469	S20-Ja04470	S20-Ja04471	S20-Ja04472	S20-Ja04473
Date Sampled				8/01/2020	8/01/2020	8/01/2020	8/01/2020	8/01/2020	8/01/2020
Sample Matrix				Water	Water	Water	Water	Water	Water
	NEPM (2013) - Table 1A(4)	**ANZECC & ARMCANZ (2000)**							
	Groundwater HSL's for Vapour Intrusion (SAND) - HSL D Commercial/Industrial 2m - <4m	**Fresh Waters**	**Marine Waters**						
	(mg/L)	**(mg/L)**	**(mg/L)**						
Aroclor-1232	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1242	-	**0.003**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1248	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1254	-	**0.0000001**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1260	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total PCB*	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Organochlorine Pesticides	**-**	**-**	**-**						
4.4'-DDD	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDE	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDT	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
a-BHC	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aldrin	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aldrin and Dieldrin (Total)*	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
b-BHC	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chlordanes - Total	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
d-BHC	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
DDT + DDE + DDD (Total)*	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Dieldrin	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan I	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan II	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan sulphate	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin aldehyde	-	**-**	**-**	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin ketone	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
g-BHC (Lindane)	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor epoxide	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Hexachlorobenzene	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methoxychlor	-	**-**	**-**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Toxaphene	-	**-**	**-**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Vic EPA IWRG 621 OCP (Total)*	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Organophosphorus Pesticides									
Azinphos-methyl	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bolstar	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Chlorfenvinphos	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Chlorpyrifos	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Chlorpyrifos-methyl	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Coumaphos	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Demeton-O	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Demeton-S	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Diazinon	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dichlorvos	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dimethoate	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Disulfoton	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
EPN	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Ethion	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Ethoprop	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Ethyl parathion	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Fenitrothion	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Fensulfothion	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Fenthion	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Malathion	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Merphos	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Methyl parathion	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Mevinphos	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Monocrotophos	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Naled	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Omethoate	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phorate	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Pirimiphos-methyl	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Pyrazophos	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Ronnel	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Terbufos	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Tetrachlorvinphos	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Tokuthion	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Trichloronate	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Table LAR3
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, N
Relative Percent Difference
9996-ER-1-1

			Sample ID	BH01_0.0-0.2	DUP_01		BH01_0.0-0.2	DUP-1A		BH31_0.0-0.2
			Reference	S19-De29140	S19-De29225		S19-De29140	ES1942492001		S19-De29174
			Date Sampled	16/12/2019	16/12/2019		16/12/2019	16/12/2019		16/12/2019
			Sample Matrix	Soil	Soil		Soil	Soil		Soil
Group	Analyte	Units	LOR			RPD (%)			RPD (%)	
Metals	Arsenic	mg/kg	2	6.3	16	87	6.3	23	114	4.8
	Cadmium	mg/kg	0.4	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	< 0.4
	Chromium	mg/kg	5.0	17	34	67	17	36	72	9.8
	Copper	mg/kg	5.0	14	15	7	14	9	43	8.6
	Lead	mg/kg	5	16	29	58	16	21	27	18
	Mercury	mg/kg	0.1	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1
	Nickel	mg/kg	5	6.3	11	54	6.3	5	23	< 5
	Zinc	mg/kg	5	43	56	26	43	58	30	27
PAH	Acenaphthene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Acenaphthylene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Anthracene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	0.6	0.6	0	0.6	0.6	0	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	1.2	1.2	0	1.2	1.2	0	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Chrysene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Fluoranthene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Fluorene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Naphthalene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Phenanthrene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Pyrene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Total PAH (18)	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5

RPD exceeding criteria

N/A Primary, Duplicate or Triplicate less than LOR and/or not analysed

DUP_02		BH31_0.0-0.2	DUP-2A		BH07_0.0-0.2	DUP_03		BH07_0.0-0.2	DUP-3A		BH08_0.0-0.2	DUP_04		BH08_0.0-0.2
S19-De29226		S19-De29174	ES1942492002		S19-De29152	S19-De29227		S19-De29152	ES1942492003		S19-De29154	S19-De29228		S19-De29154
16/12/2019		16/12/2019	16/12/2019		17/12/2019	17/12/2019		17/12/2019	17/12/2019		18/12/2019	18/12/2019		18/12/2019
Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil
	RPD (%)			RPD (%)			RPD (%)			RPD (%)			RPD (%)	
8.5	56	4.8	9	61	11	19	53	11	11	0	3	3.8	24	3
< 0.4	N/A	< 0.4	<1	N/A	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	< 0.4	< 0.4	N/A	< 0.4
15	42	9.8	25	87	20	24	18	20	19	5	6.4	7.9	21	6.4
13	41	8.6	11	24	16	21	27	16	15	6	23	25	8	23
28	43	18	27	40	25	36	36	25	28	11	31	36	15	31
< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1
< 5	N/A	< 5	5	N/A	12	16	29	12	12	0	< 5	< 5	N/A	< 5
43	46	27	44	48	32	40	22	32	34	6	91	93	2	91
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6
1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5

DUP-4A		BH54-0.0-0.2	DUP-05		DUP-05	DUP-5A		BH98-0.0-0.2	DUP-06		BH98-0.0-0.2	DUP-6A		TP09-0.0-0.2
ES1942492004		S20-Ja04493	S20-Ja04499		S20-Ja04499	ES2000668001		S20-Ja04495	S20-Ja04500		S20-Ja04495	ES2000668002		S20-Ja12898
18/12/2019		9/01/2020	9/01/2020		9/01/2020	9/01/2020		9/01/2020	9/01/2020		9/01/2020	9/01/2020		15/01/2020
Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil
	RPD (%)			RPD (%)			RPD (%)			RPD (%)			RPD (%)	
<5	N/A	2.50	2.7	8	2.7	<5	N/A	< 2	< 2	N/A	< 2	<5	N/A	12
<1	N/A	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	< 0.4
6	6	6.80	7.2	6	7.2	7	3	< 5	< 5	N/A	< 5	8	N/A	16
23	0	11.00	13	17	13	12	8	8.8	8.9	1	8.8	12	31	20
26	18	8.40	9	7	9	10	11	11	13	17	11	18	48	25
<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1
4	N/A	< 5	< 5	N/A	< 5	4	N/A	< 5	< 5	N/A	< 5	3	N/A	7.7
86	6	39.00	40	3	40	42	5	41	39	5	41	51	22	51
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
0.6	0	0.60	0.60	0	0.60	0.6	0	0.60	0.60	0	0.60	0.6	0	0.6
1.2	0	1.20	1.20	0	1.20	1.2	0	1.20	1.20	0	1.20	1.2	0	1.2
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5

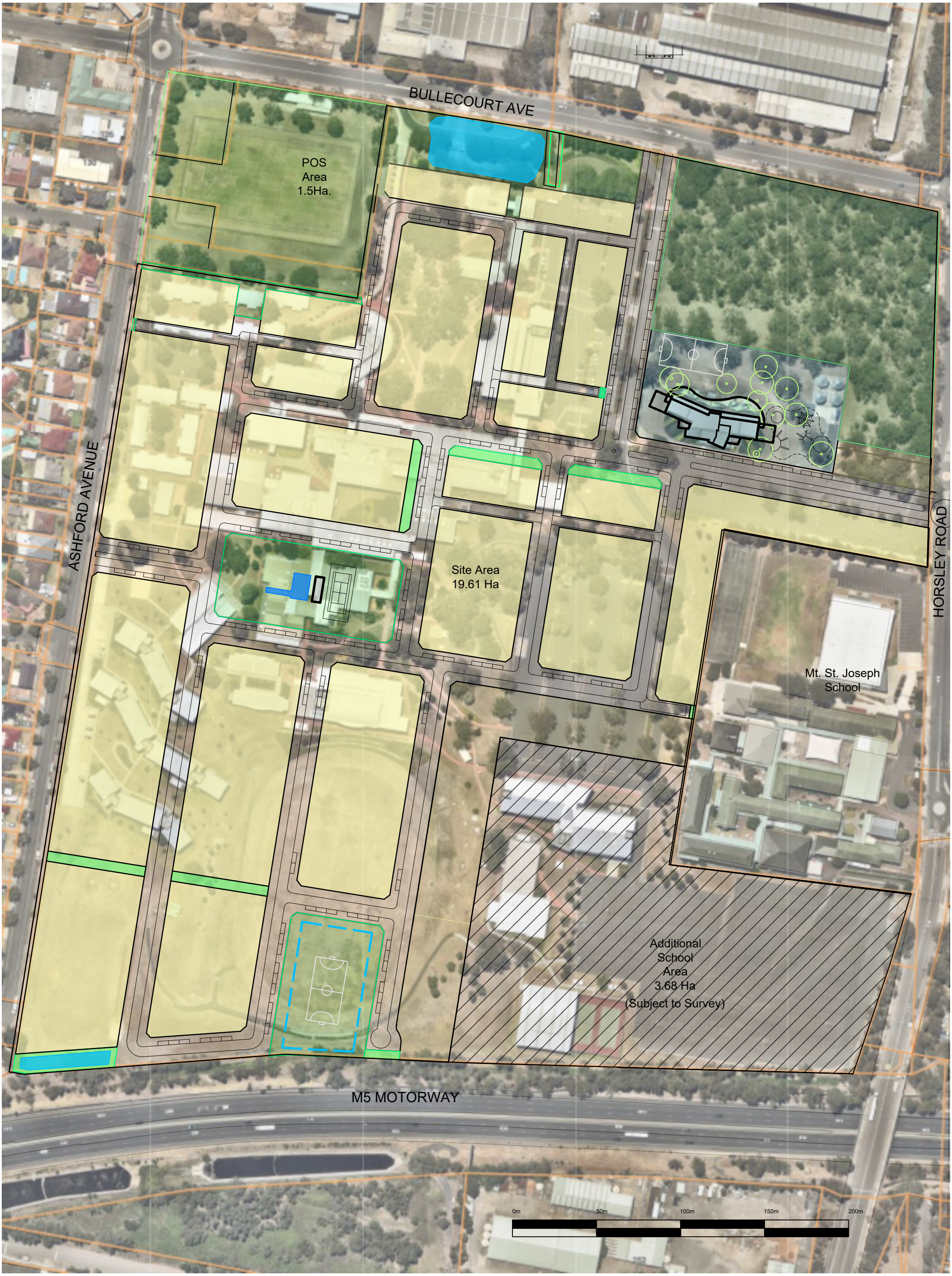
DUP-07		TP09-0.0-0.2	DUP-7A		TP16-0.0-0.2	DUP-08		TP16-0.0-0.2	DUP-8A		TP12-0.0-0.2	DUP-09		TP12-0.0-0.2
S20-Ja12925		S20-Ja12898	ES2001581001		S20-Ja12938	S20-Ja12926		S20-Ja12938	ES2001581002		S20-Ja12935	S20-Ja12927		S20-Ja12935
15/01/2020		15/01/2020	15/01/2020		15/01/2020	15/01/2020		15/01/2020	15/01/2020		15/01/2020	15/01/2020		15/01/2020
Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil
	RPD (%)			RPD (%)			RPD (%)			RPD (%)			RPD (%)	
16	29	12	9.7	21	5.4	6.7	21	5.4	6.7	21	8.4	5.4	43	8.4
< 0.4	N/A	< 0.4	<0.1	N/A	< 0.4	< 0.4	N/A	< 0.4	0.1	N/A	< 0.4	< 0.4	N/A	< 0.4
29	58	16	15.2	5	9	8.5	6	9	7.7	16	18	11	48	18
40	67	20	19	5	22	27	20	22	22.1	0	26	32	21	26
26	4	25	23	8	19	23	19	19	19.7	4	30	35	15	30
< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1
6.2	22	7.7	4.7	48	17	24	34	17	16	6	8.8	38	125	8.8
55	8	51	43.7	15	79	99	22	79	78.8	0	79	99	22	79
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6
1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5

DUP-9A		BH97_0.0-0.2	DUP_14		BH97_0.0-0.2	DUP-14A		MW01	DUP-01		MW01	Dup-1A	
ES2001581003		S19-De29222	S19-De29229		S19-De29222	ES1942492009		S20-Ja04468	S20-Ja04474		S20-Ja04468	ES2000668003	
15/01/2020		18/12/2019	18/12/2019		18/12/2019	18/12/2019		8/01/2020	8/01/2020		8/01/2020	8/01/2020	
Soil		Soil	Soil		Soil	Soil		Groundwater	Groundwater		Groundwater	Groundwater	
	RPD (%)			RPD (%)			RPD (%)			RPD (%)			RPD (%)
6.2	30	5	5.4	8	5	<5	N/A	0.001	0.001	0	0.001	0.001	0
<0.1	N/A	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	0.0017	0.0017	0	0.0017	0.0017	0
13.7	27	7.3	8	9	7.3	5	37	< 0.001	< 0.001	N/A	< 0.001	0.001	N/A
26.7	3	14	12	15	14	11	24	< 0.001	< 0.001	N/A	< 0.001	0.003	N/A
20.7	37	19	22	15	19	15	24	0.001	0.001	0	0.001	0.001	0
<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.0001	< 0.0001	N/A	< 0.0001	<0.0001	N/A
14.7	50	< 5	< 5	N/A	< 5	3	N/A	0.022	0.019	15	0.022	0.03	31
75.4	5	71	70	1	71	74	4	0.048	0.043	11	0.048	0.069	36
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
0.6	0	0.6	0.6	0	0.6	0.6	0	-	-	N/A	-	-	N/A
1.2	0	1.2	1.2	0	1.2	1.2	0	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
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< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A

APPENDIX A

SITE DEVELOPMENT PLANS

DRAFT

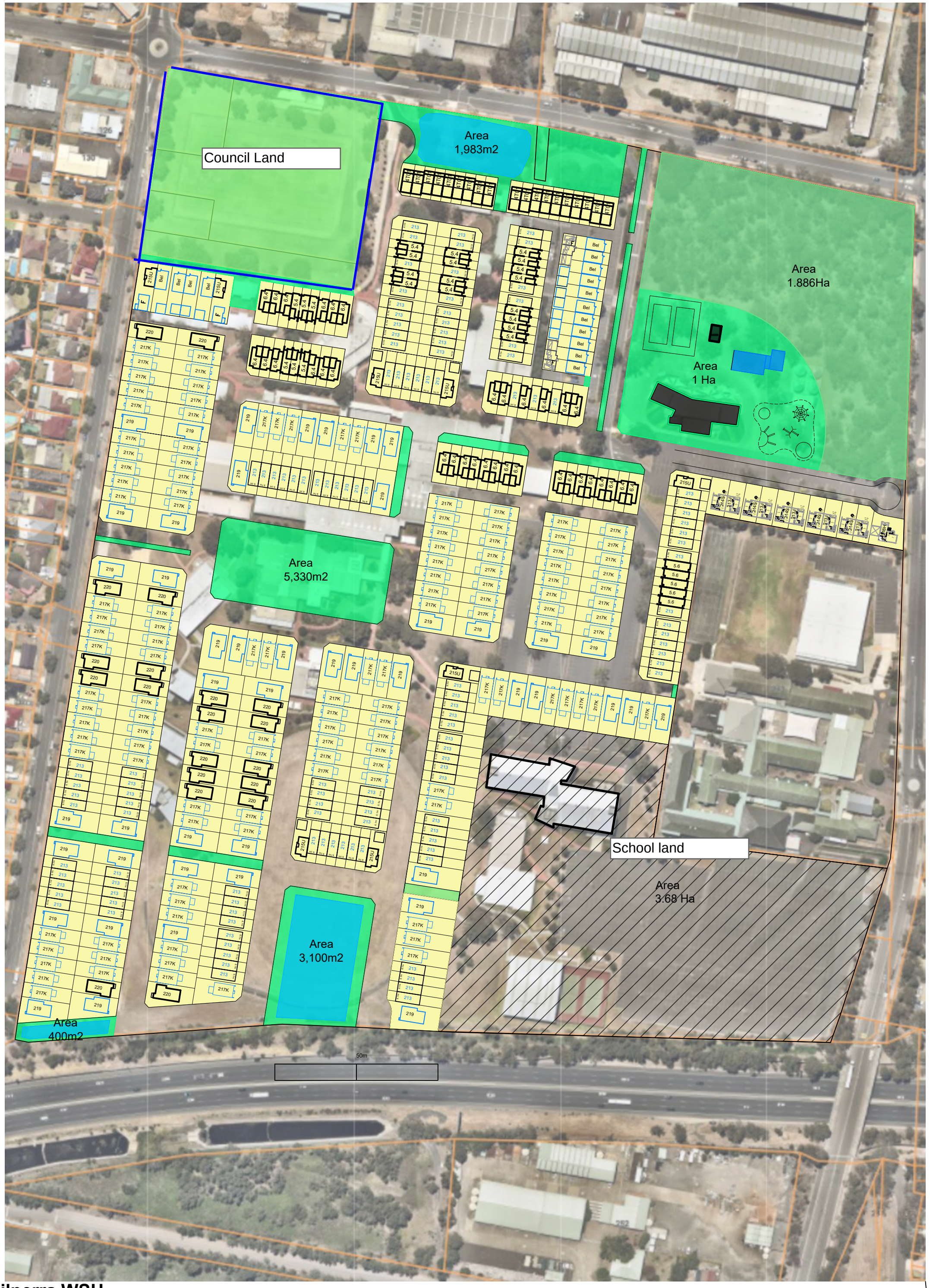


MILPERRA WSU

Current Masterplan

22.10.19

MIRVAC DESIGN



Milperra WSU

Layout- Option 1h8b

21.06.19

APPENDIX B

SITE SURVEY

DRAFT

BULLECOURT AVE
Bus Bay
Hockey Club
DP 91953
SINAI AVE
Student Residence
DP 547674
FIRST AVENUE
IAN SMITH AVENUE
MERRIS PL
LILLE PL
MESSINES AVE
ASHFORD AVE
Student Residence
DERNANCOURT PDE
THIRD AVENUE
HORSLEY RD
ZONNEBEKE AVE
Volleyball Court
HAMEL CL
SOMME CR
Javelin, Hammer & Shot put fields
Storage Containers
Cricket Oval Football Field Running Track
Long Jump Fields
Covered Courts
Tennis Courts
Mt St Joseph Catholic School
FLANDERS AVE
SOUTH WESTERN MOTORWAY
DP 231721
DP 236028
DP 237192
DP 237191
DP 230101
DP 239008
DP 232889
DP 232608
DP 228751
DP 230022
DP 229631
DP 229888
DP 603074
DP 238384
DP 752013
SP 67073
DP 533380
DP 752013
DP 1093355
DP 1027307
DP 514918
DP 516522
DP 1096110
DP 526235
DP 228751
DP 225714
DP 512619
DP 1092293
DP 327986
DP 73
SP 64626
DP 16010
DP 132496
DP 554515
DP 16010
DP 16010
SP 62916
DP 16010
DP 732013
DP 221860
50 100 200

APPENDIX C

BOREHOLE AND TEST PIT LOGS

DRAFT

APPENDIX D

PID CALIBRATION CERTIFICATION

DRAFT

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-105429

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:	Flowrate					

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		92ppm Isobutylene	NATA	SY245		91.8ppm

Calibrated by: **Sen Phiilp**

Calibration date: **12/12/2019**

Next calibration due: **9/06/2020**

Calibration & Service Report
PID

Company:	Active Environmental Solutions Hire	**Manufacturer:**	RAE Systems	**Serial #:**	592-905200
Contact:	William Pak/Milenko Sisic	**Instrument:**	MiniRAE 3000	**Hire #:**	891
Address:	Unit 16, 191 Parramatta Road	**Model:**	PGM 7320	**Client:**	Sam Scully
	AUBURN NSW 2144	**Configuration:**	PID (10.6eV)	**Company:**	Alliance Geotech
Phone:	02 9716 5966 | **Fax**: 02 9716 5988	**Wireless:**	-	**Project #:**	9996
Email:	hire@aesolutions.com.au	**Network ID:**	-	**Notes:**	

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>500 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	2.16
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
PID	Lamp	✓	
PID	Sensor	✓	
THP	Sensor	✓	

Engineer's Report

Setup, service and calibration for hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	10.6eV	-	Isobutylene	100ppm	A0442963	1.00	0	100ppm
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: William Pak

Date: 06.01.2020

Next due: 06.07.2020

APPENDIX E

GROUNDWATER WELL SURVEY

DRAFT

12d Project - c:\12dS\data\Affinity\Projects_5\02 - Royal Randwick Hospital - Diona\02.1 Controlled 12d Projects\SERVICES EXISTING.12dmodel\SERVICES EXISTING



THIS SHEET MAY BE PREPARED USING COLOUR AND MAY BE INCOMPLETE IF COPIED
DRAWING FILE LOCATION \ NAME
C:\Users\Affinity Survey\Desktop\Kevin O Gorman Personal\New Jobs Details\Milperra Western Sydney Campus\Western Sydney University Monitoring Wells111

A3 ORIGINAL 100 mm ON ORIGINAL
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

PLOT DATE
Mon Jan 20 17:49:09 2020

REV	DATE	NOTES	WVR No	APPROVAL

TITLE	NAME
DRAFTER	Affinity Survey
DRAFTING CHECK	
DESIGNER	
DESIGN CHECK	
DESIGN MANAGER	
PROJECT MANAGER	

AFFINITY SURVEY

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

CLIENT

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING

SCALE at A3 1:1000

N

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: A.H.D.

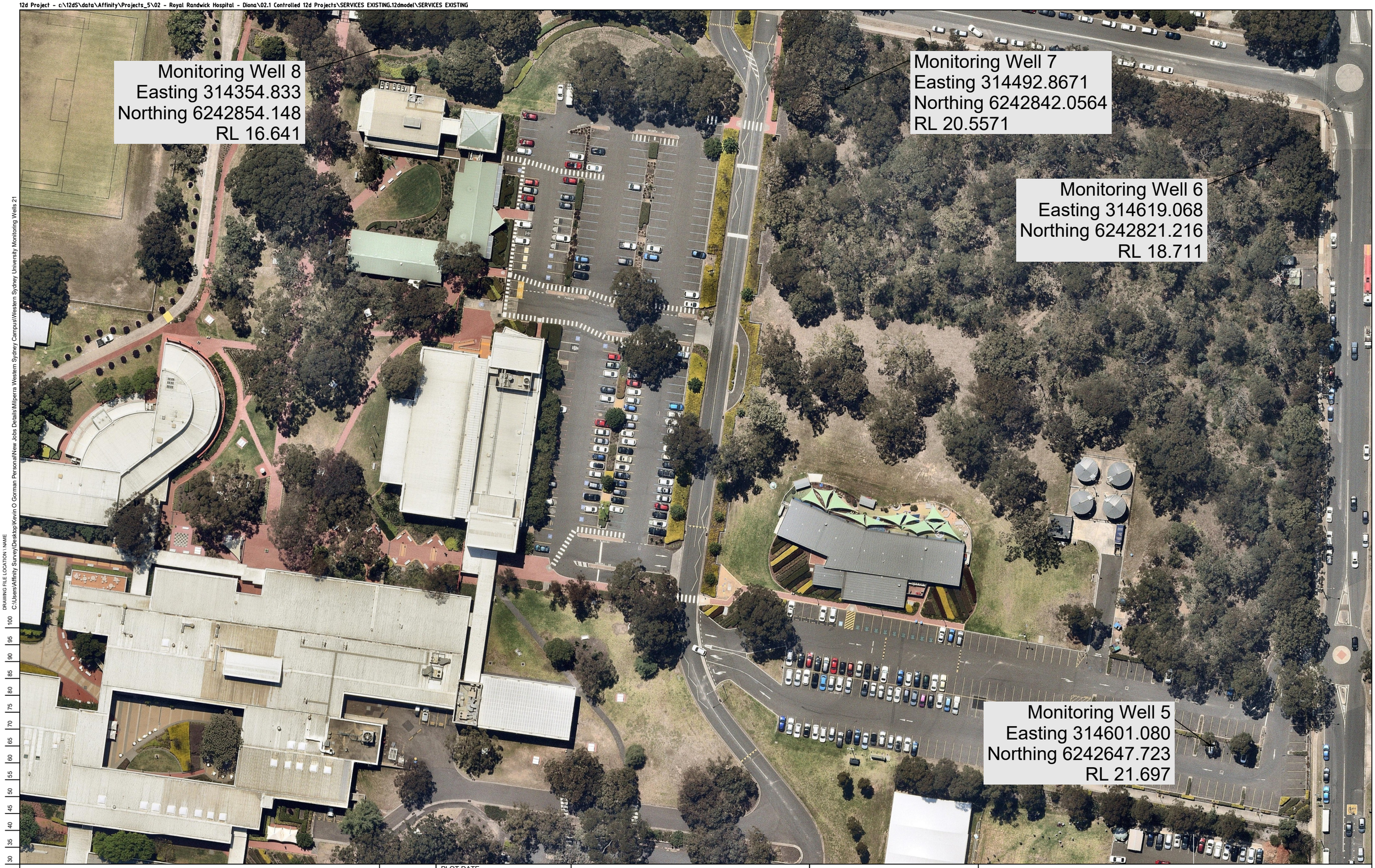
Western Sydney University Campus, Milperra

Location And Level Monitoring Wells

PLOT DATE = Mon Jan 20 17:49:09 2020

CLIENT PROJECT / DRAWING No	ISSUE STATUS	AS PROJECT / DRAWING No	ISSUE

12d Project - c:\12dS\data\Affinity\Projects_5\02 - Royal Randwick Hospital - Diona\02.1 Controlled 12d Projects\SERVICES EXISTING.12dmodel\SERVICES EXISTING



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DRAWING FILE LOCATION \ NAME
C:\Users\Affinity Survey\Desktop\Kevin O Gorman Personal\New Jobs Details\Milperra Western Sydney Campus\Western Sydney University Monitoring Wells 21

A3 ORIGINAL 100 mm ON ORIGINAL

PLOT DATE
Mon Jan 20 18:03:18 2020

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

SCALE at A3 1:1000

Western Sydney University Campus, Milperra

REV	DATE	NOTES	WVR No	APPROVAL

TITLE	NAME
DRAFTER	Affinity Survey
DRAFTING CHECK	
DESIGNER	
DESIGN CHECK	
DESIGN MANAGER	
PROJECT MANAGER	

AFFINITY SURVEY

CLIENT

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING

N

Location And Level
Monitoring Wells

CO-ORDINATE SYSTEM: MGA ZONE 56 | HEIGHT DATUM: A.H.D.

CLIENT PROJECT / DRAWING No	ISSUE STATUS	AS PROJECT / DRAWING No	ISSUE
		PLOT DATE - Mon Jan 20 18:03:18 2020	

APPENDIX F

GROUNDWATER SAMPLING CALIBRATION DOCUMENTATION

DRAFT

Calibration & Service Report
Water Quality Meter

Company:	Active Environmental Solutions Hire	**Manufacturer:**	YSI	**Hire Contract:**	891
Address:	Unit 16, 191 Parramatta Road AUBURN NSW 2144	**Instrument/Model:**	Professional Plus	**Client:**	Alliance Geotech
		Cable:	1m Quatro Cable	**Contact:**	Sam Scully
Phone:	02 9716 5966 | **Fax**: 02 9716 5988	**Serial #:**	18K100443	**Project #:**	9996
Email:	hire@aesoultions.com.au	**Notes:**		**Notes:**	

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 60 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	New probe fitted
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	55 to 60 mV/pH; ideal 59mV
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	New probe fitted
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	Variance range ± 20mV
Conductivity			
Condition		✓	Good, Clean.
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	New probe fitted
DO sensor in use		✓	Polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

				Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Before**	**After**	**Units**
Temperature	Center 370 Thermometer	Room Temp.	23.6	N/A	23.6	°C
pH	pH 4.00	328104	4.01	4.00	4.01	pH
pH	pH 7.00	329744	7.00	6.97	7.00	pH
Conductivity	2760 µs/cm at 25°C	332208	2760	2848	2760	µs/cm
ORP (Ref. check only)	Zobell A & B	326918 & 326693	235.3	233.1	235.3	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	283762	0.0	2.4	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Fresh Air	100.0	92.7	100.0	%

Calibrated By: William Pak

Calibration Date: 06/01/2020 **Calibration Due:** 06/07/2020

Calibration & Service Report
Peristaltic Pump

Company:	Active Environmental Solutions Hire	**Manufacturer:**	Geotech	**Serial #:**	4449
Address:	Unit 16, 191 Parramatta Road AUBURN NSW 2144	**Instrument/Model:**	51350021	**Cable Length:**	4.5m
Phone:	02 9716 5966 | **Fax**: 02 9716 5988	**Client Company:**	Alliance Geotech	**Client Email:**	
Email:	hire@aesoultions.com.au	**Client Name:**	Sam Scully	**Client Phone:**	

Equipment Check

Geopump Peristaltic Pump

Customer:	Alliance Geotech	**Manufacturer:**	Geotech
Contact:	Sam Scully	**Instrument:**	Peristaltic Pump
Order:	9996	**Serial #:**	4449
		Head Serial #:	
		Cable length:	4.5m

Item	Test	Pass	Comments
Battery	12 Voltage	✓	Voltage above 13 V
	Fuses	✓	
	Capacity	✓	
Pump	Decontaminated	✓	
	Condition	✓	
	Operation	✓	
	0.5 m Silicon Tubing	✓	New Tubing
Charger	Condition	✓	
Hard Case	Condition	✓	
Instrument Test	Operation checked	✓	
Instruction manual	Included	✓	

Comments

2 batteries sent.

This is to certify that the above instrument has been checked and is in good working order.

Checked By: Jerry Ji

Check Date: 06/01/2020 **Due for Check:** 06/07/2020

APPENDIX G

LABORATORY DOCUMENTATION

DRAFT

Helen Simpson

From: Sam Scully <sam@allgeo.com.au>
Sent: Tuesday, 21 January 2020 12:11 PM
To: Helen Simpson
Subject: [EXTERNAL] - RE: ALS Workorder ES2001581, Client ALLGEOT, Project 9996

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi Helen,

Standard 8 metals suite (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc). By trace metals we mean if they could please be analysed using a lower LOR.

Please do not hesitate to contact me if you have any queries or questions,

Kind Regards,

Sam Scully

Environmental Consultant - 0400 339 745 | **Email:** sam@allgeo.com.au

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING
Your On-Site Geotechnical & Environmental Specialists

OHSAS18001 ISO9001 ISO14001 AS/NZS4801
OH&S QUALITY ENVIRONMENT OH&S

Office Email: admin@allgeo.com.au - **Website:** allgeo.com.au - **Office Phone:** 1800 288 188
PO Box 275, Seven Hills NSW 1730 / Address: 10 Welder Road, Seven Hills NSW 2147

Our office administration will be closed from December 23rd and will reopen on January 6th
For any urgent or unexpected geotechnical or environmental enquiries, please phone 1800 288 188
WISHING EVERYONE HAPPY HOLIDAYS FROM THE ALLIANCE GEOTECHNICAL TEAM!

Environmental Division
Sydney
Work Order Reference
ES2001581

Telephone : +61-2-8784 8555

From: Helen Simpson <helen.simpson@alsglobal.com>
Sent: Tuesday, 21 January 2020 11:54 AM
To: Sam Scully <sam@allgeo.com.au>
Subject: ALS Workorder ES2001581, Client ALLGEOT, Project 9996

Hi Sam,

For the attached COC, the 2 soils have been logged for PAH, but we do require further clarification on which "trace metals" are required for these samples.

Kind Regards,

Helen Simpson
Sample Admin, Environmental
Sydney

T +61 2 8784 8555
F +61 2 8784 8500
helen.simpson@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164 AUSTRALIA

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EnviroMail™ 128 – Revised PFAS Bottle Requirements

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ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2001581**	Page	: 1 of 4
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Telephone	: +61-2-8784 8555
Project	: 9996	Date Samples Received	: 17-Jan-2020
Site	: ----	Issue Date	: 23-Jan-2020
Sampler	: SAM SCULLY	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Total Mercury by FIMS	1	15	6.67	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
DUP-7A, DUP-8A, DUP-9A	**15-Jan-2020**	**----**	----	----	**20-Jan-2020**	29-Jan-2020	✓
EG020T: Total Metals by ICP-MS							
Soil Glass Jar - Unpreserved (EG020X-T)							
DUP-7A, DUP-8A, DUP-9A	**15-Jan-2020**	**22-Jan-2020**	13-Jul-2020	✓	**22-Jan-2020**	13-Jul-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
DUP-7A, DUP-8A, DUP-9A	**15-Jan-2020**	**22-Jan-2020**	12-Feb-2020	✓	**22-Jan-2020**	12-Feb-2020	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
DUP-7A, DUP-8A, DUP-9A	**15-Jan-2020**	**21-Jan-2020**	29-Jan-2020	✓	**22-Jan-2020**	01-Mar-2020	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite X	EG020X-T	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite Y	EG020Y-T	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite X	EG020X-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite Y	EG020Y-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite X	EG020X-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite Y	EG020Y-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite X	EG020X-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite Y	EG020Y-T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Total Metals by ICP-MS - Suite X	EG020X-T	SOIL	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite Y	EG020Y-T	SOIL	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

QUALITY CONTROL REPORT

Work Order	: **ES2001581**	Page	: 1 of 5
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Contact	: Customer Services ES
Address	: 10 Welder Road, Seven Hills, NSW	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 9996	Date Samples Received	: 17-Jan-2020
Order number	: ----	Date Analysis Commenced	: 20-Jan-2020
C-O-C number	: ----	Issue Date	: 23-Jan-2020
Sampler	: SAM SCULLY		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Gaston Allende	R&D Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2818847)									
ES2001325-001	Anonymous	EA055: Moisture Content	----	0.1	%	89.9	90.4	0.590	0% - 20%
ES2001577-002	Anonymous	EA055: Moisture Content	----	0.1	%	14.9	15.1	1.37	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 2821949)									
ES2001581-001	DUP-7A	EG020Y-T: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2821950)									
ES2001581-001	DUP-7A	EG020X-T: Arsenic	7440-38-2	0.1	mg/kg	9.7	9.0	7.20	0% - 20%
		EG020X-T: Chromium	7440-47-3	0.1	mg/kg	15.2	12.5	19.2	0% - 20%
		EG020X-T: Copper	7440-50-8	0.1	mg/kg	19.0	16.0	17.4	0% - 20%
		EG020X-T: Nickel	7440-02-0	0.1	mg/kg	4.7	5.1	6.99	0% - 20%
		EG020X-T: Lead	7439-92-1	0.1	mg/kg	23.0	20.6	10.9	0% - 20%
		EG020X-T: Zinc	7440-66-6	0.5	mg/kg	43.7	50.5	14.5	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2821947)									
ES2001588-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2819097)									
ES2001441-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2819097) - continued									
ES2001441-001	Anonymous	EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 2821949)								
EG020Y-T: Cadmium	7440-43-9	0.1	mg/kg	<0.1	4.64 mg/kg	101	86.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2821950)								
EG020X-T: Arsenic	7440-38-2	0.1	mg/kg	<0.1	21.7 mg/kg	106	90.0	130
EG020X-T: Chromium	7440-47-3	0.1	mg/kg	<0.1	43.9 mg/kg	96.0	72.0	124
EG020X-T: Copper	7440-50-8	0.1	mg/kg	<0.1	32 mg/kg	111	76.0	132
EG020X-T: Nickel	7440-02-0	0.1	mg/kg	<0.1	55 mg/kg	110	73.0	135
EG020X-T: Lead	7439-92-1	0.1	mg/kg	<0.1	40 mg/kg	107	73.0	128
EG020X-T: Zinc	7440-66-6	0.5	mg/kg	<0.5	60.8 mg/kg	111	83.0	138
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2821947)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	86.3	70.0	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2819097)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	94.3	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	96.0	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	95.0	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	95.8	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	95.1	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	96.1	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	99.0	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	96.6	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	96.8	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	94.3	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	96.4	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	95.2	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	94.4	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	91.9	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	94.9	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	95.7	63.0	121

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Matrix Spike (MS) Report

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS (QCLot: 2821949)							
ES2001581-001	DUP-7A	EG020Y-T: Cadmium	7440-43-9	50 mg/kg	119	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2821950)							
ES2001581-001	DUP-7A	EG020X-T: Arsenic	7440-38-2	50 mg/kg	121	70.0	130
		EG020X-T: Chromium	7440-47-3	50 mg/kg	122	70.0	130
		EG020X-T: Copper	7440-50-8	250 mg/kg	129	70.0	130
		EG020X-T: Nickel	7440-02-0	50 mg/kg	129	70.0	130
		EG020X-T: Lead	7439-92-1	250 mg/kg	116	70.0	130
		EG020X-T: Zinc	7440-66-6	250 mg/kg	127	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2821947)							
ES2001326-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	87.8	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2819097)							
ES2001458-016	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.9	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.3	70.0	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2001581**	Page	: 1 of 5
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Contact	: Customer Services ES
Address	: 10 Welder Road, Seven Hills, NSW	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 9996	Date Samples Received	: 17-Jan-2020 14:15
Order number	: ----	Date Analysis Commenced	: 20-Jan-2020
C-O-C number	: ----	Issue Date	: 23-Jan-2020 19:51
Sampler	: SAM SCULLY		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Gaston Allende	R&D Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DUP-7A	DUP-8A	DUP-9A	----	----
			Client sampling date / time	15-Jan-2020 00:00	15-Jan-2020 00:00	15-Jan-2020 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2001581-001	ES2001581-002	ES2001581-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**7.9**	**3.9**	**5.9**	**----**	**----**
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.1	mg/kg	**9.7**	**6.7**	**6.2**	**----**	**----**
Cadmium	7440-43-9	0.1	mg/kg	<0.1	**0.1**	<0.1	**----**	**----**
Chromium	7440-47-3	0.1	mg/kg	**15.2**	**7.7**	**13.7**	**----**	**----**
Copper	7440-50-8	0.1	mg/kg	**19.0**	**22.1**	**26.7**	**----**	**----**
Nickel	7440-02-0	0.1	mg/kg	**4.7**	**16.0**	**14.7**	**----**	**----**
Lead	7439-92-1	0.1	mg/kg	**23.0**	**19.7**	**20.7**	**----**	**----**
Zinc	7440-66-6	0.5	mg/kg	**43.7**	**78.8**	**75.4**	**----**	**----**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	**----**	**----**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	**----**	**----**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**----**	**----**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**----**	**----**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**85.3**	**86.5**	**84.4**	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	DUP-7A	DUP-8A	DUP-9A	----	----
				Client sampling date / time	15-Jan-2020 00:00	15-Jan-2020 00:00	15-Jan-2020 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2001581-001	ES2001581-002	ES2001581-003	--------	--------
					Result	Result	Result	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		89.3	90.5	89.1	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		87.3	87.6	90.6	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		102	100	103	----	----
Anthracene-d10	1719-06-8	0.5	%		95.2	95.0	94.8	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		100	104	102	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2000668**	Page	: 1 of 4
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Telephone	: +61-2-8784 8555
Project	: 9996 Milperra	Date Samples Received	: 10-Jan-2020
Site	: ----	Issue Date	: 16-Jan-2020
Sampler	: SAM SCULLY	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005(ED093)T: Total Metals by ICP-AES	ES2000502--001	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
DUP-5A, DUP-6A	**09-Jan-2020**	**----**	----	----	**13-Jan-2020**	23-Jan-2020	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
DUP-5A, DUP-6A	**09-Jan-2020**	**13-Jan-2020**	07-Jul-2020	✓	**14-Jan-2020**	07-Jul-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
DUP-5A, DUP-6A	**09-Jan-2020**	**13-Jan-2020**	06-Feb-2020	✓	**14-Jan-2020**	06-Feb-2020	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
DUP-5A, DUP-6A	**09-Jan-2020**	**14-Jan-2020**	23-Jan-2020	✓	**15-Jan-2020**	23-Feb-2020	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T)							
Dup-1A	**08-Jan-2020**	**14-Jan-2020**	06-Jul-2020	✓	**14-Jan-2020**	06-Jul-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T)							
Dup-1A	**08-Jan-2020**	**----**	----	----	**13-Jan-2020**	05-Feb-2020	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Total Mercury by FIMS	EG035T	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2000668**	Page	: 1 of 6
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Contact	: Customer Services ES
Address	: 10 Welder Road, Seven Hills, NSW	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 9996 Milperra	Date Samples Received	: 10-Jan-2020
Order number	: ----	Date Analysis Commenced	: 13-Jan-2020
C-O-C number	: ----	Issue Date	: 16-Jan-2020
Sampler	: SAM SCULLY		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2806520)									
ES2000711-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	2	<1	78.2	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	50	45	10.1	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	31	34	10.7	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	23	<5	129	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	375	408	8.44	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	236	232	1.37	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	269	256	4.94	0% - 20%
ES2000502-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	45	51	11.2	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	13	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	22	5.42	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	19	22	13.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	2980	3370	12.5	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2806524)									
ES2000668-002	DUP-6A	EA055: Moisture Content	----	0.1	%	6.7	6.9	3.55	No Limit
ES2000711-005	Anonymous	EA055: Moisture Content	----	0.1	%	9.7	9.4	2.71	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2806519)									
ES2000502-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2000711-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2807357)									
ES2000754-053	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2807357) - continued									
ES2000754-053	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 2807237)									
ES2000703-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.013	0.013	0.00	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.022	0.022	0.00	No Limit
ES2000674-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.585	0.584	0.250	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.011	0.012	10.7	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2805657)									
ES2000668-003	Dup-1A	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES2000792-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2806520)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	108	86.0	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	106	83.0	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	92.8	76.0	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	110	86.0	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	102	80.0	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	105	87.0	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	109	80.0	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2806519)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	84.9	70.0	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2807357)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	101	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	99.6	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	98.3	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	103	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	107	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	99.6	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	96.5	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	91.7	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	89.4	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	91.9	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	99.0	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	108	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	95.8	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	91.8	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	89.7	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	96.3	63.0	121

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 2807237)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.7	82.0	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	84.0	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.8	86.0	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 2807237) - continued								
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.5	83.0	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.6	85.0	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.5	84.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	94.1	79.0	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2805657)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	107	77.0	111

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2806520)							
ES2000502-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	99.9	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	110	70.0	130
		EG005T: Copper	7440-50-8	250 mg/kg	106	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	106	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	107	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	# Not Determined	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2806519)							
ES2000502-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	89.0	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2807357)							
ES2000754-053	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	102	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	70.0	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 2807237)							
ES2000668-003	Dup-1A	EG020A-T: Arsenic	7440-38-2	1 mg/L	109	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	97.8	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	92.9	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	96.4	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 2807237) - continued							
ES2000668-003	Dup-1A	EG020A-T: Nickel	7440-02-0	1 mg/L	97.8	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	98.2	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2805657)							
ES2000749-001	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	76.6	70.0	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2000668**	Page	: 1 of 6
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Contact	: Customer Services ES
Address	: 10 Welder Road, Seven Hills, NSW	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 9996 Milperra	Date Samples Received	: 10-Jan-2020 11:30
Order number	: ----	Date Analysis Commenced	: 13-Jan-2020
C-O-C number	: ----	Issue Date	: 16-Jan-2020 13:26
Sampler	: SAM SCULLY		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 3		
No. of samples analysed	: 3		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DUP-5A	DUP-6A	----	----	----
			Client sampling date / time	09-Jan-2020 00:00	09-Jan-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2000668-001	ES2000668-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**10.1**	**6.7**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**7**	**8**	----	----	----
Copper	7440-50-8	5	mg/kg	**12**	**12**	----	----	----
Lead	7439-92-1	5	mg/kg	**10**	**18**	----	----	----
Nickel	7440-02-0	2	mg/kg	**4**	**3**	----	----	----
Zinc	7440-66-6	5	mg/kg	**42**	**51**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**77.1**	**80.0**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	DUP-5A	DUP-6A	----	----	----
				Client sampling date / time	09-Jan-2020 00:00	09-Jan-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2000668-001	ES2000668-002	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		**81.8**	**82.8**	**----**	**----**	**----**
2.4.6-Tribromophenol	118-79-6	0.5	%		**59.5**	**61.2**	**----**	**----**	**----**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**88.5**	**87.8**	**----**	**----**	**----**
Anthracene-d10	1719-06-8	0.5	%		**84.0**	**83.9**	**----**	**----**	**----**
4-Terphenyl-d14	1718-51-0	0.5	%		**88.1**	**94.5**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Dup-1A	----	----	----	----
				Client sampling date / time	08-Jan-2020 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2000668-003	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.001**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0017**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.001**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.003**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.030**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**0.001**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.069**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ **Sydney Laboratory** Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory** Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2, 91 Leach Highway, Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 2 Kingston Town Close, Oakleigh, VIC 3166 03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully				
Handed over by	Sam Scully				
Email for Invoice	Enviro@allgeo.com.au				
Email for Results	Enviro@allgeo.com.au				

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964, WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)* ☐ 1 Day* ☐ 2 Day* ☐ 3 Day* ☒ 5 Day *Surcharges apply ☐ Other ( )

№		Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	1	DUP-1A	16/12/19	Soil	X	X									Please forward to ALS
2		DUP-02	16/12/19	Soil	X	X									
3	2	DUP-2A	16/12/19	Soil	X	X									Please forward to ALS
4		DUP-03	17/12/19	Soil	X	X									
5	3	DUP-3A	17/12/19	Soil	X	X									Please forward to ALS
6		DUP-04	18/12/19	Soil	X	X									
7	4	DUP-4A	18/12/19	Soil	X	X									Please forward to ALS
8		DUP-10	17/12/19	Soil											
9	5	DUP-10A	17/12/19	Soil											Please forward to ALS
10		DUP-11	17/12/19	Soil											
		Total Counts													

Environmental Division Sydney
Work Order Reference
ES1942492

Telephone : + 61-2-8784 8555

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Name: Sam Scully Signature: Date: 17-12-19 Time: 4 : 00pm

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Rec- Sam 20/12/19 1850 12.2°C 12.2°C

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ **Sydney Laboratory** Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory** Unit 1, 21 Smallwood Pl, Murarrie, QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2, 91 Leach Highway, Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 2 Kingston Town Close, Oakleigh, VIC 3166 03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully				
Handed over by	Sam Scully				
Email for Invoice	Enviro@allgeo.com.au				
Email for Results	Enviro@allgeo.com.au				

Containers: 1L Plastic; 250mL Plastic; 125mL Amber Glass; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Please Specify e.g. ASTM/BS/AS/NEPM/WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)* ☐ 1 Day* ☐ 2 Day* ☐ 3 Day* ☒ 5 Day ☐ Other ( ) *Surcharges apply

№		Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	6	DUP-11A	16/12/19	Soil											Please forward to ALS
2		DUP-12	16/12/19	Soil											
3	7	DUP-12A	16/12/19	Soil											Please forward to ALS
4		DUP-13	17/12/19	Soil											
5	8	DUP-13A	17/12/19	Soil											Please forward to ALS
6		DUP-14	18/12/19	Soil	X	X									
7	9	DUP-14A	18/12/19	Soil	X	X									Please forward to ALS
8		TRIP SPIKE	16/12/19	Soil								X			
9		TRIP BLANK	16/12/19	Soil								X			
10		TRIP SPIKE	17/12/19	Soil								X			
		Total Counts													

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal | Name: Sam Scully | Signature | Date: 19-12-19 | Time: 4 : 00pm

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Rec'd Scaffer 20/12/19 1850 12°C

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ **Sydney Laboratory** Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory** Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2, 91 Leach Highway, Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 2 Kingston Town Close, Oakleigh, VIC 3166 03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

| | | | | |

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1942492**	Page	: 1 of 5
Amendment	: **1**		
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Contact	: Customer Services ES
Address	: 10 Welder Road, Seven Hills, NSW	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 9996 Milperra	Date Samples Received	: 20-Dec-2019 15:30
Order number	: ----	Date Analysis Commenced	: 23-Dec-2019
C-O-C number	: ----	Issue Date	: 15-Jan-2020 11:17
Sampler	: SAM SCULLY		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 9		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- Amendment (15/01/2020): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Sam Scully on 15/1/2020. All analysis results are as per the previous report.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DUP-1A	DUP-2A	DUP-3A	DUP-4A	DUP-14A
			Client sampling date / time	16-Dec-2019 00:00	16-Dec-2019 00:00	17-Dec-2019 00:00	18-Dec-2019 00:00	18-Dec-2019 00:00
Compound	CAS Number	LOR	Unit	ES1942492-001	ES1942492-002	ES1942492-003	ES1942492-004	ES1942492-009
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	5.7	5.5	5.7	2.0	2.9
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	23	9	11	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	36	25	19	6	5
Copper	7440-50-8	5	mg/kg	9	11	15	23	11
Lead	7439-92-1	5	mg/kg	21	27	28	26	15
Nickel	7440-02-0	2	mg/kg	5	5	12	4	3
Zinc	7440-66-6	5	mg/kg	58	44	34	86	74
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	72.9	75.2	72.6	77.7	74.9

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	DUP-1A	DUP-2A	DUP-3A	DUP-4A	DUP-14A
				Client sampling date / time	16-Dec-2019 00:00	16-Dec-2019 00:00	17-Dec-2019 00:00	18-Dec-2019 00:00	18-Dec-2019 00:00
Compound	CAS Number	LOR	Unit		ES1942492-001	ES1942492-002	ES1942492-003	ES1942492-004	ES1942492-009
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		76.5	77.8	75.9	81.2	78.8
2.4.6-Tribromophenol	118-79-6	0.5	%		62.6	66.3	72.2	73.6	78.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		81.8	83.9	79.8	85.4	83.2
Anthracene-d10	1719-06-8	0.5	%		76.3	77.1	75.3	81.0	77.7
4-Terphenyl-d14	1718-51-0	0.5	%		79.4	81.4	78.8	84.6	81.3

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1942492**	Page	: 1 of 4
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Telephone	: +61-2-8784 8555
Project	: 9996 Milperra	Date Samples Received	: 20-Dec-2019
Site	: ----	Issue Date	: 02-Jan-2020
Sampler	: SAM SCULLY	No. of samples received	: 9
Order number	: ----	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) DUP-1A, DUP-2A	**16-Dec-2019**	**----**	----	----	**27-Dec-2019**	30-Dec-2019	✓
Soil Glass Jar - Unpreserved (EA055) DUP-3A	**17-Dec-2019**	**----**	----	----	**27-Dec-2019**	31-Dec-2019	✓
Soil Glass Jar - Unpreserved (EA055) DUP-4A, DUP-14A	**18-Dec-2019**	**----**	----	----	**27-Dec-2019**	01-Jan-2020	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) DUP-1A, DUP-2A	**16-Dec-2019**	**27-Dec-2019**	13-Jun-2020	✓	**27-Dec-2019**	13-Jun-2020	✓
Soil Glass Jar - Unpreserved (EG005T) DUP-3A	**17-Dec-2019**	**27-Dec-2019**	14-Jun-2020	✓	**27-Dec-2019**	14-Jun-2020	✓
Soil Glass Jar - Unpreserved (EG005T) DUP-4A, DUP-14A	**18-Dec-2019**	**27-Dec-2019**	15-Jun-2020	✓	**27-Dec-2019**	15-Jun-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) DUP-1A, DUP-2A	**16-Dec-2019**	**27-Dec-2019**	13-Jan-2020	✓	**30-Dec-2019**	13-Jan-2020	✓
Soil Glass Jar - Unpreserved (EG035T) DUP-3A	**17-Dec-2019**	**27-Dec-2019**	14-Jan-2020	✓	**30-Dec-2019**	14-Jan-2020	✓
Soil Glass Jar - Unpreserved (EG035T) DUP-4A, DUP-14A	**18-Dec-2019**	**27-Dec-2019**	15-Jan-2020	✓	**30-Dec-2019**	15-Jan-2020	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) DUP-1A, DUP-2A	**16-Dec-2019**	**23-Dec-2019**	30-Dec-2019	✓	**27-Dec-2019**	01-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) DUP-3A	**17-Dec-2019**	**23-Dec-2019**	31-Dec-2019	✓	**27-Dec-2019**	01-Feb-2020	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) DUP-4A, DUP-14A	**18-Dec-2019**	**23-Dec-2019**	01-Jan-2020	✓	**27-Dec-2019**	01-Feb-2020	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 6.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

QUALITY CONTROL REPORT

Work Order	: **ES1942492**	Page	: 1 of 5
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Contact	: Customer Services ES
Address	: 10 Welder Road, Seven Hills, NSW	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 9996 Milperra	Date Samples Received	: 20-Dec-2019
Order number	: ----	Date Analysis Commenced	: 23-Dec-2019
C-O-C number	: ----	Issue Date	: 02-Jan-2020
Sampler	: SAM SCULLY		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 9		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2786420)									
ES1942537-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	13	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	26	25	0.00	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	109	122	11.3	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	215	210	2.65	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	350	380	8.40	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	332	336	1.22	0% - 20%
ES1942492-003	DUP-3A	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	19	12	48.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	9	26.5	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	6	53.2	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	13	13.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	28	21	25.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	34	26	25.8	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2786426)									
ES1942280-001	Anonymous	EA055: Moisture Content	----	0.1	%	35.2	34.2	2.72	0% - 20%
ES1942492-009	DUP-14A	EA055: Moisture Content	----	0.1	%	2.9	5.6	64.2	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2786416)									
ES1942492-003	DUP-3A	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
--------		EG035T: Mercury	7439-97-6	0.1	mg/kg	----	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2781409)									
ES1942417-007	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2781409) - continued									
ES1942417-007	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.8	0.8	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.8	0.8	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.6	1.6	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1942543-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2786420)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	98.0	86.0	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	95.1	83.0	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.4	76.0	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	97.9	86.0	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	94.4	80.0	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	87.0	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	104	80.0	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2786416)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	100	70.0	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2781409)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.6	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	95.1	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	85.0	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	91.7	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	89.7	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	95.4	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	91.6	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	90.1	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	82.3	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	78.7	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	82.2	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	89.8	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	86.2	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	79.2	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	76.0	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	81.0	63.0	121

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Matrix Spike (MS) Report		
Spike	SpikeRecovery(%)	Recovery Limits (%)

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2786420)							
ES1942348-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	95.6	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.7	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	95.4	70.0	130
		EG005T: Copper	7440-50-8	250 mg/kg	93.6	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	94.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	96.5	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	117	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2786416)							
ES1942276-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	92.6	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2781409)							
ES1942543-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	84.5	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	88.9	70.0	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1942492**	Page	: 1 of 5
Client	: **ALLIANCE GEOTECHNICAL**	Laboratory	: Environmental Division Sydney
Contact	: SAM SCULLY	Contact	: Customer Services ES
Address	: 10 Welder Road, Seven Hills, NSW	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 9996 Milperra	Date Samples Received	: 20-Dec-2019 15:30
Order number	: ----	Date Analysis Commenced	: 23-Dec-2019
C-O-C number	: ----	Issue Date	: 02-Jan-2020 17:51
Sampler	: SAM SCULLY		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 9		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	DUP-1A	DUP-2A	DUP-3A	DUP-4A	DUP-14A
			Client sampling date / time	16-Dec-2019 00:00	16-Dec-2019 00:00	17-Dec-2019 00:00	18-Dec-2019 00:00	18-Dec-2019 00:00
Compound	CAS Number	LOR	Unit	ES1942492-001	ES1942492-002	ES1942492-003	ES1942492-004	ES1942492-009
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	5.7	5.5	5.7	2.0	2.9
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	23	9	11	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	36	25	19	6	5
Copper	7440-50-8	5	mg/kg	9	11	15	23	11
Lead	7439-92-1	5	mg/kg	21	27	28	26	15
Nickel	7440-02-0	2	mg/kg	5	5	12	4	3
Zinc	7440-66-6	5	mg/kg	58	44	34	86	74
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	72.9	75.2	72.6	77.7	74.9

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	DUP-1A	DUP-2A	DUP-3A	DUP-4A	DUP-14A
				Client sampling date / time	16-Dec-2019 00:00	16-Dec-2019 00:00	17-Dec-2019 00:00	18-Dec-2019 00:00	18-Dec-2019 00:00
Compound	CAS Number	LOR	Unit		ES1942492-001	ES1942492-002	ES1942492-003	ES1942492-004	ES1942492-009
					Result	Result	Result	Result	Result
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	0.5	%		76.5	77.8	75.9	81.2	78.8
2.4.6-Tribromophenol	118-79-6	0.5	%		62.6	66.3	72.2	73.6	78.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		81.8	83.9	79.8	85.4	83.2
Anthracene-d10	1719-06-8	0.5	%		76.3	77.1	75.3	81.0	77.7
4-Terphenyl-d14	1718-51-0	0.5	%		79.4	81.4	78.8	84.6	81.3

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129

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Certificate of Analysis

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Sam Scully**

Report **698995-S**
Project name ADDITIONAL - 9996
Project ID 9996
Received Date Jan 29, 2020

Client Sample ID			**DUP-07**
Sample Matrix			**Soil**
Eurofins Sample No.			**S20-Ja28021**
Date Sampled			**Jan 15, 2020**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	16
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	29
Copper	5	mg/kg	40
Lead	5	mg/kg	26
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	6.2
Zinc	5	mg/kg	55
% Moisture	1	%	7.9

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Jan 29, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jan 29, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: ADDITIONAL - 9996
Project ID: 9996

Order No.:
Report #: 698995
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 29, 2020 1:53 PM
Due: Jan 30, 2020
Priority: Overnight
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Metals M8	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	DUP-07	Jan 15, 2020		Soil	S20-Ja28021	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	107			70-130	Pass	
Cadmium	%	108			70-130	Pass	
Chromium	%	112			70-130	Pass	
Copper	%	109			70-130	Pass	
Lead	%	109			70-130	Pass	
Mercury	%	99			70-130	Pass	
Nickel	%	110			70-130	Pass	
Zinc	%	109			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Ja23611	NCP	%	100			70-130	Pass	
Cadmium	S20-Ja23611	NCP	%	99			70-130	Pass	
Chromium	S20-Ja23611	NCP	%	99			70-130	Pass	
Copper	S20-Ja23611	NCP	%	99			70-130	Pass	
Lead	S20-Ja23611	NCP	%	97			70-130	Pass	
Mercury	S20-Ja23611	NCP	%	105			70-130	Pass	
Nickel	S20-Ja23611	NCP	%	100			70-130	Pass	
Zinc	S20-Ja23611	NCP	%	95			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Ja27776	NCP	mg/kg	5.8	6.7	15	30%	Pass	
Cadmium	S20-Ja27776	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ja27776	NCP	mg/kg	23	19	17	30%	Pass	
Copper	S20-Ja27776	NCP	mg/kg	44	38	13	30%	Pass	
Lead	S20-Ja27776	NCP	mg/kg	240	210	12	30%	Pass	
Mercury	S20-Ja27776	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ja27776	NCP	mg/kg	15	14	7.0	30%	Pass	
Zinc	S20-Ja27776	NCP	mg/kg	150	180	17	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Andrew Black	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

#AU04_Enviro_Sample_NSW

To: Andrew Black
Subject: RE: OVERNIGHT TAT RETEST: Fwd: Eurofins Test Results, Invoice - Report 697102 : Site 9996 (9996)

-------- Original message --------
From: Sam Scully <sam@allgeo.com.au>
Date: 29/1/20 1:53 pm (GMT+10:00)
To: Andrew Black <AndrewBlack@eurofins.com>
Subject: RE: Eurofins Test Results, Invoice - Report 697102 : Site 9996 (9996)

EXTERNAL EMAIL*

Thanks Andrew,

Could you please run soil sample DUP-07 for metals again on overnight TAT. The concentrations are way higher than the primary sample analysed by Eurofins and triplicate analysed by ALS.

Thanks mate,

Sam Scully

From: AndrewBlack@eurofins.com <AndrewBlack@eurofins.com>
Sent: Thursday, 23 January 2020 7:47 PM
To: Sam Scully <sam@allgeo.com.au>
Cc: enviro <enviro@allgeo.com.au>; admin <admin@allgeo.com.au>
Subject: Eurofins Test Results, Invoice - Report 697102 : Site 9996 (9996)

Regards

Andrew Black
Analytical Services Manager

Eurofins | Environment Testing
Unit 7
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SANDGATE NSW 2304
AUSTRALIA
Phone: +61 299 008 490
Mobile: +61 410 220 750
Email: AndrewBlack@eurofins.com
Website:environment.eurofins.com.au
EnviroNote 1079 - PFAS Fingerprinting
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

Click here to report this email as spam.

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* WARNING - EXTERNAL: This email originated from outside of Eurofins. Do not click any links or open any attachments unless you trust the sender and know that the content is safe!

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Sam Scully**

Report **697102-W**
Project name 9996
Project ID 9996
Received Date Jan 16, 2020

Client Sample ID			**TRIP SPIKE**	**TRIP BLANK**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S20-Ja12932**	**S20-Ja12933**
Date Sampled			**Jan 15, 2020**	**Jan 15, 2020**
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	88	< 0.001
Toluene	0.001	mg/L	89	< 0.001
Ethylbenzene	0.001	mg/L	89	< 0.001
m&p-Xylenes	0.002	mg/L	85	< 0.002
o-Xylene	0.001	mg/L	88	< 0.001
Xylenes - Total	0.003	mg/L	86	< 0.003
4-Bromofluorobenzene (surr.)	1	%	74	76

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Sydney	Jan 16, 2020	14 Days

- Method: LTM-ORG-2010 TRH C6-C40

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IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: 9996
Project ID: 9996

Order No.:
Report #: 697102
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 16, 2020 5:51 PM
Due: Jan 23, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Phenols (IWRG 621)	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	TP09-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12898	X					X		X	X	X
2	TP09-0.7-0.9	Jan 15, 2020		Soil	S20-Ja12899	X								X	X
3	TP09-1.1-1.3	Jan 15, 2020		Soil	S20-Ja12900	X								X	X
4	TP12-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12901	X					X		X	X	X
5	TP12-2.6-2.8	Jan 15, 2020		Soil	S20-Ja12902	X					X		X	X	X
6	TP13-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12903	X					X		X	X	X
7	TP13-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12904	X					X		X	X	X
8	TP16-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12905	X					X		X	X	X
9	TP16-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12906	X								X	X
10	TP17-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12907	X								X	X

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Christchurch
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Phone : 0800 856 450
IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: 9996
Project ID: 9996

Order No.:
Report #: 697102
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 16, 2020 5:51 PM
Due: Jan 23, 2020
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Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Phenols (IWRG 621)	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
11	TP17-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12908	X					X		X	X	X
12	TP22-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12909	X					X		X	X	X
13	TP22-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12910	X					X		X	X	X
14	TP53-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12911	X					X		X	X	X
15	TP53-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12912	X					X		X	X	X
16	TP55-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12913									X	X
17	TP55-0.8-1.0	Jan 15, 2020		Soil	S20-Ja12914	X					X		X	X	X
18	TP56-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12915	X					X		X	X	X
19	TP56-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12916									X	X
20	TP56-1.8-2.0	Jan 15, 2020		Soil	S20-Ja12917	X					X		X	X	X
21	TP85-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12918	X					X		X	X	X
22	TP85-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12919	X									
23	TP85-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12920	X					X		X	X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
24	TP85-2.5-2.7	Jan 15, 2020		Soil	S20-Ja12921	X								X	X
25	TP101-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12922	X					X		X	X	X
26	TP101-0.8-1.0	Jan 15, 2020		Soil	S20-Ja12923	X								X	X
27	TP101-1.3-1.5	Jan 15, 2020		Soil	S20-Ja12924	X					X		X	X	X
28	DUP-07	Jan 15, 2020		Soil	S20-Ja12925				X	X				X	
29	DUP-08	Jan 15, 2020		Soil	S20-Ja12926				X	X				X	
30	DUP-09	Jan 15, 2020		Soil	S20-Ja12927				X	X				X	
31	TP09-FCS	Jan 15, 2020		Building Materials	S20-Ja12928		X								
32	TP53-FCS	Jan 15, 2020		Building Materials	S20-Ja12929		X								
33	TP56-FCS	Jan 15, 2020		Building Materials	S20-Ja12930		X								
34	TP101-FCS	Jan 15, 2020		Building	S20-Ja12931		X								

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Phone: 1800 288 188
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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
				Materials											
35	TRIP SPIKE	Jan 15, 2020		Water	S20-Ja12932							X			
36	TRIP BLANK	Jan 15, 2020		Water	S20-Ja12933							X			
37	TP12-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12935				X	X				X	
38	TP12-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12936			X							
39	TP13-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12937			X							
40	TP16-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12938				X	X				X	
41	TP17-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12939			X							
42	TP22-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12940			X							
43	TP53-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12941			X							
44	TP53-2.3-2.5	Jan 15, 2020		Soil	S20-Ja12942			X							
45	TP55-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12943			X							
Test Counts						25	4	7	5	5	18	2	18	31	26

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
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QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	113			70-130	Pass	
Toluene	%	104			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	95			70-130	Pass	
o-Xylene	%	101			70-130	Pass	
Xylenes - Total	%	97			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-Ja11208	NCP	%	91			70-130	Pass	
Toluene	S20-Ja11208	NCP	%	95			70-130	Pass	
Ethylbenzene	S20-Ja11208	NCP	%	95			70-130	Pass	
m&p-Xylenes	S20-Ja11208	NCP	%	95			70-130	Pass	
o-Xylene	S20-Ja11208	NCP	%	95			70-130	Pass	
Xylenes - Total	S20-Ja11208	NCP	%	95			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Ja11207	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S20-Ja11207	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S20-Ja11207	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S20-Ja11207	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S20-Ja11207	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S20-Ja11207	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Andrew Black Analytical Services Manager



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Sam Scully**

Report **697102-S**
Project name 9996
Project ID 9996
Received Date Jan 16, 2020

Client Sample ID			TP09-0.0-0.2	TP09-0.7-0.9	TP09-1.1-1.3	TP12-0.9-1.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ja12898**	**S20-Ja12899**	**S20-Ja12900**	**S20-Ja12901**
Date Sampled			**Jan 15, 2020**	**Jan 15, 2020**	**Jan 15, 2020**	**Jan 15, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	53	95	102	143
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP09-0.0-0.2	TP09-0.7-0.9	TP09-1.1-1.3	TP12-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12898	S20-Ja12899	S20-Ja12900	S20-Ja12901
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	85	80	75	80
p-Terphenyl-d14 (surr.)	1	%	77	75	77	83
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	-	-	< 0.2
Toxaphene	1	mg/kg	< 1	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	< 0.2
Dibutylchlorendate (surr.)	1	%	84	-	-	79
Tetrachloro-m-xylene (surr.)	1	%	109	-	-	99
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	-	< 0.2

Client Sample ID			TP09-0.0-0.2	TP09-0.7-0.9	TP09-1.1-1.3	TP12-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12898	S20-Ja12899	S20-Ja12900	S20-Ja12901
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	-	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	-	< 0.2
EPN	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	-	< 2
Naled	0.2	mg/kg	< 0.2	-	-	< 0.2
Omethoate	2	mg/kg	< 2	-	-	< 2
Phorate	0.2	mg/kg	< 0.2	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	133	-	-	137
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	84	-	-	79
Tetrachloro-m-xylene (surr.)	1	%	109	-	-	99
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	< 1
Pentachlorophenol	1	mg/kg	< 1	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	< 1

Client Sample ID			TP09-0.0-0.2	TP09-0.7-0.9	TP09-1.1-1.3	TP12-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12898	S20-Ja12899	S20-Ja12900	S20-Ja12901
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	< 0.2
2-Nitrophenol	1	mg/kg	< 1	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	-	-	< 5
Dinoseb	20	mg/kg	< 20	-	-	< 20
Phenol	0.5	mg/kg	< 0.5	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	< 20
Phenol-d6 (surr.)	1	%	75	-	-	79
Heavy Metals						
Arsenic	2	mg/kg	12	5.8	6.5	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	11	21	5.1
Copper	5	mg/kg	20	40	9.0	14
Lead	5	mg/kg	25	26	13	6.1
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2
Nickel	5	mg/kg	7.7	23	< 5	8.3
Zinc	5	mg/kg	51	120	9.7	54
% Moisture	1	%	7.3	6.7	14	9.5

Client Sample ID			TP12-2.6-2.8	TP13-0.0-0.2	TP13-1.9-2.1	TP16-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12902	S20-Ja12903	S20-Ja12904	S20-Ja12905
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	98	89	108	86
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			TP12-2.6-2.8	TP13-0.0-0.2	TP13-1.9-2.1	TP16-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12902	S20-Ja12903	S20-Ja12904	S20-Ja12905
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	78	72	81	77
p-Terphenyl-d14 (surr.)	1	%	83	77	84	79
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			TP12-2.6-2.8	TP13-0.0-0.2	TP13-1.9-2.1	TP16-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12902	S20-Ja12903	S20-Ja12904	S20-Ja12905
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	84	86	91	88
Tetrachloro-m-xylene (surr.)	1	%	99	99	101	100
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	137	124	133	125
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP12-2.6-2.8	TP13-0.0-0.2	TP13-1.9-2.1	TP16-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12902	S20-Ja12903	S20-Ja12904	S20-Ja12905
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	84	86	91	88
Tetrachloro-m-xylene (surr.)	1	%	99	99	101	100
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	68	62	68	67
Heavy Metals						
Arsenic	2	mg/kg	4.2	5.8	3.9	4.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.4	12	8.2	9.1
Copper	5	mg/kg	34	37	34	41
Lead	5	mg/kg	22	27	23	29
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	73	27	18	28
Zinc	5	mg/kg	240	97	82	160
% Moisture	1	%	9.5	9.4	9.6	8.8

Client Sample ID			TP16-1.9-2.1	TP17-0.9-1.1	TP17-1.9-2.1	TP22-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12906	S20-Ja12907	S20-Ja12908	S20-Ja12909
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	79	105	146	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	65	58	59	60
p-Terphenyl-d14 (surr.)	1	%	82	67	84	85

Client Sample ID			TP16-1.9-2.1	TP17-0.9-1.1	TP17-1.9-2.1	TP22-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12906	S20-Ja12907	S20-Ja12908	S20-Ja12909
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	0.06
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	-	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	-	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	0.06
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	99	87
Tetrachloro-m-xylene (surr.)	1	%	-	-	118	92
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Bolstar	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Coumaphos	2	mg/kg	-	-	< 2	< 2
Demeton-S	0.2	mg/kg	-	-	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	-	-	< 0.2	< 0.2
Diazinon	0.2	mg/kg	-	-	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	-	-	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	-	-	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	-	-	< 0.2	< 0.2
EPN	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethion	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fenthion	0.2	mg/kg	-	-	< 0.2	< 0.2
Malathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Merphos	0.2	mg/kg	-	-	< 0.2	< 0.2

Client Sample ID			TP16-1.9-2.1	TP17-0.9-1.1	TP17-1.9-2.1	TP22-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12906	S20-Ja12907	S20-Ja12908	S20-Ja12909
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Monocrotophos	2	mg/kg	-	-	< 2	< 2
Naled	0.2	mg/kg	-	-	< 0.2	< 1
Omethoate	2	mg/kg	-	-	< 2	< 2
Phorate	0.2	mg/kg	-	-	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	-	-	< 0.2	< 0.2
Ronnel	0.2	mg/kg	-	-	< 0.2	< 0.2
Terbufos	0.2	mg/kg	-	-	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	-	-	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	-	-	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	129	135
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	99	87
Tetrachloro-m-xylene (surr.)	1	%	-	-	118	92
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	< 1
Pentachlorophenol	1	mg/kg	-	-	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	-	-	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	-	-	< 5	< 5
Dinoseb	20	mg/kg	-	-	< 20	< 20
Phenol	0.5	mg/kg	-	-	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	< 20
Phenol-d6 (surr.)	1	%	-	-	57	50

Client Sample ID			TP16-1.9-2.1	TP17-0.9-1.1	TP17-1.9-2.1	TP22-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12906	S20-Ja12907	S20-Ja12908	S20-Ja12909
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	4.8	3.5	2.9	10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.7	7.9	5.8	14
Copper	5	mg/kg	16	30	13	16
Lead	5	mg/kg	11	24	19	20
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.0	19	< 5	9.5
Zinc	5	mg/kg	36	100	18	52
% Moisture	1	%	13	8.5	12	6.1

Client Sample ID			TP22-1.9-2.1	TP53-0.0-0.2	TP53-1.7-1.9	TP55-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12910	S20-Ja12911	S20-Ja12912	S20-Ja12913
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	112	54	98	106
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP22-1.9-2.1	TP53-0.0-0.2	TP53-1.7-1.9	TP55-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12910	S20-Ja12911	S20-Ja12912	S20-Ja12913
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	57	76	75	66
p-Terphenyl-d14 (surr.)	1	%	87	82	82	75
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	0.07	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	< 1	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	0.07	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	-
Dibutylchlorendate (surr.)	1	%	59	61	63	-
Tetrachloro-m-xylene (surr.)	1	%	91	88	93	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Coumaphos	2	mg/kg	< 2	< 2	< 2	-

Client Sample ID			TP22-1.9-2.1	TP53-0.0-0.2	TP53-1.7-1.9	TP55-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12910	S20-Ja12911	S20-Ja12912	S20-Ja12913
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Merphos	0.2	mg/kg	< 2	< 2	< 2	-
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Monocrotophos	2	mg/kg	< 2	< 2	< 2	-
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Omethoate	2	mg/kg	< 2	< 2	< 2	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Triphenylphosphate (surr.)	1	%	89	120	100	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	59	61	63	-
Tetrachloro-m-xylene (surr.)	1	%	91	88	93	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	-
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	-
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	-
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	-

Client Sample ID			TP22-1.9-2.1	TP53-0.0-0.2	TP53-1.7-1.9	TP55-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12910	S20-Ja12911	S20-Ja12912	S20-Ja12913
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	-
Dinoseb	20	mg/kg	< 20	< 20	< 20	-
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	-
Phenol-d6 (surr.)	1	%	85	85	86	-
Heavy Metals						
Arsenic	2	mg/kg	11	4.5	6.5	7.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.7	9.3	13	15
Copper	5	mg/kg	35	11	14	8.4
Lead	5	mg/kg	25	14	22	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	22	< 5	< 5	< 5
Zinc	5	mg/kg	100	39	28	35
% Moisture	1	%	9.4	4.9	8.9	3.9

Client Sample ID			TP55-0.8-1.0	TP56-0.0-0.2	TP56-0.9-1.1	TP56-1.8-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12914	S20-Ja12915	S20-Ja12916	S20-Ja12917
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	71	< 50	< 50
TRH C29-C36	50	mg/kg	70	63	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	70	134	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	94	102	80	72
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			TP55-0.8-1.0	TP56-0.0-0.2	TP56-0.9-1.1	TP56-1.8-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12914	S20-Ja12915	S20-Ja12916	S20-Ja12917
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	110	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	110	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	59	75	79	80
p-Terphenyl-d14 (surr.)	1	%	84	83	92	87
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	0.08	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	-	< 1

Client Sample ID			TP55-0.8-1.0	TP56-0.0-0.2	TP56-0.9-1.1	TP56-1.8-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12914	S20-Ja12915	S20-Ja12916	S20-Ja12917
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	0.08	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	< 0.2
Dibutylchlorendate (surr.)	1	%	69	83	-	86
Tetrachloro-m-xylene (surr.)	1	%	94	89	-	109
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	< 2	< 2	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	-	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Omethoate	2	mg/kg	< 2	< 2	-	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	111	116	-	134
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5

Client Sample ID			TP55-0.8-1.0	TP56-0.0-0.2	TP56-0.9-1.1	TP56-1.8-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12914	S20-Ja12915	S20-Ja12916	S20-Ja12917
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	69	83	-	86
Tetrachloro-m-xylene (surr.)	1	%	94	89	-	109
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	-	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	-	< 5
Dinoseb	20	mg/kg	< 20	< 20	-	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	-	< 20
Phenol-d6 (surr.)	1	%	81	84	-	79
Heavy Metals						
Arsenic	2	mg/kg	8.0	6.0	12	8.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.4	13	24	25
Copper	5	mg/kg	15	19	20	24
Lead	5	mg/kg	25	18	27	27
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	13	11
Zinc	5	mg/kg	49	30	45	34
% Moisture	1	%	4.3	5.7	9.2	9.0

Client Sample ID			TP85-0.0-0.2	TP85-1.7-1.9	TP85-2.5-2.7	TP101-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12918	S20-Ja12920	S20-Ja12921	S20-Ja12922
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	98	101	97	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	81	64	53	83
p-Terphenyl-d14 (surr.)	1	%	85	85	74	86

Client Sample ID			TP85-0.0-0.2	TP85-1.7-1.9	TP85-2.5-2.7	TP101-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12918	S20-Ja12920	S20-Ja12921	S20-Ja12922
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	< 0.2
Dibutylchlorendate (surr.)	1	%	95	77	-	77
Tetrachloro-m-xylene (surr.)	1	%	89	101	-	99
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2

Client Sample ID			TP85-0.0-0.2	TP85-1.7-1.9	TP85-2.5-2.7	TP101-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12918	S20-Ja12920	S20-Ja12921	S20-Ja12922
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	-	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Omethoate	2	mg/kg	< 2	< 2	-	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	134	136	-	138
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	95	77	-	77
Tetrachloro-m-xylene (surr.)	1	%	89	101	-	99
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	-	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	-	< 5
Dinoseb	20	mg/kg	< 20	< 20	-	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	-	< 20
Phenol-d6 (surr.)	1	%	80	74	-	77

Client Sample ID			TP85-0.0-0.2	TP85-1.7-1.9	TP85-2.5-2.7	TP101-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12918	S20-Ja12920	S20-Ja12921	S20-Ja12922
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	15	9.6	18	11
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	21	28	27	18
Copper	5	mg/kg	18	15	15	20
Lead	5	mg/kg	29	23	16	44
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.7	9.5	8.1	7.2
Zinc	5	mg/kg	38	29	23	120
% Moisture	1	%	8.5	11	16	6.3

Client Sample ID			TP101-0.8-1.0	TP101-1.3-1.5	DUP-07	DUP-08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12923	S20-Ja12924	S20-Ja12925	S20-Ja12926
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	80	98	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			TP101-0.8-1.0	TP101-1.3-1.5	DUP-07	DUP-08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12923	S20-Ja12924	S20-Ja12925	S20-Ja12926
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	63	INT	73	67
p-Terphenyl-d14 (surr.)	1	%	78	89	82	81
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2	-	-
Dibutylchlorendate (surr.)	1	%	-	71	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	92	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Bolstar	0.2	mg/kg	-	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	-
Coumaphos	2	mg/kg	-	< 2	-	-

Client Sample ID			TP101-0.8-1.0	TP101-1.3-1.5	DUP-07	DUP-08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12923	S20-Ja12924	S20-Ja12925	S20-Ja12926
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Demeton-S	0.2	mg/kg	-	< 0.2	-	-
Demeton-O	0.2	mg/kg	-	< 0.2	-	-
Diazinon	0.2	mg/kg	-	< 0.2	-	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-	-
Dimethoate	0.2	mg/kg	-	< 0.2	-	-
Disulfoton	0.2	mg/kg	-	< 0.2	-	-
EPN	0.2	mg/kg	-	< 0.2	-	-
Ethion	0.2	mg/kg	-	< 0.2	-	-
Ethoprop	0.2	mg/kg	-	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-	-
Fenthion	0.2	mg/kg	-	< 0.2	-	-
Malathion	0.2	mg/kg	-	< 0.2	-	-
Merphos	0.2	mg/kg	-	< 0.2	-	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-	-
Mevinphos	0.2	mg/kg	-	< 0.2	-	-
Monocrotophos	2	mg/kg	-	< 2	-	-
Naled	0.2	mg/kg	-	< 0.2	-	-
Omethoate	2	mg/kg	-	< 2	-	-
Phorate	0.2	mg/kg	-	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-	-
Ronnel	0.2	mg/kg	-	< 0.2	-	-
Terbufos	0.2	mg/kg	-	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	-
Tokuthion	0.2	mg/kg	-	< 0.2	-	-
Trichloronate	0.2	mg/kg	-	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	-	139	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	71	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	92	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	-	-
Pentachlorophenol	1	mg/kg	-	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	-	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-	-

Client Sample ID			TP101-0.8-1.0	TP101-1.3-1.5	DUP-07	DUP-08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12923	S20-Ja12924	S20-Ja12925	S20-Ja12926
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
2-Nitrophenol	1	mg/kg	-	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
4-Nitrophenol	5	mg/kg	-	< 5	-	-
Dinoseb	20	mg/kg	-	< 20	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	-	-
Phenol-d6 (surr.)	1	%	-	71	-	-
Heavy Metals						
Arsenic	2	mg/kg	7.4	6.5	12	6.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	21	22	8.5
Copper	5	mg/kg	19	11	110000	27
Lead	5	mg/kg	25	18	32	23
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.9	< 5	1600	24
Zinc	5	mg/kg	45	5.6	1000	99
% Moisture	1	%	9.6	13	7.9	6.3

Client Sample ID			DUP-09	TP12-0.0-0.2	TP16-0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12927	S20-Ja12935	S20-Ja12938
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5

Client Sample ID			DUP-09	TP12-0.0-0.2	TP16-0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Ja12927	S20-Ja12935	S20-Ja12938
Date Sampled			Jan 15, 2020	Jan 15, 2020	Jan 15, 2020
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	64	73	85
p-Terphenyl-d14 (surr.)	1	%	75	82	89
Heavy Metals					
Arsenic	2	mg/kg	5.4	8.4	5.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	18	9.0
Copper	5	mg/kg	32	26	22
Lead	5	mg/kg	35	30	19
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	38	8.8	17
Zinc	5	mg/kg	99	79	79
% Moisture	1	%	8.3	6.7	6.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 21, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 21, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 21, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 21, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 21, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jan 21, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Jan 21, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Jan 21, 2020	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Jan 21, 2020	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Phenols (Halogenated)	Sydney	Jan 21, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Jan 21, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
% Moisture	Sydney	Jan 17, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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NSW 2147

Project Name: 9996
Project ID: 9996

Order No.:
Report #: 697102
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 16, 2020 5:51 PM
Due: Jan 23, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Phenols (IWRG 621)	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	TP09-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12898	X					X		X	X	X
2	TP09-0.7-0.9	Jan 15, 2020		Soil	S20-Ja12899	X								X	X
3	TP09-1.1-1.3	Jan 15, 2020		Soil	S20-Ja12900	X								X	X
4	TP12-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12901	X					X		X	X	X
5	TP12-2.6-2.8	Jan 15, 2020		Soil	S20-Ja12902	X					X		X	X	X
6	TP13-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12903	X					X		X	X	X
7	TP13-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12904	X					X		X	X	X
8	TP16-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12905	X					X		X	X	X
9	TP16-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12906	X								X	X
10	TP17-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12907	X								X	X

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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: 9996
Project ID: 9996

Order No.:
Report #: 697102
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 16, 2020 5:51 PM
Due: Jan 23, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Phenols (IWRG 621)	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
11	TP17-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12908	X					X		X	X	X
12	TP22-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12909	X					X		X	X	X
13	TP22-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12910	X					X		X	X	X
14	TP53-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12911	X					X		X	X	X
15	TP53-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12912	X					X		X	X	X
16	TP55-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12913									X	X
17	TP55-0.8-1.0	Jan 15, 2020		Soil	S20-Ja12914	X					X		X	X	X
18	TP56-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12915	X					X		X	X	X
19	TP56-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12916									X	X
20	TP56-1.8-2.0	Jan 15, 2020		Soil	S20-Ja12917	X					X		X	X	X
21	TP85-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12918	X					X		X	X	X
22	TP85-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12919	X									
23	TP85-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12920	X					X		X	X	X

eurofins | Environment Testing

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
24	TP85-2.5-2.7	Jan 15, 2020		Soil	S20-Ja12921	X								X	X
25	TP101-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12922	X					X		X	X	X
26	TP101-0.8-1.0	Jan 15, 2020		Soil	S20-Ja12923	X								X	X
27	TP101-1.3-1.5	Jan 15, 2020		Soil	S20-Ja12924	X					X		X	X	X
28	DUP-07	Jan 15, 2020		Soil	S20-Ja12925				X	X				X	
29	DUP-08	Jan 15, 2020		Soil	S20-Ja12926				X	X				X	
30	DUP-09	Jan 15, 2020		Soil	S20-Ja12927				X	X				X	
31	TP09-FCS	Jan 15, 2020		Building Materials	S20-Ja12928		X								
32	TP53-FCS	Jan 15, 2020		Building Materials	S20-Ja12929		X								
33	TP56-FCS	Jan 15, 2020		Building Materials	S20-Ja12930		X								
34	TP101-FCS	Jan 15, 2020		Building	S20-Ja12931		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
				Materials											
35	TRIP SPIKE	Jan 15, 2020		Water	S20-Ja12932							X			
36	TRIP BLANK	Jan 15, 2020		Water	S20-Ja12933							X			
37	TP12-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12935				X	X				X	
38	TP12-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12936			X							
39	TP13-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12937			X							
40	TP16-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12938				X	X				X	
41	TP17-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12939			X							
42	TP22-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12940			X							
43	TP53-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12941			X							
44	TP53-2.3-2.5	Jan 15, 2020		Soil	S20-Ja12942			X							
45	TP55-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12943			X							
Test Counts						25	4	7	5	5	18	2	18	31	26

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	97			70-130	Pass	
TRH C10-C14	%	73			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	98			70-130	Pass	
Toluene	%	97			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	80			70-130	Pass	
TRH C6-C10	%	90			70-130	Pass	
TRH >C10-C16	%	81			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	102			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	%	99			70-130	Pass	
Anthracene	%	117			70-130	Pass	
Benz(a)anthracene	%	88			70-130	Pass	
Benzo(a)pyrene	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	%	73			70-130	Pass	
Benzo(g.h.i)perylene	%	114			70-130	Pass	
Benzo(k)fluoranthene	%	106			70-130	Pass	
Chrysene	%	113			70-130	Pass	
Dibenz(a.h)anthracene	%	121			70-130	Pass	
Fluoranthene	%	100			70-130	Pass	
Fluorene	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	96			70-130	Pass	
Naphthalene	%	100			70-130	Pass	
Phenanthrene	%	99			70-130	Pass	
Pyrene	%	94			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	88			70-130	Pass	
4.4'-DDD	%	91			70-130	Pass	
4.4'-DDE	%	89			70-130	Pass	
4.4'-DDT	%	90			70-130	Pass	
a-BHC	%	78			70-130	Pass	
Aldrin	%	93			70-130	Pass	
b-BHC	%	90			70-130	Pass	
d-BHC	%	97			70-130	Pass	
Dieldrin	%	87			70-130	Pass	
Endosulfan I	%	90			70-130	Pass	
Endosulfan II	%	85			70-130	Pass	
Endosulfan sulphate	%	83			70-130	Pass	
Endrin	%	93			70-130	Pass	
Endrin aldehyde	%	79			70-130	Pass	
Endrin ketone	%	74			70-130	Pass	
g-BHC (Lindane)	%	95			70-130	Pass	
Heptachlor	%	96			70-130	Pass	
Heptachlor epoxide	%	95			70-130	Pass	
Hexachlorobenzene	%	94			70-130	Pass	
Methoxychlor	%	86			70-130	Pass	
Toxaphene	%	75			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	78			70-130	Pass	
Dimethoate	%	80			70-130	Pass	
Ethion	%	101			70-130	Pass	
Fenitrothion	%	95			70-130	Pass	
Methyl parathion	%	124			70-130	Pass	
Mevinphos	%	79			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	75			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	97			30-130	Pass	
2.4-Dichlorophenol	%	91			30-130	Pass	
2.4.5-Trichlorophenol	%	94			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.6-Trichlorophenol	%	90			30-130	Pass	
2.6-Dichlorophenol	%	94			30-130	Pass	
4-Chloro-3-methylphenol	%	101			30-130	Pass	
Pentachlorophenol	%	92			30-130	Pass	
Tetrachlorophenols - Total	%	95			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	95			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	96			30-130	Pass	
2-Methylphenol (o-Cresol)	%	95			30-130	Pass	
2-Nitrophenol	%	94			30-130	Pass	
2.4-Dimethylphenol	%	86			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	90			30-130	Pass	
4-Nitrophenol	%	97			30-130	Pass	
Dinoseb	%	79			30-130	Pass	
Phenol	%	93			30-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	103			70-130	Pass	
Cadmium	%	106			70-130	Pass	
Chromium	%	114			70-130	Pass	
Copper	%	116			70-130	Pass	
Lead	%	101			70-130	Pass	
Mercury	%	103			70-130	Pass	
Nickel	%	116			70-130	Pass	
Zinc	%	115			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S20-Ja12481	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S20-Ja12481	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDT	S20-Ja20338	NCP	%	86			70-130	Pass	
Endrin ketone	S20-Ja20338	NCP	%	73			70-130	Pass	
Methoxychlor	S20-Ja20338	NCP	%	103			70-130	Pass	
Toxaphene	S20-Ja20338	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S20-Ja07506	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-Ja18440	NCP	%	88			70-130	Pass	
Acenaphthylene	S20-Ja18440	NCP	%	91			70-130	Pass	
Anthracene	S20-Ja18440	NCP	%	83			70-130	Pass	
Benz(a)anthracene	S20-Ja18440	NCP	%	95			70-130	Pass	
Benzo(a)pyrene	S20-Ja18440	NCP	%	93			70-130	Pass	
Benzo(b&j)fluoranthene	S20-Ja18440	NCP	%	86			70-130	Pass	
Benzo(g.h.i)perylene	S20-Ja18440	NCP	%	98			70-130	Pass	
Benzo(k)fluoranthene	S20-Ja18440	NCP	%	88			70-130	Pass	
Chrysene	S20-Ja18440	NCP	%	92			70-130	Pass	
Dibenz(a.h)anthracene	S20-Ja18440	NCP	%	113			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluoranthene	S20-Ja18440	NCP	%	88			70-130	Pass	
Fluorene	S20-Ja18440	NCP	%	89			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-Ja18440	NCP	%	110			70-130	Pass	
Naphthalene	S20-Ja18440	NCP	%	84			70-130	Pass	
Phenanthrene	S20-Ja18440	NCP	%	109			70-130	Pass	
Pyrene	S20-Ja18440	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-Ja12901	CP	%	83			70-130	Pass	
4.4'-DDD	S20-Ja12901	CP	%	93			70-130	Pass	
4.4'-DDE	S20-Ja12901	CP	%	81			70-130	Pass	
a-BHC	S20-Ja12901	CP	%	76			70-130	Pass	
Aldrin	S20-Ja12901	CP	%	84			70-130	Pass	
b-BHC	S20-Ja12901	CP	%	86			70-130	Pass	
d-BHC	S20-Ja12901	CP	%	89			70-130	Pass	
Dieldrin	S20-Ja12901	CP	%	79			70-130	Pass	
Endosulfan I	S20-Ja12901	CP	%	83			70-130	Pass	
Endosulfan II	S20-Ja12901	CP	%	75			70-130	Pass	
Endrin	S20-Ja12901	CP	%	83			70-130	Pass	
Endrin aldehyde	S20-Ja12901	CP	%	76			70-130	Pass	
g-BHC (Lindane)	S20-Ja12901	CP	%	90			70-130	Pass	
Heptachlor	S20-Ja12901	CP	%	88			70-130	Pass	
Heptachlor epoxide	S20-Ja12901	CP	%	88			70-130	Pass	
Hexachlorobenzene	S20-Ja12901	CP	%	92			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Ja12901	CP	%	109			70-130	Pass	
Cadmium	S20-Ja12901	CP	%	98			70-130	Pass	
Chromium	S20-Ja12901	CP	%	113			70-130	Pass	
Copper	S20-Ja12901	CP	%	116			70-130	Pass	
Mercury	S20-Ja12901	CP	%	97			70-130	Pass	
Nickel	S20-Ja12901	CP	%	104			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	M20-Ja09534	NCP	%	83			70-130	Pass	
Dimethoate	M20-Ja09534	NCP	%	75			70-130	Pass	
Ethion	M20-Ja09534	NCP	%	95			70-130	Pass	
Fenitrothion	M20-Ja09534	NCP	%	87			70-130	Pass	
Methyl parathion	M20-Ja09534	NCP	%	111			70-130	Pass	
Mevinphos	M20-Ja09534	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2.4.5-Trichlorophenol	S20-Ja08534	NCP	%	116			30-130	Pass	
2.4.6-Trichlorophenol	S20-Ja08534	NCP	%	84			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methyl-4.6-dinitrophenol	S20-Ja08534	NCP	%	125			30-130	Pass	
2-Nitrophenol	S20-Ja08534	NCP	%	125			30-130	Pass	
4-Nitrophenol	S20-Ja08534	NCP	%	92			30-130	Pass	
Phenol	S20-Ja08534	NCP	%	78			30-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-Ja12911	CP	%	94			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
BTEX				Result 1					
Benzene	S20-Ja12911	CP	%	93			70-130	Pass	
Toluene	S20-Ja12911	CP	%	98			70-130	Pass	
Ethylbenzene	S20-Ja12911	CP	%	96			70-130	Pass	
m&p-Xylenes	S20-Ja12911	CP	%	100			70-130	Pass	
o-Xylene	S20-Ja12911	CP	%	100			70-130	Pass	
Xylenes - Total	S20-Ja12911	CP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-Ja12911	CP	%	71			70-130	Pass	
TRH C6-C10	S20-Ja12911	CP	%	89			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-Ja12914	CP	%	84			70-130	Pass	
4.4'-DDD	S20-Ja12914	CP	%	102			70-130	Pass	
4.4'-DDE	S20-Ja12914	CP	%	82			70-130	Pass	
Aldrin	S20-Ja12914	CP	%	90			70-130	Pass	
b-BHC	S20-Ja12914	CP	%	89			70-130	Pass	
d-BHC	S20-Ja12914	CP	%	95			70-130	Pass	
Dieldrin	S20-Ja12914	CP	%	83			70-130	Pass	
Endosulfan I	S20-Ja12914	CP	%	87			70-130	Pass	
Endosulfan II	S20-Ja12914	CP	%	79			70-130	Pass	
Endosulfan sulphate	S20-Ja12914	CP	%	75			70-130	Pass	
Endrin	S20-Ja12914	CP	%	81			70-130	Pass	
Endrin aldehyde	S20-Ja12914	CP	%	72			70-130	Pass	
g-BHC (Lindane)	S20-Ja12914	CP	%	92			70-130	Pass	
Heptachlor	S20-Ja12914	CP	%	88			70-130	Pass	
Heptachlor epoxide	S20-Ja12914	CP	%	92			70-130	Pass	
Hexachlorobenzene	S20-Ja12914	CP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Ja12922	CP	%	85			70-130	Pass	
Cadmium	S20-Ja12922	CP	%	92			70-130	Pass	
Chromium	S20-Ja12922	CP	%	90			70-130	Pass	
Copper	S20-Ja12922	CP	%	95			70-130	Pass	
Lead	S20-Ja12922	CP	%	106			70-130	Pass	
Mercury	S20-Ja12922	CP	%	105			70-130	Pass	
Nickel	S20-Ja12922	CP	%	100			70-130	Pass	
Zinc	S20-Ja12922	CP	%	92			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Ja16219	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S20-Ja11193	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S20-Ja11193	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S20-Ja11193	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S20-Ja11193	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Ja12900	CP	mg/kg	6.5	8.0	21	30%	Pass	
Cadmium	S20-Ja12900	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ja12900	CP	mg/kg	21	26	22	30%	Pass	
Copper	S20-Ja12900	CP	mg/kg	9.0	12	30	30%	Pass	
Lead	S20-Ja12900	CP	mg/kg	13	17	32	30%	Fail	Q15
Mercury	S20-Ja12900	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ja12900	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-Ja12900	CP	mg/kg	9.7	18	59	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Ja12905	CP	%	8.8	8.6	3.0	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S20-Ja10822	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S20-Ja10822	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S20-Ja10822	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S20-Ja10822	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S20-Ja10822	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S20-Ja10822	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S20-Ja10822	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S20-Ja10822	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S20-Ja10822	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S20-Ja10822	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S20-Ja10822	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S20-Ja10822	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S20-Ja10822	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S20-Ja10822	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S20-Ja10822	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S20-Ja10822	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S20-Ja10822	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S20-Ja10822	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Ja12910	CP	mg/kg	11	5.5	66	30%	Fail	Q15
Cadmium	S20-Ja12910	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ja12910	CP	mg/kg	7.7	8.8	13	30%	Pass	
Copper	S20-Ja12910	CP	mg/kg	35	32	8.0	30%	Pass	
Lead	S20-Ja12910	CP	mg/kg	25	24	<1	30%	Pass	
Mercury	S20-Ja12910	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ja12910	CP	mg/kg	22	16	30	30%	Pass	
Zinc	S20-Ja12910	CP	mg/kg	100	84	21	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S20-Ja12912	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Ja12912	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-Ja12912	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S20-Ja12912	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Ja12912	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-Ja12912	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-Ja12912	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-Ja12912	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-Ja12912	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S20-Ja12912	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S20-Ja12912	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S20-Ja12912	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S20-Ja12912	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S20-Ja12912	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S20-Ja12912	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S20-Ja12912	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S20-Ja12912	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-Ja12913	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Ja12913	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-Ja12913	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-Ja12913	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-Ja12913	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-Ja12913	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S20-Ja12913	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Ja12913	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-Ja12913	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Ja12915	CP	%	5.7	6.0	6.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Ja12921	CP	mg/kg	18	14	25	30%	Pass	
Cadmium	S20-Ja12921	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ja12921	CP	mg/kg	27	25	8.0	30%	Pass	
Copper	S20-Ja12921	CP	mg/kg	15	17	11	30%	Pass	
Lead	S20-Ja12921	CP	mg/kg	16	14	13	30%	Pass	
Mercury	S20-Ja12921	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ja12921	CP	mg/kg	8.1	6.9	16	30%	Pass	
Zinc	S20-Ja12921	CP	mg/kg	23	23	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Ja12926	CP	%	6.3	6.4	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

Attention:	Sam Scully
Report	697102-AID
Project Name	9996
Project ID	9996
Received Date	Jan 16, 2020
Date Reported	Jan 23, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Project Name 9996
Project ID 9996
Date Sampled Jan 15, 2020
Report 697102-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP09-0.0-0.2	20-Ja12898	Jan 15, 2020	Approximate Sample 616g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP09-0.7-0.9	20-Ja12899	Jan 15, 2020	Approximate Sample 773g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP09-1.1-1.3	20-Ja12900	Jan 15, 2020	Approximate Sample 486g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP12-0.9-1.1	20-Ja12901	Jan 15, 2020	Approximate Sample 928g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP12-2.6-2.8	20-Ja12902	Jan 15, 2020	Approximate Sample 1088g Sample consisted of: Brown coarse-grained soil, rocks and fragments of shale	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP13-0.0-0.2	20-Ja12903	Jan 15, 2020	Approximate Sample 877g Sample consisted of: Brown coarse-grained soil, rocks and fragments of shale	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP13-1.9-2.1	20-Ja12904	Jan 15, 2020	Approximate Sample 1023g Sample consisted of: Brown coarse-grained soil, rocks and fragments of shale	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP16-0.9-1.1	20-Ja12905	Jan 15, 2020	Approximate Sample 698g Sample consisted of: Brown coarse-grained soil, rocks and fragments of shale	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP16-1.9-2.1	20-Ja12906	Jan 15, 2020	Approximate Sample 502g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP17-0.9-1.1	20-Ja12907	Jan 15, 2020	Approximate Sample 915g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP17-1.9-2.1	20-Ja12908	Jan 15, 2020	Approximate Sample 941g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP22-0.0-0.2	20-Ja12909	Jan 15, 2020	Approximate Sample 634g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP22-1.9-2.1	20-Ja12910	Jan 15, 2020	Approximate Sample 713g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP53-0.0-0.2	20-Ja12911	Jan 15, 2020	Approximate Sample 642g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP53-1.7-1.9	20-Ja12912	Jan 15, 2020	Approximate Sample 661g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP55-0.8-1.0	20-Ja12914	Jan 15, 2020	Approximate Sample 852g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP56-0.0-0.2	20-Ja12915	Jan 15, 2020	Approximate Sample 670g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP56-1.8-2.0	20-Ja12917	Jan 15, 2020	Approximate Sample 759g Sample consisted of: Brown coarse-grained soil, rocks and glass	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP85-0.0-0.2	20-Ja12918	Jan 15, 2020	Approximate Sample 572g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP85-0.9-1.1	20-Ja12919	Jan 15, 2020	Approximate Sample 715g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP85-1.7-1.9	20-Ja12920	Jan 15, 2020	Approximate Sample 617g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
TP85-2.5-2.7	20-Ja12921	Jan 15, 2020	Approximate Sample 504g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP101-0.0-0.2	20-Ja12922	Jan 15, 2020	Approximate Sample 570g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP101-0.8-1.0	20-Ja12923	Jan 15, 2020	Approximate Sample 622g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP101-1.3-1.5	20-Ja12924	Jan 15, 2020	Approximate Sample 492g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
TP09-FCS	20-Ja12928	Jan 15, 2020	Approximate Sample 9g / 30x30x5mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.
TP53-FCS	20-Ja12929	Jan 15, 2020	Approximate Sample 125g / 95x70x10mm Sample consisted of: Grey compressed fibre cement material	Chrysotile and amosite asbestos detected.
TP56-FCS	20-Ja12930	Jan 15, 2020	Approximate Sample 14g / 60x20x5mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.
TP101-FCS	20-Ja12931	Jan 15, 2020	Approximate Sample 9g / 65x40x5mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jan 16, 2020	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Jan 16, 2020	Indefinite

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Company Name: Alliance Geotechnical
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NSW 2147

Project Name: 9996
Project ID: 9996

Order No.:
Report #: 697102
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 16, 2020 5:51 PM
Due: Jan 23, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Phenols (IWRG 621)	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	TP09-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12898	X					X		X	X	X
2	TP09-0.7-0.9	Jan 15, 2020		Soil	S20-Ja12899	X								X	X
3	TP09-1.1-1.3	Jan 15, 2020		Soil	S20-Ja12900	X								X	X
4	TP12-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12901	X					X		X	X	X
5	TP12-2.6-2.8	Jan 15, 2020		Soil	S20-Ja12902	X					X		X	X	X
6	TP13-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12903	X					X		X	X	X
7	TP13-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12904	X					X		X	X	X
8	TP16-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12905	X					X		X	X	X
9	TP16-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12906	X								X	X
10	TP17-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12907	X								X	X

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Company Name: Alliance Geotechnical
Address: 10 Welder Road
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NSW 2147

Project Name: 9996
Project ID: 9996

Order No.:
Report #: 697102
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 16, 2020 5:51 PM
Due: Jan 23, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Phenols (IWRG 621)	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
11	TP17-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12908	X					X		X	X	X
12	TP22-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12909	X					X		X	X	X
13	TP22-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12910	X					X		X	X	X
14	TP53-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12911	X					X		X	X	X
15	TP53-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12912	X					X		X	X	X
16	TP55-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12913									X	X
17	TP55-0.8-1.0	Jan 15, 2020		Soil	S20-Ja12914	X					X		X	X	X
18	TP56-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12915	X					X		X	X	X
19	TP56-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12916									X	X
20	TP56-1.8-2.0	Jan 15, 2020		Soil	S20-Ja12917	X					X		X	X	X
21	TP85-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12918	X					X		X	X	X
22	TP85-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12919	X									
23	TP85-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12920	X					X		X	X	X

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IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: 9996
Project ID: 9996

Order No.:
Report #: 697102
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 16, 2020 5:51 PM
Due: Jan 23, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Phenols (IWRG 621)	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
24	TP85-2.5-2.7	Jan 15, 2020		Soil	S20-Ja12921	X								X	X
25	TP101-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12922	X					X		X	X	X
26	TP101-0.8-1.0	Jan 15, 2020		Soil	S20-Ja12923	X								X	X
27	TP101-1.3-1.5	Jan 15, 2020		Soil	S20-Ja12924	X					X		X	X	X
28	DUP-07	Jan 15, 2020		Soil	S20-Ja12925				X	X				X	
29	DUP-08	Jan 15, 2020		Soil	S20-Ja12926				X	X				X	
30	DUP-09	Jan 15, 2020		Soil	S20-Ja12927				X	X				X	
31	TP09-FCS	Jan 15, 2020		Building Materials	S20-Ja12928		X								
32	TP53-FCS	Jan 15, 2020		Building Materials	S20-Ja12929		X								
33	TP56-FCS	Jan 15, 2020		Building Materials	S20-Ja12930		X								
34	TP101-FCS	Jan 15, 2020		Building	S20-Ja12931		X								

eurofins | Environment Testing

ABN – 50 005 085 521 web : www.eurofins.com.au e.mail : EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
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Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
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16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

New Zealand

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35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: 9996
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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Metals M8	Phenols (IWRG 621)	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
				Materials											
35	TRIP SPIKE	Jan 15, 2020		Water	S20-Ja12932							X			
36	TRIP BLANK	Jan 15, 2020		Water	S20-Ja12933							X			
37	TP12-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12935				X	X				X	
38	TP12-1.9-2.1	Jan 15, 2020		Soil	S20-Ja12936			X							
39	TP13-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12937			X							
40	TP16-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12938				X	X				X	
41	TP17-0.0-0.2	Jan 15, 2020		Soil	S20-Ja12939			X							
42	TP22-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12940			X							
43	TP53-0.9-1.1	Jan 15, 2020		Soil	S20-Ja12941			X							
44	TP53-2.3-2.5	Jan 15, 2020		Soil	S20-Ja12942			X							
45	TP55-1.7-1.9	Jan 15, 2020		Soil	S20-Ja12943			X							
Test Counts						25	4	7	5	5	18	2	18	31	26

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

S20-Ja12900, S20-Ja12924: Samples received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Sydney Laboratory
Unit F3 Bld F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name		EDD Format (ESdat EQuIS, Custom)	
Contact Name				Sampler(s)	Sam Scully
Phone №				Handed over by	
Special Directions				Email for Invoice	admin@allgeo.com.au
Purchase Order				Email for Results	Enviro@allgeo.com.au
Quote ID №					

Analyses (Please refer to the Requested Analysis Table for specific analytes within each group. Date of sampling must be stated if required for Guideline compliance)

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)
- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☒ 5 Day
- * Surcharges apply
- ☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	TRH	BTEX	PAH	8 Metals	CEC/pH	OCP/OPP	PCB	Phenols	Asbestos (0.001%)	Sample Comments / Dangerous Goods Hazard Warning
1	TP09-0.0-0.2	15/01/20	Soil	X	X	X	X		X	X	X	X	
2	TP09-0.7-0.9	15/01/20	Soil	X	X	X	X					X	
3	TP09-1.1-1.3	15/01/20	Soil	X	X	X	X					X	
4	TP12-0.0-0.2	15/01/20	Soil										
5	TP12-0.9-1.1	15/01/20	Soil	X	X	X	X		X	X	X	X	
6	TP12-1.9-2.1	15/01/20	Soil										
7	TP12-2.6-2.8	15/01/20	Soil	X	X	X	X		X	X	X	X	
8	TP13-0.0-0.2	15/01/20	Soil	X	X	X	X		X	X	X	X	
9	TP13-0.9-1.1	15/01/20	Soil										
10	TP13-1.9-2.1	15/01/20	Soil	X	X	X	X		X	X	X	X	
	Total Counts												

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal | Name: Sam Scully | Signature | Date: 16-1-20 | Time

Eurofins | mgt Laboratory Use Only

Received By	Lina D	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date: 16/01/20	Time: 5:51pm	Temperature	12.2°C
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date: __/__/__	Time: __:__	Report №	697102

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ **Brisbane Laboratory** Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2, 91 Leach Highway, Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 2 Kingston Town Close, Oakleigh, VIC 3166 03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name		EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully	
Handed over by		
Email for Invoice	admin@allgeo.com.au	
Email for Results	Enviro@allgeo.com.au	

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Ziplock (Asbestos AS4964: WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☑ ~~5~~ Day
- * Surcharges apply
- ☐ Other ( )

Analyses (Note: Where metals are requested, please specify Total or Filtered | SUITE code must be placed in brackets after analyte)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	TRH	BTEX	PAH	8 Metals	CEC/pH	OCP/OPP	PCB	Phenols	Asbestos (0.001%)	Sample Comments / Dangerous Goods Hazard Warning
1	TP16-0.0-0.2	15/01/20	Soil										
2	TP16-0.9-1.1	15/01/20	Soil	X	X	X	X		X	X	X	X	
3	TP16-1.9-2.1	15/01/20	Soil	X	X	X	X					X	
4	TP17-0.0-0.2	15/01/20	Soil										
5	TP17-0.9-1.1	15/01/20	Soil	X	X	X	X					X	
6	TP17-1.9-2.1	15/01/20	Soil	X	X	X	X		X	X	X	X	
7	TP22-0.0-0.2	15/01/20	Soil	X	X	X	X		X	X	X	X	
8	TP22-0.9-1.1	15/01/20	Soil										
9	TP22-1.9-2.1	15/01/20	Soil	X	X	X	X		X	X	X	X	
10	TP53-0.0-0.2	15/01/20	Soil	X	X	X	X		X	X	X	X	
	Total Counts												

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name: Sam Scully Signature: Date: 16-1-20 Time:

Eurofins | mgt Laboratory Use Only						
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report № 69710

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02 9900 8400 EnviroSampleNSW@eurofins.com

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☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name		EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

| | | | | |

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03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name		EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	
Email for Invoice	admin@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Containers: 1L Plastic; 250mL Plastic; 125mL Amber Glass; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)
- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☑ 5 Day
- * Surcharges apply
- ☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	TRH	BTEX	PAH	8 Metals	CEC/pH	OCP/OPP	PCB	Phenols	Asbestos (0.001%)	True Metals	Sample Comments / Dangerous Goods Hazard Warning
1	TP85-0.9-1.1	15/01/20	Soil									X		
2	TP85-1.7-1.9	15/01/20	Soil	X	X	X	X		X	X	X	X		
3	TP85-2.5-2.7	15/01/20	Soil	X	X	X	X					X		
4	TP101-0.0-0.2	15/01/20	Soil	X	X	X	X		X	X	X	X		
5	TP101-0.8-1.0	15/01/20	Soil	X	X	X	X					X		
6	TP101-1.3-1.5	15/01/20	Soil	X	X	X	X		X	X	X	X		
7	DUP-07	15/01/20	Soil			X	X							
8	DUP-7A	15/01/20	Soil			X							X	Please forward to ALS
9	DUP-08	15/01/20	Soil			X	X							
10	DUP-8A	15/01/20	Soil			X							X	Please forward to ALS
	Total Counts													

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date	16-1-20	Time	

Eurofins | mgt Laboratory Use Only									
Received By		SYD | SNE | MEL | PER | ADL | NTL | DRW	Signature	Date	16/01/20	Time	5:51 pm	Temperature	12.2°C
Received By		SYD | SNE | MEL | PER | ADL | NTL | DRW	Signature	Date	/ /	Time	:	Report №	697102

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☐ Melbourne Laboratory
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Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name		EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully	
Handed over by		
Email for Invoice	admin@allgeo.com.au	
Email for Results	Enviro@allgeo.com.au	

Analyses (Note: Where metals are required, please specify 1 filter or 1 field. Plus 8% ANZG to apply to quote)

Containers

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☒ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	TRH	BTEX	PAH	8 Metals	CEC/pH	OCP/OPP	PCB	Phenols	Asbestos (0.001%)	ASBESTOS ID	TRACE METALS	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964 WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	DUP-09	15/01/20	Soil			X	X																
2	DUP-9A	15/01/20	Soil			X								X									PLEASE FORWARD TO ALS
3	TP09-FCS	15/01/20	Soil										X										
4	TP53-FCS	15/01/20	Soil										X										
5	TP56-FCS	15/01/20	Soil										X										
6	TP101-FCS	15/01/20	Soil										X										
7	TRIP SPIKE / BLANK	15/01/20	Soil		X																		
8																							
9																							
10																							
	Total Counts																						

Method of Shipment ☐ Courier (#) ☐ Hand Delivered ☐ Postal Name Sam Scully Signature Date 16-1-20 Time

Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature		
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	697102	

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

#AU04_Enviro_Sample_NSW

To: Sam Scully
Subject: RE: Eurofins Sample Receipt Advice - Report 697102 : Site 9996 (9996)

From: Sam Scully [mailto:sam@allgeo.com.au]
Sent: Friday, 17 January 2020 9:08 AM
To: #AU04_Enviro_Sample_NSW
Cc: enviro
Subject: RE: Eurofins Sample Receipt Advice - Report 697102 : Site 9996 (9996)

Thanks,

Could we please request metals and PAH analysis on soil samples:

- TP16-0.0-0.2; and
- TP12-0.0-0.2.

Could these results please come with all other on same COC.

Please do not hesitate to contact me if you have any queries or questions,

Kind Regards,

Sam Scully

Environmental Consultant - 0400 339 745 | **Email:** sam@allgeo.com.au

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING
Your On-Site Geotechnical & Environmental Specialists

OHSAS18001 ISO9001 ISO14001 AS/NZS4801
OH&S QUALITY ENVIRONMENT OH&S

Office Email: admin@allgeo.com.au - **Website:** allgeo.com.au - **Office Phone:** 1800 288 188
PO Box 275, Seven Hills NSW 1730 / Address: 10 Welder Road, Seven Hills NSW 2147

Our office administration will be closed from December 23rd and will reopen on January 6th
For any urgent or unexpected geotechnical or environmental enquiries, please phone 1800 288 188
WISHING EVERYONE HAPPY HOLIDAYS FROM THE ALLIANCE GEOTECHNICAL TEAM!

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Thursday, 16 January 2020 8:20 PM
To: Sam Scully <sam@allgeo.com.au>
Cc: enviro <enviro@allgeo.com.au>
Subject: Eurofins Sample Receipt Advice - Report 697102 : Site 9996 (9996)

Dear Valued Client,
Samples DUP-7A, DUP-8A and DUP-9A forwarded to ALS for analysis
Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers

as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Luca Dominici
Sample Receipt

Eurofins | Environmental Testing
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
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EnviroNote 1079 - PFAS Fingerprinting
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations

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Attention: **Sam Scully**

Report **696041-W**
Project name MILLPERRA
Project ID 9996
Received Date Jan 09, 2020

Client Sample ID			**MW01**	**MW02**	**MW03**	**MW04**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S20-Ja04468**	**S20-Ja04469**	**S20-Ja04470**	**S20-Ja04471**
Date Sampled			**Jan 08, 2020**	**Jan 08, 2020**	**Jan 08, 2020**	**Jan 08, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	0.15	0.13	0.17	0.09
TRH C15-C28	0.1	mg/L	0.2	0.2	< 0.1	0.2
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.35	0.33	0.17	0.29
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	80	75	75	74
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW01	MW02	MW03	MW04
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S20-Ja04468	S20-Ja04469	S20-Ja04470	S20-Ja04471
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
4-Bromofluorobenzene (surr.)	1	%	80	75	75	74
Toluene-d8 (surr.)	1	%	91	84	81	83
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	0.07	0.05	0.08	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	0.07	0.05	0.08	< 0.05
TRH >C16-C34	0.1	mg/L	0.2	0.2	< 0.1	0.2
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.27	0.25	< 0.1	0.2

Client Sample ID			MW01	MW02	MW03	MW04
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S20-Ja04468	S20-Ja04469	S20-Ja04470	S20-Ja04471
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	53	78	89	72
p-Terphenyl-d14 (surr.)	1	%	80	126	145	127
Organochlorine Pesticides						
Chlordanes - Total	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4.4'-DDD	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDE	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDT	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
a-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
b-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
d-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin ketone	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Toxaphene	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibutylchlorendate (surr.)	1	%	INT	54	73	68
Tetrachloro-m-xylene (surr.)	1	%	50	82	89	76

Client Sample ID			MW01	MW02	MW03	MW04
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S20-Ja04468	S20-Ja04469	S20-Ja04470	S20-Ja04471
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Bolstar	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Chlorfenvinphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Chlorpyrifos	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Chlorpyrifos-methyl	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Coumaphos	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Demeton-S	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Demeton-O	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Diazinon	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Dichlorvos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Dimethoate	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Disulfoton	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
EPN	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Ethion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Ethoprop	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Ethyl parathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Fenitrothion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Fensulfothion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Fenthion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Malathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Merphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methyl parathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Mevinphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Monocrotophos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Naled	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Omethoate	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Phorate	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Pirimiphos-methyl	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Pyrazophos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Ronnel	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Terbufos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Tetrachlorvinphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Tokuthion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Trichloronate	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Triphenylphosphate (surr.)	1	%	INT	104	120	101
Polychlorinated Biphenyls						
Aroclor-1016	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1221	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1232	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1242	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1248	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1254	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1260	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Total PCB*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibutylchlorendate (surr.)	1	%	INT	54	73	68
Tetrachloro-m-xylene (surr.)	1	%	50	82	89	76

Client Sample ID			MW01	MW02	MW03	MW04
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S20-Ja04468	S20-Ja04469	S20-Ja04470	S20-Ja04471
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	0.53	0.23	0.41	1.2
Chloride	1	mg/L	10000	3200	6100	5400
Conductivity (at 25°C)	10	uS/cm	14000	4900	11000	9100
Nitrate (as N)	0.02	mg/L	5.7	0.35	0.18	0.07
pH (at 25°C)	0.1	pH Units	6.9	5.7	5.7	7.1
Sulphate (as SO4)	2	mg/L	920	710	960	740
Total Dissolved Solids Dried at 180°C ± 2°C	5	mg/L	17000	5300	9900	10000
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	430	< 20	23	1100
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10	< 10	< 10	< 10
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	430	< 20	23	1100
Alkali Metals						
Calcium	0.5	mg/L	220	43	74	250
Magnesium	0.5	mg/L	850	140	380	380
Potassium	0.5	mg/L	26	4.2	14	53
Sodium	0.5	mg/L	4800	1800	3200	3300
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	0.001	< 0.001	< 0.001	0.013
Cadmium (filtered)	0.0002	mg/L	0.0017	0.0003	0.0005	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	0.001	0.002	0.003
Copper (filtered)	0.001	mg/L	< 0.001	0.030	0.007	0.022
Lead (filtered)	0.001	mg/L	0.001	0.001	0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.022	0.012	0.067	0.062
Zinc (filtered)	0.005	mg/L	0.048	0.076	0.21	0.023

Client Sample ID			MW05	MW08	DUP-01
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S20-Ja04472	S20-Ja04473	S20-Ja04474
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	-
TRH C10-C14	0.05	mg/L	0.06	0.13	-
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	-
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	-
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	0.13	-
BTEX					
Benzene	0.001	mg/L	< 0.001	< 0.001	-
Toluene	0.001	mg/L	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	-
4-Bromofluorobenzene (surr.)	1	%	77	72	-

Client Sample ID			MW05	MW08	DUP-01
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S20-Ja04472	S20-Ja04473	S20-Ja04474
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Volatile Organics					
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	-
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	-
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	-
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	-
Benzene	0.001	mg/L	< 0.001	< 0.001	-
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	-
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	-
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	-
Bromoform	0.001	mg/L	< 0.001	< 0.001	-
Bromomethane	0.001	mg/L	< 0.001	< 0.001	-
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	-
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	-
Chloroethane	0.001	mg/L	< 0.001	< 0.001	-
Chloroform	0.005	mg/L	< 0.005	< 0.005	-
Chloromethane	0.001	mg/L	< 0.001	< 0.001	-
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	-
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	-
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	-
Iodomethane	0.001	mg/L	< 0.001	< 0.001	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	-
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	-
Styrene	0.001	mg/L	< 0.001	< 0.001	-
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	-
Toluene	0.001	mg/L	< 0.001	< 0.001	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	-

Client Sample ID			MW05	MW08	DUP-01
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S20-Ja04472	S20-Ja04473	S20-Ja04474
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Volatile Organics					
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	-
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	-
Total MAH*	0.003	mg/L	< 0.003	< 0.003	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	-
4-Bromofluorobenzene (surr.)	1	%	77	72	-
Toluene-d8 (surr.)	1	%	89	84	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	-
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	-
TRH >C10-C16	0.05	mg/L	< 0.05	0.05	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	0.05	-
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	-
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	-
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	-
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	-
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	-
Anthracene	0.001	mg/L	< 0.001	< 0.001	-
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	-
Chrysene	0.001	mg/L	< 0.001	< 0.001	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	-
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	-
Fluorene	0.001	mg/L	< 0.001	< 0.001	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	-
Naphthalene	0.001	mg/L	< 0.001	< 0.001	-
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	-
Pyrene	0.001	mg/L	< 0.001	< 0.001	-
Total PAH*	0.001	mg/L	< 0.001	< 0.001	-
2-Fluorobiphenyl (surr.)	1	%	147	93	-
p-Terphenyl-d14 (surr.)	1	%	INT	INT	-
Organochlorine Pesticides					
Chlordanes - Total	0.001	mg/L	< 0.001	< 0.001	-
4.4'-DDD	0.0001	mg/L	< 0.0001	< 0.0001	-
4.4'-DDE	0.0001	mg/L	< 0.0001	< 0.0001	-
4.4'-DDT	0.0001	mg/L	< 0.0001	< 0.0001	-
a-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-
Aldrin	0.0001	mg/L	< 0.0001	< 0.0001	-
b-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-
d-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-
Dieldrin	0.0001	mg/L	< 0.0001	< 0.0001	-
Endosulfan I	0.0001	mg/L	< 0.0001	< 0.0001	-

Client Sample ID			MW05	MW08	DUP-01
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S20-Ja04472	S20-Ja04473	S20-Ja04474
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Endosulfan II	0.0001	mg/L	< 0.0001	< 0.0001	-
Endosulfan sulphate	0.0001	mg/L	< 0.0001	< 0.0001	-
Endrin	0.0001	mg/L	< 0.0001	< 0.0001	-
Endrin aldehyde	0.0001	mg/L	< 0.0002	< 0.0002	-
Endrin ketone	0.0001	mg/L	< 0.0001	< 0.0001	-
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	< 0.0001	-
Heptachlor	0.0001	mg/L	< 0.0001	< 0.0001	-
Heptachlor epoxide	0.0001	mg/L	< 0.0001	< 0.0001	-
Hexachlorobenzene	0.0001	mg/L	< 0.0001	< 0.0001	-
Methoxychlor	0.0001	mg/L	< 0.0001	< 0.0001	-
Toxaphene	0.01	mg/L	< 0.01	< 0.01	-
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	-
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	-
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	-
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	-
Dibutylchlorendate (surr.)	1	%	INT	112	-
Tetrachloro-m-xylene (surr.)	1	%	INT	104	-
Organophosphorus Pesticides					
Azinphos-methyl	0.002	mg/L	< 0.002	< 0.002	-
Bolstar	0.002	mg/L	< 0.002	< 0.002	-
Chlorfenvinphos	0.002	mg/L	< 0.002	< 0.002	-
Chlorpyrifos	0.02	mg/L	< 0.02	< 0.02	-
Chlorpyrifos-methyl	0.002	mg/L	< 0.002	< 0.002	-
Coumaphos	0.02	mg/L	< 0.02	< 0.02	-
Demeton-S	0.02	mg/L	< 0.02	< 0.02	-
Demeton-O	0.002	mg/L	< 0.002	< 0.002	-
Diazinon	0.002	mg/L	< 0.002	< 0.002	-
Dichlorvos	0.002	mg/L	< 0.002	< 0.002	-
Dimethoate	0.002	mg/L	< 0.002	< 0.002	-
Disulfoton	0.002	mg/L	< 0.002	< 0.002	-
EPN	0.002	mg/L	< 0.002	< 0.002	-
Ethion	0.002	mg/L	< 0.002	< 0.002	-
Ethoprop	0.002	mg/L	< 0.002	< 0.002	-
Ethyl parathion	0.002	mg/L	< 0.002	< 0.002	-
Fenitrothion	0.002	mg/L	< 0.002	< 0.002	-
Fensulfothion	0.002	mg/L	< 0.002	< 0.002	-
Fenthion	0.002	mg/L	< 0.002	< 0.002	-
Malathion	0.002	mg/L	< 0.002	< 0.002	-
Merphos	0.002	mg/L	< 0.002	< 0.002	-
Methyl parathion	0.002	mg/L	< 0.002	< 0.002	-
Mevinphos	0.002	mg/L	< 0.002	< 0.002	-
Monocrotophos	0.002	mg/L	< 0.002	< 0.002	-
Naled	0.002	mg/L	< 0.002	< 0.002	-
Omethoate	0.002	mg/L	< 0.002	< 0.002	-
Phorate	0.002	mg/L	< 0.002	< 0.002	-
Pirimiphos-methyl	0.02	mg/L	< 0.02	< 0.02	-
Pyrazophos	0.002	mg/L	< 0.002	< 0.002	-
Ronnel	0.002	mg/L	< 0.002	< 0.002	-
Terbufos	0.002	mg/L	< 0.002	< 0.002	-

Client Sample ID			MW05	MW08	DUP-01
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S20-Ja04472	S20-Ja04473	S20-Ja04474
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Organophosphorus Pesticides					
Tetrachlorvinphos	0.002	mg/L	< 0.002	< 0.002	-
Tokuthion	0.002	mg/L	< 0.002	< 0.002	-
Trichloronate	0.002	mg/L	< 0.002	< 0.002	-
Triphenylphosphate (surr.)	1	%	INT	INT	-
Polychlorinated Biphenyls					
Aroclor-1016	0.005	mg/L	< 0.005	< 0.005	-
Aroclor-1221	0.001	mg/L	< 0.001	< 0.001	-
Aroclor-1232	0.005	mg/L	< 0.005	< 0.005	-
Aroclor-1242	0.005	mg/L	< 0.005	< 0.005	-
Aroclor-1248	0.005	mg/L	< 0.005	< 0.005	-
Aroclor-1254	0.005	mg/L	< 0.005	< 0.005	-
Aroclor-1260	0.005	mg/L	< 0.005	< 0.005	-
Total PCB*	0.001	mg/L	< 0.001	< 0.001	-
Dibutylchlorendate (surr.)	1	%	INT	112	-
Tetrachloro-m-xylene (surr.)	1	%	INT	104	-
Ammonia (as N)	0.01	mg/L	0.47	0.42	-
Chloride	1	mg/L	10000	9600	-
Conductivity (at 25°C)	10	uS/cm	14000	23000	-
Nitrate (as N)	0.02	mg/L	< 0.02	0.17	-
pH (at 25°C)	0.1	pH Units	6.7	5.9	-
Sulphate (as SO4)	2	mg/L	960	730	-
Total Dissolved Solids Dried at 180°C ± 2°C	5	mg/L	16000	17000	-
Alkalinity (speciated)					
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	320	110	-
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10	< 10	-
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	-
Total Alkalinity (as CaCO3)	20	mg/L	320	110	-
Alkali Metals					
Calcium	0.5	mg/L	340	150	-
Magnesium	0.5	mg/L	770	700	-
Potassium	0.5	mg/L	53	32	-
Sodium	0.5	mg/L	4900	4700	-
Heavy Metals					
Arsenic (filtered)	0.001	mg/L	0.004	0.001	0.001
Cadmium (filtered)	0.0002	mg/L	0.013	0.016	0.0017
Chromium (filtered)	0.001	mg/L	0.015	0.003	< 0.001
Copper (filtered)	0.001	mg/L	0.003	0.002	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.21	0.34	0.019
Zinc (filtered)	0.005	mg/L	0.089	0.77	0.043

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 09, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 09, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 09, 2020	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 09, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 09, 2020	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Volatile Organics	Sydney	Jan 09, 2020	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Conductivity (at 25°C)	Sydney	Jan 10, 2020	28 Days
- Method: LTM-INO-4030 Conductivity			
pH (at 25°C)	Sydney	Jan 10, 2020	1 Days
- Method: LTM-GEN-7090 pH in water by ISE			
Total Dissolved Solids Dried at 180°C ± 2°C	Sydney	Jan 10, 2020	7 Days
- Method: LTM-INO-4170 Total Dissolved Solids in Water			
Alkalinity (speciated)	Melbourne	Jan 13, 2020	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Organochlorine Pesticides	Sydney	Jan 09, 2020	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Jan 09, 2020	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Jan 09, 2020	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Major Cations			
Ammonia (as N)	Sydney	Jan 10, 2020	28 Days
- Method: LTM-INO-4200 Ammonia by Discrete Analyser			
Alkali Metals	Sydney	Jan 16, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Major Anions			
Chloride	Sydney	Jan 10, 2020	28 Days
- Method: E045 /E047 Chloride			
Nitrate (as N)	Melbourne	Jan 13, 2020	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Sulphate (as SO4)	Sydney	Jan 10, 2020	28 Days
- Method: E045 Anions by Ion Chromatography			
Metals M8 filtered	Sydney	Jan 09, 2020	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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Project Name: MILLPERRA
Project ID: 9996

Order No.:
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Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	Conductivity screen for salinity	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
External Laboratory																									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																				
1	MW01	Jan 08, 2020		Water	S20-Ja04468			X	X		X	X		X				X	X	X	X			X	
2	MW02	Jan 08, 2020		Water	S20-Ja04469			X	X		X	X		X				X	X	X	X			X	
3	MW03	Jan 08, 2020		Water	S20-Ja04470			X	X		X	X		X				X	X	X	X			X	
4	MW04	Jan 08, 2020		Water	S20-Ja04471			X	X		X	X		X				X	X	X	X			X	
5	MW05	Jan 08, 2020		Water	S20-Ja04472			X	X		X	X		X				X	X	X	X			X	
6	MW08	Jan 08, 2020		Water	S20-Ja04473			X	X		X	X		X				X	X	X	X			X	
7	DUP-01	Jan 08, 2020		Water	S20-Ja04474											X									
8	TRIP SPIKE	Jan 08, 2020		Soil	S20-Ja04475												X								
9	TRIP SPIKE LAB	Jan 08, 2020		Soil	S20-Ja04476												X								

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Project Name: MILLPERRA
Project ID: 9996

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Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	Conductivity screen for salinity	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
10	TRIP BLANK	Jan 08, 2020		Soil	S20-Ja04477												X								
11	BH24-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04478	X												X				X			X
12	BH27-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04479	X																X	X		
13	BH39-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04480	X												X				X			X
14	BH40-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04481	X																X	X		
15	BH41-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04482	X												X				X			X
16	BH42-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04483	X																X	X		
17	BH43-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04484	X												X				X			X
18	BH44-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04485	X																X	X		
19	BH45-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04486	X												X				X			X
20	BH45-0.2-0.4	Jan 09, 2020		Soil	S20-Ja04487	X																X	X		
21	BH46-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04488	X																X	X		
22	BH47-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04489	X												X				X			X

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IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILLPERRA
Project ID: 9996

Order No.:
Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	Conductivity screen for salinity	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
23	BH48-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04490	X																X	X		
24	BH48-0.5-0.7	Jan 09, 2020		Soil	S20-Ja04491	X																X	X		
25	BH49-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04492	X												X				X			X
26	BH54-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04493	X												X				X			X
27	BH63-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04494	X																X	X		
28	BH98-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04495	X												X				X			X
29	BH99-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04496	X																X	X		
30	BH99-0.2-0.4	Jan 09, 2020		Soil	S20-Ja04497	X																X	X		
31	BH102-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04498	X												X				X			X
32	DUP-05	Jan 09, 2020		Soil	S20-Ja04499								X		X							X			
33	DUP-06	Jan 09, 2020		Soil	S20-Ja04500								X		X							X			
34	TRIP SPIKE	Jan 09, 2020		Soil	S20-Ja04501												X								
35	TRIP SPIKE	Jan 09, 2020		Soil	S20-Ja04502												X								

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Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
	LAB																								
36	TRIP BLANK	Jan 09, 2020		Soil	S20-Ja04503												X								
37	BH45-0.4-0.6	Jan 09, 2020		Soil	S20-Ja04504					X															
38	BH48-0.7-0.9	Jan 09, 2020		Soil	S20-Ja04505					X															
39	BH49-0.7-0.9	Jan 09, 2020		Soil	S20-Ja04506					X															
40	BH63-0.3-0.5	Jan 09, 2020		Soil	S20-Ja04507					X															
41	BH98-0.5-0.7	Jan 09, 2020		Soil	S20-Ja04508					X															
42	BH99-0.8-1.0	Jan 09, 2020		Soil	S20-Ja04509					X															
43	BH102-0.3-0.5	Jan 09, 2020		Soil	S20-Ja04510					X															
44	MW06	Jan 08, 2020		Water	S20-Ja04511		X																		
45	MW07	Jan 08, 2020		Water	S20-Ja04512		X																		
46	BH90-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04513	X												X				X			X
47	BH90-0.5-0.7	Jan 08, 2020		Soil	S20-Ja04514					X															

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Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
48	BH91-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04515	X																X	X		
49	BH91-0.9-1.1	Jan 08, 2020		Soil	S20-Ja04516					X															
50	BH95-0.0-0.2	Jan 08, 2020		Soil	S20-Ja04517	X												X				X	X		X
51	BH95-0.5-0.7	Jan 08, 2020		Soil	S20-Ja04518					X															
52	BH96-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04519	X																X	X		
Test Counts						25	2	6	6	10	6	6	2	6	2	1	6	18	6	6	6	27	14	6	12

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.02			0.02	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.002			0.002	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB*	mg/L	< 0.001			0.001	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Conductivity (at 25°C)	uS/cm	< 10			10	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Total Dissolved Solids Dried at 180°C ± 2°C	mg/L	< 5			5	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO3)	mg/L	< 10			10	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	91			70-130	Pass	
TRH C10-C14	%	128			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	99			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
o-Xylene	%	103			70-130	Pass	
Xylenes - Total	%	101			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	96			70-130	Pass	
1.1.1-Trichloroethane	%	74			70-130	Pass	
1.2-Dichlorobenzene	%	90			70-130	Pass	
1.2-Dichloroethane	%	96			70-130	Pass	
Trichloroethene	%	94			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	95			70-130	Pass	
TRH C6-C10	%	85			70-130	Pass	
TRH >C10-C16	%	123			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	77			70-130	Pass	
Acenaphthylene	%	78			70-130	Pass	
Anthracene	%	90			70-130	Pass	
Benz(a)anthracene	%	94			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	%	89			70-130	Pass	
Benzo(b&j)fluoranthene	%	85			70-130	Pass	
Benzo(g.h.i)perylene	%	113			70-130	Pass	
Benzo(k)fluoranthene	%	80			70-130	Pass	
Chrysene	%	89			70-130	Pass	
Dibenz(a.h)anthracene	%	119			70-130	Pass	
Fluoranthene	%	91			70-130	Pass	
Fluorene	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	118			70-130	Pass	
Naphthalene	%	73			70-130	Pass	
Phenanthrene	%	84			70-130	Pass	
Pyrene	%	89			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	84			70-130	Pass	
4.4'-DDD	%	100			70-130	Pass	
4.4'-DDE	%	86			70-130	Pass	
4.4'-DDT	%	117			70-130	Pass	
a-BHC	%	85			70-130	Pass	
Aldrin	%	81			70-130	Pass	
b-BHC	%	87			70-130	Pass	
d-BHC	%	88			70-130	Pass	
Dieldrin	%	87			70-130	Pass	
Endosulfan I	%	86			70-130	Pass	
Endosulfan II	%	95			70-130	Pass	
Endosulfan sulphate	%	128			70-130	Pass	
Endrin	%	112			70-130	Pass	
Endrin ketone	%	99			70-130	Pass	
g-BHC (Lindane)	%	82			70-130	Pass	
Heptachlor	%	74			70-130	Pass	
Heptachlor epoxide	%	75			70-130	Pass	
Hexachlorobenzene	%	78			70-130	Pass	
Methoxychlor	%	105			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	116			70-130	Pass	
Dimethoate	%	109			70-130	Pass	
Ethion	%	97			70-130	Pass	
Fenitrothion	%	114			70-130	Pass	
Methyl parathion	%	113			70-130	Pass	
Mevinphos	%	116			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	87			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	106			70-130	Pass	
Conductivity (at 25°C)	%	95			70-130	Pass	
Nitrate (as N)	%	101			70-130	Pass	
Total Dissolved Solids Dried at 180°C ± 2°C	%	73			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Carbonate Alkalinity (as CaCO3)	%	97			70-130	Pass	
Total Alkalinity (as CaCO3)	%	107			70-130	Pass	
LCS - % Recovery							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Alkali Metals									
Calcium			%	103			70-130	Pass	
Magnesium			%	106			70-130	Pass	
Potassium			%	100			70-130	Pass	
Sodium			%	109			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic (filtered)			%	91			70-130	Pass	
Cadmium (filtered)			%	95			70-130	Pass	
Chromium (filtered)			%	93			70-130	Pass	
Copper (filtered)			%	95			70-130	Pass	
Lead (filtered)			%	92			70-130	Pass	
Mercury (filtered)			%	108			70-130	Pass	
Nickel (filtered)			%	95			70-130	Pass	
Zinc (filtered)			%	92			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Ammonia (as N)	S20-Ja03821	NCP	%	345			70-130	Fail	Q08
Nitrate (as N)	B20-Ja05010	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Calcium	S20-Ja04473	CP	%	79			70-130	Pass	
Potassium	S20-Ja04473	CP	%	94			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S20-Ja04474	CP	%	103			70-130	Pass	
Cadmium (filtered)	S20-Ja04474	CP	%	84			70-130	Pass	
Chromium (filtered)	S20-Ja04474	CP	%	70			70-130	Pass	
Copper (filtered)	S20-Ja04474	CP	%	61			70-130	Fail	Q08
Lead (filtered)	S20-Ja04474	CP	%	68			70-130	Fail	Q08
Mercury (filtered)	S20-Ja04474	CP	%	81			70-130	Pass	
Nickel (filtered)	S20-Ja04474	CP	%	61			70-130	Fail	Q08
Zinc (filtered)	S20-Ja04474	CP	%	56			70-130	Fail	Q08
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-Ja04468	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S20-Ja04468	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S20-Ja04468	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1-Dichloroethene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1-Trichloroethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2-Trichloroethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1.2.2-Tetrachloroethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dibromoethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichlorobenzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloroethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloropropane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.3-Trichloropropane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.4-Trimethylbenzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichlorobenzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichloropropane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3.5-Trimethylbenzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.4-Dichlorobenzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Butanone (MEK)	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Propanone (Acetone)	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Chlorotoluene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Allyl chloride	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromobenzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromochloromethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromodichloromethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromoform	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromomethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon disulfide	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon Tetrachloride	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorobenzene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroform	S20-Ja04468	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloromethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.2-Dichloroethene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.3-Dichloropropene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromochloromethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromomethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dichlorodifluoromethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iodomethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Isopropyl benzene (Cumene)	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Methylene Chloride	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Styrene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tetrachloroethene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.2-Dichloroethene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.3-Dichloropropene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichloroethene	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichlorofluoromethane	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Vinyl chloride	S20-Ja04468	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Ja04468	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S20-Ja04468	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	S20-Ja03821	NCP	mg/L	99	93	6.0	30%	Pass	
Chloride	S20-Ja10821	NCP	mg/L	1400	1300	4.0	30%	Pass	
Nitrate (as N)	S20-Ja05510	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Sulphate (as SO4)	S20-Ja10821	NCP	mg/L	250	250	5.0	30%	Pass	
Total Dissolved Solids Dried at 180°C ± 2°C	S20-Ja04468	CP	mg/L	17000	16000	8.0	30%	Pass	

Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Bicarbonate Alkalinity (as CaCO3)	M20-Ja05503	NCP	mg/L	470	450	4.0	30%	Pass	
Carbonate Alkalinity (as CaCO3)	M20-Ja05503	NCP	mg/L	< 10	< 10	<1	30%	Pass	
Hydroxide Alkalinity (as CaCO3)	M20-Ja05503	NCP	mg/L	< 20	< 20	<1	30%	Pass	
Total Alkalinity (as CaCO3)	M20-Ja05503	NCP	mg/L	470	460	2.0	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	S20-Ja04468	CP	mg/L	220	260	17	30%	Pass	
Magnesium	S20-Ja04468	CP	mg/L	850	850	<1	30%	Pass	
Potassium	S20-Ja04468	CP	mg/L	26	26	1.0	30%	Pass	
Sodium	S20-Ja04468	CP	mg/L	4800	4700	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S20-Ja05399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	S20-Ja05399	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S20-Ja05399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S20-Ja05399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	S20-Ja05399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S20-Ja05399	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S20-Ja05399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	S20-Ja05399	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25°C)	S20-Ja04473	CP	uS/cm	23000	25000	8.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Inorganic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Julie Kay	Senior Analyst-Inorganic (VIC)
Scott Beddoes	Senior Analyst-Inorganic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Sam Scully**

Report **696041-S**
Project name MILLPERRA
Project ID 9996
Received Date Jan 09, 2020

Client Sample ID			**TRIP SPIKE**	**TRIP BLANK**	**BH24-0.0-0.2**	**BH27-0.0-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Ja04475**	**S20-Ja04477**	**S20-Ja04478**	**S20-Ja04479**
Date Sampled			**Jan 08, 2020**	**Jan 08, 2020**	**Jan 09, 2020**	**Jan 09, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	< 20
TRH C10-C14	20	mg/kg	-	-	< 20	< 20
TRH C15-C28	50	mg/kg	-	-	82	< 50
TRH C29-C36	50	mg/kg	-	-	86	< 50
TRH C10-C36 (Total)	50	mg/kg	-	-	168	< 50
BTEX						
Benzene	0.1	mg/kg	120	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	100	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	100	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	100	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	100	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	100	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	56	61	60	57
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	-	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	< 20
TRH >C10-C16	50	mg/kg	-	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	< 50
TRH >C16-C34	100	mg/kg	-	-	130	< 100
TRH >C34-C40	100	mg/kg	-	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	130	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	1.2
Acenaphthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	-	-	< 0.5	< 0.5

Client Sample ID			TRIP SPIKE	TRIP BLANK	BH24-0.0-0.2	BH27-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04475	S20-Ja04477	S20-Ja04478	S20-Ja04479
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	-	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	-	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	-	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	-	88	71
p-Terphenyl-d14 (surr.)	1	%	-	-	121	102
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	-	-	105	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	91	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-
Diazinon	0.2	mg/kg	-	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID			TRIP SPIKE	TRIP BLANK	BH24-0.0-0.2	BH27-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04475	S20-Ja04477	S20-Ja04478	S20-Ja04479
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-
Monocrotophos	2	mg/kg	-	-	< 2	-
Naled	0.2	mg/kg	-	-	< 0.2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	INT	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	105	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	91	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	-

Client Sample ID			TRIP SPIKE	TRIP BLANK	BH24-0.0-0.2	BH27-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04475	S20-Ja04477	S20-Ja04478	S20-Ja04479
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
2-Nitrophenol	1	mg/kg	-	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
4-Nitrophenol	5	mg/kg	-	-	< 5	-
Dinoseb	20	mg/kg	-	-	< 20	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	-
Phenol-d6 (surr.)	1	%	-	-	81	-
Heavy Metals						
Arsenic	2	mg/kg	-	-	4.4	6.8
Cadmium	0.4	mg/kg	-	-	< 0.4	< 0.4
Chromium	5	mg/kg	-	-	11	11
Copper	5	mg/kg	-	-	18	14
Lead	5	mg/kg	-	-	29	16
Mercury	0.1	mg/kg	-	-	< 0.1	< 0.1
Nickel	5	mg/kg	-	-	8.5	6.9
Zinc	5	mg/kg	-	-	75	44
% Moisture	1	%	-	-	6.9	9.0

Client Sample ID			BH39-0.0-0.2	BH40-0.0-0.2	BH41-0.0-0.2	BH42-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04480	S20-Ja04481	S20-Ja04482	S20-Ja04483
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	67	62
TRH C29-C36	50	mg/kg	< 50	< 50	98	80
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	165	142
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	91	62	58	59
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH39-0.0-0.2	BH40-0.0-0.2	BH41-0.0-0.2	BH42-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04480	S20-Ja04481	S20-Ja04482	S20-Ja04483
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	130	110
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	130	110
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	83	88	77	93
p-Terphenyl-d14 (surr.)	1	%	116	127	108	138
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-

Client Sample ID			BH39-0.0-0.2	BH40-0.0-0.2	BH41-0.0-0.2	BH42-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04480	S20-Ja04481	S20-Ja04482	S20-Ja04483
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	84	-	93	-
Tetrachloro-m-xylene (surr.)	1	%	100	-	77	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	139	-	129	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID			BH39-0.0-0.2	BH40-0.0-0.2	BH41-0.0-0.2	BH42-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04480	S20-Ja04481	S20-Ja04482	S20-Ja04483
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	84	-	93	-
Tetrachloro-m-xylene (surr.)	1	%	100	-	77	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	< 1	-
Pentachlorophenol	1	mg/kg	< 1	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	< 0.2	-
2-Nitrophenol	1	mg/kg	< 1	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	< 0.4	-
4-Nitrophenol	5	mg/kg	< 5	-	< 5	-
Dinoseb	20	mg/kg	< 20	-	< 20	-
Phenol	0.5	mg/kg	< 0.5	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	< 20	-
Phenol-d6 (surr.)	1	%	80	-	69	-
Heavy Metals						
Arsenic	2	mg/kg	7.2	4.9	4.8	5.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	16	13	13
Copper	5	mg/kg	22	31	21	21
Lead	5	mg/kg	30	35	26	17
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.9	5.2	12	13
Zinc	5	mg/kg	97	110	72	51
% Moisture	1	%	9.7	7.3	6.9	6.4

Client Sample ID			BH43-0.0-0.2	BH44-0.0-0.2	BH45-0.0-0.2	BH45-0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04484	S20-Ja04485	S20-Ja04486	S20-Ja04487
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	22	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	77	98	83	< 50
TRH C29-C36	50	mg/kg	80	99	100	< 50
TRH C10-C36 (Total)	50	mg/kg	179	197	183	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	58	54	95	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	130	160	150	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	130	160	150	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	81	89	79	97
p-Terphenyl-d14 (surr.)	1	%	110	133	115	145

Client Sample ID			BH43-0.0-0.2	BH44-0.0-0.2	BH45-0.0-0.2	BH45-0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04484	S20-Ja04485	S20-Ja04486	S20-Ja04487
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	75	-	92	-
Tetrachloro-m-xylene (surr.)	1	%	80	-	95	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-

Client Sample ID			BH43-0.0-0.2	BH44-0.0-0.2	BH45-0.0-0.2	BH45-0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04484	S20-Ja04485	S20-Ja04486	S20-Ja04487
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	138	-	142	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	75	-	92	-
Tetrachloro-m-xylene (surr.)	1	%	80	-	95	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	< 1	-
Pentachlorophenol	1	mg/kg	< 1	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	< 0.2	-
2-Nitrophenol	1	mg/kg	< 1	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	< 0.4	-
4-Nitrophenol	5	mg/kg	< 5	-	< 5	-
Dinoseb	20	mg/kg	< 20	-	< 20	-
Phenol	0.5	mg/kg	< 0.5	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	< 20	-
Phenol-d6 (surr.)	1	%	71	-	71	-

Client Sample ID			BH43-0.0-0.2	BH44-0.0-0.2	BH45-0.0-0.2	BH45-0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04484	S20-Ja04485	S20-Ja04486	S20-Ja04487
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	9.0	6.5	8.4	16
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	18	40	17	27
Copper	5	mg/kg	20	20	11	8.4
Lead	5	mg/kg	24	23	18	20
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.9	34	6.6	< 5
Zinc	5	mg/kg	68	76	40	62
% Moisture	1	%	6.7	4.8	11	6.2

Client Sample ID			BH46-0.0-0.2	BH47-0.0-0.2	BH48-0.0-0.2	BH48-0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04488	S20-Ja04489	S20-Ja04490	S20-Ja04491
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	68	< 50	52	< 50
TRH C29-C36	50	mg/kg	65	< 50	80	< 50
TRH C10-C36 (Total)	50	mg/kg	133	< 50	132	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	75	56	58	51
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	110	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	110	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH46-0.0-0.2	BH47-0.0-0.2	BH48-0.0-0.2	BH48-0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04488	S20-Ja04489	S20-Ja04490	S20-Ja04491
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	78	61	58
p-Terphenyl-d14 (surr.)	1	%	130	125	64	77
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	0.06	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	0.06	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2	-	-
Dibutylchlorendate (surr.)	1	%	-	95	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	107	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Bolstar	0.2	mg/kg	-	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	-
Coumaphos	2	mg/kg	-	< 2	-	-

Client Sample ID			BH46-0.0-0.2	BH47-0.0-0.2	BH48-0.0-0.2	BH48-0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04488	S20-Ja04489	S20-Ja04490	S20-Ja04491
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Demeton-S	0.2	mg/kg	-	< 0.2	-	-
Demeton-O	0.2	mg/kg	-	< 0.2	-	-
Diazinon	0.2	mg/kg	-	< 0.2	-	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-	-
Dimethoate	0.2	mg/kg	-	< 0.2	-	-
Disulfoton	0.2	mg/kg	-	< 0.2	-	-
EPN	0.2	mg/kg	-	< 0.2	-	-
Ethion	0.2	mg/kg	-	< 0.2	-	-
Ethoprop	0.2	mg/kg	-	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-	-
Fenthion	0.2	mg/kg	-	< 0.2	-	-
Malathion	0.2	mg/kg	-	< 0.2	-	-
Merphos	0.2	mg/kg	-	< 0.2	-	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-	-
Mevinphos	0.2	mg/kg	-	< 0.2	-	-
Monocrotophos	2	mg/kg	-	< 2	-	-
Naled	0.2	mg/kg	-	< 0.2	-	-
Omethoate	2	mg/kg	-	< 2	-	-
Phorate	0.2	mg/kg	-	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-	-
Ronnel	0.2	mg/kg	-	< 0.2	-	-
Terbufos	0.2	mg/kg	-	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	-
Tokuthion	0.2	mg/kg	-	< 0.2	-	-
Trichloronate	0.2	mg/kg	-	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	-	146	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	95	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	107	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	-	-
Pentachlorophenol	1	mg/kg	-	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	-	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-	-

Client Sample ID			BH46-0.0-0.2	BH47-0.0-0.2	BH48-0.0-0.2	BH48-0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04488	S20-Ja04489	S20-Ja04490	S20-Ja04491
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
2-Nitrophenol	1	mg/kg	-	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
4-Nitrophenol	5	mg/kg	-	< 5	-	-
Dinoseb	20	mg/kg	-	< 20	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	-	-
Phenol-d6 (surr.)	1	%	-	70	-	-
Heavy Metals						
Arsenic	2	mg/kg	9.5	6.9	7.5	7.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	11	16	16
Copper	5	mg/kg	15	15	17	9.6
Lead	5	mg/kg	18	18	26	17
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	8.5	6.1
Zinc	5	mg/kg	65	36	39	25
% Moisture	1	%	9.9	5.9	7.4	6.5

Client Sample ID			BH49-0.0-0.2	BH54-0.0-0.2	BH63-0.0-0.2	BH98-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04492	S20-Ja04493	S20-Ja04494	S20-Ja04495
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	55
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	69
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	124
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	61	51	54	55
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH49-0.0-0.2	BH54-0.0-0.2	BH63-0.0-0.2	BH98-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04492	S20-Ja04493	S20-Ja04494	S20-Ja04495
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	110
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	110
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	86	91	92	82
p-Terphenyl-d14 (surr.)	1	%	126	136	127	113
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	0.30	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	-	< 1

Client Sample ID			BH49-0.0-0.2	BH54-0.0-0.2	BH63-0.0-0.2	BH98-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04492	S20-Ja04493	S20-Ja04494	S20-Ja04495
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	0.3	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	0.3	< 0.2	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	< 0.2
Dibutylchlorendate (surr.)	1	%	109	111	-	93
Tetrachloro-m-xylene (surr.)	1	%	128	122	-	111
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	-	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Omethoate	2	mg/kg	< 2	< 2	-	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	80	86	-	74
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5

Client Sample ID			BH49-0.0-0.2	BH54-0.0-0.2	BH63-0.0-0.2	BH98-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04492	S20-Ja04493	S20-Ja04494	S20-Ja04495
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	109	111	-	93
Tetrachloro-m-xylene (surr.)	1	%	128	122	-	111
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	-	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	-	< 5
Dinoseb	20	mg/kg	< 20	< 20	-	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	-	< 20
Phenol-d6 (surr.)	1	%	84	89	-	83
Heavy Metals						
Arsenic	2	mg/kg	12	2.5	5.9	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	51	6.8	16	< 5
Copper	5	mg/kg	21	11	7.3	8.8
Lead	5	mg/kg	20	8.4	23	11
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	24	< 5	< 5	< 5
Zinc	5	mg/kg	39	39	26	41
% Moisture	1	%	8.2	11	5.7	8.4

Client Sample ID			BH99-0.0-0.2	BH99-0.2-0.4	BH102-0.0-0.2	DUP-05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04496	S20-Ja04497	S20-Ja04498	S20-Ja04499
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	126	66	70	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	89	100	96	94
p-Terphenyl-d14 (surr.)	1	%	118	137	134	133

Client Sample ID			BH99-0.0-0.2	BH99-0.2-0.4	BH102-0.0-0.2	DUP-05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04496	S20-Ja04497	S20-Ja04498	S20-Ja04499
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	-	-	92	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	115	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-
Diazinon	0.2	mg/kg	-	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID			BH99-0.0-0.2	BH99-0.2-0.4	BH102-0.0-0.2	DUP-05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04496	S20-Ja04497	S20-Ja04498	S20-Ja04499
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-
Monocrotophos	2	mg/kg	-	-	< 2	-
Naled	0.2	mg/kg	-	-	< 0.2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	85	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	92	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	115	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
2-Nitrophenol	1	mg/kg	-	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
4-Nitrophenol	5	mg/kg	-	-	< 5	-
Dinoseb	20	mg/kg	-	-	< 20	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	-
Phenol-d6 (surr.)	1	%	-	-	94	-

Client Sample ID			BH99-0.0-0.2	BH99-0.2-0.4	BH102-0.0-0.2	DUP-05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04496	S20-Ja04497	S20-Ja04498	S20-Ja04499
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 09, 2020
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	3.1	2.5	5.5	2.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.2	6.9	9.2	7.2
Copper	5	mg/kg	16	< 5	10	13
Lead	5	mg/kg	61	< 5	15	9.0
Mercury	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.6	< 5	< 5	< 5
Zinc	5	mg/kg	67	5.7	35	40
% Moisture	1	%	7.8	5.7	8.2	11

Client Sample ID			DUP-06	TRIP SPIKE	TRIP BLANK	BH90-0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04500	S20-Ja04501	S20-Ja04503	S20-Ja04513
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 08, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	-	< 20
TRH C15-C28	50	mg/kg	-	-	-	69
TRH C29-C36	50	mg/kg	-	-	-	85
TRH C10-C36 (Total)	50	mg/kg	-	-	-	154
BTEX						
Benzene	0.1	mg/kg	-	100	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	99	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	99	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	95	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	98	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	96	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	117	89	74
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
TRH >C10-C16	50	mg/kg	-	-	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	-	< 50
TRH >C16-C34	100	mg/kg	-	-	-	120
TRH >C34-C40	100	mg/kg	-	-	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	-	120
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5

Client Sample ID			DUP-06	TRIP SPIKE	TRIP BLANK	BH90-0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04500	S20-Ja04501	S20-Ja04503	S20-Ja04513
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 08, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	-	-	97
p-Terphenyl-d14 (surr.)	1	%	126	-	-	106
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	-	126
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	122
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2

Client Sample ID			DUP-06	TRIP SPIKE	TRIP BLANK	BH90-0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04500	S20-Ja04501	S20-Ja04503	S20-Ja04513
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 08, 2020
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	126
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	126
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	122
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	-	< 1
Pentachlorophenol	1	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1

Client Sample ID			DUP-06	TRIP SPIKE	TRIP BLANK	BH90-0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04500	S20-Ja04501	S20-Ja04503	S20-Ja04513
Date Sampled			Jan 09, 2020	Jan 09, 2020	Jan 09, 2020	Jan 08, 2020
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1	mg/kg	-	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	97
Heavy Metals						
Arsenic	2	mg/kg	< 2	-	-	7.0
Cadmium	0.4	mg/kg	< 0.4	-	-	< 0.4
Chromium	5	mg/kg	< 5	-	-	11
Copper	5	mg/kg	8.9	-	-	11
Lead	5	mg/kg	13	-	-	14
Mercury	0.1	mg/kg	< 0.1	-	-	< 0.1
Nickel	5	mg/kg	< 5	-	-	< 5
Zinc	5	mg/kg	39	-	-	40
% Moisture	1	%	7.5	-	-	8.0

Client Sample ID			BH91-0.0-0.1	BH95-0.0-0.2	BH96-0.0-0.1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04515	S20-Ja04517	S20-Ja04519
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	50	< 50	68
TRH C29-C36	50	mg/kg	54	< 50	74
TRH C10-C36 (Total)	50	mg/kg	104	< 50	142
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	82	76	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50

Client Sample ID			BH91-0.0-0.1	BH95-0.0-0.2	BH96-0.0-0.1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04515	S20-Ja04517	S20-Ja04519
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	110
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	110
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	92	92	91
p-Terphenyl-d14 (surr.)	1	%	99	98	104
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	0.08	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-
Toxaphene	1	mg/kg	-	< 1	-

Client Sample ID			BH91-0.0-0.1	BH95-0.0-0.2	BH96-0.0-0.1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04515	S20-Ja04517	S20-Ja04519
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	0.08	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	-	94	-
Tetrachloro-m-xylene (surr.)	1	%	-	112	-
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-
Bolstar	0.2	mg/kg	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-
Coumaphos	2	mg/kg	-	< 2	-
Demeton-S	0.2	mg/kg	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	< 0.2	-
Diazinon	0.2	mg/kg	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	< 0.2	-
EPN	0.2	mg/kg	-	< 0.2	-
Ethion	0.2	mg/kg	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-
Fenthion	0.2	mg/kg	-	< 0.2	-
Malathion	0.2	mg/kg	-	< 0.2	-
Merphos	0.2	mg/kg	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	< 0.2	-
Monocrotophos	2	mg/kg	-	< 2	-
Naled	0.2	mg/kg	-	< 0.2	-
Omethoate	2	mg/kg	-	< 2	-
Phorate	0.2	mg/kg	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-
Ronnel	0.2	mg/kg	-	< 0.2	-
Terbufos	0.2	mg/kg	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	111	-
Polychlorinated Biphenyls					
Aroclor-1016	0.5	mg/kg	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-

Client Sample ID			BH91-0.0-0.1	BH95-0.0-0.2	BH96-0.0-0.1
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S20-Ja04515	S20-Ja04517	S20-Ja04519
Date Sampled			Jan 08, 2020	Jan 08, 2020	Jan 08, 2020
Test/Reference	LOR	Unit			
Polychlorinated Biphenyls					
Aroclor-1260	0.5	mg/kg	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	94	-
Tetrachloro-m-xylene (surr.)	1	%	-	112	-
Phenols (Halogenated)					
2-Chlorophenol	0.5	mg/kg	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	-
Pentachlorophenol	1	mg/kg	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-
2-Nitrophenol	1	mg/kg	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-
4-Nitrophenol	5	mg/kg	-	< 5	-
Dinoseb	20	mg/kg	-	< 20	-
Phenol	0.5	mg/kg	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	-
Phenol-d6 (surr.)	1	%	-	97	-
Heavy Metals					
Arsenic	2	mg/kg	6.6	6.2	4.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.6	< 5	11
Copper	5	mg/kg	12	7.4	9.6
Lead	5	mg/kg	10	9.7	15
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	6.0
Zinc	5	mg/kg	30	26	50
% Moisture	1	%	4.6	3.7	4.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 13, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 13, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 13, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 13, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 13, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Sydney	Jan 13, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Jan 13, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jan 13, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Jan 13, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Jan 13, 2020	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Jan 13, 2020	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Jan 10, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: Alliance Geotechnical
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NSW 2147

Project Name: MILLPERRA
Project ID: 9996

Order No.:
Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	Conductivity screen for salinity	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
External Laboratory																									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																				
1	MW01	Jan 08, 2020		Water	S20-Ja04468			X	X		X	X		X				X	X	X	X			X	
2	MW02	Jan 08, 2020		Water	S20-Ja04469			X	X		X	X		X				X	X	X	X			X	
3	MW03	Jan 08, 2020		Water	S20-Ja04470			X	X		X	X		X				X	X	X	X			X	
4	MW04	Jan 08, 2020		Water	S20-Ja04471			X	X		X	X		X				X	X	X	X			X	
5	MW05	Jan 08, 2020		Water	S20-Ja04472			X	X		X	X		X				X	X	X	X			X	
6	MW08	Jan 08, 2020		Water	S20-Ja04473			X	X		X	X		X				X	X	X	X			X	
7	DUP-01	Jan 08, 2020		Water	S20-Ja04474											X									
8	TRIP SPIKE	Jan 08, 2020		Soil	S20-Ja04475												X								
9	TRIP SPIKE LAB	Jan 08, 2020		Soil	S20-Ja04476												X								

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Company Name: Alliance Geotechnical
Address: 10 Welder Road
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NSW 2147

Project Name: MILLPERRA
Project ID: 9996

Order No.:
Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	Conductivity screen for salinity	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
10	TRIP BLANK	Jan 08, 2020		Soil	S20-Ja04477												X								
11	BH24-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04478	X												X				X			X
12	BH27-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04479	X																X	X		
13	BH39-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04480	X												X				X			X
14	BH40-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04481	X																X	X		
15	BH41-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04482	X												X				X			X
16	BH42-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04483	X																X	X		
17	BH43-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04484	X												X				X			X
18	BH44-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04485	X																X	X		
19	BH45-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04486	X												X				X			X
20	BH45-0.2-0.4	Jan 09, 2020		Soil	S20-Ja04487	X																X	X		
21	BH46-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04488	X																X	X		
22	BH47-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04489	X												X				X			X

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Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILLPERRA
Project ID: 9996

Order No.:
Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	Conductivity screen for salinity	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
23	BH48-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04490	X																X	X		
24	BH48-0.5-0.7	Jan 09, 2020		Soil	S20-Ja04491	X																X	X		
25	BH49-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04492	X												X				X			X
26	BH54-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04493	X												X				X			X
27	BH63-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04494	X																X	X		
28	BH98-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04495	X												X				X			X
29	BH99-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04496	X																X	X		
30	BH99-0.2-0.4	Jan 09, 2020		Soil	S20-Ja04497	X																X	X		
31	BH102-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04498	X												X				X			X
32	DUP-05	Jan 09, 2020		Soil	S20-Ja04499								X		X							X			
33	DUP-06	Jan 09, 2020		Soil	S20-Ja04500								X		X							X			
34	TRIP SPIKE	Jan 09, 2020		Soil	S20-Ja04501												X								
35	TRIP SPIKE	Jan 09, 2020		Soil	S20-Ja04502												X								

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Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
	LAB																								
36	TRIP BLANK	Jan 09, 2020		Soil	S20-Ja04503												X								
37	BH45-0.4-0.6	Jan 09, 2020		Soil	S20-Ja04504					X															
38	BH48-0.7-0.9	Jan 09, 2020		Soil	S20-Ja04505					X															
39	BH49-0.7-0.9	Jan 09, 2020		Soil	S20-Ja04506					X															
40	BH63-0.3-0.5	Jan 09, 2020		Soil	S20-Ja04507					X															
41	BH98-0.5-0.7	Jan 09, 2020		Soil	S20-Ja04508					X															
42	BH99-0.8-1.0	Jan 09, 2020		Soil	S20-Ja04509					X															
43	BH102-0.3-0.5	Jan 09, 2020		Soil	S20-Ja04510					X															
44	MW06	Jan 08, 2020		Water	S20-Ja04511		X																		
45	MW07	Jan 08, 2020		Water	S20-Ja04512		X																		
46	BH90-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04513	X												X				X			X
47	BH90-0.5-0.7	Jan 08, 2020		Soil	S20-Ja04514					X															

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Melbourne Laboratory - NATA Site # 1254 & 14271														X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																									
Perth Laboratory - NATA Site # 23736																									
48	BH91-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04515	X																X	X		
49	BH91-0.9-1.1	Jan 08, 2020		Soil	S20-Ja04516					X															
50	BH95-0.0-0.2	Jan 08, 2020		Soil	S20-Ja04517	X												X				X	X		X
51	BH95-0.5-0.7	Jan 08, 2020		Soil	S20-Ja04518					X															
52	BH96-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04519	X																X	X		
Test Counts						25	2	6	6	10	6	6	2	6	2	1	6	18	6	6	6	27	14	6	12

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	86			70-130	Pass	
TRH C10-C14	%	75			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	83			70-130	Pass	
Toluene	%	85			70-130	Pass	
Ethylbenzene	%	82			70-130	Pass	
m&p-Xylenes	%	77			70-130	Pass	
o-Xylene	%	83			70-130	Pass	
Xylenes - Total	%	79			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	75			70-130	Pass	
TRH C6-C10	%	82			70-130	Pass	
TRH >C10-C16	%	74			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	92			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	%	99			70-130	Pass	
Anthracene	%	101			70-130	Pass	
Benz(a)anthracene	%	96			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	130			70-130	Pass	
Benzo(g.h.i)perylene	%	85			70-130	Pass	
Benzo(k)fluoranthene	%	110			70-130	Pass	
Chrysene	%	82			70-130	Pass	
Dibenz(a.h)anthracene	%	90			70-130	Pass	
Fluoranthene	%	129			70-130	Pass	
Fluorene	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	90			70-130	Pass	
Naphthalene	%	110			70-130	Pass	
Phenanthrene	%	72			70-130	Pass	
Pyrene	%	128			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	101			70-130	Pass	
4.4'-DDD	%	103			70-130	Pass	
4.4'-DDE	%	94			70-130	Pass	
4.4'-DDT	%	98			70-130	Pass	
a-BHC	%	112			70-130	Pass	
Aldrin	%	104			70-130	Pass	
b-BHC	%	103			70-130	Pass	
d-BHC	%	106			70-130	Pass	
Dieldrin	%	98			70-130	Pass	
Endosulfan I	%	101			70-130	Pass	
Endosulfan II	%	91			70-130	Pass	
Endosulfan sulphate	%	90			70-130	Pass	
Endrin	%	99			70-130	Pass	
Endrin aldehyde	%	92			70-130	Pass	
Endrin ketone	%	83			70-130	Pass	
g-BHC (Lindane)	%	107			70-130	Pass	
Heptachlor	%	104			70-130	Pass	
Heptachlor epoxide	%	107			70-130	Pass	
Hexachlorobenzene	%	105			70-130	Pass	
Methoxychlor	%	96			70-130	Pass	
Toxaphene	%	84			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	102			70-130	Pass	
Dimethoate	%	95			70-130	Pass	
Ethion	%	99			70-130	Pass	
Fenitrothion	%	104			70-130	Pass	
Methyl parathion	%	126			70-130	Pass	
Mevinphos	%	102			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	76			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	103			30-130	Pass	
2.4-Dichlorophenol	%	82			30-130	Pass	
2.4.5-Trichlorophenol	%	76			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.6-Trichlorophenol	%	82			30-130	Pass	
2.6-Dichlorophenol	%	95			30-130	Pass	
4-Chloro-3-methylphenol	%	102			30-130	Pass	
Pentachlorophenol	%	72			30-130	Pass	
Tetrachlorophenols - Total	%	82			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	90			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	98			30-130	Pass	
2-Methylphenol (o-Cresol)	%	93			30-130	Pass	
2-Nitrophenol	%	97			30-130	Pass	
2.4-Dimethylphenol	%	88			30-130	Pass	
2.4-Dinitrophenol	%	74			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	101			30-130	Pass	
4-Nitrophenol	%	95			30-130	Pass	
Dinoseb	%	74			30-130	Pass	
Phenol	%	115			30-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	97			70-130	Pass	
Cadmium	%	92			70-130	Pass	
Chromium	%	97			70-130	Pass	
Copper	%	96			70-130	Pass	
Lead	%	92			70-130	Pass	
Mercury	%	94			70-130	Pass	
Nickel	%	96			70-130	Pass	
Zinc	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-Ja01972	NCP	%	97			70-130	Pass	
Toluene	S20-Ja01972	NCP	%	89			70-130	Pass	
Ethylbenzene	S20-Ja01972	NCP	%	83			70-130	Pass	
m&p-Xylenes	S20-Ja01972	NCP	%	83			70-130	Pass	
o-Xylene	S20-Ja01972	NCP	%	83			70-130	Pass	
Xylenes - Total	S20-Ja01972	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-Ja01972	NCP	%	82			70-130	Pass	
TRH C10-C14	S20-Ja02683	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-Ja01972	NCP	%	70			70-130	Pass	
TRH C6-C10	S20-Ja01972	NCP	%	82			70-130	Pass	
TRH >C10-C16	S20-Ja02683	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S20-Ja02686	NCP	%	96			70-130	Pass	
4.4'-DDD	S20-Ja02686	NCP	%	116			70-130	Pass	
4.4'-DDE	S20-Ja02686	NCP	%	92			70-130	Pass	
4.4'-DDT	S20-Ja02563	NCP	%	75			70-130	Pass	
a-BHC	S20-Ja02686	NCP	%	109			70-130	Pass	
Aldrin	S20-Ja02686	NCP	%	104			70-130	Pass	
b-BHC	S20-Ja02686	NCP	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
d-BHC	S20-Ja02686	NCP	%	109			70-130	Pass	
Dieldrin	S20-Ja02686	NCP	%	98			70-130	Pass	
Endosulfan I	S20-Ja02686	NCP	%	100			70-130	Pass	
Endosulfan II	S20-Ja02686	NCP	%	88			70-130	Pass	
Endosulfan sulphate	S20-Ja02686	NCP	%	84			70-130	Pass	
Endrin	S20-Ja02686	NCP	%	96			70-130	Pass	
Endrin aldehyde	S20-Ja02686	NCP	%	87			70-130	Pass	
Endrin ketone	S20-Ja02686	NCP	%	75			70-130	Pass	
g-BHC (Lindane)	S20-Ja02686	NCP	%	106			70-130	Pass	
Heptachlor	S20-Ja02686	NCP	%	96			70-130	Pass	
Heptachlor epoxide	S20-Ja02686	NCP	%	106			70-130	Pass	
Hexachlorobenzene	S20-Ja02686	NCP	%	105			70-130	Pass	
Methoxychlor	S20-Ja02563	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Ja04482	CP	%	102			70-130	Pass	
Cadmium	S20-Ja04482	CP	%	105			70-130	Pass	
Chromium	S20-Ja04482	CP	%	97			70-130	Pass	
Copper	S20-Ja04482	CP	%	94			70-130	Pass	
Lead	S20-Ja04482	CP	%	90			70-130	Pass	
Mercury	S20-Ja04482	CP	%	101			70-130	Pass	
Nickel	S20-Ja04482	CP	%	95			70-130	Pass	
Zinc	S20-Ja04482	CP	%	85			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S20-Ja04489	CP	%	79			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Ja04500	CP	%	92			70-130	Pass	
Cadmium	S20-Ja04500	CP	%	94			70-130	Pass	
Chromium	S20-Ja04500	CP	%	90			70-130	Pass	
Copper	S20-Ja04500	CP	%	91			70-130	Pass	
Lead	S20-Ja04500	CP	%	88			70-130	Pass	
Mercury	S20-Ja04500	CP	%	93			70-130	Pass	
Nickel	S20-Ja04500	CP	%	88			70-130	Pass	
Zinc	S20-Ja04500	CP	%	99			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-Ja07240	NCP	%	80			70-130	Pass	
Acenaphthylene	S20-Ja07240	NCP	%	92			70-130	Pass	
Anthracene	S20-Ja07240	NCP	%	97			70-130	Pass	
Benz(a)anthracene	S20-Ja07323	NCP	%	109			70-130	Pass	
Benzo(a)pyrene	S20-Ja07240	NCP	%	130			70-130	Pass	
Benzo(b&j)fluoranthene	S20-Ja07240	NCP	%	102			70-130	Pass	
Benzo(g.h.i)perylene	S20-Ja07240	NCP	%	110			70-130	Pass	
Benzo(k)fluoranthene	S20-Ja07240	NCP	%	95			70-130	Pass	
Chrysene	S20-Ja07240	NCP	%	109			70-130	Pass	
Dibenz(a.h)anthracene	S20-Ja07240	NCP	%	122			70-130	Pass	
Fluoranthene	S20-Ja07323	NCP	%	108			70-130	Pass	
Fluorene	S20-Ja07240	NCP	%	90			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S20-Ja07240	NCP	%	121			70-130	Pass	
Naphthalene	S20-Ja07240	NCP	%	92			70-130	Pass	
Phenanthrene	S20-Ja07240	NCP	%	119			70-130	Pass	
Pyrene	S20-Ja07323	NCP	%	97			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	M20-Ja09534	NCP	%	83			70-130	Pass	
Dimethoate	M20-Ja09534	NCP	%	75			70-130	Pass	
Ethion	M20-Ja09534	NCP	%	95			70-130	Pass	
Fenitrothion	M20-Ja09534	NCP	%	87			70-130	Pass	
Methyl parathion	M20-Ja09534	NCP	%	111			70-130	Pass	
Mevinphos	M20-Ja09534	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2.4.5-Trichlorophenol	S20-Ja08534	NCP	%	116			30-130	Pass	
2.4.6-Trichlorophenol	S20-Ja08534	NCP	%	84			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Methyl-4.6-dinitrophenol	S20-Ja08534	NCP	%	125			30-130	Pass	
2-Nitrophenol	S20-Ja08534	NCP	%	125			30-130	Pass	
4-Nitrophenol	S20-Ja08534	NCP	%	92			30-130	Pass	
Phenol	S20-Ja08534	NCP	%	78			30-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Ja01971	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-Ja01971	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-Ja01971	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-Ja01971	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-Ja01971	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S20-Ja01971	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-Ja01971	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S20-Ja02682	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Ja02682	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S20-Ja02682	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Ja01971	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-Ja01971	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S20-Ja02682	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Ja02682	NCP	mg/kg	< 100		<1	30%	Pass	
TRH >C34-C40	S20-Ja02682	NCP	mg/kg	< 100		3.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-Ja04252	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-Ja02561	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-Ja04126	NCP	mg/kg	0.14	0.09	40	30%	Fail	Q02
Endosulfan I	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-Ja02561	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-Ja02561	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S20-Ja02561	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S20-Ja03696	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S20-Ja03696	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Omethoate	S20-Ja03696	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S20-Ja03696	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S20-Ja04126	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S20-Ja04126	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S20-Ja04126	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S20-Ja04126	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S20-Ja04126	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S20-Ja04126	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S20-Ja04126	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Ja04481	CP	mg/kg	4.9	3.7	27	30%	Pass	
Cadmium	S20-Ja04481	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ja04481	CP	mg/kg	16	11	30	30%	Pass	
Copper	S20-Ja04481	CP	mg/kg	31	31	1.0	30%	Pass	
Lead	S20-Ja04481	CP	mg/kg	35	37	5.0	30%	Pass	
Mercury	S20-Ja04481	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ja04481	CP	mg/kg	5.2	7.0	30	30%	Pass	
Zinc	S20-Ja04481	CP	mg/kg	110	110	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Ja04481	CP	%	7.3	7.2	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Ja04491	CP	mg/kg	7.3	7.8	7.0	30%	Pass	
Cadmium	S20-Ja04491	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ja04491	CP	mg/kg	16	17	7.0	30%	Pass	
Copper	S20-Ja04491	CP	mg/kg	9.6	10	8.0	30%	Pass	
Lead	S20-Ja04491	CP	mg/kg	17	17	2.0	30%	Pass	
Mercury	S20-Ja04491	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ja04491	CP	mg/kg	6.1	6.0	2.0	30%	Pass	
Zinc	S20-Ja04491	CP	mg/kg	25	25	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Ja04491	CP	%	6.5	6.7	2.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Ja04498	CP	mg/kg	5.5	5.6	2.0	30%	Pass	
Cadmium	S20-Ja04498	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ja04498	CP	mg/kg	9.2	9.2	<1	30%	Pass	
Copper	S20-Ja04498	CP	mg/kg	10	11	7.0	30%	Pass	
Lead	S20-Ja04498	CP	mg/kg	15	15	<1	30%	Pass	
Mercury	S20-Ja04498	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ja04498	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-Ja04498	CP	mg/kg	35	35	2.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Ja04499	CP	mg/kg	2.7	2.8	3.0	30%	Pass	
Cadmium	S20-Ja04499	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Ja04499	CP	mg/kg	7.2	7.0	3.0	30%	Pass	
Copper	S20-Ja04499	CP	mg/kg	13	14	12	30%	Pass	
Lead	S20-Ja04499	CP	mg/kg	9.0	12	29	30%	Pass	
Mercury	S20-Ja04499	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Ja04499	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S20-Ja04499	CP	mg/kg	40	45	12	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Ja04519	CP	%	4.5	4.3	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

Attention:	Sam Scully
Report	696041-AID
Project Name	MILLPERRA
Project ID	9996
Received Date	Jan 09, 2020
Date Reported	Jan 16, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name MILLPERRA
Project ID 9996
Date Sampled Jan 08, 2020 to Jan 09, 2020
Report 696041-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH24-0.0-0.2	20-Ja04478	Jan 09, 2020	Approximate Sample 566g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH27-0.0-0.2	20-Ja04479	Jan 09, 2020	Approximate Sample 897g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH39-0.0-0.2	20-Ja04480	Jan 09, 2020	Approximate Sample 540g Sample consisted of: Brown coarse-grained soil and rocks	FA: Chrysotile asbestos detected in weathered fibre cement fragment. Approximate raw weight of FA = 0.77g Estimated asbestos content in FA = 0.23g* Total estimated asbestos concentration in FA = 0.043% w/w* Organic fibre detected. No trace asbestos detected.
BH40-0.0-0.2	20-Ja04481	Jan 09, 2020	Approximate Sample 513g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH41-0.0-0.2	20-Ja04482	Jan 09, 2020	Approximate Sample 538g Sample consisted of: Brown coarse-grained soil, cement, bituminous material and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH42-0.0-0.2	20-Ja04483	Jan 09, 2020	Approximate Sample 636g Sample consisted of: Brown coarse-grained clayey soil, bituminous material, cement, brick and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH43-0.0-0.2	20-Ja04484	Jan 09, 2020	Approximate Sample 436g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH44-0.0-0.2	20-Ja04485	Jan 09, 2020	Approximate Sample 1016g Sample consisted of: Brown coarse-grained soil, bituminous material, cement, brick and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH45-0.0-0.2	20-Ja04486	Jan 09, 2020	Approximate Sample 780g Sample consisted of: Brown coarse-grained clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH45-0.2-0.4	20-Ja04487	Jan 09, 2020	Approximate Sample 588g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH46-0.0-0.2	20-Ja04488	Jan 09, 2020	Approximate Sample 413g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH47-0.0-0.2	20-Ja04489	Jan 09, 2020	Approximate Sample 879g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH48-0.0-0.2	20-Ja04490	Jan 09, 2020	Approximate Sample 933g Sample consisted of: Brown coarse-grained soil, bituminous material and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH48-0.5-0.7	20-Ja04491	Jan 09, 2020	Approximate Sample 878g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH49-0.0-0.2	20-Ja04492	Jan 09, 2020	Approximate Sample 674g Sample consisted of: Brown coarse-grained soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH54-0.0-0.2	20-Ja04493	Jan 09, 2020	Approximate Sample 445g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH63-0.0-0.2	20-Ja04494	Jan 09, 2020	Approximate Sample 644g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH98-0.0-0.2	20-Ja04495	Jan 09, 2020	Approximate Sample 699g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH99-0.0-0.2	20-Ja04496	Jan 09, 2020	Approximate Sample 552g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH99-0.2-0.4	20-Ja04497	Jan 09, 2020	Approximate Sample 945g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH102-0.0-0.2	20-Ja04498	Jan 09, 2020	Approximate Sample 760g Sample consisted of: Brown coarse-grained clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH90-0.0-0.1	20-Ja04513	Jan 08, 2020	Approximate Sample 747g Sample consisted of: Brown coarse-grained clayey soil, brick and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH91-0.0-0.1	20-Ja04515	Jan 08, 2020	Approximate Sample 725g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH95-0.0-0.2	20-Ja04517	Jan 08, 2020	Approximate Sample 619g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH96-0.0-0.1	20-Ja04519	Jan 08, 2020	Approximate Sample 656g Sample consisted of: Brown coarse-grained clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jan 10, 2020	Indefinite

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Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILLPERRA
Project ID: 9996

Order No.:
Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271													X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																								
Perth Laboratory - NATA Site # 23736																								
External Laboratory																								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																			
1	MW01	Jan 08, 2020		Water	S20-Ja04468			X		X	X		X				X	X	X	X			X	
2	MW02	Jan 08, 2020		Water	S20-Ja04469			X		X	X		X				X	X	X	X			X	
3	MW03	Jan 08, 2020		Water	S20-Ja04470			X		X	X		X				X	X	X	X			X	
4	MW04	Jan 08, 2020		Water	S20-Ja04471			X		X	X		X				X	X	X	X			X	
5	MW05	Jan 08, 2020		Water	S20-Ja04472			X		X	X		X				X	X	X	X			X	
6	MW08	Jan 08, 2020		Water	S20-Ja04473			X		X	X		X				X	X	X	X			X	
7	DUP-01	Jan 08, 2020		Water	S20-Ja04474										X									
8	TRIP SPIKE	Jan 08, 2020		Soil	S20-Ja04475											X								
9	TRIP BLANK	Jan 08, 2020		Soil	S20-Ja04477											X								
10	BH24-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04478	X											X				X			X

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NSW 2147

Project Name: MILLPERRA
Project ID: 9996

Order No.:
Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271													X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																								
Perth Laboratory - NATA Site # 23736																								
11	BH27-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04479	X															X	X		
12	BH39-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04480	X											X				X			X
13	BH40-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04481	X															X	X		
14	BH41-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04482	X											X				X			X
15	BH42-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04483	X															X	X		
16	BH43-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04484	X											X				X			X
17	BH44-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04485	X															X	X		
18	BH45-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04486	X											X				X			X
19	BH45-0.2-0.4	Jan 09, 2020		Soil	S20-Ja04487	X															X	X		
20	BH46-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04488	X															X	X		
21	BH47-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04489	X											X				X			X
22	BH48-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04490	X															X	X		
23	BH48-0.5-0.7	Jan 09, 2020		Soil	S20-Ja04491	X															X	X		

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Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271													X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																								
Perth Laboratory - NATA Site # 23736																								
24	BH49-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04492	X											X				X			X
25	BH54-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04493	X											X				X			X
26	BH63-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04494	X															X	X		
27	BH98-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04495	X											X				X			X
28	BH99-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04496	X															X	X		
29	BH99-0.2-0.4	Jan 09, 2020		Soil	S20-Ja04497	X															X	X		
30	BH102-0.0-0.2	Jan 09, 2020		Soil	S20-Ja04498	X											X				X			X
31	DUP-05	Jan 09, 2020		Soil	S20-Ja04499							X		X							X			
32	DUP-06	Jan 09, 2020		Soil	S20-Ja04500							X		X							X			
33	TRIP SPIKE	Jan 09, 2020		Soil	S20-Ja04501											X								
34	TRIP BLANK	Jan 09, 2020		Soil	S20-Ja04503											X								
35	BH45-0.4-0.6	Jan 09, 2020		Soil	S20-Ja04504				X															
36	BH48-0.7-0.9	Jan 09, 2020		Soil	S20-Ja04505				X															

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Site # 1254 & 14271

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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILLPERRA
Project ID: 9996

Order No.:
Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271													X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																								
Perth Laboratory - NATA Site # 23736																								
37	BH49-0.7-0.9	Jan 09, 2020		Soil	S20-Ja04506				X															
38	BH63-0.3-0.5	Jan 09, 2020		Soil	S20-Ja04507				X															
39	BH98-0.5-0.7	Jan 09, 2020		Soil	S20-Ja04508				X															
40	BH99-0.8-1.0	Jan 09, 2020		Soil	S20-Ja04509				X															
41	BH102-0.3-0.5	Jan 09, 2020		Soil	S20-Ja04510				X															
42	MW06	Jan 08, 2020		Water	S20-Ja04511		X																	
43	MW07	Jan 08, 2020		Water	S20-Ja04512		X																	
44	BH90-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04513	X											X				X			X
45	BH90-0.5-0.7	Jan 08, 2020		Soil	S20-Ja04514				X															
46	BH91-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04515	X															X	X		
47	BH91-0.9-1.1	Jan 08, 2020		Soil	S20-Ja04516				X															
48	BH95-0.0-0.2	Jan 08, 2020		Soil	S20-Ja04517	X											X				X	X		X
49	BH95-0.5-0.7	Jan 08, 2020		Soil	S20-Ja04518				X															

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Site # 23736

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IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILLPERRA
Project ID: 9996

Order No.:
Report #: 696041
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jan 9, 2020 5:44 PM
Due: Jan 16, 2020
Priority: 5 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	CANCELLED	Conductivity (at 25°C)	HOLD	pH (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Polycyclic Aromatic Hydrocarbons	Alkalinity (speciated)	Metals M8	Metals M8 filtered	BTEX	Eurofins | mgt Suite B15	Major Anions	Major Cations	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7 (filtered metals)	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271													X					X						
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																								
Perth Laboratory - NATA Site # 23736																								
50	BH96-0.0-0.1	Jan 08, 2020		Soil	S20-Ja04519	X															X	X		
Test Counts						25	2	6	10	6	6	2	6	2	1	4	18	6	6	6	27	14	6	12

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

S20-Ja04484, S20-Ja04488, S20-Ja04493: Samples received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Authorised by:

Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Melbourne Laboratory
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03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	Sam Scully	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name		EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Sc ully
Handed over by	
Email for Invoice	admin@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	Inorganic compounds	BTEX	PAH	8 Metals	VOCs	OCP/OPP	PCB	TRH
1	MW01	8/01/19	Water	X	X	X	X	X	X	X	X
2	MW02	8/01/19	Water	X	X	X	X	X	X	X	X
3	MW03	8/01/19	Water	X	X	X	X	X	X	X	X
4	MW04	8/01/19	Water	X	X	X	X	X	X	X	X
5	MW05	8/01/19	Water	X	X	X	X	X	X	X	X
6	MW06	8/01/19	Water	X	X	X	X	X	X	X	X
7	MW07	8/01/19	Water	X	X	X	X	X	X	X	X
8	MW08	8/01/19	Water	X	X	X	X	X	X	X	X
9	Dup-01	8/01/19	Water				X				
	Dup-1A	8/01/19	Water				X				
	Trip Spike	8/01/19	Water		X						
10	Trip Blank	8/01/19	Water		X						
	Total Counts										

Containers

1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other Asbestos AS4964 (WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☒ 5 Day
*Surcharges apply
☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Please forward to ALS

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date	9-1-20 Time
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	9/1/2020 Time	Temperature 11.3°C
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report № 696044

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☐ Melbourne Laboratory
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Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

| | | | | |

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Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	
Email for Invoice	admin@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☒ 5 Day
- * Surcharges apply
- ☐ Other ( )

Analyses (Please mark the analysis required below. Where multiple tests are required for one sample, please list in the order to be performed.)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	CEC/pH	BTEX	PAH	8 Metals	OCP/OPP	PCB	Phenols	Asbestos (0.001%)	TRH	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	BH45-0.4-0.6	9/01/20	Soil											
2	BH46-0.0-0.2	9/01/20	Soil		X	X	X				X	X		
3	BH47-0.0-0.2	9/01/20	Soil		X	X	X	X	X	X	X	X		
4	BH48-0.0-0.2	9/01/20	Soil		X	X	X				X	X		
5	BH48-0.5-0.7	9/01/20	Soil		X	X	X				X	X		
6	BH48-0.7-0.9	9/01/20	Soil											
7	BH49-0.0-0.2	9/01/20	Soil		X	X	X	X	X	X	X	X		
8	BH49-0.7-0.9	9/01/20	Soil											
9	BH54-0.0-0.2	9/01/20	Soil		X	X	X	X	X	X	X	X		
10	BH63-0.0-0.2	9/01/20	Soil		X	X	X				X	X		
	Total Counts													

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date 9/01/2020 Time
Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date 9/1/2020	Time 5:44PM	Temperature 11.3°C	
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report № 696041	

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03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	
Email for Invoice	admin@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)
- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☒ 5 Day
- * Surcharges apply
- ☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Analyses: CEC/pH; BTEX; PAH; 8 Metals; OCP/OPP; PCB; Phenols; Asbestos (0.001%); TRH; Hold

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	CEC/pH	BTEX	PAH	8 Metals	OCP/OPP	PCB	Phenols	Asbestos (0.001%)	TRH	Hold
1	BH63-0.3-0.5	9/01/20	Soil										
2	BH90-0.0-0.1	8/01/20	Soil		X	X	X	X	X	X	X	X	
3	BH90-0.5-0.7	8/01/20	Soil										
4	BH91-0.0-0.1	8/01/20	Soil		X	X	X				X	X	
5	BH91-0.9-1.1	8/01/20	Soil										
6	BH95-0.0-0.2	8/01/20	Soil		X	X	X	X	X	X	X	X	
7	BH95-0.5-0.7	8/01/20	Soil										
8	BH96-0.0-0.1	8/01/20	Soil		X	X	X				X	X	
9	BH98-0.0-0.2	9/01/20	Soil		X	X	X	X	X	X	X	X	
10	BH98-0.5-0.7	9/01/20	Soil										
	Total Counts												

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal | Name: Sam Scully | Signature | Date: 9/01/2020 | Time

Eurofins | mgt Laboratory Use Only

Received By	Lyanne Ford	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: 9/1/2020	Time: 5:40pm	Temperature: 11.3°C
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: __/__/__	Time: __:__	Report № 696041

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☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name					
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully				
Handed over by					
Email for Invoice	admin@allgeo.com.au				
Email for Results	Enviro@allgeo.com.au				

Analyses (Note: Where "metals" are requested, please specify 1 layer or 3 layers (i.e. 0-0.2, 0.2-0.4, 0.8-1.0). Where "asbestos" is requested, please specify if 40g sample is required for SLS/TF testing)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	CEC/pH	BTEX	PAH	8 Metals	OCP/OPP	PCB	Phenols	Asbestos (0.001%)	TRH	Hold	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964 WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH99-0.0-0.2	9/01/20	Soil		X	X	X				X	X										
2	BH99-0.2-0.4	9/01/20	Soil		X	X	X				X	X										
3	BH99-0.8-1.0	9/01/20	Soil																			
4	BH102-0.0-0.2	9/01/20	Soil		X	X	X	X	X	X	X	X										
5	BH102-0.3-0.5	9/01/20	Soil																			
6	DUP-05	9/01/20	Soil			X	X															
7	DUP-5A	9/01/20	Soil			X	X															Please forward to ALS
8	DUP-06	9/01/20	Soil			X	X															
9	DUP-6A	9/01/20	Soil			X	X															Please forward to ALS
10	TRIP SPIKE / BLANK	9/01/20	Soil		X																	
	Total Counts																					

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not advised)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☒ 5 Day
- * Surcharges apply
- ☐ Other ( )

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature		Date	9/1/2020	Time	
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	9/1/2020	Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	__/__/__	Time	__:__	Report №	690044

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Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

#AU04_Enviro_Sample_NSW

To: Sam Scully
Subject: RE: ATTENTION:Eurofins Sample Receipt Advice - Report 696041 : Site MILLPERRA (9996)

From: Sam Scully [mailto:sam@allgeo.com.au]
Sent: Friday, 10 January 2020 8:25 AM
To: #AU04_Enviro_Sample_NSW
Cc: enviro
Subject: RE: ATTENTION:Eurofins Sample Receipt Advice - Report 696041 : Site MILLPERRA (9996)

Morning,

Please test groundwater samples for pH, EC, TDS, Anions, Cations, Alkalinity.

Please cancel MW06 and MW07.

Soil samples BH90-0.0-0.1, BH90-0.5-0.7, BH91-0.0-0.1, BH91-0.9-1.1 BH95-0.0-0.2, BH95-0.5-0.7

And

BH96-0.0-0.1 were left out of the eskies accidently yesterday and will be forwarded today.

Please analyse as per COC.

Please do not hesitate to contact me if you have any queries or questions,

Kind Regards,

Sam Scully

Environmental Consultant - 0400 339 745 | **Email:** sam@allgeo.com.au

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING
Your On-Site Geotechnical & Environmental Specialists

OHSAS18001 ISO9001 ISO14001 AS/NZS4801
OH&S QUALITY ENVIRONMENT OH&S

Office Email: admin@allgeo.com.au - **Website:** allgeo.com.au - **Office Phone:** 1800 288 188
PO Box 275, Seven Hills NSW 1730 / Address: 10 Welder Road, Seven Hills NSW 2147

Our office administration will be closed from December 23rd and will reopen on January 6th
For any urgent or unexpected geotechnical or environmental enquiries, please phone 1800 288 188
WISHING EVERYONE HAPPY HOLIDAYS FROM THE ALLIANCE GEOTECHNICAL TEAM!

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Thursday, 9 January 2020 9:20 PM
To: Sam Scully <sam@allgeo.com.au>

Cc: enviro <enviro@allgeo.com.au>
Subject: ATTENTION:Eurofins Sample Receipt Advice - Report 696041 : Site MILLPERRA (9996)

Dear Valued Client,

Please clarify what is meant by Inorganic Compounds. Samples forwarded to ALS; DUP-1A (Metals Bottle), DUP-5A (Soil Jar), and DUP-6A (Soil Jar). Samples not received; MW06, MW07, BH90-0.0-0.1, BH90-0.5-0.7, BH91-0.0-0.1, BH91-0.9-1.1 BH95-0.0-0.2, BH95-0.5-0.7 - analysis cancelled.

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Suzanne Ford
Sample Receipt

Eurofins | Environment Testing
Unit F3, Parkview Building
16 Mars Road
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AUSTRALIA
Phone: +61 29900 8492
Email: EnviroSampleNSW@eurofins.com
Website:environment.eurofins.com.au

EnviroNote 1079 - PFAS Fingerprinting
EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations
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10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Sam Scully**

Report **694811-W**
Project name MILPERRA
Project ID 9996
Received Date Dec 19, 2019

Client Sample ID			**TRIP SPIKE_16/12/19**	**TRIP BLANK_16/12/19**	**TRIP SPIKE_17/12/19**	**TRIP BLANK_17/12/19**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S19-De29230**	**S19-De29231**	**S19-De29232**	**S19-De29233**
Date Sampled			**Dec 16, 2019**	**Dec 16, 2019**	**Dec 17, 2019**	**Dec 17, 2019**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	97	< 0.001	99	< 0.001
Toluene	0.001	mg/L	97	< 0.001	100	< 0.001
Ethylbenzene	0.001	mg/L	97	< 0.001	100	< 0.001
m&p-Xylenes	0.002	mg/L	94	< 0.002	99	< 0.002
o-Xylene	0.001	mg/L	100	< 0.001	110	< 0.001
Xylenes - Total	0.003	mg/L	96	< 0.003	100	< 0.003
4-Bromofluorobenzene (surr.)	1	%	101	105	110	97

Client Sample ID			**TRIP SPIKE_18/12/19**	**TRIP BLANK_18/12/19**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S19-De29234**	**S19-De29235**
Date Sampled			**Dec 18, 2019**	**Dec 18, 2019**
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	100	< 0.001
Toluene	0.001	mg/L	100	< 0.001
Ethylbenzene	0.001	mg/L	97	< 0.001
m&p-Xylenes	0.002	mg/L	97	< 0.002
o-Xylene	0.001	mg/L	100	< 0.001
Xylenes - Total	0.003	mg/L	98	< 0.003
4-Bromofluorobenzene (surr.)	1	%	104	94

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Sydney	Dec 19, 2019	14 Days

- Method: LTM-ORG-2010 TRH C6-C40

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IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILPERRA
Project ID: 9996

Order No.:
Report #: 694811
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	BH01_0.0-0.2	Dec 16, 2019		Soil	S19-De29140	X							X	X			X
2	BH01_1.2-1.4	Dec 16, 2019		Soil	S19-De29141	X			X				X	X	X		X
3	BH02_0.0-0.2	Dec 16, 2019		Soil	S19-De29142	X							X	X			X
4	BH02_1.4-1.6	Dec 16, 2019		Soil	S19-De29143	X							X	X			X
5	BH03_0.0-0.2	Dec 16, 2019		Soil	S19-De29144	X							X	X			X
6	BH03_1.5-1.7	Dec 16, 2019		Soil	S19-De29145	X			X				X	X	X		X
7	BH04_0.2-0.4	Dec 17, 2019		Soil	S19-De29146	X							X	X			X
8	BH04_0.8-1.0	Dec 17, 2019		Soil	S19-De29147	X							X	X			X
9	BH05_0.2-0.4	Dec 17, 2019		Soil	S19-De29148	X							X	X			X
10	BH05_0.8-1.0	Dec 17, 2019		Soil	S19-De29149	X							X	X			X

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
11	BH06_0.0.-0.2	Dec 17, 2019		Soil	S19-De29150	X							X	X			X
12	BH06_0.5-0.7	Dec 17, 2019		Soil	S19-De29151	X							X	X			X
13	BH07_0.0-0.2	Dec 17, 2019		Soil	S19-De29152	X							X	X			X
14	BH07_0.5-0.7	Dec 16, 2019		Soil	S19-De29153				X					X	X		
15	BH08_0.0-0.2	Dec 18, 2019		Soil	S19-De29154	X							X	X			X
16	BH08_0.5-0.7	Dec 18, 2019		Soil	S19-De29155	X							X	X			X
17	BH10_0.1-0.3	Dec 16, 2019		Soil	S19-De29156									X		X	
18	BH11_0.0-0.2	Dec 16, 2019		Soil	S19-De29157	X							X	X			X
19	BH14_0.0-0.2	Dec 16, 2019		Soil	S19-De29158									X		X	
20	BH15_0.0-0.2	Dec 16, 2019		Soil	S19-De29159									X		X	
21	BH16_0.0-0.2	Dec 16, 2019		Soil	S19-De29160	X							X	X			X
22	BH17_0.0-0.2	Dec 16, 2019		Soil	S19-De29161	X							X	X			X
23	BH18_0.2-0.4	Dec 16, 2019		Soil	S19-De29162									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
24	BH19_0.0-0.2	Dec 16, 2019		Soil	S19-De29163									X		X	
25	BH20_0.0-0.15	Dec 16, 2019		Soil	S19-De29164									X		X	
26	BH21_0.1-0.3	Dec 16, 2019		Soil	S19-De29165	X							X	X			X
27	BH22_0.8-1.0	Dec 16, 2019		Soil	S19-De29166	X							X	X			X
28	BH23_0.0-0.2	Dec 16, 2019		Soil	S19-De29167	X							X	X			X
29	BH25_0.0-0.2	Dec 16, 2019		Soil	S19-De29168									X		X	
30	BH26_0.0-0.2	Dec 16, 2019		Soil	S19-De29169									X		X	
31	BH28_0.0-0.2	Dec 16, 2019		Soil	S19-De29170	X							X	X			X
32	BH28_0.8-1.0	Dec 16, 2019		Soil	S19-De29171	X							X	X			X
33	BH29_0.0-0.2	Dec 16, 2019		Soil	S19-De29172	X							X	X			X
34	BH30_0.0-0.2	Dec 16, 2019		Soil	S19-De29173									X		X	
35	BH31_0.0-0.2	Dec 16, 2019		Soil	S19-De29174									X		X	
36	BH32_0.0-0.2	Dec 16, 2019		Soil	S19-De29175									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
37	BH33_0.0-0.2	Dec 16, 2019		Soil	S19-De29176									X		X	
38	BH34_0.0-0.2	Dec 16, 2019		Soil	S19-De29177	X								X		X	
39	BH35_0.0-0.2	Dec 16, 2019		Soil	S19-De29178	X							X	X			X
40	BH36_0.0-0.2	Dec 16, 2019		Soil	S19-De29179	X							X	X			X
41	BH36_1.0-1.2	Dec 16, 2019		Soil	S19-De29180	X							X	X			X
42	BH36_2.0-2.2	Dec 16, 2019		Soil	S19-De29181									X		X	
43	BH37_0.3-0.5	Dec 16, 2019		Soil	S19-De29182	X							X	X			X
44	BH38_0.0-0.2	Dec 16, 2019		Soil	S19-De29183	X								X		X	
45	BH50_0.2-0.4	Dec 17, 2019		Soil	S19-De29184	X							X	X			X
46	BH51_0.2-0.4	Dec 17, 2019		Soil	S19-De29185									X		X	
47	BH52_0.2-0.4	Dec 17, 2019		Soil	S19-De29186									X		X	
48	BH52_0.8-1.0	Dec 17, 2019		Soil	S19-De29187				X					X	X		
49	BH57_0.2-0.4	Dec 17, 2019		Soil	S19-De29188	X							X	X			X

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
50	BH58_0.2-0.4	Dec 17, 2019		Soil	S19-De29189									X		X	
51	BH59_0.0-0.05	Dec 17, 2019		Soil	S19-De29190	X								X		X	
52	BH60_0.0-0.2	Dec 17, 2019		Soil	S19-De29191									X		X	
53	BH61_0.15-0.3	Dec 17, 2019		Soil	S19-De29192	X							X	X			X
54	BH62_0.0-0.15	Dec 17, 2019		Soil	S19-De29193									X		X	
55	BH64_0.0-0.1	Dec 17, 2019		Soil	S19-De29194									X		X	
56	BH65_0.0-0.1	Dec 18, 2019		Soil	S19-De29195	X							X	X			X
57	BH66_0.0-0.1	Dec 18, 2019		Soil	S19-De29196	X							X	X			X
58	BH66_0.3-0.5	Dec 18, 2019		Soil	S19-De29197								X	X			X
59	BH66_1.0-1.2	Dec 18, 2019		Soil	S19-De29198									X		X	
60	BH67_0.0-0.05	Dec 18, 2019		Soil	S19-De29199									X		X	
61	BH68_0.0-0.1	Dec 18, 2019		Soil	S19-De29200	X							X	X			X
62	BH69_0.05-0.2	Dec 17, 2019		Soil	S19-De29201									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
63	BH71_0.0-0.2	Dec 17, 2019		Soil	S19-De29202	X								X		X	
64	BH72_0.0-0.2	Dec 17, 2019		Soil	S19-De29203	X							X	X			X
65	BH73_0.0-0.2	Dec 17, 2019		Soil	S19-De29204									X		X	
66	BH74_0.0-0.2	Dec 17, 2019		Soil	S19-De29205	X							X	X			X
67	BH75_0.0-0.2	Dec 16, 2019		Soil	S19-De29206									X		X	
68	BH76_0.0-0.2	Dec 16, 2019		Soil	S19-De29207									X		X	
69	BH77_0.0-0.2	Dec 16, 2019		Soil	S19-De29208	X							X	X			X
70	BH78_0.0-0.2	Dec 16, 2019		Soil	S19-De29209									X		X	
71	BH79_0.0-0.2	Dec 16, 2019		Soil	S19-De29210									X		X	
72	BH80_0.0-0.2	Dec 17, 2019		Soil	S19-De29211									X		X	
73	BH81_0.2-0.4	Dec 17, 2019		Soil	S19-De29212	X							X	X			X
74	BH82_0.05-0.2	Dec 17, 2019		Soil	S19-De29213									X		X	
75	BH83_0.05-0.2	Dec 17, 2019		Soil	S19-De29214									X		X	

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Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILPERRA
Project ID: 9996

Order No.:
Report #: 694811
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
76	BH84_0.05-0.2	Dec 17, 2019		Soil	S19-De29215									X		X	
77	BH86_0.0-0.2	Dec 17, 2019		Soil	S19-De29216									X		X	
78	BH87_0.0-0.2	Dec 18, 2019		Soil	S19-De29217									X		X	
79	BH88_0.0-0.2	Dec 18, 2019		Soil	S19-De29218									X		X	
80	BH89_0.0-0.2	Dec 18, 2019		Soil	S19-De29219	X							X	X			X
81	BH92_0.0-0.2	Dec 18, 2019		Soil	S19-De29220	X							X	X			X
82	BH93_0.0-0.2	Dec 18, 2019		Soil	S19-De29221									X		X	
83	BH97_0.0-0.2	Dec 18, 2019		Soil	S19-De29222	X							X	X			X
84	BH100_0.2-0.4	Dec 17, 2019		Soil	S19-De29223									X		X	
85	BH101_0.0-0.2	Dec 18, 2019		Soil	S19-De29224	X								X		X	
86	DUP_01	Dec 16, 2019		Soil	S19-De29225					X	X			X			
87	DUP_02	Dec 16, 2019		Soil	S19-De29226					X	X			X			
88	DUP_03	Dec 17, 2019		Soil	S19-De29227					X	X			X			

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
89	DUP_04	Dec 18, 2019		Soil	S19-De29228					X	X			X			
90	DUP_14	Dec 18, 2019		Soil	S19-De29229					X	X			X			
91	TRIP SPIKE_16/12/19	Dec 16, 2019		Water	S19-De29230							X					
92	TRIP BLANK_16/12/19	Dec 16, 2019		Water	S19-De29231							X					
93	TRIP SPIKE_17/12/19	Dec 17, 2019		Water	S19-De29232							X					
94	TRIP BLANK_17/12/19	Dec 17, 2019		Water	S19-De29233							X					
95	TRIP SPIKE_18/12/	Dec 18, 2019		Water	S19-De29234							X					

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
	SPIKE_18/12/19																
96	TRIP BLANK_18/12/19	Dec 18, 2019		Water	S19-De29235							X					
97	FCS_59	Not Provided		Building Materials	S19-De29236		X										
98	FCS_101	Not Provided		Building Materials	S19-De29237		X										
99	BH01_0.8-1.0	Dec 16, 2019		Soil	S19-De29250			X									
100	BH01_2.2-2.4	Dec 16, 2019		Soil	S19-De29251			X									
101	BH02_0.8-1.0	Dec 16, 2019		Soil	S19-De29252			X									
102	BH02_2.0-2.2	Dec 16, 2019		Soil	S19-De29253			X									
103	BH02_2.9-3.1	Dec 16, 2019		Soil	S19-De29254			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
104	BH03_0.8-1.0	Dec 16, 2019		Soil	S19-De29255			X									
105	BH03_2.3-2.5	Dec 16, 2019		Soil	S19-De29256			X									
106	BH03_3.3-3.5	Dec 16, 2019		Soil	S19-De29257			X									
107	BH05_1.3-1.5	Dec 17, 2019		Soil	S19-De29258			X									
108	BH07_1.4-1.6	Dec 17, 2019		Soil	S19-De29259			X									
109	BH08_1.4-1.6	Dec 18, 2019		Soil	S19-De29260			X									
110	BH10_0.7-0.9	Dec 16, 2019		Soil	S19-De29261			X									
111	BH11_0.2-0.4	Dec 16, 2019		Soil	S19-De29262			X									
112	BH14_0.2-0.4	Dec 16, 2019		Soil	S19-De29263			X									
113	BH15_0.2-0.4	Dec 16, 2019		Soil	S19-De29264			X									
114	BH16_0.8-1.0	Dec 16, 2019		Soil	S19-De29265			X									
115	BH16_2.4-2.6	Dec 16, 2019		Soil	S19-De29266			X									
116	BH17_0.8-1.0	Dec 16, 2019		Soil	S19-De29267			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
117	BH17_1.9-2.1	Dec 16, 2019		Soil	S19-De29268			X									
118	BH18_0.7-0.9	Dec 16, 2019		Soil	S19-De29269			X									
119	BH20_0.7-0.9	Dec 16, 2019		Soil	S19-De29270			X									
120	BH21_0.7-0.9	Dec 16, 2019		Soil	S19-De29271			X									
121	BH22_0.0-0.2	Dec 16, 2019		Soil	S19-De29272			X									
122	BH22_1.9-2.1	Dec 16, 2019		Soil	S19-De29273			X									
123	BH23_0.5-0.7	Dec 16, 2019		Soil	S19-De29274			X									
124	BH25_0.7-0.9	Dec 16, 2019		Soil	S19-De29275			X									
125	BH26_0.7-0.9	Dec 16, 2019		Soil	S19-De29276			X									
126	BH28_1.9-2.1	Dec 16, 2019		Soil	S19-De29277			X									
127	BH29_0.2-0.4	Dec 16, 2019		Soil	S19-De29278			X									
128	BH30_0.2-0.4	Dec 16, 2019		Soil	S19-De29279			X									
129	BH31_0.5-0.7	Dec 16, 2019		Soil	S19-De29280			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
130	BH32_0.5-0.7	Dec 16, 2019		Soil	S19-De29281			X									
131	BH33_0.3-0.5	Dec 16, 2019		Soil	S19-De29282			X									
132	BH35_0.8-1.0	Dec 16, 2019		Soil	S19-De29283			X									
133	BH37_0.8-1.0	Dec 16, 2019		Soil	S19-De29284			X									
134	BH38_0.7-0.9	Dec 16, 2019		Soil	S19-De29285			X									
135	BH50_0.8-1.0	Dec 17, 2019		Soil	S19-De29286			X									
136	BH51_0.8-1.0	Dec 17, 2019		Soil	S19-De29287			X									
137	BH57_0.8-1.0	Dec 17, 2019		Soil	S19-De29288			X									
138	BH58_0.8-1.0	Dec 17, 2019		Soil	S19-De29289			X									
139	BH59_0.1-0.3	Dec 17, 2019		Soil	S19-De29290			X									
140	BH60_0.2-0.4	Dec 17, 2019		Soil	S19-De29291			X									
141	BH61_0.7-0.9	Dec 17, 2019		Soil	S19-De29292			X									
142	BH62_0.2-0.4	Dec 17, 2019		Soil	S19-De29293			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
143	BH64_0.1-0.3	Dec 17, 2019		Soil	S19-De29294			X									
144	BH65_0.1-0.3	Dec 18, 2019		Soil	S19-De29295			X									
145	BH67_0.1-0.3	Dec 18, 2019		Soil	S19-De29296			X									
146	BH68_0.1-0.3	Dec 18, 2019		Soil	S19-De29297			X									
147	BH70_0.05-0.2	Dec 17, 2019		Soil	S19-De29298			X									
148	BH71_0.5-0.7	Dec 17, 2019		Soil	S19-De29299			X									
149	BH72_0.5-0.7	Dec 17, 2019		Soil	S19-De29300			X									
150	BH73_0.5-0.7	Dec 17, 2019		Soil	S19-De29301			X									
151	BH74_0.5-0.7	Dec 17, 2019		Soil	S19-De29302			X									
152	BH75_0.5-0.7	Dec 16, 2019		Soil	S19-De29303			X									
153	BH76_0.5-0.7	Dec 16, 2019		Soil	S19-De29304			X									
154	BH77_0.5-0.7	Dec 16, 2019		Soil	S19-De29305			X									
155	BH78_0.5-0.7	Dec 16, 2019		Soil	S19-De29306			X									

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
156	BH79_0.5-0.7	Dec 16, 2019		Soil	S19-De29307			X									
157	BH80_0.5-0.7	Dec 17, 2019		Soil	S19-De29308			X									
158	BH81_0.5-0.7	Dec 17, 2019		Soil	S19-De29309			X									
159	BH83_0.7-0.9	Dec 17, 2019		Soil	S19-De29310			X									
160	BH84_0.4-0.6	Dec 17, 2019		Soil	S19-De29311			X									
161	BH86_0.5-0.7	Dec 18, 2019		Soil	S19-De29312			X									
162	BH87_0.7-0.9	Dec 18, 2019		Soil	S19-De29313			X									
163	BH88_0.5-0.7	Dec 18, 2019		Soil	S19-De29314			X									
164	BH89_0.6-0.8	Dec 18, 2019		Soil	S19-De29315			X									
165	BH92_0.5-0.7	Dec 18, 2019		Soil	S19-De29316			X									
166	BH93_0.6-0.8	Dec 18, 2019		Soil	S19-De29317			X									
167	BH94_0.6-0.8	Dec 18, 2019		Soil	S19-De29318			X									
168	BH97_0.9-1.1	Dec 18, 2019		Soil	S19-De29319			X									

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Company Name: Alliance Geotechnical
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Project Name: MILPERRA
Project ID: 9996

Order No.:
Report #: 694811
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
169	BH100_0.8-1.0	Dec 17, 2019		Soil	S19-De29320			X									
170	BH101_0.8-1.0	Dec 18, 2019		Soil	S19-De29321			X									
171	DUP10	Dec 17, 2019		Soil	S19-De29322			X									
172	DUP11	Dec 17, 2019		Soil	S19-De29323			X									
173	DUP12	Dec 16, 2019		Soil	S19-De29324			X									
174	DUP13	Dec 17, 2019		Soil	S19-De29325			X									
175	BH94_0.0-0.2	Dec 18, 2019		Soil	S19-De29446									X		X	
176	BH35_1.4-1.6	Dec 16, 2019		Soil	S19-De29449			X									
177	BH64_0.05-0.2	Dec 17, 2019		Soil	S19-De29450			X									
Test Counts						46	2	78	4	5	5	6	42	91	4	42	42

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	90			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	93			70-130	Pass	
o-Xylene	%	96			70-130	Pass	
Xylenes - Total	%	94			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-De26503	NCP	%	100			70-130	Pass	
Toluene	S19-De26503	NCP	%	105			70-130	Pass	
Ethylbenzene	S19-De26503	NCP	%	105			70-130	Pass	
m&p-Xylenes	S19-De26503	NCP	%	106			70-130	Pass	
o-Xylene	S19-De26503	NCP	%	102			70-130	Pass	
Xylenes - Total	S19-De26503	NCP	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	W19-De30367	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	W19-De30367	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	W19-De30367	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	W19-De30367	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	W19-De30367	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	W19-De30367	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Andrew Black Analytical Services Manager



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Sam Scully**

Report **694811-S**
Project name MILPERRA
Project ID 9996
Received Date Dec 19, 2019

Client Sample ID			**BH01_0.0-0.2**	**BH01_1.2-1.4**	**BH02_0.0-0.2**	**BH02_1.4-1.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S19-De29140**	**S19-De29141**	**S19-De29142**	**S19-De29143**
Date Sampled			**Dec 16, 2019**	**Dec 16, 2019**	**Dec 16, 2019**	**Dec 16, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	60
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	190
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	250
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	58	56	52	103
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	200
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	220
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	420
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH01_0.0-0.2	BH01_1.2-1.4	BH02_0.0-0.2	BH02_1.4-1.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29140	S19-De29141	S19-De29142	S19-De29143
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	87	92	91	86
p-Terphenyl-d14 (surr.)	1	%	77	101	110	93
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 10
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.5
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 2
Dibutylchlorendate (surr.)	1	%	93	104	92	79
Tetrachloro-m-xylene (surr.)	1	%	93	106	94	86
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			BH01_0.0-0.2	BH01_1.2-1.4	BH02_0.0-0.2	BH02_1.4-1.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29140	S19-De29141	S19-De29142	S19-De29143
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	116	100	133	108
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 5
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	<5
Dibutylchlorendate (surr.)	1	%	93	104	92	79
Tetrachloro-m-xylene (surr.)	1	%	93	106	94	86
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			BH01_0.0-0.2	BH01_1.2-1.4	BH02_0.0-0.2	BH02_1.4-1.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29140	S19-De29141	S19-De29142	S19-De29143
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	74	77	73	73
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	540	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	5.6	-	-
% Moisture	1	%	7.5	14	2.7	11
Heavy Metals						
Arsenic	2	mg/kg	6.3	4.5	6.1	9.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	16	6.9	13
Copper	5	mg/kg	14	12	10	20
Lead	5	mg/kg	16	13	28	17
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.3	5.4	< 5	9.2
Zinc	5	mg/kg	43	13	55	43
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	9.1	-	-

Client Sample ID			BH03_0.0-0.2	BH03_1.5-1.7	BH04_0.2-0.4	BH04_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29144	S19-De29145	S19-De29146	S19-De29147
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	93	78	87	76

Client Sample ID			BH03_0.0-0.2	BH03_1.5-1.7	BH04_0.2-0.4	BH04_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29144	S19-De29145	S19-De29146	S19-De29147
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	87	89	121	101
p-Terphenyl-d14 (surr.)	1	%	89	89	125	88
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			BH03_0.0-0.2	BH03_1.5-1.7	BH04_0.2-0.4	BH04_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29144	S19-De29145	S19-De29146	S19-De29147
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	89	92	83	57
Tetrachloro-m-xylene (surr.)	1	%	96	103	147	67
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	117	116	89	77

Client Sample ID			BH03_0.0-0.2	BH03_1.5-1.7	BH04_0.2-0.4	BH04_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29144	S19-De29145	S19-De29146	S19-De29147
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	89	92	83	57
Tetrachloro-m-xylene (surr.)	1	%	96	103	147	67
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	81	84	118	99
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	220	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	5.9	-	-
% Moisture	1	%	6.6	12	17	11
Heavy Metals						
Arsenic	2	mg/kg	11	6.6	8.9	4.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	13	19	20	8.5
Copper	5	mg/kg	13	15	24	27
Lead	5	mg/kg	23	15	19	16
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	50	9.7	14	20
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	7.1	-	-

Client Sample ID			BH05_0.2-0.4	BH05_0.8-1.0	BH06_0.0.-0.2	BH06_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29148	S19-De29149	S19-De29150	S19-De29151
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	80	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	270	69
TRH C29-C36	50	mg/kg	< 50	< 50	450	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	800	69
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	94	97	146	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	93	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	93	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	580	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	310	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	983	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100	95	111	90
p-Terphenyl-d14 (surr.)	1	%	87	99	73	137

Client Sample ID			BH05_0.2-0.4	BH05_0.8-1.0	BH06_0.0.-0.2	BH06_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29148	S19-De29149	S19-De29150	S19-De29151
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	76	75	85	116
Tetrachloro-m-xylene (surr.)	1	%	104	74	69	122
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			BH05_0.2-0.4	BH05_0.8-1.0	BH06_0.0.-0.2	BH06_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29148	S19-De29149	S19-De29150	S19-De29151
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	109	94	111	94
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	76	75	85	116
Tetrachloro-m-xylene (surr.)	1	%	104	74	69	122
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	93	102	99	79
% Moisture	1	%	13	13	6.1	19

Client Sample ID			BH05_0.2-0.4	BH05_0.8-1.0	BH06_0.0.-0.2	BH06_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29148	S19-De29149	S19-De29150	S19-De29151
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	9.8	7.1	5.2	9.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	22	14	12	28
Copper	5	mg/kg	19	14	18	12
Lead	5	mg/kg	24	15	73	15
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	5.6	< 5
Zinc	5	mg/kg	27	7.0	58	13

Client Sample ID			BH07_0.0-0.2	BH07_0.5-0.7	BH08_0.0-0.2	BH08_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29152	S19-De29153	S19-De29154	S19-De29155
Date Sampled			Dec 17, 2019	Dec 16, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	-	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	-	< 50	< 50
TRH C29-C36	50	mg/kg	67	-	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	67	-	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	124	-	120	126
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	-	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5

Client Sample ID			BH07_0.0-0.2	BH07_0.5-0.7	BH08_0.0-0.2	BH08_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29152	S19-De29153	S19-De29154	S19-De29155
Date Sampled			Dec 17, 2019	Dec 16, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	73	-	73	90
p-Terphenyl-d14 (surr.)	1	%	115	-	89	148
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	-	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	101	-	99	104
Tetrachloro-m-xylene (surr.)	1	%	90	-	75	113
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	-	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2

Client Sample ID			BH07_0.0-0.2	BH07_0.5-0.7	BH08_0.0-0.2	BH08_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29152	S19-De29153	S19-De29154	S19-De29155
Date Sampled			Dec 17, 2019	Dec 16, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	-	< 2	< 2
Naled	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	-	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	114	-	105	89
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	101	-	99	104
Tetrachloro-m-xylene (surr.)	1	%	90	-	75	113
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	-	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	-	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	-	< 1	< 1

Client Sample ID			BH07_0.0-0.2	BH07_0.5-0.7	BH08_0.0-0.2	BH08_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29152	S19-De29153	S19-De29154	S19-De29155
Date Sampled			Dec 17, 2019	Dec 16, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	-	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	-	< 5	< 5
Dinoseb	20	mg/kg	< 20	-	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	< 20	< 20
Phenol-d6 (surr.)	1	%	86	-	76	81
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	63	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	5.1	-	-
% Moisture	1	%	6.1	13	4.5	20
Heavy Metals						
Arsenic	2	mg/kg	11	-	3.0	11
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
Chromium	5	mg/kg	20	-	6.4	30
Copper	5	mg/kg	16	-	23	23
Lead	5	mg/kg	25	-	31	15
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Nickel	5	mg/kg	12	-	< 5	< 5
Zinc	5	mg/kg	32	-	91	24
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	6.1	-	-

Client Sample ID			BH10_0.1-0.3	BH11_0.0-0.2	BH14_0.0-0.2	BH15_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29156	S19-De29157	S19-De29158	S19-De29159
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	94
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	94
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	103	92	66	81

Client Sample ID			BH10_0.1-0.3	BH11_0.0-0.2	BH14_0.0-0.2	BH15_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29156	S19-De29157	S19-De29158	S19-De29159
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	110
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	110
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93	89	101	99
p-Terphenyl-d14 (surr.)	1	%	143	129	102	121
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-

Client Sample ID			BH10_0.1-0.3	BH11_0.0-0.2	BH14_0.0-0.2	BH15_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29156	S19-De29157	S19-De29158	S19-De29159
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2	-	-
Dibutylchlorendate (surr.)	1	%	-	91	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	96	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Bolstar	0.2	mg/kg	-	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	-
Coumaphos	2	mg/kg	-	< 2	-	-
Demeton-S	0.2	mg/kg	-	< 0.2	-	-
Demeton-O	0.2	mg/kg	-	< 0.2	-	-
Diazinon	0.2	mg/kg	-	< 0.2	-	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-	-
Dimethoate	0.2	mg/kg	-	< 0.2	-	-
Disulfoton	0.2	mg/kg	-	< 0.2	-	-
EPN	0.2	mg/kg	-	< 0.2	-	-
Ethion	0.2	mg/kg	-	< 0.2	-	-
Ethoprop	0.2	mg/kg	-	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-	-
Fenthion	0.2	mg/kg	-	< 0.2	-	-
Malathion	0.2	mg/kg	-	< 0.2	-	-
Merphos	0.2	mg/kg	-	< 0.2	-	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-	-
Mevinphos	0.2	mg/kg	-	< 0.2	-	-
Monocrotophos	2	mg/kg	-	< 2	-	-
Naled	0.2	mg/kg	-	< 0.2	-	-
Omethoate	2	mg/kg	-	< 2	-	-
Phorate	0.2	mg/kg	-	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-	-
Ronnel	0.2	mg/kg	-	< 0.2	-	-
Terbufos	0.2	mg/kg	-	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	-
Tokuthion	0.2	mg/kg	-	< 0.2	-	-
Trichloronate	0.2	mg/kg	-	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	-	87	-	-

Client Sample ID			BH10_0.1-0.3	BH11_0.0-0.2	BH14_0.0-0.2	BH15_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29156	S19-De29157	S19-De29158	S19-De29159
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	91	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	96	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	-	-
Pentachlorophenol	1	mg/kg	-	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	-	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
2-Nitrophenol	1	mg/kg	-	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
4-Nitrophenol	5	mg/kg	-	< 5	-	-
Dinoseb	20	mg/kg	-	< 20	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	-	-
Phenol-d6 (surr.)	1	%	-	73	-	-
% Moisture	1	%	2.0	6.6	5.0	5.3
Heavy Metals						
Arsenic	2	mg/kg	< 2	72	7.9	8.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	7.0	13	8.4
Copper	5	mg/kg	23	9.3	8.5	11
Lead	5	mg/kg	27	14	16	22
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	5.9	< 5	< 5
Zinc	5	mg/kg	85	34	17	41

Client Sample ID			BH16_0.0-0.2	BH17_0.0-0.2	BH18_0.2-0.4	BH19_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29160	S19-De29161	S19-De29162	S19-De29163
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	130	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	160	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	290	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	87	92	69
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	210	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	110	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	320	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	99	103	85	96
p-Terphenyl-d14 (surr.)	1	%	110	69	67	85

Client Sample ID			BH16_0.0-0.2	BH17_0.0-0.2	BH18_0.2-0.4	BH19_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29160	S19-De29161	S19-De29162	S19-De29163
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	0.14	0.14	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	-
Toxaphene	1	mg/kg	< 1	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	0.14	0.14	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	-
Dibutylchlorendate (surr.)	1	%	85	84	-	-
Tetrachloro-m-xylene (surr.)	1	%	107	109	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Coumaphos	2	mg/kg	< 2	< 2	-	-
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	-
EPN	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	-

Client Sample ID			BH16_0.0-0.2	BH17_0.0-0.2	BH18_0.2-0.4	BH19_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29160	S19-De29161	S19-De29162	S19-De29163
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Monocrotophos	2	mg/kg	< 2	< 2	-	-
Naled	0.2	mg/kg	< 0.2	< 0.2	-	-
Omethoate	2	mg/kg	< 2	< 2	-	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	-
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	97	86	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	85	84	-	-
Tetrachloro-m-xylene (surr.)	1	%	107	109	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	-	-
Pentachlorophenol	1	mg/kg	< 1	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	-	-
2-Nitrophenol	1	mg/kg	< 1	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	-	-
4-Nitrophenol	5	mg/kg	< 5	< 5	-	-
Dinoseb	20	mg/kg	< 20	< 20	-	-
Phenol	0.5	mg/kg	< 0.5	< 0.5	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	-	-
Phenol-d6 (surr.)	1	%	93	95	-	-
% Moisture	1	%	4.1	3.4	5.6	7.4

Client Sample ID			BH16_0.0-0.2	BH17_0.0-0.2	BH18_0.2-0.4	BH19_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29160	S19-De29161	S19-De29162	S19-De29163
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	11	16	6.6	10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	10	19	9.1	16
Copper	5	mg/kg	11	9.7	12	15
Lead	5	mg/kg	15	18	18	31
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	7.2
Zinc	5	mg/kg	47	36	72	72

Client Sample ID			BH20_0.0-0.15	BH21_0.1-0.3	BH22_0.8-1.0	BH23_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29164	S19-De29165	S19-De29166	S19-De29167
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	72	< 50	< 50
TRH C29-C36	50	mg/kg	66	72	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	66	144	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	91	72	96	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	120	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	120	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH20_0.0-0.15	BH21_0.1-0.3	BH22_0.8-1.0	BH23_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29164	S19-De29165	S19-De29166	S19-De29167
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	99	105	93	97
p-Terphenyl-d14 (surr.)	1	%	91	71	61	75
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	-	91	51	77
Tetrachloro-m-xylene (surr.)	1	%	-	103	103	104
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	-	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2

Client Sample ID			BH20_0.0-0.15	BH21_0.1-0.3	BH22_0.8-1.0	BH23_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29164	S19-De29165	S19-De29166	S19-De29167
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Diazinon	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	-	< 2	< 2	< 2
Naled	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	-	< 2	< 2	< 2
Phorate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	-	94	83	79
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	-	91	51	77
Tetrachloro-m-xylene (surr.)	1	%	-	103	103	104
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	-	< 1	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	-	< 10	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	-	< 1	< 1	< 1

Client Sample ID			BH20_0.0-0.15	BH21_0.1-0.3	BH22_0.8-1.0	BH23_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29164	S19-De29165	S19-De29166	S19-De29167
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	-	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	-	< 5	< 5	< 5
Dinoseb	20	mg/kg	-	< 20	< 20	< 20
Phenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	-	91	98	103
% Moisture	1	%	2.1	1.5	7.0	3.8
Heavy Metals						
Arsenic	2	mg/kg	5.2	15	6.6	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.5	7.5	11	< 5
Copper	5	mg/kg	38	19	47	5.3
Lead	5	mg/kg	66	40	24	6.8
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	38	< 5
Zinc	5	mg/kg	160	56	180	19

Client Sample ID			BH25_0.0-0.2	BH26_0.0-0.2	BH28_0.0-0.2	BH28_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29168	S19-De29169	S19-De29170	S19-De29171
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	65	63	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	65	63	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	84	77	70
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH25_0.0-0.2	BH26_0.0-0.2	BH28_0.0-0.2	BH28_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29168	S19-De29169	S19-De29170	S19-De29171
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	89	90	88	87
p-Terphenyl-d14 (surr.)	1	%	136	135	114	122
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	-	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	-	< 1	< 1

Client Sample ID			BH25_0.0-0.2	BH26_0.0-0.2	BH28_0.0-0.2	BH28_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29168	S19-De29169	S19-De29170	S19-De29171
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	90	92
Tetrachloro-m-xylene (surr.)	1	%	-	-	96	97
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Bolstar	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Coumaphos	2	mg/kg	-	-	< 2	< 2
Demeton-S	0.2	mg/kg	-	-	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	-	-	< 0.2	< 0.2
Diazinon	0.2	mg/kg	-	-	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	-	-	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	-	-	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	-	-	< 0.2	< 0.2
EPN	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethion	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fenthion	0.2	mg/kg	-	-	< 0.2	< 0.2
Malathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Merphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Monocrotophos	2	mg/kg	-	-	< 2	< 2
Naled	0.2	mg/kg	-	-	< 0.2	< 0.2
Omethoate	2	mg/kg	-	-	< 2	< 2
Phorate	0.2	mg/kg	-	-	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	-	-	< 0.2	< 0.2
Ronnel	0.2	mg/kg	-	-	< 0.2	< 0.2
Terbufos	0.2	mg/kg	-	-	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	-	-	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	-	-	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	99	87
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	< 0.5

Client Sample ID			BH25_0.0-0.2	BH26_0.0-0.2	BH28_0.0-0.2	BH28_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29168	S19-De29169	S19-De29170	S19-De29171
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	90	92
Tetrachloro-m-xylene (surr.)	1	%	-	-	96	97
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	< 1
Pentachlorophenol	1	mg/kg	-	-	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	-	-	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	-	-	< 5	< 5
Dinoseb	20	mg/kg	-	-	< 20	< 20
Phenol	0.5	mg/kg	-	-	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	< 20
Phenol-d6 (surr.)	1	%	-	-	82	75
% Moisture	1	%	4.9	4.6	4.4	9.2
Heavy Metals						
Arsenic	2	mg/kg	2.1	3.6	2.9	4.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.2	8.2	7.1	27
Copper	5	mg/kg	6.5	11	5.5	< 5
Lead	5	mg/kg	14	20	7.9	8.9
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	32	61	27	6.1

Client Sample ID			BH29_0.0-0.2	BH30_0.0-0.2	BH31_0.0-0.2	BH32_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29172	S19-De29173	S19-De29174	S19-De29175
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	58	< 50	57	< 50
TRH C10-C36 (Total)	50	mg/kg	58	< 50	57	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	75	79	79	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	88	85	88	86
p-Terphenyl-d14 (surr.)	1	%	121	125	137	119

Client Sample ID			BH29_0.0-0.2	BH30_0.0-0.2	BH31_0.0-0.2	BH32_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29172	S19-De29173	S19-De29174	S19-De29175
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	93	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	92	-	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-

Client Sample ID			BH29_0.0-0.2	BH30_0.0-0.2	BH31_0.0-0.2	BH32_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29172	S19-De29173	S19-De29174	S19-De29175
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 0.2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	98	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	93	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	92	-	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	80	-	-	-
% Moisture	1	%	4.3	3.8	5.3	5.5

Client Sample ID			BH29_0.0-0.2	BH30_0.0-0.2	BH31_0.0-0.2	BH32_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29172	S19-De29173	S19-De29174	S19-De29175
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	19	15	4.8	6.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	10	8.3	9.8	17
Copper	5	mg/kg	8.8	12	8.6	9.9
Lead	5	mg/kg	18	39	18	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	6.3
Zinc	5	mg/kg	40	30	27	16

Client Sample ID			BH33_0.0-0.2	BH34_0.0-0.2	BH35_0.0-0.2	BH36_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29176	S19-De29177	S19-De29178	S19-De29179
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	56	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	106	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	76	79	77	86
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH33_0.0-0.2	BH34_0.0-0.2	BH35_0.0-0.2	BH36_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29176	S19-De29177	S19-De29178	S19-De29179
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	90	96	87
p-Terphenyl-d14 (surr.)	1	%	129	127	101	53
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	0.07
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	-	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	-	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	0.07
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	140	52
Tetrachloro-m-xylene (surr.)	1	%	-	-	115	66
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Bolstar	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Coumaphos	2	mg/kg	-	-	< 2	< 2
Demeton-S	0.2	mg/kg	-	-	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	-	-	< 0.2	< 0.2

Client Sample ID			BH33_0.0-0.2	BH34_0.0-0.2	BH35_0.0-0.2	BH36_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29176	S19-De29177	S19-De29178	S19-De29179
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Diazinon	0.2	mg/kg	-	-	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	-	-	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	-	-	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	-	-	< 0.2	< 0.2
EPN	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethion	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fenthion	0.2	mg/kg	-	-	< 0.2	< 0.2
Malathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Merphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Monocrotophos	2	mg/kg	-	-	< 2	< 2
Naled	0.2	mg/kg	-	-	< 0.2	< 0.2
Omethoate	2	mg/kg	-	-	< 2	< 2
Phorate	0.2	mg/kg	-	-	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	-	-	< 0.2	< 0.2
Ronnel	0.2	mg/kg	-	-	< 0.2	< 0.2
Terbufos	0.2	mg/kg	-	-	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	-	-	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	-	-	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	102	83
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	140	52
Tetrachloro-m-xylene (surr.)	1	%	-	-	115	66
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	< 1
Pentachlorophenol	1	mg/kg	-	-	< 1	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	< 1

Client Sample ID			BH33_0.0-0.2	BH34_0.0-0.2	BH35_0.0-0.2	BH36_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29176	S19-De29177	S19-De29178	S19-De29179
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	-	-	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	-	-	< 5	< 5
Dinoseb	20	mg/kg	-	-	< 20	< 20
Phenol	0.5	mg/kg	-	-	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	< 20
Phenol-d6 (surr.)	1	%	-	-	92	85
% Moisture	1	%	5.5	5.7	9.6	8.3
Heavy Metals						
Arsenic	2	mg/kg	14	12	11	10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	17	22	15
Copper	5	mg/kg	16	13	16	22
Lead	5	mg/kg	16	19	20	41
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	16	< 5	5.8	6.6
Zinc	5	mg/kg	67	42	43	84

Client Sample ID			BH36_1.0-1.2	BH36_2.0-2.2	BH37_0.3-0.5	BH38_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29180	S19-De29181	S19-De29182	S19-De29183
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	54
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	58
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	112
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	96	68	79	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH36_1.0-1.2	BH36_2.0-2.2	BH37_0.3-0.5	BH38_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29180	S19-De29181	S19-De29182	S19-De29183
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.6
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.6
2-Fluorobiphenyl (surr.)	1	%	109	90	78	90
p-Terphenyl-d14 (surr.)	1	%	84	127	91	80
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	0.18	-	0.17	-
4.4'-DDT	0.05	mg/kg	0.23	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-

Client Sample ID			BH36_1.0-1.2	BH36_2.0-2.2	BH37_0.3-0.5	BH38_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29180	S19-De29181	S19-De29182	S19-De29183
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	0.41	-	0.17	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	0.41	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	78	-	97	-
Tetrachloro-m-xylene (surr.)	1	%	70	-	79	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	92	-	94	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID			BH36_1.0-1.2	BH36_2.0-2.2	BH37_0.3-0.5	BH38_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29180	S19-De29181	S19-De29182	S19-De29183
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	78	-	97	-
Tetrachloro-m-xylene (surr.)	1	%	70	-	79	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	< 1	-
Pentachlorophenol	1	mg/kg	< 1	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	< 0.2	-
2-Nitrophenol	1	mg/kg	< 1	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	< 0.4	-
4-Nitrophenol	5	mg/kg	< 5	-	< 5	-
Dinoseb	20	mg/kg	< 20	-	< 20	-
Phenol	0.5	mg/kg	< 0.5	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	< 20	-
Phenol-d6 (surr.)	1	%	91	-	77	-
% Moisture	1	%	8.9	17	8.0	3.2
Heavy Metals						
Arsenic	2	mg/kg	13	12	8.3	2.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	22	27	17	7.2
Copper	5	mg/kg	17	24	14	29
Lead	5	mg/kg	43	20	19	44
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.2	< 5	< 5	6.5
Zinc	5	mg/kg	51	23	38	120

Client Sample ID			BH50_0.2-0.4	BH51_0.2-0.4	BH52_0.2-0.4	BH52_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29184	S19-De29185	S19-De29186	S19-De29187
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	69	76	124	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	77	101	96	-
p-Terphenyl-d14 (surr.)	1	%	82	87	93	-

Client Sample ID			BH50_0.2-0.4	BH51_0.2-0.4	BH52_0.2-0.4	BH52_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29184	S19-De29185	S19-De29186	S19-De29187
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	104	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	82	-	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-

Client Sample ID			BH50_0.2-0.4	BH51_0.2-0.4	BH52_0.2-0.4	BH52_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29184	S19-De29185	S19-De29186	S19-De29187
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 0.2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	95	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	104	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	82	-	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	83	-	-	-

Client Sample ID			BH50_0.2-0.4	BH51_0.2-0.4	BH52_0.2-0.4	BH52_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29184	S19-De29185	S19-De29186	S19-De29187
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	-	29
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	5.2
% Moisture	1	%	11	14	14	10
Heavy Metals						
Arsenic	2	mg/kg	14	13	7.3	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	27	30	13	-
Copper	5	mg/kg	32	25	20	-
Lead	5	mg/kg	17	14	16	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	15	18	< 5	-
Zinc	5	mg/kg	27	22	11	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	8.4

Client Sample ID			BH57_0.2-0.4	BH58_0.2-0.4	BH59_0.0-0.05	BH60_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29188	S19-De29189	S19-De29190	S19-De29191
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	85	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	74	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	159	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	138	111	109	107
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	120	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	120	< 100

Client Sample ID			BH57_0.2-0.4	BH58_0.2-0.4	BH59_0.0-0.05	BH60_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29188	S19-De29189	S19-De29190	S19-De29191
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	71	95	86	94
p-Terphenyl-d14 (surr.)	1	%	92	89	82	82
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	102	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	73	-	-	-

Client Sample ID			BH57_0.2-0.4	BH58_0.2-0.4	BH59_0.0-0.05	BH60_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29188	S19-De29189	S19-De29190	S19-De29191
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 0.2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	97	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	102	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	73	-	-	-

Client Sample ID			BH57_0.2-0.4	BH58_0.2-0.4	BH59_0.0-0.05	BH60_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29188	S19-De29189	S19-De29190	S19-De29191
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	77	-	-	-
% Moisture	1	%	13	9.2	6.7	24
Heavy Metals						
Arsenic	2	mg/kg	9.1	8.4	2.3	14
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	29	8.7	19
Copper	5	mg/kg	41	24	6.1	21
Lead	5	mg/kg	22	13	8.7	15
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	25	5.5	< 5
Zinc	5	mg/kg	23	29	19	16

Client Sample ID			BH61_0.15-0.3	BH62_0.0-0.15	BH64_0.0-0.1	BH65_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29192	S19-De29193	S19-De29194	S19-De29195
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 40	< 40	< 20
TRH C10-C14	20	mg/kg	< 20	120	170	< 20
TRH C15-C28	50	mg/kg	< 50	1400	660	110
TRH C29-C36	50	mg/kg	< 50	720	610	170
TRH C10-C36 (Total)	50	mg/kg	< 50	2240	1440	280

Client Sample ID			BH61_0.15-0.3	BH62_0.0-0.15	BH64_0.0-0.1	BH65_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29192	S19-De29193	S19-De29194	S19-De29195
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	119	109	119	119
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 1	< 1	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 40	< 40	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 40	< 40	< 20
TRH >C10-C16	50	mg/kg	< 50	140	210	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	140	210	< 50
TRH >C16-C34	100	mg/kg	< 100	1800	1000	220
TRH >C34-C40	100	mg/kg	< 100	610	480	140
TRH >C10-C40 (total)*	100	mg/kg	< 100	2550	1690	360
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	78	99	95	80
p-Terphenyl-d14 (surr.)	1	%	89	104	78	106
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05

Client Sample ID			BH61_0.15-0.3	BH62_0.0-0.15	BH64_0.0-0.1	BH65_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29192	S19-De29193	S19-De29194	S19-De29195
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	-	-	< 0.2
Toxaphene	1	mg/kg	< 1	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	< 0.2
Dibutylchlorendate (surr.)	1	%	107	-	-	95
Tetrachloro-m-xylene (surr.)	1	%	82	-	-	85
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	-	< 0.2
EPN	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	-	< 2
Naled	0.2	mg/kg	< 0.2	-	-	< 0.2
Omethoate	2	mg/kg	< 2	-	-	< 2
Phorate	0.2	mg/kg	< 0.2	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	-	< 0.2

Client Sample ID			BH61_0.15-0.3	BH62_0.0-0.15	BH64_0.0-0.1	BH65_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29192	S19-De29193	S19-De29194	S19-De29195
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Terbufos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	99	-	-	107
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	107	-	-	95
Tetrachloro-m-xylene (surr.)	1	%	82	-	-	85
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	< 1
Pentachlorophenol	1	mg/kg	< 1	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	< 0.2
2-Nitrophenol	1	mg/kg	< 1	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	-	-	< 5
Dinoseb	20	mg/kg	< 20	-	-	< 20
Phenol	0.5	mg/kg	< 0.5	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	< 20
Phenol-d6 (surr.)	1	%	84	-	-	79
% Moisture	1	%	10	11	8.3	6.2
Heavy Metals						
Arsenic	2	mg/kg	6.0	< 2	2.4	5.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	< 5	7.4	21
Copper	5	mg/kg	17	15	23	24
Lead	5	mg/kg	15	13	21	28
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2
Nickel	5	mg/kg	12	< 5	5.9	14
Zinc	5	mg/kg	28	50	96	72

Client Sample ID			BH66_0.0-0.1	BH66_0.3-0.5	BH66_1.0-1.2	BH67_0.0-0.05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29196	S19-De29197	S19-De29198	S19-De29199
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	29
TRH C15-C28	50	mg/kg	78	62	< 50	120
TRH C29-C36	50	mg/kg	130	81	< 50	210
TRH C10-C36 (Total)	50	mg/kg	208	143	< 50	359
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	108	111	118	129
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	150	120	< 100	260
TRH >C34-C40	100	mg/kg	110	< 100	< 100	120
TRH >C10-C40 (total)*	100	mg/kg	260	120	< 100	380
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	0.6	0.8	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Pyrene	0.5	mg/kg	0.6	0.8	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	1.2	2.2	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	83	83	104	106
p-Terphenyl-d14 (surr.)	1	%	103	99	103	97

Client Sample ID			BH66_0.0-0.1	BH66_0.3-0.5	BH66_1.0-1.2	BH67_0.0-0.05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29196	S19-De29197	S19-De29198	S19-De29199
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	-
Toxaphene	1	mg/kg	< 1	< 1	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	-
Dibutylchlorendate (surr.)	1	%	90	95	-	-
Tetrachloro-m-xylene (surr.)	1	%	82	87	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Coumaphos	2	mg/kg	< 2	< 2	-	-
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	-
EPN	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	-

Client Sample ID			BH66_0.0-0.1	BH66_0.3-0.5	BH66_1.0-1.2	BH67_0.0-0.05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29196	S19-De29197	S19-De29198	S19-De29199
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Monocrotophos	2	mg/kg	< 2	< 2	-	-
Naled	0.2	mg/kg	< 0.2	< 0.2	-	-
Omethoate	2	mg/kg	< 2	< 2	-	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	-
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	102	111	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	90	95	-	-
Tetrachloro-m-xylene (surr.)	1	%	82	87	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	-	-
Pentachlorophenol	1	mg/kg	< 1	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	-	-
2-Nitrophenol	1	mg/kg	< 1	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	-	-
4-Nitrophenol	5	mg/kg	< 5	< 5	-	-
Dinoseb	20	mg/kg	< 20	< 20	-	-
Phenol	0.5	mg/kg	< 0.5	< 0.5	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	-	-
Phenol-d6 (surr.)	1	%	81	86	-	-
% Moisture	1	%	7.2	7.1	11	6.7

Client Sample ID			BH66_0.0-0.1	BH66_0.3-0.5	BH66_1.0-1.2	BH67_0.0-0.05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29196	S19-De29197	S19-De29198	S19-De29199
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	7.4	16	12	5.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	21	26	27	10
Copper	5	mg/kg	42	21	28	14
Lead	5	mg/kg	45	59	31	14
Mercury	0.1	mg/kg	0.1	0.1	0.1	< 0.1
Nickel	5	mg/kg	10	7.5	9.5	5.7
Zinc	5	mg/kg	83	140	58	47

Client Sample ID			BH68_0.0-0.1	BH69_0.05-0.2	BH71_0.0-0.2	BH72_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29200	S19-De29201	S19-De29202	S19-De29203
Date Sampled			Dec 18, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	290	< 50	140	< 50
TRH C29-C36	50	mg/kg	310	< 50	180	140
TRH C10-C36 (Total)	50	mg/kg	600	< 50	320	140
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	115	108	118	117
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	52	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	52	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	490	< 100	310	110
TRH >C34-C40	100	mg/kg	170	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	712	< 100	310	110
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH68_0.0-0.1	BH69_0.05-0.2	BH71_0.0-0.2	BH72_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29200	S19-De29201	S19-De29202	S19-De29203
Date Sampled			Dec 18, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	87	70	109	71
p-Terphenyl-d14 (surr.)	1	%	108	92	102	88
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	-	-	< 0.2
Toxaphene	1	mg/kg	< 1	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	< 0.2
Dibutylchlorendate (surr.)	1	%	94	-	-	102
Tetrachloro-m-xylene (surr.)	1	%	82	-	-	74
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	-	< 0.2

Client Sample ID			BH68_0.0-0.1	BH69_0.05-0.2	BH71_0.0-0.2	BH72_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29200	S19-De29201	S19-De29202	S19-De29203
Date Sampled			Dec 18, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Diazinon	0.2	mg/kg	< 0.2	-	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	-	< 0.2
EPN	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	-	< 2
Naled	0.2	mg/kg	< 0.2	-	-	< 0.2
Omethoate	2	mg/kg	< 2	-	-	< 2
Phorate	0.2	mg/kg	< 0.2	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	107	-	-	106
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	94	-	-	102
Tetrachloro-m-xylene (surr.)	1	%	82	-	-	74
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	< 1
Pentachlorophenol	1	mg/kg	< 1	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	< 1

Client Sample ID			BH68_0.0-0.1	BH69_0.05-0.2	BH71_0.0-0.2	BH72_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29200	S19-De29201	S19-De29202	S19-De29203
Date Sampled			Dec 18, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	< 0.2
2-Nitrophenol	1	mg/kg	< 1	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	-	-	< 5
Dinoseb	20	mg/kg	< 20	-	-	< 20
Phenol	0.5	mg/kg	< 0.5	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	< 20
Phenol-d6 (surr.)	1	%	90	-	-	81
% Moisture	1	%	2.7	12	5.3	4.4
Heavy Metals						
Arsenic	2	mg/kg	3.2	9.0	12	7.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.7	20	15	16
Copper	5	mg/kg	9.0	7.1	28	17
Lead	5	mg/kg	12	15	65	41
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1
Nickel	5	mg/kg	6.9	8.8	6.6	5.1
Zinc	5	mg/kg	34	13	110	70

Client Sample ID			BH73_0.0-0.2	BH74_0.0-0.2	BH75_0.0-0.2	BH76_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29204	S19-De29205	S19-De29206	S19-De29207
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	81	120
TRH C29-C36	50	mg/kg	< 50	110	150	160
TRH C10-C36 (Total)	50	mg/kg	< 50	110	231	280
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	118	113	67	78
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH73_0.0-0.2	BH74_0.0-0.2	BH75_0.0-0.2	BH76_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29204	S19-De29205	S19-De29206	S19-De29207
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	130	200	250
TRH >C34-C40	100	mg/kg	< 100	< 100	100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	130	300	250
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	95	74	95	95
p-Terphenyl-d14 (surr.)	1	%	76	98	73	68
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-

Client Sample ID			BH73_0.0-0.2	BH74_0.0-0.2	BH75_0.0-0.2	BH76_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29204	S19-De29205	S19-De29206	S19-De29207
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.2	-	-
Dibutylchlorendate (surr.)	1	%	-	97	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	82	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Bolstar	0.2	mg/kg	-	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	-
Coumaphos	2	mg/kg	-	< 2	-	-
Demeton-S	0.2	mg/kg	-	< 0.2	-	-
Demeton-O	0.2	mg/kg	-	< 0.2	-	-
Diazinon	0.2	mg/kg	-	< 0.2	-	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-	-
Dimethoate	0.2	mg/kg	-	< 0.2	-	-
Disulfoton	0.2	mg/kg	-	< 0.2	-	-
EPN	0.2	mg/kg	-	< 0.2	-	-
Ethion	0.2	mg/kg	-	< 0.2	-	-
Ethoprop	0.2	mg/kg	-	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-	-
Fenthion	0.2	mg/kg	-	< 0.2	-	-
Malathion	0.2	mg/kg	-	< 0.2	-	-
Merphos	0.2	mg/kg	-	< 0.2	-	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-	-
Mevinphos	0.2	mg/kg	-	< 0.2	-	-
Monocrotophos	2	mg/kg	-	< 2	-	-
Naled	0.2	mg/kg	-	< 0.2	-	-
Omethoate	2	mg/kg	-	< 2	-	-
Phorate	0.2	mg/kg	-	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-	-
Ronnel	0.2	mg/kg	-	< 0.2	-	-
Terbufos	0.2	mg/kg	-	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	-
Tokuthion	0.2	mg/kg	-	< 0.2	-	-
Trichloronate	0.2	mg/kg	-	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	-	101	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			BH73_0.0-0.2	BH74_0.0-0.2	BH75_0.0-0.2	BH76_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29204	S19-De29205	S19-De29206	S19-De29207
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 16, 2019	Dec 16, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	97	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	82	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	-	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	-	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	-	-
Pentachlorophenol	1	mg/kg	-	< 1	-	-
Tetrachlorophenols - Total	10	mg/kg	-	< 10	-	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	-	-
2-Nitrophenol	1	mg/kg	-	< 1	-	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	-	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	-	-
4-Nitrophenol	5	mg/kg	-	< 5	-	-
Dinoseb	20	mg/kg	-	< 20	-	-
Phenol	0.5	mg/kg	-	< 0.5	-	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	-	-
Phenol-d6 (surr.)	1	%	-	77	-	-
% Moisture	1	%	3.7	5.9	6.4	5.4
Heavy Metals						
Arsenic	2	mg/kg	7.6	5.3	5.4	7.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	19	21	18	20
Copper	5	mg/kg	25	15	13	18
Lead	5	mg/kg	22	71	45	47
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	9.7	6.4	5.1	7.5
Zinc	5	mg/kg	70	46	31	40

Client Sample ID			BH77_0.0-0.2	BH78_0.0-0.2	BH79_0.0-0.2	BH80_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29208	S19-De29209	S19-De29210	S19-De29211
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	110	< 20	< 20
TRH C15-C28	50	mg/kg	100	290	190	110
TRH C29-C36	50	mg/kg	130	330	340	210
TRH C10-C36 (Total)	50	mg/kg	230	730	530	320
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	78	85	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	130	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	130	< 50	< 50
TRH >C16-C34	100	mg/kg	200	510	450	270
TRH >C34-C40	100	mg/kg	< 100	160	190	110
TRH >C10-C40 (total)*	100	mg/kg	200	800	640	380
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	79	70	94	91
p-Terphenyl-d14 (surr.)	1	%	98	60	80	84

Client Sample ID			BH77_0.0-0.2	BH78_0.0-0.2	BH79_0.0-0.2	BH80_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29208	S19-De29209	S19-De29210	S19-De29211
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	96	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	80	-	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-

Client Sample ID			BH77_0.0-0.2	BH78_0.0-0.2	BH79_0.0-0.2	BH80_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29208	S19-De29209	S19-De29210	S19-De29211
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 0.2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	100	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	96	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	80	-	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	79	-	-	-
% Moisture	1	%	5.6	5.1	5.1	5.5

Client Sample ID			BH77_0.0-0.2	BH78_0.0-0.2	BH79_0.0-0.2	BH80_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29208	S19-De29209	S19-De29210	S19-De29211
Date Sampled			Dec 16, 2019	Dec 16, 2019	Dec 16, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	6.5	16	6.4	7.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	13	14	20
Copper	5	mg/kg	16	11	18	20
Lead	5	mg/kg	33	24	55	72
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.9	< 5	5.5	7.0
Zinc	5	mg/kg	31	25	42	53

Client Sample ID			BH81_0.2-0.4	BH82_0.05-0.2	BH83_0.05-0.2	BH84_0.05-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29212	S19-De29213	S19-De29214	S19-De29215
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	91	< 50	< 50	53
TRH C29-C36	50	mg/kg	330	< 50	< 50	51
TRH C10-C36 (Total)	50	mg/kg	421	< 50	< 50	104
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	61	63	67	72
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	300	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	180	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	480	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH81_0.2-0.4	BH82_0.05-0.2	BH83_0.05-0.2	BH84_0.05-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29212	S19-De29213	S19-De29214	S19-De29215
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	79	94	92	94
p-Terphenyl-d14 (surr.)	1	%	97	78	82	88
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	108	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	78	-	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Bolstar	0.2	mg/kg	< 0.2	-	-	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	-
Coumaphos	2	mg/kg	< 2	-	-	-
Demeton-S	0.2	mg/kg	< 0.2	-	-	-
Demeton-O	0.2	mg/kg	< 0.2	-	-	-

Client Sample ID			BH81_0.2-0.4	BH82_0.05-0.2	BH83_0.05-0.2	BH84_0.05-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29212	S19-De29213	S19-De29214	S19-De29215
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Diazinon	0.2	mg/kg	< 0.2	-	-	-
Dichlorvos	0.2	mg/kg	< 0.2	-	-	-
Dimethoate	0.2	mg/kg	< 0.2	-	-	-
Disulfoton	0.2	mg/kg	< 0.2	-	-	-
EPN	0.2	mg/kg	< 0.2	-	-	-
Ethion	0.2	mg/kg	< 0.2	-	-	-
Ethoprop	0.2	mg/kg	< 0.2	-	-	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	-
Fenitrothion	0.2	mg/kg	< 0.2	-	-	-
Fensulfothion	0.2	mg/kg	< 0.2	-	-	-
Fenthion	0.2	mg/kg	< 0.2	-	-	-
Malathion	0.2	mg/kg	< 0.2	-	-	-
Merphos	0.2	mg/kg	< 0.2	-	-	-
Methyl parathion	0.2	mg/kg	< 0.2	-	-	-
Mevinphos	0.2	mg/kg	< 0.2	-	-	-
Monocrotophos	2	mg/kg	< 2	-	-	-
Naled	0.2	mg/kg	< 0.2	-	-	-
Omethoate	2	mg/kg	< 2	-	-	-
Phorate	0.2	mg/kg	< 0.2	-	-	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	-
Pyrazophos	0.2	mg/kg	< 0.2	-	-	-
Ronnel	0.2	mg/kg	< 0.2	-	-	-
Terbufos	0.2	mg/kg	< 0.2	-	-	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	-
Tokuthion	0.2	mg/kg	< 0.2	-	-	-
Trichloronate	0.2	mg/kg	< 0.2	-	-	-
Triphenylphosphate (surr.)	1	%	109	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	108	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	78	-	-	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-

Client Sample ID			BH81_0.2-0.4	BH82_0.05-0.2	BH83_0.05-0.2	BH84_0.05-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29212	S19-De29213	S19-De29214	S19-De29215
Date Sampled			Dec 17, 2019	Dec 17, 2019	Dec 17, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	78	-	-	-
% Moisture	1	%	22	18	7.6	2.9
Heavy Metals						
Arsenic	2	mg/kg	5.8	15	14	5.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	15	32	28	41
Copper	5	mg/kg	14	19	< 5	12
Lead	5	mg/kg	18	14	12	11
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.4	15	< 5	29
Zinc	5	mg/kg	25	19	< 5	25

Client Sample ID			BH86_0.0-0.2	BH87_0.0-0.2	BH88_0.0-0.2	BH89_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29216	S19-De29217	S19-De29218	S19-De29219
Date Sampled			Dec 17, 2019	Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	140	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	420	69	51	< 50
TRH C29-C36	50	mg/kg	540	99	63	55
TRH C10-C36 (Total)	50	mg/kg	1100	168	114	55
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	97	70	113	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	150	< 50	< 50	< 50

Client Sample ID			BH86_0.0-0.2	BH87_0.0-0.2	BH88_0.0-0.2	BH89_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29216	S19-De29217	S19-De29218	S19-De29219
Date Sampled			Dec 17, 2019	Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	150	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	790	130	< 100	< 100
TRH >C34-C40	100	mg/kg	380	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	1320	130	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	95	98	106	82
p-Terphenyl-d14 (surr.)	1	%	80	98	104	102
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Toxaphene	1	mg/kg	-	-	-	< 1

Client Sample ID			BH86_0.0-0.2	BH87_0.0-0.2	BH88_0.0-0.2	BH89_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29216	S19-De29217	S19-De29218	S19-De29219
Date Sampled			Dec 17, 2019	Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Dibutylchlorendate (surr.)	1	%	-	-	-	111
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	86
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	114
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5

Client Sample ID			BH86_0.0-0.2	BH87_0.0-0.2	BH88_0.0-0.2	BH89_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29216	S19-De29217	S19-De29218	S19-De29219
Date Sampled			Dec 17, 2019	Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	111
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	86
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	-	< 1
Pentachlorophenol	1	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1	mg/kg	-	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	89
% Moisture	1	%	6.5	7.1	4.5	6.4
Heavy Metals						
Arsenic	2	mg/kg	12	6.0	11	11
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	13	12	15	15
Copper	5	mg/kg	18	13	19	11
Lead	5	mg/kg	28	25	37	27
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	5.5	8.8	< 5
Zinc	5	mg/kg	56	57	120	40

Client Sample ID			BH92_0.0-0.2	BH93_0.0-0.2	BH97_0.0-0.2	BH100_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29220	S19-De29221	S19-De29222	S19-De29223
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	110	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	100	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	210	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	86	90	131	79
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	160	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	160	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	92	105	91	101
p-Terphenyl-d14 (surr.)	1	%	117	91	111	101

Client Sample ID			BH92_0.0-0.2	BH93_0.0-0.2	BH97_0.0-0.2	BH100_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29220	S19-De29221	S19-De29222	S19-De29223
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	0.17	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	0.17	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	< 0.2	-
Dibutylchlorendate (surr.)	1	%	121	-	111	-
Tetrachloro-m-xylene (surr.)	1	%	103	-	93	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-

Client Sample ID			BH92_0.0-0.2	BH93_0.0-0.2	BH97_0.0-0.2	BH100_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29220	S19-De29221	S19-De29222	S19-De29223
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	118	-	110	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	121	-	111	-
Tetrachloro-m-xylene (surr.)	1	%	103	-	93	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	< 1	-
Pentachlorophenol	1	mg/kg	< 1	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	< 0.2	-
2-Nitrophenol	1	mg/kg	< 1	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	< 0.4	-
4-Nitrophenol	5	mg/kg	< 5	-	< 5	-
Dinoseb	20	mg/kg	< 20	-	< 20	-
Phenol	0.5	mg/kg	< 0.5	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	< 20	-
Phenol-d6 (surr.)	1	%	96	-	84	-
% Moisture	1	%	3.1	5.3	3.5	15

Client Sample ID			BH92_0.0-0.2	BH93_0.0-0.2	BH97_0.0-0.2	BH100_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29220	S19-De29221	S19-De29222	S19-De29223
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	19	8.5	5.0	14
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	18	7.7	7.3	17
Copper	5	mg/kg	10.0	13	14	16
Lead	5	mg/kg	13	21	19	16
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	15	40	71	8.6

Client Sample ID			BH101_0.0-0.2	DUP_01	DUP_02	DUP_03
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29224	S19-De29225	S19-De29226	S19-De29227
Date Sampled			Dec 18, 2019	Dec 16, 2019	Dec 16, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	-
TRH C10-C14	20	mg/kg	< 20	-	-	-
TRH C15-C28	50	mg/kg	< 50	-	-	-
TRH C29-C36	50	mg/kg	57	-	-	-
TRH C10-C36 (Total)	50	mg/kg	57	-	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
4-Bromofluorobenzene (surr.)	1	%	93	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	-
TRH C6-C10	20	mg/kg	< 20	-	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	-
TRH >C10-C16	50	mg/kg	< 50	-	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	-	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH101_0.0-0.2	DUP_01	DUP_02	DUP_03
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-De29224	S19-De29225	S19-De29226	S19-De29227
Date Sampled			Dec 18, 2019	Dec 16, 2019	Dec 16, 2019	Dec 17, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	104	95	100	101
p-Terphenyl-d14 (surr.)	1	%	91	87	87	76
% Moisture	1	%	6.3	2.1	5.6	6.4
Heavy Metals						
Arsenic	2	mg/kg	14	16	8.5	19
Cadmium	0.4	mg/kg	0.5	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	20	34	15	24
Copper	5	mg/kg	23	15	13	21
Lead	5	mg/kg	62	29	28	36
Mercury	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	9.2	11	< 5	16
Zinc	5	mg/kg	140	56	43	40

Client Sample ID			DUP_04	DUP_14	BH94_0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-De29228	S19-De29229	S19-De29446
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	26
TRH C15-C28	50	mg/kg	-	-	200
TRH C29-C36	50	mg/kg	-	-	140
TRH C10-C36 (Total)	50	mg/kg	-	-	366
BTEX					
Benzene	0.1	mg/kg	-	-	< 0.1
Toluene	0.1	mg/kg	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2
o-Xylene	0.1	mg/kg	-	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	78
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5
TRH C6-C10	20	mg/kg	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20
TRH >C10-C16	50	mg/kg	-	-	< 50

Client Sample ID			DUP_04	DUP_14	BH94_0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S19-De29228	S19-De29229	S19-De29446
Date Sampled			Dec 18, 2019	Dec 18, 2019	Dec 18, 2019
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50
TRH >C16-C34	100	mg/kg	-	-	280
TRH >C34-C40	100	mg/kg	-	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	280
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	99	101	80
p-Terphenyl-d14 (surr.)	1	%	91	95	93
% Moisture	1	%	3.8	3.5	5.8
Heavy Metals					
Arsenic	2	mg/kg	3.8	5.4	7.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.9	8.0	9.1
Copper	5	mg/kg	25	12	14
Lead	5	mg/kg	36	22	18
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5
Zinc	5	mg/kg	93	70	38

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Dec 23, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Dec 23, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 23, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 23, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Dec 23, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Sydney	Dec 23, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Dec 23, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Dec 23, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Dec 23, 2019	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Dec 23, 2019	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Dec 23, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Dec 30, 2019	7 Days
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Dec 30, 2019	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
pH (1:5 Aqueous extract at 25°C as rec.)	Sydney	Dec 20, 2019	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
% Moisture	Sydney	Dec 19, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

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Project ID: 9996

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Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	BH01_0.0-0.2	Dec 16, 2019		Soil	S19-De29140	X							X	X			X
2	BH01_1.2-1.4	Dec 16, 2019		Soil	S19-De29141	X			X				X	X	X		X
3	BH02_0.0-0.2	Dec 16, 2019		Soil	S19-De29142	X							X	X			X
4	BH02_1.4-1.6	Dec 16, 2019		Soil	S19-De29143	X							X	X			X
5	BH03_0.0-0.2	Dec 16, 2019		Soil	S19-De29144	X							X	X			X
6	BH03_1.5-1.7	Dec 16, 2019		Soil	S19-De29145	X			X				X	X	X		X
7	BH04_0.2-0.4	Dec 17, 2019		Soil	S19-De29146	X							X	X			X
8	BH04_0.8-1.0	Dec 17, 2019		Soil	S19-De29147	X							X	X			X
9	BH05_0.2-0.4	Dec 17, 2019		Soil	S19-De29148	X							X	X			X
10	BH05_0.8-1.0	Dec 17, 2019		Soil	S19-De29149	X							X	X			X

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Project Name: MILPERRA
Project ID: 9996

Order No.:
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Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
11	BH06_0.0.-0.2	Dec 17, 2019		Soil	S19-De29150	X							X	X			X
12	BH06_0.5-0.7	Dec 17, 2019		Soil	S19-De29151	X							X	X			X
13	BH07_0.0-0.2	Dec 17, 2019		Soil	S19-De29152	X							X	X			X
14	BH07_0.5-0.7	Dec 16, 2019		Soil	S19-De29153				X					X	X		
15	BH08_0.0-0.2	Dec 18, 2019		Soil	S19-De29154	X							X	X			X
16	BH08_0.5-0.7	Dec 18, 2019		Soil	S19-De29155	X							X	X			X
17	BH10_0.1-0.3	Dec 16, 2019		Soil	S19-De29156									X		X	
18	BH11_0.0-0.2	Dec 16, 2019		Soil	S19-De29157	X							X	X			X
19	BH14_0.0-0.2	Dec 16, 2019		Soil	S19-De29158									X		X	
20	BH15_0.0-0.2	Dec 16, 2019		Soil	S19-De29159									X		X	
21	BH16_0.0-0.2	Dec 16, 2019		Soil	S19-De29160	X							X	X			X
22	BH17_0.0-0.2	Dec 16, 2019		Soil	S19-De29161	X							X	X			X
23	BH18_0.2-0.4	Dec 16, 2019		Soil	S19-De29162									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
24	BH19_0.0-0.2	Dec 16, 2019		Soil	S19-De29163									X		X	
25	BH20_0.0-0.15	Dec 16, 2019		Soil	S19-De29164									X		X	
26	BH21_0.1-0.3	Dec 16, 2019		Soil	S19-De29165	X							X	X			X
27	BH22_0.8-1.0	Dec 16, 2019		Soil	S19-De29166	X							X	X			X
28	BH23_0.0-0.2	Dec 16, 2019		Soil	S19-De29167	X							X	X			X
29	BH25_0.0-0.2	Dec 16, 2019		Soil	S19-De29168									X		X	
30	BH26_0.0-0.2	Dec 16, 2019		Soil	S19-De29169									X		X	
31	BH28_0.0-0.2	Dec 16, 2019		Soil	S19-De29170	X							X	X			X
32	BH28_0.8-1.0	Dec 16, 2019		Soil	S19-De29171	X							X	X			X
33	BH29_0.0-0.2	Dec 16, 2019		Soil	S19-De29172	X							X	X			X
34	BH30_0.0-0.2	Dec 16, 2019		Soil	S19-De29173									X		X	
35	BH31_0.0-0.2	Dec 16, 2019		Soil	S19-De29174									X		X	
36	BH32_0.0-0.2	Dec 16, 2019		Soil	S19-De29175									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
37	BH33_0.0-0.2	Dec 16, 2019		Soil	S19-De29176									X		X	
38	BH34_0.0-0.2	Dec 16, 2019		Soil	S19-De29177	X								X		X	
39	BH35_0.0-0.2	Dec 16, 2019		Soil	S19-De29178	X							X	X			X
40	BH36_0.0-0.2	Dec 16, 2019		Soil	S19-De29179	X							X	X			X
41	BH36_1.0-1.2	Dec 16, 2019		Soil	S19-De29180	X							X	X			X
42	BH36_2.0-2.2	Dec 16, 2019		Soil	S19-De29181									X		X	
43	BH37_0.3-0.5	Dec 16, 2019		Soil	S19-De29182	X							X	X			X
44	BH38_0.0-0.2	Dec 16, 2019		Soil	S19-De29183	X								X		X	
45	BH50_0.2-0.4	Dec 17, 2019		Soil	S19-De29184	X							X	X			X
46	BH51_0.2-0.4	Dec 17, 2019		Soil	S19-De29185									X		X	
47	BH52_0.2-0.4	Dec 17, 2019		Soil	S19-De29186									X		X	
48	BH52_0.8-1.0	Dec 17, 2019		Soil	S19-De29187				X					X	X		
49	BH57_0.2-0.4	Dec 17, 2019		Soil	S19-De29188	X							X	X			X

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
50	BH58_0.2-0.4	Dec 17, 2019		Soil	S19-De29189									X		X	
51	BH59_0.0-0.05	Dec 17, 2019		Soil	S19-De29190	X								X		X	
52	BH60_0.0-0.2	Dec 17, 2019		Soil	S19-De29191									X		X	
53	BH61_0.15-0.3	Dec 17, 2019		Soil	S19-De29192	X							X	X			X
54	BH62_0.0-0.15	Dec 17, 2019		Soil	S19-De29193									X		X	
55	BH64_0.0-0.1	Dec 17, 2019		Soil	S19-De29194									X		X	
56	BH65_0.0-0.1	Dec 18, 2019		Soil	S19-De29195	X							X	X			X
57	BH66_0.0-0.1	Dec 18, 2019		Soil	S19-De29196	X							X	X			X
58	BH66_0.3-0.5	Dec 18, 2019		Soil	S19-De29197								X	X			X
59	BH66_1.0-1.2	Dec 18, 2019		Soil	S19-De29198									X		X	
60	BH67_0.0-0.05	Dec 18, 2019		Soil	S19-De29199									X		X	
61	BH68_0.0-0.1	Dec 18, 2019		Soil	S19-De29200	X							X	X			X
62	BH69_0.05-0.2	Dec 17, 2019		Soil	S19-De29201									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
63	BH71_0.0-0.2	Dec 17, 2019		Soil	S19-De29202	X								X		X	
64	BH72_0.0-0.2	Dec 17, 2019		Soil	S19-De29203	X							X	X			X
65	BH73_0.0-0.2	Dec 17, 2019		Soil	S19-De29204									X		X	
66	BH74_0.0-0.2	Dec 17, 2019		Soil	S19-De29205	X							X	X			X
67	BH75_0.0-0.2	Dec 16, 2019		Soil	S19-De29206									X		X	
68	BH76_0.0-0.2	Dec 16, 2019		Soil	S19-De29207									X		X	
69	BH77_0.0-0.2	Dec 16, 2019		Soil	S19-De29208	X							X	X			X
70	BH78_0.0-0.2	Dec 16, 2019		Soil	S19-De29209									X		X	
71	BH79_0.0-0.2	Dec 16, 2019		Soil	S19-De29210									X		X	
72	BH80_0.0-0.2	Dec 17, 2019		Soil	S19-De29211									X		X	
73	BH81_0.2-0.4	Dec 17, 2019		Soil	S19-De29212	X							X	X			X
74	BH82_0.05-0.2	Dec 17, 2019		Soil	S19-De29213									X		X	
75	BH83_0.05-0.2	Dec 17, 2019		Soil	S19-De29214									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
76	BH84_0.05-0.2	Dec 17, 2019		Soil	S19-De29215									X		X	
77	BH86_0.0-0.2	Dec 17, 2019		Soil	S19-De29216									X		X	
78	BH87_0.0-0.2	Dec 18, 2019		Soil	S19-De29217									X		X	
79	BH88_0.0-0.2	Dec 18, 2019		Soil	S19-De29218									X		X	
80	BH89_0.0-0.2	Dec 18, 2019		Soil	S19-De29219	X							X	X			X
81	BH92_0.0-0.2	Dec 18, 2019		Soil	S19-De29220	X							X	X			X
82	BH93_0.0-0.2	Dec 18, 2019		Soil	S19-De29221									X		X	
83	BH97_0.0-0.2	Dec 18, 2019		Soil	S19-De29222	X							X	X			X
84	BH100_0.2-0.4	Dec 17, 2019		Soil	S19-De29223									X		X	
85	BH101_0.0-0.2	Dec 18, 2019		Soil	S19-De29224	X								X		X	
86	DUP_01	Dec 16, 2019		Soil	S19-De29225					X	X			X			
87	DUP_02	Dec 16, 2019		Soil	S19-De29226					X	X			X			
88	DUP_03	Dec 17, 2019		Soil	S19-De29227					X	X			X			

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
89	DUP_04	Dec 18, 2019		Soil	S19-De29228					X	X			X			
90	DUP_14	Dec 18, 2019		Soil	S19-De29229					X	X			X			
91	TRIP SPIKE_16/12/19	Dec 16, 2019		Water	S19-De29230							X					
92	TRIP BLANK_16/12/19	Dec 16, 2019		Water	S19-De29231							X					
93	TRIP SPIKE_17/12/19	Dec 17, 2019		Water	S19-De29232							X					
94	TRIP BLANK_17/12/19	Dec 17, 2019		Water	S19-De29233							X					
95	TRIP SPIKE_18/12/	Dec 18, 2019		Water	S19-De29234							X					

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Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILPERRA
Project ID: 9996

Order No.:
Report #: 694811
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
	SPIKE_18/12/19																
96	TRIP BLANK_18/12/19	Dec 18, 2019		Water	S19-De29235							X					
97	FCS_59	Not Provided		Building Materials	S19-De29236		X										
98	FCS_101	Not Provided		Building Materials	S19-De29237		X										
99	BH01_0.8-1.0	Dec 16, 2019		Soil	S19-De29250			X									
100	BH01_2.2-2.4	Dec 16, 2019		Soil	S19-De29251			X									
101	BH02_0.8-1.0	Dec 16, 2019		Soil	S19-De29252			X									
102	BH02_2.0-2.2	Dec 16, 2019		Soil	S19-De29253			X									
103	BH02_2.9-3.1	Dec 16, 2019		Soil	S19-De29254			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
104	BH03_0.8-1.0	Dec 16, 2019		Soil	S19-De29255			X									
105	BH03_2.3-2.5	Dec 16, 2019		Soil	S19-De29256			X									
106	BH03_3.3-3.5	Dec 16, 2019		Soil	S19-De29257			X									
107	BH05_1.3-1.5	Dec 17, 2019		Soil	S19-De29258			X									
108	BH07_1.4-1.6	Dec 17, 2019		Soil	S19-De29259			X									
109	BH08_1.4-1.6	Dec 18, 2019		Soil	S19-De29260			X									
110	BH10_0.7-0.9	Dec 16, 2019		Soil	S19-De29261			X									
111	BH11_0.2-0.4	Dec 16, 2019		Soil	S19-De29262			X									
112	BH14_0.2-0.4	Dec 16, 2019		Soil	S19-De29263			X									
113	BH15_0.2-0.4	Dec 16, 2019		Soil	S19-De29264			X									
114	BH16_0.8-1.0	Dec 16, 2019		Soil	S19-De29265			X									
115	BH16_2.4-2.6	Dec 16, 2019		Soil	S19-De29266			X									
116	BH17_0.8-1.0	Dec 16, 2019		Soil	S19-De29267			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
117	BH17_1.9-2.1	Dec 16, 2019		Soil	S19-De29268			X									
118	BH18_0.7-0.9	Dec 16, 2019		Soil	S19-De29269			X									
119	BH20_0.7-0.9	Dec 16, 2019		Soil	S19-De29270			X									
120	BH21_0.7-0.9	Dec 16, 2019		Soil	S19-De29271			X									
121	BH22_0.0-0.2	Dec 16, 2019		Soil	S19-De29272			X									
122	BH22_1.9-2.1	Dec 16, 2019		Soil	S19-De29273			X									
123	BH23_0.5-0.7	Dec 16, 2019		Soil	S19-De29274			X									
124	BH25_0.7-0.9	Dec 16, 2019		Soil	S19-De29275			X									
125	BH26_0.7-0.9	Dec 16, 2019		Soil	S19-De29276			X									
126	BH28_1.9-2.1	Dec 16, 2019		Soil	S19-De29277			X									
127	BH29_0.2-0.4	Dec 16, 2019		Soil	S19-De29278			X									
128	BH30_0.2-0.4	Dec 16, 2019		Soil	S19-De29279			X									
129	BH31_0.5-0.7	Dec 16, 2019		Soil	S19-De29280			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
130	BH32_0.5-0.7	Dec 16, 2019		Soil	S19-De29281			X									
131	BH33_0.3-0.5	Dec 16, 2019		Soil	S19-De29282			X									
132	BH35_0.8-1.0	Dec 16, 2019		Soil	S19-De29283			X									
133	BH37_0.8-1.0	Dec 16, 2019		Soil	S19-De29284			X									
134	BH38_0.7-0.9	Dec 16, 2019		Soil	S19-De29285			X									
135	BH50_0.8-1.0	Dec 17, 2019		Soil	S19-De29286			X									
136	BH51_0.8-1.0	Dec 17, 2019		Soil	S19-De29287			X									
137	BH57_0.8-1.0	Dec 17, 2019		Soil	S19-De29288			X									
138	BH58_0.8-1.0	Dec 17, 2019		Soil	S19-De29289			X									
139	BH59_0.1-0.3	Dec 17, 2019		Soil	S19-De29290			X									
140	BH60_0.2-0.4	Dec 17, 2019		Soil	S19-De29291			X									
141	BH61_0.7-0.9	Dec 17, 2019		Soil	S19-De29292			X									
142	BH62_0.2-0.4	Dec 17, 2019		Soil	S19-De29293			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
143	BH64_0.1-0.3	Dec 17, 2019		Soil	S19-De29294			X									
144	BH65_0.1-0.3	Dec 18, 2019		Soil	S19-De29295			X									
145	BH67_0.1-0.3	Dec 18, 2019		Soil	S19-De29296			X									
146	BH68_0.1-0.3	Dec 18, 2019		Soil	S19-De29297			X									
147	BH70_0.05-0.2	Dec 17, 2019		Soil	S19-De29298			X									
148	BH71_0.5-0.7	Dec 17, 2019		Soil	S19-De29299			X									
149	BH72_0.5-0.7	Dec 17, 2019		Soil	S19-De29300			X									
150	BH73_0.5-0.7	Dec 17, 2019		Soil	S19-De29301			X									
151	BH74_0.5-0.7	Dec 17, 2019		Soil	S19-De29302			X									
152	BH75_0.5-0.7	Dec 16, 2019		Soil	S19-De29303			X									
153	BH76_0.5-0.7	Dec 16, 2019		Soil	S19-De29304			X									
154	BH77_0.5-0.7	Dec 16, 2019		Soil	S19-De29305			X									
155	BH78_0.5-0.7	Dec 16, 2019		Soil	S19-De29306			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
156	BH79_0.5-0.7	Dec 16, 2019		Soil	S19-De29307			X									
157	BH80_0.5-0.7	Dec 17, 2019		Soil	S19-De29308			X									
158	BH81_0.5-0.7	Dec 17, 2019		Soil	S19-De29309			X									
159	BH83_0.7-0.9	Dec 17, 2019		Soil	S19-De29310			X									
160	BH84_0.4-0.6	Dec 17, 2019		Soil	S19-De29311			X									
161	BH86_0.5-0.7	Dec 18, 2019		Soil	S19-De29312			X									
162	BH87_0.7-0.9	Dec 18, 2019		Soil	S19-De29313			X									
163	BH88_0.5-0.7	Dec 18, 2019		Soil	S19-De29314			X									
164	BH89_0.6-0.8	Dec 18, 2019		Soil	S19-De29315			X									
165	BH92_0.5-0.7	Dec 18, 2019		Soil	S19-De29316			X									
166	BH93_0.6-0.8	Dec 18, 2019		Soil	S19-De29317			X									
167	BH94_0.6-0.8	Dec 18, 2019		Soil	S19-De29318			X									
168	BH97_0.9-1.1	Dec 18, 2019		Soil	S19-De29319			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
169	BH100_0.8-1.0	Dec 17, 2019		Soil	S19-De29320			X									
170	BH101_0.8-1.0	Dec 18, 2019		Soil	S19-De29321			X									
171	DUP10	Dec 17, 2019		Soil	S19-De29322			X									
172	DUP11	Dec 17, 2019		Soil	S19-De29323			X									
173	DUP12	Dec 16, 2019		Soil	S19-De29324			X									
174	DUP13	Dec 17, 2019		Soil	S19-De29325			X									
175	BH94_0.0-0.2	Dec 18, 2019		Soil	S19-De29446									X		X	
176	BH35_1.4-1.6	Dec 16, 2019		Soil	S19-De29449			X									
177	BH64_0.05-0.2	Dec 17, 2019		Soil	S19-De29450			X									
Test Counts						46	2	78	4	5	5	6	42	91	4	42	42

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	85			70-130	Pass	
TRH C10-C14	%	110			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	111			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	120			70-130	Pass	
TRH C6-C10	%	76			70-130	Pass	
TRH >C10-C16	%	106			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	89			70-130	Pass	
Acenaphthylene	%	103			70-130	Pass	
Anthracene	%	128			70-130	Pass	
Benz(a)anthracene	%	108			70-130	Pass	
Benzo(a)pyrene	%	112			70-130	Pass	
Benzo(b&j)fluoranthene	%	112			70-130	Pass	
Benzo(g.h.i)perylene	%	113			70-130	Pass	
Benzo(k)fluoranthene	%	114			70-130	Pass	
Chrysene	%	104			70-130	Pass	
Dibenz(a.h)anthracene	%	116			70-130	Pass	
Fluoranthene	%	105			70-130	Pass	
Fluorene	%	102			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	113			70-130	Pass	
Naphthalene	%	106			70-130	Pass	
Phenanthrene	%	122			70-130	Pass	
Pyrene	%	109			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	101			70-130	Pass	
4.4'-DDD	%	102			70-130	Pass	
4.4'-DDE	%	101			70-130	Pass	
4.4'-DDT	%	101			70-130	Pass	
a-BHC	%	101			70-130	Pass	
Aldrin	%	100			70-130	Pass	
b-BHC	%	98			70-130	Pass	
d-BHC	%	100			70-130	Pass	
Dieldrin	%	100			70-130	Pass	
Endosulfan I	%	95			70-130	Pass	
Endosulfan II	%	94			70-130	Pass	
Endosulfan sulphate	%	102			70-130	Pass	
Endrin	%	107			70-130	Pass	
Endrin aldehyde	%	100			70-130	Pass	
Endrin ketone	%	98			70-130	Pass	
g-BHC (Lindane)	%	99			70-130	Pass	
Heptachlor	%	96			70-130	Pass	
Heptachlor epoxide	%	106			70-130	Pass	
Hexachlorobenzene	%	100			70-130	Pass	
Methoxychlor	%	104			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	88			70-130	Pass	
Dimethoate	%	84			70-130	Pass	
Ethion	%	104			70-130	Pass	
Fenitrothion	%	97			70-130	Pass	
Methyl parathion	%	123			70-130	Pass	
Mevinphos	%	104			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	82			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	85			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4-Dichlorophenol	%	97			30-130	Pass	
2.4.5-Trichlorophenol	%	111			30-130	Pass	
2.4.6-Trichlorophenol	%	106			30-130	Pass	
2.6-Dichlorophenol	%	111			30-130	Pass	
4-Chloro-3-methylphenol	%	95			30-130	Pass	
Pentachlorophenol	%	87			30-130	Pass	
Tetrachlorophenols - Total	%	97			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	75			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	92			30-130	Pass	
2-Methylphenol (o-Cresol)	%	85			30-130	Pass	
2-Nitrophenol	%	114			30-130	Pass	
2.4-Dimethylphenol	%	115			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	98			30-130	Pass	
4-Nitrophenol	%	112			30-130	Pass	
Phenol	%	74			30-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	96			70-130	Pass	
Cadmium	%	97			70-130	Pass	
Chromium	%	100			70-130	Pass	
Copper	%	100			70-130	Pass	
Lead	%	95			70-130	Pass	
Mercury	%	98			70-130	Pass	
Nickel	%	100			70-130	Pass	
Zinc	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S19-De22720	NCP	%	88			70-130	Pass	
Acenaphthylene	S19-De22720	NCP	%	99			70-130	Pass	
Anthracene	S19-De22720	NCP	%	106			70-130	Pass	
Benz(a)anthracene	S19-De22720	NCP	%	110			70-130	Pass	
Benzo(a)pyrene	S19-De22720	NCP	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	S19-De22720	NCP	%	96			70-130	Pass	
Benzo(g.h.i)perylene	S19-De22720	NCP	%	97			70-130	Pass	
Benzo(k)fluoranthene	S19-De22720	NCP	%	94			70-130	Pass	
Chrysene	S19-De22720	NCP	%	99			70-130	Pass	
Dibenz(a.h)anthracene	S19-De22720	NCP	%	103			70-130	Pass	
Fluoranthene	S19-De22720	NCP	%	96			70-130	Pass	
Fluorene	S19-De22720	NCP	%	100			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-De22720	NCP	%	100			70-130	Pass	
Naphthalene	S19-De22720	NCP	%	99			70-130	Pass	
Phenanthrene	S19-De22720	NCP	%	103			70-130	Pass	
Pyrene	S19-De22720	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S19-De28705	NCP	%	94			70-130	Pass	
4.4'-DDD	S19-De28705	NCP	%	123			70-130	Pass	
4.4'-DDE	S19-De28705	NCP	%	96			70-130	Pass	
4.4'-DDT	S19-De23218	NCP	%	78			70-130	Pass	
a-BHC	S19-De28705	NCP	%	97			70-130	Pass	
Aldrin	S19-De28705	NCP	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
b-BHC	S19-De28705	NCP	%	92			70-130	Pass	
d-BHC	S19-De28705	NCP	%	95			70-130	Pass	
Dieldrin	S19-De28705	NCP	%	94			70-130	Pass	
Endosulfan I	S19-De28705	NCP	%	96			70-130	Pass	
Endosulfan II	S19-De28705	NCP	%	95			70-130	Pass	
Endosulfan sulphate	S19-De28705	NCP	%	92			70-130	Pass	
Endrin	S19-De28705	NCP	%	96			70-130	Pass	
Endrin aldehyde	S19-De28705	NCP	%	89			70-130	Pass	
Endrin ketone	S19-De28705	NCP	%	73			70-130	Pass	
g-BHC (Lindane)	S19-De28705	NCP	%	90			70-130	Pass	
Heptachlor	S19-De28705	NCP	%	79			70-130	Pass	
Heptachlor epoxide	S19-De28705	NCP	%	100			70-130	Pass	
Hexachlorobenzene	S19-De28705	NCP	%	96			70-130	Pass	
Methoxychlor	S19-De23218	NCP	%	80			70-130	Pass	
Toxaphene	S19-De23218	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S19-De22720	NCP	%	95			70-130	Pass	
Dimethoate	S19-De22720	NCP	%	92			70-130	Pass	
Ethion	S19-De22720	NCP	%	119			70-130	Pass	
Fenitrothion	S19-De22720	NCP	%	103			70-130	Pass	
Methyl parathion	S19-De22720	NCP	%	130			70-130	Pass	
Mevinphos	S19-De22720	NCP	%	112			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-De29162	CP	%	103			70-130	Pass	
Cadmium	S19-De29162	CP	%	102			70-130	Pass	
Chromium	S19-De29162	CP	%	107			70-130	Pass	
Copper	S19-De29162	CP	%	108			70-130	Pass	
Lead	S19-De29162	CP	%	100			70-130	Pass	
Mercury	S19-De29162	CP	%	94			70-130	Pass	
Nickel	S19-De29162	CP	%	113			70-130	Pass	
Zinc	S19-De29162	CP	%	123			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-De29181	CP	%	80			70-130	Pass	
TRH C10-C14	S19-De29181	CP	%	79			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-De29181	CP	%	98			70-130	Pass	
Toluene	S19-De29181	CP	%	98			70-130	Pass	
Ethylbenzene	S19-De29181	CP	%	95			70-130	Pass	
m&p-Xylenes	S19-De29181	CP	%	97			70-130	Pass	
o-Xylene	S19-De29181	CP	%	94			70-130	Pass	
Xylenes - Total	S19-De29181	CP	%	96			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-De29181	CP	%	90			70-130	Pass	
TRH C6-C10	S19-De29181	CP	%	72			70-130	Pass	
TRH >C10-C16	S19-De29181	CP	%	76			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-De29208	CP	%	92			70-130	Pass	
Cadmium	S19-De29208	CP	%	95			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium	S19-De29208	CP	%	94			70-130	Pass	
Copper	S19-De29208	CP	%	97			70-130	Pass	
Lead	S19-De29208	CP	%	100			70-130	Pass	
Mercury	S19-De29208	CP	%	114			70-130	Pass	
Nickel	S19-De29208	CP	%	99			70-130	Pass	
Zinc	S19-De29208	CP	%	82			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-De29213	CP	%	110			70-130	Pass	
Cadmium	S19-De29213	CP	%	103			70-130	Pass	
Chromium	S19-De29213	CP	%	98			70-130	Pass	
Copper	S19-De29213	CP	%	83			70-130	Pass	
Lead	S19-De29213	CP	%	99			70-130	Pass	
Mercury	S19-De29213	CP	%	111			70-130	Pass	
Nickel	S19-De29213	CP	%	88			70-130	Pass	
Zinc	S19-De29213	CP	%	81			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S19-De29222	CP	%	80			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S19-De29222	CP	%	76			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-De29223	CP	%	110			70-130	Pass	
Cadmium	S19-De29223	CP	%	111			70-130	Pass	
Chromium	S19-De29223	CP	%	101			70-130	Pass	
Copper	S19-De29223	CP	%	92			70-130	Pass	
Lead	S19-De29223	CP	%	100			70-130	Pass	
Mercury	S19-De29223	CP	%	124			70-130	Pass	
Nickel	S19-De29223	CP	%	95			70-130	Pass	
Zinc	S19-De29223	CP	%	91			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Toxaphene	S19-De28703	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29140	CP	mg/kg	6.3	8.9	35	30%	Fail	Q15
Cadmium	S19-De29140	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29140	CP	mg/kg	17	21	22	30%	Pass	
Copper	S19-De29140	CP	mg/kg	14	13	5.0	30%	Pass	
Lead	S19-De29140	CP	mg/kg	16	19	18	30%	Pass	
Mercury	S19-De29140	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29140	CP	mg/kg	6.3	6.0	5.0	30%	Pass	
Zinc	S19-De29140	CP	mg/kg	43	47	10	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	B19-De26048	NCP	uS/cm	260	250	5.2	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S19-De29141	CP	pH Units	5.6	5.3	Pass	30%	Pass	
Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	B19-De28447	NCP	meq/100g	19	19	4.0	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-De29149	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S19-De29149	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-De29149	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-De29149	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-De29149	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-De29149	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-De29149	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-De29149	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-De29149	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-De29149	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S19-De29149	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-De29149	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-De29149	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-De29149	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
g-BHC (Lindane)	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-De29149	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S19-De29149	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S19-De29149	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S19-De29149	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S19-De29149	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Total PCB*	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-De29149	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-De29149	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S19-De29149	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-De29149	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-De29149	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-De29149	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-De29149	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-De29149	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-De29149	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-De29149	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-De29149	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-De29149	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-De29149	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-De29149	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S19-De29155	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-De29155	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-De29155	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S19-De29155	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-De29155	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-De29155	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Chlorpyrifos-methyl	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S19-De29155	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S19-De29155	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S19-De29155	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-De29155	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-De29155	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S19-De29155	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-De29155	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-De29155	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-De29155	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-De29155	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-De29155	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-De29155	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-De29155	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-De29155	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-De29155	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-De29155	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-De29155	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-De29155	CP	%	20	20	2.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29161	CP	mg/kg	16	15	12	30%	Pass	
Cadmium	S19-De29161	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29161	CP	mg/kg	19	22	14	30%	Pass	
Copper	S19-De29161	CP	mg/kg	9.7	11	11	30%	Pass	
Lead	S19-De29161	CP	mg/kg	18	19	8.0	30%	Pass	
Mercury	S19-De29161	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29161	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-De29161	CP	mg/kg	36	39	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-De29165	CP	%	1.5	2.0	29	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29171	CP	mg/kg	4.3	4.4	2.0	30%	Pass	
Cadmium	S19-De29171	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29171	CP	mg/kg	27	24	9.0	30%	Pass	
Copper	S19-De29171	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S19-De29171	CP	mg/kg	8.9	8.9	1.0	30%	Pass	
Mercury	S19-De29171	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29171	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-De29171	CP	mg/kg	6.1	5.6	8.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-De29175	CP	%	5.5	8.3	41	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S19-De29180	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-De29180	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-De29180	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S19-De29180	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-De29180	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-De29180	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S19-De29180	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Total PCB*	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-De29180	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-De29180	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S19-De29180	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-De29180	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-De29180	CP	mg/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-De29180	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-De29180	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-De29180	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-De29180	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-De29180	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-De29180	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-De29180	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-De29180	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-De29180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29181	CP	mg/kg	12	12	2.0	30%	Pass	
Cadmium	S19-De29181	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29181	CP	mg/kg	27	27	3.0	30%	Pass	
Copper	S19-De29181	CP	mg/kg	24	24	1.0	30%	Pass	
Lead	S19-De29181	CP	mg/kg	20	24	15	30%	Pass	
Mercury	S19-De29181	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29181	CP	mg/kg	< 5	5.1	12	30%	Pass	
Zinc	S19-De29181	CP	mg/kg	23	25	10	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-De29185	CP	%	14	14	2.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29191	CP	mg/kg	14	14	4.0	30%	Pass	
Cadmium	S19-De29191	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29191	CP	mg/kg	19	19	1.0	30%	Pass	
Copper	S19-De29191	CP	mg/kg	21	21	1.0	30%	Pass	
Lead	S19-De29191	CP	mg/kg	15	16	1.0	30%	Pass	
Mercury	S19-De29191	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29191	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-De29191	CP	mg/kg	16	16	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29192	CP	mg/kg	6.0	8.0	29	30%	Pass	
Cadmium	S19-De29192	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29192	CP	mg/kg	17	14	22	30%	Pass	
Copper	S19-De29192	CP	mg/kg	17	19	14	30%	Pass	
Lead	S19-De29192	CP	mg/kg	15	17	9.0	30%	Pass	
Mercury	S19-De29192	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29192	CP	mg/kg	12	8.3	39	30%	Fail	Q15
Zinc	S19-De29192	CP	mg/kg	28	29	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-De29195	CP	%	6.2	5.3	16	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29202	CP	mg/kg	12	10	15	30%	Pass	
Cadmium	S19-De29202	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29202	CP	mg/kg	15	13	13	30%	Pass	
Copper	S19-De29202	CP	mg/kg	28	26	4.0	30%	Pass	
Lead	S19-De29202	CP	mg/kg	65	58	11	30%	Pass	
Mercury	S19-De29202	CP	mg/kg	0.1	0.1	2.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Nickel	S19-De29202	CP	mg/kg	6.6	6.0	9.0	30%	Pass	
Zinc	S19-De29202	CP	mg/kg	110	100	9.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-De29205	CP	%	5.9	5.9	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29212	CP	mg/kg	5.8	5.8	<1	30%	Pass	
Cadmium	S19-De29212	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29212	CP	mg/kg	15	13	11	30%	Pass	
Copper	S19-De29212	CP	mg/kg	14	15	7.0	30%	Pass	
Lead	S19-De29212	CP	mg/kg	18	15	22	30%	Pass	
Mercury	S19-De29212	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29212	CP	mg/kg	7.4	8.1	10	30%	Pass	
Zinc	S19-De29212	CP	mg/kg	25	22	10	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-De29215	CP	%	2.9	3.4	17	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S19-De29220	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-De29220	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-De29220	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S19-De29220	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-De29220	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-De29220	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-De29220	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-De29220	CP	mg/kg	0.17	0.19	8.0	30%	Pass	
4.4'-DDT	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
b-BHC	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-De29220	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S19-De29220	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S19-De29220	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S19-De29220	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S19-De29220	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Total PCB*	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-De29220	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-De29220	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S19-De29220	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-De29220	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-De29220	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-De29220	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-De29220	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-De29220	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-De29220	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-De29220	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-De29220	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-De29220	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-De29220	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-De29220	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-De29221	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-De29221	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-De29221	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-De29221	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-De29221	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-De29221	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-De29221	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-De29221	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-De29221	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29222	CP	mg/kg	5.0	5.4	8.0	30%	Pass	
Cadmium	S19-De29222	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29222	CP	mg/kg	7.3	7.5	4.0	30%	Pass	
Copper	S19-De29222	CP	mg/kg	14	14	<1	30%	Pass	
Lead	S19-De29222	CP	mg/kg	19	20	8.0	30%	Pass	
Mercury	S19-De29222	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29222	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-De29222	CP	mg/kg	71	76	7.0	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-De29226	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29229	CP	mg/kg	5.4	5.1	4.0	30%	Pass	
Cadmium	S19-De29229	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29229	CP	mg/kg	8.0	7.2	12	30%	Pass	
Copper	S19-De29229	CP	mg/kg	12	11	8.0	30%	Pass	
Lead	S19-De29229	CP	mg/kg	22	20	8.0	30%	Pass	
Mercury	S19-De29229	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29229	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-De29229	CP	mg/kg	70	90	25	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-De29446	CP	mg/kg	7.3	5.7	23	30%	Pass	
Cadmium	S19-De29446	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-De29446	CP	mg/kg	9.1	7.8	15	30%	Pass	
Copper	S19-De29446	CP	mg/kg	14	15	1.0	30%	Pass	
Lead	S19-De29446	CP	mg/kg	18	19	6.0	30%	Pass	
Mercury	S19-De29446	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-De29446	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-De29446	CP	mg/kg	38	41	9.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Gabriele Cordero	Senior Analyst-Inorganic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Julie Kay	Senior Analyst-Inorganic (VIC)
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Scott Beddoes	Senior Analyst-Inorganic (VIC)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

Attention:	Sam Scully
Report	694811-AID
Project Name	MILPERRA
Project ID	9996
Received Date	Dec 19, 2019
Date Reported	Jan 08, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Project Name MILPERRA
Project ID 9996
Date Sampled Dec 18, 2019
Report 694811-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH01_0.0-0.2	19-De29140	Dec 16, 2019	Approximate Sample 869g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH01_1.2-1.4	19-De29141	Dec 16, 2019	Approximate Sample 414g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH02_0.0-0.2	19-De29142	Dec 16, 2019	Approximate Sample 662g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH02_1.4-1.6	19-De29143	Dec 16, 2019	Approximate Sample 468g Sample consisted of: Brown coarse-grained clayey soil, bituminous material and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH03_0.0-0.2	19-De29144	Dec 16, 2019	Approximate Sample 598g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH03_1.5-1.7	19-De29145	Dec 16, 2019	Approximate Sample 570g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH04_0.2-0.4	19-De29146	Dec 17, 2019	Approximate Sample 361g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH04_0.8-1.0	19-De29147	Dec 17, 2019	Approximate Sample 517g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH05_0.2-0.4	19-De29148	Dec 17, 2019	Approximate Sample 546g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH05_0.8-1.0	19-De29149	Dec 17, 2019	Approximate Sample 392g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH06_0.0.-0.2	19-De29150	Dec 17, 2019	Approximate Sample 608g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH06_0.5-0.7	19-De29151	Dec 17, 2019	Approximate Sample 326g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH07_0.0-0.2	19-De29152	Dec 17, 2019	Approximate Sample 602g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH08_0.0-0.2	19-De29154	Dec 18, 2019	Approximate Sample 698g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH08_0.5-0.7	19-De29155	Dec 18, 2019	Approximate Sample 427g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH11_0.0-0.2	19-De29157	Dec 16, 2019	Approximate Sample 476g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH16_0.0-0.2	19-De29160	Dec 16, 2019	Approximate Sample 975g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH17_0.0-0.2	19-De29161	Dec 16, 2019	Approximate Sample 1035g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH21_0.1-0.3	19-De29165	Dec 16, 2019	Approximate Sample 989g Sample consisted of: Brown coarse-grained soil, fragments of glass and rocks	FA: Chrysotile asbestos detected in weathered fibre cement material Approximate raw weight of FA = 0.0051g Estimated asbestos content in FA = 0.0020g* Total estimated asbestos concentration in FA = 0.00021% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH22_0.8-1.0	19-De29166	Dec 16, 2019	Approximate Sample 905g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH23_0.0-0.2	19-De29167	Dec 16, 2019	Approximate Sample 868g Sample consisted of: Brown coarse-grained soil, bituminous material and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH28_0.0-0.2	19-De29170	Dec 16, 2019	Approximate Sample 993g Sample consisted of: Brown coarse-grained soil, cement, brick, fragments of glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH28_0.8-1.0	19-De29171	Dec 16, 2019	Approximate Sample 736g Sample consisted of: Brown coarse-grained clayey soil, plaster and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH29_0.0-0.2	19-De29172	Dec 16, 2019	Approximate Sample 589g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH34_0.0-0.2	19-De29177	Dec 16, 2019	Approximate Sample 413g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH35_0.0-0.2	19-De29178	Dec 16, 2019	Approximate Sample 766g Sample consisted of: Brown coarse-grained clayey soil, cement, brick and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH36_0.0-0.2	19-De29179	Dec 16, 2019	Approximate Sample 560g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH36_1.0-1.2	19-De29180	Dec 16, 2019	Approximate Sample 971g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH37_0.3-0.5	19-De29182	Dec 16, 2019	Approximate Sample 729g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH38_0.0-0.2	19-De29183	Dec 16, 2019	Approximate Sample 960g Sample consisted of: Brown coarse-grained soil, brick, fragments of glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH50_0.2-0.4	19-De29184	Dec 17, 2019	Approximate Sample 866g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH57_0.2-0.4	19-De29188	Dec 17, 2019	Approximate Sample 475g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH59_0.0-0.05	19-De29190	Dec 17, 2019	Approximate Sample 1018g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH61_0.15-0.3	19-De29192	Dec 17, 2019	Approximate Sample 952g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH65_0.0-0.1	19-De29195	Dec 18, 2019	Approximate Sample 551g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH66_0.0-0.1	19-De29196	Dec 18, 2019	Approximate Sample 717g Sample consisted of: Brown coarse-grained clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH68_0.0-0.1	19-De29200	Dec 18, 2019	Approximate Sample 751g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH71_0.0-0.2	19-De29202	Dec 17, 2019	Approximate Sample 413g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH72_0.0-0.2	19-De29203	Dec 17, 2019	Approximate Sample 500g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH74_0.0-0.2	19-De29205	Dec 17, 2019	Approximate Sample 358g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH77_0.0-0.2	19-De29208	Dec 16, 2019	Approximate Sample 751g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH81_0.2-0.4	19-De29212	Dec 17, 2019	Approximate Sample 611g Sample consisted of: Brown coarse-grained clayey soil, brick and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH89_0.0-0.2	19-De29219	Dec 18, 2019	Approximate Sample 561g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH92_0.0-0.2	19-De29220	Dec 18, 2019	Approximate Sample 767g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH97_0.0-0.2	19-De29222	Dec 18, 2019	Approximate Sample 505g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

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The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH101_0.0-0.2	19-De29224	Dec 18, 2019	Approximate Sample 392g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
FCS_59	19-De29236	not provided	Approximate Sample 9g / 75x55x5mm Sample consisted of: Yellow fibre cement sheet	Chrysotile asbestos detected.
FCS_101	19-De29237	not provided	Approximate Sample 11g / 50x45x5mm Sample consisted of: Grey fibre cement sheet	Chrysotile asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Dec 19, 2019	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Dec 19, 2019	Indefinite

eurofins | Environment Testing

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Address: 10 Welder Road
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NSW 2147

Project Name: MILPERRA
Project ID: 9996

Order No.:
Report #: 694811
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	BH01_0.0-0.2	Dec 16, 2019		Soil	S19-De29140	X							X	X			X
2	BH01_1.2-1.4	Dec 16, 2019		Soil	S19-De29141	X			X				X	X	X		X
3	BH02_0.0-0.2	Dec 16, 2019		Soil	S19-De29142	X							X	X			X
4	BH02_1.4-1.6	Dec 16, 2019		Soil	S19-De29143	X							X	X			X
5	BH03_0.0-0.2	Dec 16, 2019		Soil	S19-De29144	X							X	X			X
6	BH03_1.5-1.7	Dec 16, 2019		Soil	S19-De29145	X			X				X	X	X		X
7	BH04_0.2-0.4	Dec 17, 2019		Soil	S19-De29146	X							X	X			X
8	BH04_0.8-1.0	Dec 17, 2019		Soil	S19-De29147	X							X	X			X
9	BH05_0.2-0.4	Dec 17, 2019		Soil	S19-De29148	X							X	X			X
10	BH05_0.8-1.0	Dec 17, 2019		Soil	S19-De29149	X							X	X			X

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NSW 2147

Project Name: MILPERRA
Project ID: 9996

Order No.:
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Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
11	BH06_0.0.-0.2	Dec 17, 2019		Soil	S19-De29150	X							X	X			X
12	BH06_0.5-0.7	Dec 17, 2019		Soil	S19-De29151	X							X	X			X
13	BH07_0.0-0.2	Dec 17, 2019		Soil	S19-De29152	X							X	X			X
14	BH07_0.5-0.7	Dec 16, 2019		Soil	S19-De29153				X					X	X		
15	BH08_0.0-0.2	Dec 18, 2019		Soil	S19-De29154	X							X	X			X
16	BH08_0.5-0.7	Dec 18, 2019		Soil	S19-De29155	X							X	X			X
17	BH10_0.1-0.3	Dec 16, 2019		Soil	S19-De29156									X		X	
18	BH11_0.0-0.2	Dec 16, 2019		Soil	S19-De29157	X							X	X			X
19	BH14_0.0-0.2	Dec 16, 2019		Soil	S19-De29158									X		X	
20	BH15_0.0-0.2	Dec 16, 2019		Soil	S19-De29159									X		X	
21	BH16_0.0-0.2	Dec 16, 2019		Soil	S19-De29160	X							X	X			X
22	BH17_0.0-0.2	Dec 16, 2019		Soil	S19-De29161	X							X	X			X
23	BH18_0.2-0.4	Dec 16, 2019		Soil	S19-De29162									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
24	BH19_0.0-0.2	Dec 16, 2019		Soil	S19-De29163									X		X	
25	BH20_0.0-0.15	Dec 16, 2019		Soil	S19-De29164									X		X	
26	BH21_0.1-0.3	Dec 16, 2019		Soil	S19-De29165	X							X	X			X
27	BH22_0.8-1.0	Dec 16, 2019		Soil	S19-De29166	X							X	X			X
28	BH23_0.0-0.2	Dec 16, 2019		Soil	S19-De29167	X							X	X			X
29	BH25_0.0-0.2	Dec 16, 2019		Soil	S19-De29168									X		X	
30	BH26_0.0-0.2	Dec 16, 2019		Soil	S19-De29169									X		X	
31	BH28_0.0-0.2	Dec 16, 2019		Soil	S19-De29170	X							X	X			X
32	BH28_0.8-1.0	Dec 16, 2019		Soil	S19-De29171	X							X	X			X
33	BH29_0.0-0.2	Dec 16, 2019		Soil	S19-De29172	X							X	X			X
34	BH30_0.0-0.2	Dec 16, 2019		Soil	S19-De29173									X		X	
35	BH31_0.0-0.2	Dec 16, 2019		Soil	S19-De29174									X		X	
36	BH32_0.0-0.2	Dec 16, 2019		Soil	S19-De29175									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
37	BH33_0.0-0.2	Dec 16, 2019		Soil	S19-De29176									X		X	
38	BH34_0.0-0.2	Dec 16, 2019		Soil	S19-De29177	X								X		X	
39	BH35_0.0-0.2	Dec 16, 2019		Soil	S19-De29178	X							X	X			X
40	BH36_0.0-0.2	Dec 16, 2019		Soil	S19-De29179	X							X	X			X
41	BH36_1.0-1.2	Dec 16, 2019		Soil	S19-De29180	X							X	X			X
42	BH36_2.0-2.2	Dec 16, 2019		Soil	S19-De29181									X		X	
43	BH37_0.3-0.5	Dec 16, 2019		Soil	S19-De29182	X							X	X			X
44	BH38_0.0-0.2	Dec 16, 2019		Soil	S19-De29183	X								X		X	
45	BH50_0.2-0.4	Dec 17, 2019		Soil	S19-De29184	X							X	X			X
46	BH51_0.2-0.4	Dec 17, 2019		Soil	S19-De29185									X		X	
47	BH52_0.2-0.4	Dec 17, 2019		Soil	S19-De29186									X		X	
48	BH52_0.8-1.0	Dec 17, 2019		Soil	S19-De29187				X					X	X		
49	BH57_0.2-0.4	Dec 17, 2019		Soil	S19-De29188	X							X	X			X

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
50	BH58_0.2-0.4	Dec 17, 2019		Soil	S19-De29189									X		X	
51	BH59_0.0-0.05	Dec 17, 2019		Soil	S19-De29190	X								X		X	
52	BH60_0.0-0.2	Dec 17, 2019		Soil	S19-De29191									X		X	
53	BH61_0.15-0.3	Dec 17, 2019		Soil	S19-De29192	X							X	X			X
54	BH62_0.0-0.15	Dec 17, 2019		Soil	S19-De29193									X		X	
55	BH64_0.0-0.1	Dec 17, 2019		Soil	S19-De29194									X		X	
56	BH65_0.0-0.1	Dec 18, 2019		Soil	S19-De29195	X							X	X			X
57	BH66_0.0-0.1	Dec 18, 2019		Soil	S19-De29196	X							X	X			X
58	BH66_0.3-0.5	Dec 18, 2019		Soil	S19-De29197								X	X			X
59	BH66_1.0-1.2	Dec 18, 2019		Soil	S19-De29198									X		X	
60	BH67_0.0-0.05	Dec 18, 2019		Soil	S19-De29199									X		X	
61	BH68_0.0-0.1	Dec 18, 2019		Soil	S19-De29200	X							X	X			X
62	BH69_0.05-0.2	Dec 17, 2019		Soil	S19-De29201									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
63	BH71_0.0-0.2	Dec 17, 2019		Soil	S19-De29202	X								X		X	
64	BH72_0.0-0.2	Dec 17, 2019		Soil	S19-De29203	X							X	X			X
65	BH73_0.0-0.2	Dec 17, 2019		Soil	S19-De29204									X		X	
66	BH74_0.0-0.2	Dec 17, 2019		Soil	S19-De29205	X							X	X			X
67	BH75_0.0-0.2	Dec 16, 2019		Soil	S19-De29206									X		X	
68	BH76_0.0-0.2	Dec 16, 2019		Soil	S19-De29207									X		X	
69	BH77_0.0-0.2	Dec 16, 2019		Soil	S19-De29208	X							X	X			X
70	BH78_0.0-0.2	Dec 16, 2019		Soil	S19-De29209									X		X	
71	BH79_0.0-0.2	Dec 16, 2019		Soil	S19-De29210									X		X	
72	BH80_0.0-0.2	Dec 17, 2019		Soil	S19-De29211									X		X	
73	BH81_0.2-0.4	Dec 17, 2019		Soil	S19-De29212	X							X	X			X
74	BH82_0.05-0.2	Dec 17, 2019		Soil	S19-De29213									X		X	
75	BH83_0.05-0.2	Dec 17, 2019		Soil	S19-De29214									X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
76	BH84_0.05-0.2	Dec 17, 2019		Soil	S19-De29215									X		X	
77	BH86_0.0-0.2	Dec 17, 2019		Soil	S19-De29216									X		X	
78	BH87_0.0-0.2	Dec 18, 2019		Soil	S19-De29217									X		X	
79	BH88_0.0-0.2	Dec 18, 2019		Soil	S19-De29218									X		X	
80	BH89_0.0-0.2	Dec 18, 2019		Soil	S19-De29219	X							X	X			X
81	BH92_0.0-0.2	Dec 18, 2019		Soil	S19-De29220	X							X	X			X
82	BH93_0.0-0.2	Dec 18, 2019		Soil	S19-De29221									X		X	
83	BH97_0.0-0.2	Dec 18, 2019		Soil	S19-De29222	X							X	X			X
84	BH100_0.2-0.4	Dec 17, 2019		Soil	S19-De29223									X		X	
85	BH101_0.0-0.2	Dec 18, 2019		Soil	S19-De29224	X								X		X	
86	DUP_01	Dec 16, 2019		Soil	S19-De29225					X	X			X			
87	DUP_02	Dec 16, 2019		Soil	S19-De29226					X	X			X			
88	DUP_03	Dec 17, 2019		Soil	S19-De29227					X	X			X			

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
89	DUP_04	Dec 18, 2019		Soil	S19-De29228					X	X			X			
90	DUP_14	Dec 18, 2019		Soil	S19-De29229					X	X			X			
91	TRIP SPIKE_16/12/19	Dec 16, 2019		Water	S19-De29230							X					
92	TRIP BLANK_16/12/19	Dec 16, 2019		Water	S19-De29231							X					
93	TRIP SPIKE_17/12/19	Dec 17, 2019		Water	S19-De29232							X					
94	TRIP BLANK_17/12/19	Dec 17, 2019		Water	S19-De29233							X					
95	TRIP SPIKE_18/12/	Dec 18, 2019		Water	S19-De29234							X					

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NATA # 1261 Site # 20794

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Christchurch
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Phone : 0800 856 450
IANZ # 1290

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147

Project Name: MILPERRA
Project ID: 9996

Order No.:
Report #: 694811
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Dec 19, 2019 5:02 PM
Due: Jan 8, 2020
Priority: 10 Day
Contact Name: Sam Scully

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
	SPIKE_18/12/19																
96	TRIP BLANK_18/12/19	Dec 18, 2019		Water	S19-De29235							X					
97	FCS_59	Not Provided		Building Materials	S19-De29236		X										
98	FCS_101	Not Provided		Building Materials	S19-De29237		X										
99	BH01_0.8-1.0	Dec 16, 2019		Soil	S19-De29250			X									
100	BH01_2.2-2.4	Dec 16, 2019		Soil	S19-De29251			X									
101	BH02_0.8-1.0	Dec 16, 2019		Soil	S19-De29252			X									
102	BH02_2.0-2.2	Dec 16, 2019		Soil	S19-De29253			X									
103	BH02_2.9-3.1	Dec 16, 2019		Soil	S19-De29254			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
104	BH03_0.8-1.0	Dec 16, 2019		Soil	S19-De29255			X									
105	BH03_2.3-2.5	Dec 16, 2019		Soil	S19-De29256			X									
106	BH03_3.3-3.5	Dec 16, 2019		Soil	S19-De29257			X									
107	BH05_1.3-1.5	Dec 17, 2019		Soil	S19-De29258			X									
108	BH07_1.4-1.6	Dec 17, 2019		Soil	S19-De29259			X									
109	BH08_1.4-1.6	Dec 18, 2019		Soil	S19-De29260			X									
110	BH10_0.7-0.9	Dec 16, 2019		Soil	S19-De29261			X									
111	BH11_0.2-0.4	Dec 16, 2019		Soil	S19-De29262			X									
112	BH14_0.2-0.4	Dec 16, 2019		Soil	S19-De29263			X									
113	BH15_0.2-0.4	Dec 16, 2019		Soil	S19-De29264			X									
114	BH16_0.8-1.0	Dec 16, 2019		Soil	S19-De29265			X									
115	BH16_2.4-2.6	Dec 16, 2019		Soil	S19-De29266			X									
116	BH17_0.8-1.0	Dec 16, 2019		Soil	S19-De29267			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
117	BH17_1.9-2.1	Dec 16, 2019		Soil	S19-De29268			X									
118	BH18_0.7-0.9	Dec 16, 2019		Soil	S19-De29269			X									
119	BH20_0.7-0.9	Dec 16, 2019		Soil	S19-De29270			X									
120	BH21_0.7-0.9	Dec 16, 2019		Soil	S19-De29271			X									
121	BH22_0.0-0.2	Dec 16, 2019		Soil	S19-De29272			X									
122	BH22_1.9-2.1	Dec 16, 2019		Soil	S19-De29273			X									
123	BH23_0.5-0.7	Dec 16, 2019		Soil	S19-De29274			X									
124	BH25_0.7-0.9	Dec 16, 2019		Soil	S19-De29275			X									
125	BH26_0.7-0.9	Dec 16, 2019		Soil	S19-De29276			X									
126	BH28_1.9-2.1	Dec 16, 2019		Soil	S19-De29277			X									
127	BH29_0.2-0.4	Dec 16, 2019		Soil	S19-De29278			X									
128	BH30_0.2-0.4	Dec 16, 2019		Soil	S19-De29279			X									
129	BH31_0.5-0.7	Dec 16, 2019		Soil	S19-De29280			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
130	BH32_0.5-0.7	Dec 16, 2019		Soil	S19-De29281			X									
131	BH33_0.3-0.5	Dec 16, 2019		Soil	S19-De29282			X									
132	BH35_0.8-1.0	Dec 16, 2019		Soil	S19-De29283			X									
133	BH37_0.8-1.0	Dec 16, 2019		Soil	S19-De29284			X									
134	BH38_0.7-0.9	Dec 16, 2019		Soil	S19-De29285			X									
135	BH50_0.8-1.0	Dec 17, 2019		Soil	S19-De29286			X									
136	BH51_0.8-1.0	Dec 17, 2019		Soil	S19-De29287			X									
137	BH57_0.8-1.0	Dec 17, 2019		Soil	S19-De29288			X									
138	BH58_0.8-1.0	Dec 17, 2019		Soil	S19-De29289			X									
139	BH59_0.1-0.3	Dec 17, 2019		Soil	S19-De29290			X									
140	BH60_0.2-0.4	Dec 17, 2019		Soil	S19-De29291			X									
141	BH61_0.7-0.9	Dec 17, 2019		Soil	S19-De29292			X									
142	BH62_0.2-0.4	Dec 17, 2019		Soil	S19-De29293			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
143	BH64_0.1-0.3	Dec 17, 2019		Soil	S19-De29294			X									
144	BH65_0.1-0.3	Dec 18, 2019		Soil	S19-De29295			X									
145	BH67_0.1-0.3	Dec 18, 2019		Soil	S19-De29296			X									
146	BH68_0.1-0.3	Dec 18, 2019		Soil	S19-De29297			X									
147	BH70_0.05-0.2	Dec 17, 2019		Soil	S19-De29298			X									
148	BH71_0.5-0.7	Dec 17, 2019		Soil	S19-De29299			X									
149	BH72_0.5-0.7	Dec 17, 2019		Soil	S19-De29300			X									
150	BH73_0.5-0.7	Dec 17, 2019		Soil	S19-De29301			X									
151	BH74_0.5-0.7	Dec 17, 2019		Soil	S19-De29302			X									
152	BH75_0.5-0.7	Dec 16, 2019		Soil	S19-De29303			X									
153	BH76_0.5-0.7	Dec 16, 2019		Soil	S19-De29304			X									
154	BH77_0.5-0.7	Dec 16, 2019		Soil	S19-De29305			X									
155	BH78_0.5-0.7	Dec 16, 2019		Soil	S19-De29306			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
156	BH79_0.5-0.7	Dec 16, 2019		Soil	S19-De29307			X									
157	BH80_0.5-0.7	Dec 17, 2019		Soil	S19-De29308			X									
158	BH81_0.5-0.7	Dec 17, 2019		Soil	S19-De29309			X									
159	BH83_0.7-0.9	Dec 17, 2019		Soil	S19-De29310			X									
160	BH84_0.4-0.6	Dec 17, 2019		Soil	S19-De29311			X									
161	BH86_0.5-0.7	Dec 18, 2019		Soil	S19-De29312			X									
162	BH87_0.7-0.9	Dec 18, 2019		Soil	S19-De29313			X									
163	BH88_0.5-0.7	Dec 18, 2019		Soil	S19-De29314			X									
164	BH89_0.6-0.8	Dec 18, 2019		Soil	S19-De29315			X									
165	BH92_0.5-0.7	Dec 18, 2019		Soil	S19-De29316			X									
166	BH93_0.6-0.8	Dec 18, 2019		Soil	S19-De29317			X									
167	BH94_0.6-0.8	Dec 18, 2019		Soil	S19-De29318			X									
168	BH97_0.9-1.1	Dec 18, 2019		Soil	S19-De29319			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X		
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																	
Perth Laboratory - NATA Site # 23736																	
169	BH100_0.8-1.0	Dec 17, 2019		Soil	S19-De29320			X									
170	BH101_0.8-1.0	Dec 18, 2019		Soil	S19-De29321			X									
171	DUP10	Dec 17, 2019		Soil	S19-De29322			X									
172	DUP11	Dec 17, 2019		Soil	S19-De29323			X									
173	DUP12	Dec 16, 2019		Soil	S19-De29324			X									
174	DUP13	Dec 17, 2019		Soil	S19-De29325			X									
175	BH94_0.0-0.2	Dec 18, 2019		Soil	S19-De29446									X		X	
176	BH35_1.4-1.6	Dec 16, 2019		Soil	S19-De29449			X									
177	BH64_0.05-0.2	Dec 17, 2019		Soil	S19-De29450			X									
Test Counts						46	2	78	4	5	5	6	42	91	4	42	42

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

S19-De29141, S19-De29143, S19-De29146, S19-De29149, S19-De29151, S19-De29155, S19-De29177, S19-De29188, S19-De29202, S19-De29205, S19-De29224: Samples received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Authorised by:

Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1, 21 Smallwood Pl, Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully				
Handed over by	Sam Scully				
Email for Invoice	Enviro@allgeo.com.au				
Email for Results	Enviro@allgeo.com.au				

Analyses (Note: Where metals are requested please specify Total or Dissolved (dp). Filtration must be performed within 24hrs of sampling)

Containers

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Soil (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964 WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X										
2	BH01-0.8-1.0	16/12/19	Soil										X									
3	BH01-1.2-1.4	16/12/19	Soil	X	X	X	X	X	X	X	X	X										
4	BH01-2.2-2.4	16/12/19	Soil										X									
5	BH02-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X										
6	BH02-0.8-1.0	16/12/19	Soil																			
7	BH02-1.4-1.6	16/12/19	Soil	X	X		X	X	X	X	X	X										
8	BH02-2.0-2.2	16/12/19	Soil			X																
9	BH02-2.9-3.1	16/12/19	Soil																			
10	BH03-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X										
	Total Counts																					

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Name: Sam Scully Signature: Date: 19-12-19 Time: 4:00pm

Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	19/12/19	Time	5:02 PM	Temperature 11.9°C
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	/ /	Time	:	Report № 694811

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CHAIN OF CUSTODY RECORD

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Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses (Please tick which analyses are required / attach separate sheet. Mark any known hazards)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold
1	BH03-0.8-1.0	16/12/19	Soil										
2	BH03-1.5-1.7	16/12/19	Soil	X	X	X	X	X	X	X	X	X	
3	BH03-2.3-2.5	16/12/19	Soil										
4	BH03-3.3-3.5	16/12/19	Soil										
5	BH04-0.2-0.4	17/12/19	Soil	X	X		X	X	X	X	X	X	
6	BH04-0.8-1.0	17/12/19	Soil	X	X		X	X	X	X	X	X	
7	BH05-0.2-0.4	17/12/19	Soil	X	X		X	X	X	X	X	X	
8	BH05-0.8-1.0	17/12/19	Soil	X	X		X	X	X	X	X	X	
9	BH05-1.3-1.5	17/12/19	Soil										
10	BH06-0.0-0.2	17/12/19	Soil	X	X		X	X	X	X	X	X	
	Total Counts												

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☑ 5 Day
- * Surcharges apply
- ☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal

Name: Sam Scully Signature: Date: 19-12-19 Time: 4 : 00pm

Eurofins | mgt Laboratory Use Only

Received By: SYD | BNE | MEL | PER | ADL | NTL | DRW Signature: Date: 19/12/19 Time: Temperature:

Received By: SYD | BNE | MEL | PER | ADL | NTL | DRW Signature: Date: Time: Report №:

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Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Containers	Sample Comments / Dangerous Goods Hazard Warning
1	BH06-0.5-0.7	17/12/19	Soil	X	X		X	X	X	X	X	X			
2	BH07-0.0-0.2	17/12/19	Soil	X	X		X	X	X	X	X	X			
3	BH07-0.5-0.7	17/12/19	Soil			X									
4	BH07-1.4-1.6	17/12/19	Soil												
5	BH08-0.0-0.2	18/12/19	Soil	X	X		X	X	X	X	X	X			
6	BH08-0.5-0.7	18/12/19	Soil	X	X		X	X	X	X	X	X			
7	BH08-1.4-1.6	18/12/19	Soil												
8	BH10-0.1-0.3	16/12/19	Soil	X	X					X	X				
9	BH10-0.7-0.9	16/12/19	Soil												
10	BH11-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X			
	Total Counts														

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Method of Shipment							
☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date 19-12-19	Time 4 : 00pm

Eurofins | mgt Laboratory Use Only									
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19	Time :	Temperature		
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date / /	Time :	Report №		

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Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Containers

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964 - WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH11-0.2-0.4	16/12/19	Soil																			
2	BH14-0.0-0.2	16/12/19	Soil	X	X					X	X											
3	BH14-0.2-0.4	16/12/19	Soil																			
4	BH15-0.0-0.2	16/12/19	Soil	X	X					X	X											
5	BH15-0.2-0.4	16/12/19	Soil																			
6	BH16-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X										
7	BH16-0.8-1.0	16/12/19	Soil																			
8	BH16-2.4-2.6	16/12/19	Soil																			
9	BH17-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X										
10	BH17-0.8-1.0	16/12/19	Soil																			
	Total Counts																					

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal | Name: Sam Scully | Signature: | Date: 16-12-19 | Time: 4:00pm

Eurofins | mgt Laboratory Use Only							
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: 16/12/19	Time: :	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: / /	Time: :	Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses (Please tick the analyses required and specify "Full Suite" or "Short Suite" where applicable. Please specify any particular analytical methods or detection limits required)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold
1	BH17-1.9-2.1	16/12/19	Soil										
2	BH18-0.2-0.4	16/12/19	Soil	X	X					X	X		
3	BH18-0.7-0.9	16/12/19	Soil										
4	BH19-0.0-0.2	16/12/19	Soil	X	X					X	X		
5	BH20-0.0-0.15	16/12/19	Soil	X	X					X	X		
6	BH20-0.7-0.9	16/12/19	Soil										
7	BH21-0.1-0.3	16/12/19	Soil	X	X		X	X	X	X	X	X	
8	BH21-0.7-0.9	16/12/19	Soil										
9	BH22-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X	
10	BH22-0.8-1.0	16/12/19	Soil	X	X		X	X	X	X	X	X	
	Total Counts												

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☑ 5 Day
- * Surcharges apply
- ☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature		Date 19-12-19	Time 4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19	Time :	Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date / /	Time :	Report №	

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Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully				
Handed over by	Sam Scully				
Email for Invoice	Enviro@allgeo.com.au				
Email for Results	Enviro@allgeo.com.au				

Analyses (Non-dissolved metals are inherently preserved by matrix. Dissolved metals must be field filtered prior to preservation. Refer to ALS guide)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold
1	BH22-1.9-2.1	16/12/19	Soil										
2	BH23-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X	
3	BH23-0.5-0.7	16/12/19	Soil										
4	BH25-0.0-0.2	16/12/19	Soil	X	X					X	X		
5	BH25-0.7-0.9	16/12/19	Soil										
6	BH26-0.0-0.2	16/12/19	Soil	X	X					X	X		
7	BH26-0.7-0.9	16/12/19	Soil										
8	BH28-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X	
9	BH28-0.8-1.0	16/12/19	Soil	X	X		X	X	X	X	X	X	
10	BH28-1.9-2.1	16/12/19	Soil										
	Total Counts												

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 - WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☒ 5 Day
- * Surcharges apply
- ☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date 19-12-19 Time 4:00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19	Time ___:___ Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date ___/___/___	Time ___:___ Report №

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Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
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Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Soil (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold
1	BH29-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X	
2	BH29-0.2-0.4	16/12/19	Soil										
3	BH30-0.0-0.2	16/12/19	Soil	X	X					X	X		
4	BH30-0.2-0.4	16/12/19	Soil										
5	BH31-0.0-0.2	16/12/19	Soil	X	X					X	X		
6	BH31-0.5-0.7	16/12/19	Soil										
7	BH32-0.0-0.2	16/12/19	Soil	X	X					X	X		
8	BH32-0.5-0.7	16/12/19	Soil										
9	BH33-0.0-0.2	16/12/19	Soil	X	X					X	X		
10	BH33-0.3-0.5	16/12/19	Soil										
	Total Counts												

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements
(Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature		Date		Time	4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	19/12/19	Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Millperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses (Please mark in the box below to indicate required analysis. Specify "Trade" or "Filtered". Suite codes must be listed to ensure correct analysis)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold
1	BH34-0.0-0.2	16/12/19	Soil	X	X					X	X	X	
2	BH35-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X	
3	BH35-0.8-1.0	16/12/19	Soil										
4	BH36-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X	
5	BH36-1.0-1.2	16/12/19	Soil	X	X		X	X	X	X	X	X	
6	BH36-2.0-2.2	16/12/19	Soil	X	X					X	X		
7	BH37-0.3-0.5	16/12/19	Soil	X	X		X	X	X	X	X	X	
8	BH37-0.8-1.0	16/12/19	Soil										
9	BH38-0.0-0.2	16/12/19	Soil	X	X					X	X	X	
10	BH38-0.7-0.9	16/12/19	Soil										
	Total Counts												

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☑ 5 Day
- * Surcharges apply
- ☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature		Date	Time 4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19	Time	:	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date / /	Time	:	Report №

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Sydney Laboratory
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02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully	
Handed over by	Sam Scully	
Email for Invoice	Enviro@allgeo.com.au	
Email for Results	Enviro@allgeo.com.au	

Analyses (Note: Ammonia must be specified when Total N is selected. Please specify Total or Filtered fractions must be specified by ticking appropriate box)

Containers

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964 - WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH50-0.2-0.4	17/12/19	Soil	X	X		X	X	X	X	X	X										
2	BH50-0.8-1.0	17/12/19	Soil																			
3	BH51-0.2-0.4	17/12/19	Soil	X	X					X	X											
4	BH51-0.8-1.0	17/12/19	Soil																			
5	BH52-0.2-0.4	17/12/19	Soil	X	X					X	X											
6	BH52-0.8-1.0	17/12/19	Soil			X																
7	BH57-0.2-0.4	17/12/19	Soil	X	X		X	X	X	X	X	X										
8	BH57-0.8-1.0	17/12/19	Soil																			
9	BH58-0.2-0.4	17/12/19	Soil	X	X					X	X											
10	BH58-0.8-1.0	17/12/19	Soil																			
	Total Counts																					

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date 19-12-19 Time 4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date 19/12/19	Time	Temperature	
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other Asbestos AS4964 WA Guidelines

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	BH59-0.0-0.05	17/12/19	Soil	X	X					X	X	X		
2	BH59-0.1-0.3	17/12/19	Soil											
3	BH60-0.0-0.2	17/12/19	Soil	X	X					X	X			
4	BH60-0.2-0.4	17/12/19	Soil											
5	BH61-0.15-0.3	17/12/19	Soil	X	X		X	X	X	X	X	X		
6	BH61-0.7-0.9	17/12/19	Soil											
7	BH62-0.0-0.15	17/12/19	Soil	X	X					X	X			
8	BH62-0.2-0.4	17/12/19	Soil											
9	BH64-0.0-0.1	17/12/19	Soil	X	X					X	X			
10	BH64-0.1-0.3	17/12/19	Soil											
	Total Counts													

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal | Name: Sam Scully | Signature | Date: 19-12-19 | Time: 4:00pm

Eurofins | mgt Laboratory Use Only						
Received By	Milperra	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date: 19/12/19	Time: :__	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date: __/__/__	Time: :__	Report №

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☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964 - WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH65-0.0-0.1	18/12/19	Soil	X	X		X	X	X	X	X	X										
2	BH65-0.1-0.3	18/12/19	Soil																			
3	BH66-0.0-0.2	18/12/19	Soil	X	X		X	X	X	X	X	X										
4	BH66-0.3-0.5	18/12/19	Soil	X	X		X	X	X	X	X											
5	BH66-1.0-1.2	18/12/19	Soil	X	X					X	X											
6	~~BH67-0.5-0.9~~	~~18/12/19~~	~~Soil~~																			
7	BH67-0.0-0.05	18/12/19	Soil	X	X					X	X											
8	BH67-0.1-0.3	18/12/19	Soil																			
9	BH68-0.0-0.1	18/12/19	Soil	X	X		X	X	X	X	X	X										
10	BH68-0.1-0.3	18/12/19	Soil																			
	Total Counts																					

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal Name: Sam Scully Signature: Date: 19-12-19 Time: 4 : 00pm

Eurofins | mgt Laboratory Use Only							
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19	Time __:__	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date __/__/__	Time __:__	Report №

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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07 3902 4600 EnviroSampleQLD@eurofins.com

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Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses (Note: Where metals are to analyse, please specify "Total" or "Filtered". HOLD code must be used to avoid HOLD picking)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold
1	BH69-0.05-0.2	17/12/19	Soil	X	X					X	X		
2	BH70-0.05-0.2	17/12/19	Soil										
3	BH71-0.0-0.2	17/12/19	Soil	X	X					X	X	X	
4	BH71-0.5-0.7	17/12/19	Soil										
5	BH72-0.0-0.2	17/12/19	Soil	X	X		X	X	X	X	X	X	
6	BH72-0.5-0.7	17/12/19	Soil										
7	BH73-0.0-0.2	17/12/19	Soil	X	X					X	X		
8	BH73-0.5-0.7	17/12/19	Soil										
9	BH74-0.0-0.2	17/12/19	Soil	X	X		X	X	X	X	X	X	
10	BH74-0.5-0.7	17/12/19	Soil										
	Total Counts												

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other Asbestos AS4964 WA Guidelines

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☑ 5 Day
- * Surcharges apply
- ☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment: ☑ Courier (#) ☐ Hand Delivered ☐ Postal | Name: Sam Scully | Signature | Date: 19-12-19 | Time: 4:00pm

Eurofins | mgt Laboratory Use Only							
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: 19/12/19	Time:	Temperature:
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date: __/__/__	Time:	Report №

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☐ Melbourne Laboratory
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03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses (Note: Where metals are requested please specify "Total" or "Dissolved". SUITE codes must be listed to attract SUITE pricing)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold
1	BH75-0.0-0.2	16/12/19	Soil	X	X					X	X		
2	BH75-0.5-0.7	16/12/19	Soil										
3	BH76-0.0-0.2	16/12/19	Soil	X	X					X	X		
4	BH76-0.5-0.7	16/12/19	Soil										
5	BH77-0.0-0.2	16/12/19	Soil	X	X		X	X	X	X	X	X	
6	BH77-0.5-0.7	16/12/19	Soil										
7	BH78-0.0-0.2	16/12/19	Soil	X	X					X	X		
8	BH78-0.5-0.7	16/12/19	Soil										
9	BH79-0.0-0.2	16/12/19	Soil	X	X					X	X		
10	BH79-0.5-0.7	16/12/19	Soil										
	Total Counts												

Containers: 1L Plastic | 250mL Plastic | 125mL Amber Glass | 200mL VOA vial | 40mL PFAS Bottle | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day*
- ☐ 2 Day*
- ☐ 3 Day*
- ☒ 5 Day
- ☐ Other ( )

* Surcharges apply

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date 19-12-19	Time 4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19	Time	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date __/__/__	Time	Report №

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Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964 WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH80-0.0-0.2	17/12/19	Soil	X	X					X	X											
2	BH80-0.5-0.7	17/12/19	Soil																			
3	BH81-0.2-0.4	17/12/19	Soil	X	X		X	X	X	X	X	X										
4	BH81-0.5-0.7	17/12/19	Soil																			
5	BH82-0.05-0.2	17/12/19	Soil	X	X					X	X											
6	BH83-0.05-0.2	17/12/19	Soil	X	X					X	X											
7	BH83-0.7-0.9	17/12/19	Soil	[illegible]																		
8	BH84-0.05-0.2	17/12/19	Soil	X	X					X	X											
9	BH84-0.4-0.6	17/12/19	Soil																			
10	BH86-0.0-0.2	17/12/19	Soil	X	X					X	X											
	Total Counts																					

Turnaround Time (TAT) Requirements
Default will be 5 days if not ticked

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
*Surcharges apply
☐ Other ( )

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature		Date	19-12-19	Time 4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By	[illegible]	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	19/12/19	Time		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	__/__/__	Time		Report №

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☐ Melbourne Laboratory
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03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☒ 5 Day
- * Surcharges apply
- ☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	BH86-0.5-0.7	18/12/19	Soil	✓						✓				
2	BH87-0.0-0.2	18/12/19	Soil	✓	✓					✓	✓			
3	BH87-0.7-0.9	18/12/19	Soil											
4	BH88-0.0-0.2	18/12/19	Soil	✓	✓					✓	✓			
5	BH88-0.5-0.7	18/12/19	Soil											
6	BH89-0.0-0.2	18/12/19	Soil	✓	✓		✓	✓	✓	✓	✓	✓		
7	BH89-0.6-0.8	18/12/19	Soil											
8	BH92-0.0-0.2	18/12/19	Soil	✓	✓		✓	✓	✓	✓	✓	✓		
9	BH92-0.5-0.7	18/12/19	Soil											
10	BH93-0.0-0.2	18/12/19	Soil	✓	✓					✓	✓			
	Total Counts													

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date 19-12-19 Time 4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19	Time	Temperature
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date __/__/__	Time	Report №

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Sydney Laboratory — Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066 — 02 9900 8400 — EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory — Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172 — 07 3902 4600 — EnviroSampleQLD@eurofins.com

☐ Perth Laboratory — Unit 2, 91 Leach Highway, Kewdale WA 6105 — 08 9251 9600 — EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory — 2 Kingston Town Close, Oakleigh, VIC 3166 — 03 8564 5000 — EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not nelted)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☒ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	BH93-0.6-0.8	18/12/19	Soil											
2	BH94-0.0-0.2	18/12/19	Soil	X	X					X	X			
3	BH94-0.6-0.8	18/12/19	Soil											
4	BH97-0.0-0.2	18/12/19	Soil	X	X		X	X	X	X	X	X		
5	BH97-0.9-1.1	18/12/19	Soil											
6	BH100-0.2-0.4	17/12/19	Soil	X	X					X	X			
7	BH100-0.8-1.0	17/12/19	Soil											
8	BH101-0.0-0.2	18/12/19	Soil	X	X					X	X	X		
9	BH101-0.8-1.0	18/12/19	Soil											
10	DUP-01	16/12/19	Soil	X	X									
	Total Counts													

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature	Date 19-12-19 Time 4:00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19 Time :	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date / / Time :	Report №

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Sydney Laboratory
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☐ Brisbane Laboratory
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07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully				
Handed over by	Sam Scully				
Email for invoice	Enviro@allgeo.com.au				
Email for Results	Enviro@allgeo.com.au				

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Overnight will be 5 days if not advised)

☐ Overnight (9am)*
☐ 1 Day* ☐ 2 Day*
☐ 3 Day* ☑ 5 Day
* Surcharges apply
☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Soil (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	DUP-1A	16/12/19	Soil	X	X									Please forward to ALS
2	DUP-02	16/12/19	Soil	X	X									
3	DUP-2A	16/12/19	Soil	X	X									Please forward to ALS
4	DUP-03	17/12/19	Soil	X	X									
5	DUP-3A	17/12/19	Soil	X	X									Please forward to ALS
6	DUP-04	18/12/19	Soil	X	X									
7	DUP-4A	18/12/19	Soil	X	X									Please forward to ALS
8	DUP-10	17/12/19	Soil											
9	DUP-10A	17/12/19	Soil											Please forward to ALS
10	DUP-11	17/12/19	Soil											
	Total Counts													

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature		Date	19-12-19	Time	4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	19/12/19	Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time		Report №	

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ABN 50 005 085 521

☑ Sydney Laboratory
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☐ Brisbane Laboratory
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☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☒ 5 Day
- *Surcharges apply
- ☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Soil (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Sample Comments / Dangerous Goods Hazard Warning
1	DUP-11A	16/12/19	Soil											Please forward to ALS
2	DUP-12	16/12/19	Soil											
3	DUP-12A	16/12/19	Soil											Please forward to ALS
4	DUP-13	17/12/19	Soil											
5	DUP-13A	17/12/19	Soil											Please forward to ALS
6	DUP-14	18/12/19	Soil	X	X									
7	DUP-14A	18/12/19	Soil	X	X									Please forward to ALS
8	TRIP SPIKE	16/12/19	Soil								X			
9	TRIP BLANK	16/12/19	Soil								X			
10	TRIP SPIKE	17/12/19	Soil								X			
	Total Counts													

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature		Date	19-12-19	Time	4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	19/12/19	Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	/ /	Time	:	Report №	

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ABN 50 005 085 521

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08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	ALLIANCE GEOTECHNICAL	Project №	9996	Project Manager	Sam Scully
Address	10 WELDER ROAD, SEVEN HILLS NSW	Project Name	Milperra	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Sam Scully				
Phone №	400339745				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Sam Scully
Handed over by	Sam Scully
Email for Invoice	Enviro@allgeo.com.au
Email for Results	Enviro@allgeo.com.au

Analyses (Note: Where metals are requested, please specify 'Total' or 'Filtered'. Filtered to be performed in the laboratory unless otherwise specified)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	8 Metals	PAH	CEC / pH	OCP/OPP	PCB	Phenols	TRH	BTEX	ASBESTOS (0.001%)	Hold	Asbestos 1 D
1	TRIP BLANK	17/12/19	WATER								X			
2	TRIP SPIKE	18/12/19	WATER								X			
3	TRIP BLANK	18/12/19	WATER								X			
4	FCS-59		Frog										X	
5	FCS-101		Frog										X	
6														
7														
8														
9														
10														
	Total Counts													

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964 WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight (9am)*
- ☐ 1 Day* ☐ 2 Day*
- ☐ 3 Day* ☒ 5 Day
- * Surcharges apply
- ☐ Other ( )

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Sam Scully	Signature		Date 19-12-9	Time 4 : 00pm
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date 19/12/19	Time	Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №	

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APPENDIX H

ProUCL OUTPUT

DRAFT

1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.124/01/2020 1:55:57 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	**Nickel - ProUCL**											
12												
13	**General Statistics**											
14	Total Number of Observations	137			Number of Distinct Observations	53						
15					Number of Missing Observations	0						
16	Minimum	5			Mean	8.806						
17	Maximum	73			Median	5.6						
18	SD	8.257			Std. Error of Mean	0.705						
19	Coefficient of Variation	0.938			Skewness	4.507						
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic	0.528			**Shapiro Wilk GOF Test**							
23	5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level							
24	Lilliefors Test Statistic	0.322			**Lilliefors GOF Test**							
25	5% Lilliefors Critical Value	0.0761			Data Not Normal at 5% Significance Level							
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**							
30	95% Student's-t UCL	9.974			95% Adjusted-CLT UCL (Chen-1995)	10.26						
31					95% Modified-t UCL (Johnson-1978)	10.02						
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic	15.69			**Anderson-Darling Gamma GOF Test**							
35	5% A-D Critical Value	0.761			Data Not Gamma Distributed at 5% Significance Level							
36	K-S Test Statistic	0.262			**Kolmogorov-Smirnov Gamma GOF Test**							
37	5% K-S Critical Value	0.0806			Data Not Gamma Distributed at 5% Significance Level							
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)	2.704			k star (bias corrected MLE)	2.649						
42	Theta hat (MLE)	3.257			Theta star (bias corrected MLE)	3.324						
43	nu hat (MLE)	740.8			nu star (bias corrected)	725.9						
44	MLE Mean (bias corrected)	8.806			MLE Sd (bias corrected)	5.41						
45					Approximate Chi Square Value (0.05)	664.4						
46	Adjusted Level of Significance	0.0482			Adjusted Chi Square Value	663.8						
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))	9.621			95% Adjusted Gamma UCL (use when n<50)	9.63						
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic	0.732			**Shapiro Wilk Lognormal GOF Test**							

53	5% Shapiro Wilk P Value				0	Data Not Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic				0.245	**Lilliefors Lognormal GOF Test**						
55	5% Lilliefors Critical Value				0.0761	Data Not Lognormal at 5% Significance Level						
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data				1.609	Mean of logged Data						1.979
60	Maximum of Logged Data				4.29	SD of logged Data						0.535
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL				9.089	90% Chebyshev (MVUE) UCL						9.558
64	95% Chebyshev (MVUE) UCL				10.11	97.5% Chebyshev (MVUE) UCL						10.88
65	99% Chebyshev (MVUE) UCL				12.38							
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL				9.966	95% Jackknife UCL						9.974
72	95% Standard Bootstrap UCL				9.993	95% Bootstrap-t UCL						10.46
73	95% Hall's Bootstrap UCL				10.68	95% Percentile Bootstrap UCL						10.03
74	95% BCA Bootstrap UCL				10.44							
75	90% Chebyshev(Mean, Sd) UCL				10.92	95% Chebyshev(Mean, Sd) UCL						11.88
76	97.5% Chebyshev(Mean, Sd) UCL				13.21	99% Chebyshev(Mean, Sd) UCL						15.82
77												
78	**Suggested UCL to Use**											
79	95% Chebyshev (Mean, Sd) UCL				11.88							
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.124/01/2020 1:29:32 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	**TRH >C10-C16 (F2) - ProUCL**											
12												
13	**General Statistics**											
14	Total Number of Observations	135			Number of Distinct Observations	7						
15					Number of Missing Observations	0						
16	Minimum	50			Mean	53.52						
17	Maximum	210			Median	50						
18	SD	19.37			Std. Error of Mean	1.667						
19	Coefficient of Variation	0.362			Skewness	6.128						
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic	0.203			**Shapiro Wilk GOF Test**							
23	5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level							
24	Lilliefors Test Statistic	0.528			**Lilliefors GOF Test**							
25	5% Lilliefors Critical Value	0.0766			Data Not Normal at 5% Significance Level							
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**							
30	95% Student's-t UCL	56.28			95% Adjusted-CLT UCL (Chen-1995)	57.2						
31					95% Modified-t UCL (Johnson-1978)	56.43						
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic	48.72			**Anderson-Darling Gamma GOF Test**							
35	5% A-D Critical Value	0.751			Data Not Gamma Distributed at 5% Significance Level							
36	K-S Test Statistic	0.533			**Kolmogorov-Smirnov Gamma GOF Test**							
37	5% K-S Critical Value	0.0803			Data Not Gamma Distributed at 5% Significance Level							
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)	17.03			k star (bias corrected MLE)	16.66						
42	Theta hat (MLE)	3.142			Theta star (bias corrected MLE)	3.213						
43	nu hat (MLE)	4599			nu star (bias corrected)	4498						
44	MLE Mean (bias corrected)	53.52			MLE Sd (bias corrected)	13.11						
45					Approximate Chi Square Value (0.05)	4343						
46	Adjusted Level of Significance	0.0482			Adjusted Chi Square Value	4341						
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))	55.43			95% Adjusted Gamma UCL (use when n<50)	55.45						
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic	0.207			**Shapiro Wilk Lognormal GOF Test**							

53	5% Shapiro Wilk P Value				0	Data Not Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic				0.531	**Lilliefors Lognormal GOF Test**						
55	5% Lilliefors Critical Value				0.0766	Data Not Lognormal at 5% Significance Level						
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data				3.912	Mean of logged Data						3.95
60	Maximum of Logged Data				5.347	SD of logged Data						0.201
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL				54.6	90% Chebyshev (MVUE) UCL						55.79
64	95% Chebyshev (MVUE) UCL				57.05	97.5% Chebyshev (MVUE) UCL						58.8
65	99% Chebyshev (MVUE) UCL				62.23							
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL				56.26	95% Jackknife UCL						56.28
72	95% Standard Bootstrap UCL				56.2	95% Bootstrap-t UCL						58.14
73	95% Hall's Bootstrap UCL				56.43	95% Percentile Bootstrap UCL						56.39
74	95% BCA Bootstrap UCL				57.44							
75	90% Chebyshev(Mean, Sd) UCL				58.52	95% Chebyshev(Mean, Sd) UCL						60.79
76	97.5% Chebyshev(Mean, Sd) UCL				63.93	99% Chebyshev(Mean, Sd) UCL						70.11
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL				56.28	or 95% Modified-t UCL						56.43
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

1	**UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.124/01/2020 2:01:58 PM										
5	From File	WorkSheet_a.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	**TRH >C16-C34 (F3) - ProUCL**											
12												
13	**General Statistics**											
14	Total Number of Observations	135			Number of Distinct Observations	22						
15					Number of Missing Observations	0						
16	Minimum	100			Mean	152.1						
17	Maximum	1800			Median	100						
18	SD	188.3			Std. Error of Mean	16.21						
19	Coefficient of Variation	1.238			Skewness	6.277						
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic	0.332			**Shapiro Wilk GOF Test**							
23	5% Shapiro Wilk P Value	0			Data Not Normal at 5% Significance Level							
24	Lilliefors Test Statistic	0.391			**Lilliefors GOF Test**							
25	5% Lilliefors Critical Value	0.0766			Data Not Normal at 5% Significance Level							
26	**Data Not Normal at 5% Significance Level**											
27												
28	**Assuming Normal Distribution**											
29	**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**							
30	95% Student's-t UCL	179			95% Adjusted-CLT UCL (Chen-1995)	188.2						
31					95% Modified-t UCL (Johnson-1978)	180.4						
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic	30.76			**Anderson-Darling Gamma GOF Test**							
35	5% A-D Critical Value	0.762			Data Not Gamma Distributed at 5% Significance Level							
36	K-S Test Statistic	0.377			**Kolmogorov-Smirnov Gamma GOF Test**							
37	5% K-S Critical Value	0.0812			Data Not Gamma Distributed at 5% Significance Level							
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)	2.504			k star (bias corrected MLE)	2.453						
42	Theta hat (MLE)	60.76			Theta star (bias corrected MLE)	62.02						
43	nu hat (MLE)	676.1			nu star (bias corrected)	662.4						
44	MLE Mean (bias corrected)	152.1			MLE Sd (bias corrected)	97.14						
45					Approximate Chi Square Value (0.05)	603.7						
46	Adjusted Level of Significance	0.0482			Adjusted Chi Square Value	603.1						
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))	166.9			95% Adjusted Gamma UCL (use when n<50)	167.1						
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic	0.5			**Shapiro Wilk Lognormal GOF Test**							

53	5% Shapiro Wilk P Value				0	Data Not Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic				0.38	**Lilliefors Lognormal GOF Test**						
55	5% Lilliefors Critical Value				0.0766	Data Not Lognormal at 5% Significance Level						
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data				4.605	Mean of logged Data						4.812
60	Maximum of Logged Data				7.496	SD of logged Data						0.495
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL				150.3	90% Chebyshev (MVUE) UCL						157.7
64	95% Chebyshev (MVUE) UCL				166.2	97.5% Chebyshev (MVUE) UCL						178
65	99% Chebyshev (MVUE) UCL				201.1							
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL				178.8	95% Jackknife UCL						179
72	95% Standard Bootstrap UCL				178.5	95% Bootstrap-t UCL						203.9
73	95% Hall's Bootstrap UCL				273.3	95% Percentile Bootstrap UCL						179.9
74	95% BCA Bootstrap UCL				189.9							
75	90% Chebyshev(Mean, Sd) UCL				200.8	95% Chebyshev(Mean, Sd) UCL						222.8
76	97.5% Chebyshev(Mean, Sd) UCL				253.4	99% Chebyshev(Mean, Sd) UCL						313.4
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL				179	or 95% Modified-t UCL						180.4
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

DRAFT

APPENDIX L: SUPPLEMENT STAGE 2 INVESTIGATION

Sydney Environmental Group

Supplementary Stage 2 Detailed Site Investigation

Western Sydney University
Milperra Campus, Milperra NSW

Mirvac Homes (NSW) Pty Ltd

Report No: 2300-DSI-01-220224.v1f
Report Date: 22 February 2024

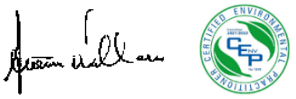


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DOCUMENT RECORD

Revision	Date	Author	Reviewer
v1d	22 February 2024	Lachlan Mulhearn	Steven Wallace

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Title	Environmental Scientist	**Title**	Managing Consultant

Document Title:	Supplementary Detailed Site Investigation, Western Sydney University – Milperra Campus, Milperra NSW
Site Address:	Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW
Client Name:	Mirvac Pty Ltd
Site Size:	≈ 18.83 ha
Investigation Area Size:	AEC01 ≈ 1.3 ha AEC01a ≈ 1 ha AEC02 ≈ 1.7 ha AEC03 ≈ 1.35 ha
Reference Number:	2300-DSI-01-160224.v1f
Project Type:	Supplementary Detailed Site Investigation
Project Type Abbreviation:	DSI
Document Draft:	DRAFT
Document Revision No.	v1

Prepared by Sydney Environmental Group Pty Ltd ABN: 14 631 026 214

EXECUTIVE SUMMARY

Sydney Environmental Group (SE) was engaged by Mirvac Pty Ltd (the client), to undertake a Supplementary Detailed Site Investigation for the site located at Western Sydney University – Milperra Campus, Milperra NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

SE has the following project appreciation:

- The entirety of the site covers an area of approximately 18.83 ha;
- The site currently comprises of infrastructure with residential and education establishment purposes;
- The site proposed for redevelopment comprising a low-density residential land use setting;
- Historically the site has been utilised for agricultural activities with rural-residential structures;
- A Detailed Site Investigation (DSI) was carried out for the site in December 2019 and January 2020 by Alliance Geotechnical (AG), which identified five (5) areas of environmental concern;
- A Remedial Action Plan (RAP) was prepared for the site by AG in January 2020, which identified four (4) data gaps requiring further assessment; and
- A Supplementary Detailed Site Investigation is required to address data gaps identified within AG 2022.

The objectives of this project were to:

- Assess the potential for contamination to be present within the cleared portion of the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

SE undertook the following scope of works to achieve the project objective:

- Review of the previous contamination assessment prepared for the site;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Laboratory analysis of selected samples collected during the field investigation; and
- An assessment of the contamination status of the fill materials within the site and the recommendation of any further remedial requirements associated with the redevelopment of the site (if necessary).

Based on SE's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, SE makes the following conclusions:

- AEC01a was not accessible at the time of this data gap assessment and requires assessment within a future assessment prior to the start of remediation works;
- Friable Asbestos Containing Materials (ACM) were identified within AEC01 during this assessment and previous contamination assessments undertaken;
- Friable and Non-Friable Asbestos Containing Materials (ACM) were identified within AEC02 during this assessment and previous contamination assessments undertaken;
- Non-Friable Asbestos Containing Materials (ACM) were identified within AEC03 during this assessment and previous contamination assessments undertaken;
- Surficial asbestos identified within all three (3) AECs assessed currently present an unacceptable aesthetics risk and require further management/remediation;
- Based on the assessments undertaken as part of this investigation, SE has concluded that the site has friable and non-friable asbestos impacted soil materials requiring remediation and further management; and
- An addendum to the existing Remedial Action Plan (AG 2022) is required to outline the remediation methodologies required to remediate the newly identified extents of contamination identified.

Based on the conclusions stated above and the background data gathered during the course of this investigation, SE recommends:

- An addendum to the existing Remedial Action Plan prepared by AG (2022) is required to outline the remediation methodologies required to remediate the newly identified extents of asbestos contamination identified.
- Following removal of hazardous building materials (if identified) and subsequent demolition of the onsite structures, a clearance inspection should be carried out by an appropriately qualified occupational hygienist / NSW LAA;
- A supplementary contamination assessment is required within AEC01a prior to the start of remedial works at the site;
- Additional contamination assessments are required to be undertaken per the site RAP (AG 2022) prior to the start of remediation works at the site; and
- A waste classification assessment should be carried out on any soil materials proposed for disposal off-site as per the NSW EPA Waste Classification Guidelines (2014).

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 16.**

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ABBREVIATIONS

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground storage tank
Bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
Btoc	Below top of casing
CoC	Chain of Custody
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
EC	Electrical conductivity
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
EPA	Environment Protection Authority
GS	Geological Survey of NSW
HIL	Health Investigation Levels
HSL	Health Screening Levels
IL	Investigation Levels
LOR	[Laboratory] Limit of reporting
NATA	National Association of Testing Laboratories
N/A	Not applicable
ND	Not detected
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW EPA	NSW Environment Protection Authority
OCP	Organochlorine Pesticide
OPP	Organophosphorus Pesticide
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photo-ionisation detector
PSH	Phase separated hydrocarbon
PSI	Preliminary Site Investigation
QA/QC	Quality assurance/Quality control
RPD	Relative percentage difference
SAQP	Sampling Analysis and Quality Plan
SE	Sydney Environmental Group Pty Ltd
SVOC	Semi-volatile organic compound
TPH	Total petroleum hydrocarbon
USCS	Unified Soil Classification System
UST	Underground storage tank
VOC	Volatile organic compound

1 INTRODUCTION

1.1 Background

Sydney Environmental Group (SE) was engaged by Mirvac Pty Ltd (the client), to undertake a Supplementary Detailed Site Investigation for the site located at Western Sydney University – Milperra Campus, Milperra NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

SE has the following project appreciation:

- The entirety of the site covers an area of approximately 18.83 ha;
- The site currently comprises of infrastructure with residential and education establishment purposes;
- The site proposed for redevelopment comprising a low-density residential land use setting;
- Historically the site has been utilised for agricultural activities with rural-residential structures;
- A Detailed Site Investigation (DSI) was carried out for the site in December 2019 and January 2020 by Alliance Geotechnical (AG), which identified five (5) areas of environmental concern;
- A Remedial Action Plan (RAP) was prepared for the site by AG in January 2020, which identified four (4) data gaps requiring further assessment; and
- A Supplementary Detailed Site Investigation is required to address data gaps identified within AG 2022.

1.2 Proposed Development

SE understands that the proposed site use will consist of demolition of the current campus structures and roadways, and residential infrastructure for redevelopment under a low-density residential land use setting.

As the proposed future site use is redevelopment under a low-density residential setting, SE considers it reasonable to adopt the 'HIL A – Low-Density Residential' per guidance provided in Section 2.2 of Schedule B (1) of the National Environment Protection Measure (Assessment of Site Contamination) 2013 (NEPM ASC 2013), in order to conservatively assess the site for any future proposed land use as well as the current land use.

Currently under the *State Environmental Planning Policy (SEPP) (Resilience and Hazards)* - a consent authority must not consent to the carrying out of any redevelopment unless it has considered whether the land is contaminated. This report has been prepared to satisfy Clause 6 and 7 of SEPP and Council planning policies.

1.3 Objectives

The objectives of this project were to:

- Assess the potential for contamination to be present within the cleared portion of the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

1.4 Scope of Work

SE undertook the following scope of works to achieve the project objective:

- Review of the previous contamination assessment prepared for the site;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Laboratory analysis of selected samples collected during the field investigation; and
- An assessment of the contamination status of the fill materials within the site and the recommendation of any further remedial requirements associated with the redevelopment of the site (if necessary).

2 SITE IDENTIFICATION

The site identification details and associated information are presented in **Table 2.1.**

Table 2.1. Site Identification Information

Attribute	Description
Street Address	Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW
Lot and Deposited Plan (DP)	Lot 2 DP1291984
Geographical Coordinates	33°56'25.876" S 150°59'26.563" E (Centre of site)
Site Area	18.83 ha
Investigation Area Size	AEC01 ≈ 1.3 ha AEC01a ≈ 1 ha AEC02 ≈ 1.7 ha AEC03 ≈ 1.35 ha
Local Government Area (LGA)	City of Canterbury-Bankstown
Parish	Bankstown
County	Cumberland
Zoning	SP2 – Infrastructure / Commercial Servies (Educational Establishment) *Canterbury-Bankstown Local Environmental Plan 2023*

The locality of the site is set out in **Figure 1**.

The general layout and boundary of the site is set out in **Figure 2**.

3 GEOLOGY, ACID SULFATE SOILS, TOPOGRAPHY AND HYDROGEOLOGY

Regional geology, topography, soil landscape and hydrogeological information are presented in **Table 3.1.**

Table 3.1. Regional Setting Information

Attribute	Description
Geology	A review of the Environment NSW 'eSpade V2.1' web application (environment.nsw.gov.au/eSpade2WebApp, accessed 10 January 2024), indicated that the site is likely to be underlain by Wianamatta Group Ashfield Shale defined as laminite and dark grey siltstone, Bringelly Shale defined as shale with occasional calcareous claystone, laminite and infrequent coal, and Minchinbury Sandstone defined as fine to medium-grained quartz lithic sandstone.
Acid Sulfate Soils	A review of the acid sulfate soil risk mapping layer accessed on the Environment NSW 'eSpade V2.1' web application (accessed 10 January 2024), indicated that the site lies in an area mapped as ***'No Known Occurrence'*** with respect to acid sulfate soils. This infers that land management activities are not likely to be affected by acid sulfate soil materials. Further assessment of acid sulfate soils in the context of this investigation is considered by SE as not warranted.
Topography	Generally, the local landscape consists of gently undulating rises on Wianamatta Group Shale with local relief 10 – 30 m and slopes generally >5% but occasionally up to 10%. The site topography slopes downwards from the north-east to south-west corner. SE understands that the site is located at an elevation approximately 3 m to 22 m Australian Height Datum (AHD).
Hydrology and Hydrogeology	Surface water courses proximal to the site include an unnamed tributary of Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site. Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the subject area within the site is considered likely to be towards the south-west. A review of the NSW Office of Water groundwater database undertaken on 16 February 2024 indicated there are seven (7) registered groundwater features located within a 500m radius of the north-eastern portion of the site; • GW113993 – groundwater monitoring bore, final drill depth 4.00 metres below ground level (mBGL), standing water level (SWL) not specified, located approximately 105 m east of the site; • GW113998 – groundwater monitoring bore, final drill depth 4.50 mBGL, SWL not specified, located approximately 150 m east of the site; • GW113994 – groundwater monitoring bore, final drill depth 5.20 mBGL, SWL not specified, located approximately 145 m east of the site; • GW113997 – groundwater monitoring bore, final drill depth 12.50 mBGL, SWL not specified, located approximately 240 m east of the site; • GW113999 – groundwater monitoring bore, final drill depth 7.00 mBGL, SWL not specified, located approximately 250 m east of the site; • GW113995 – groundwater monitoring bore, final drill depth 4.00 mBGL, SWL not specified, located approximately 278 m east of the site; and • GW113996 – groundwater monitoring bore, final drill depth 4.00 mBGL, SWL not specified, located approximately 307 m east of the site.
Adjacent Sensitive Receptors	A review of the Bureau of Meteorology Groundwater Dependent Ecosystem Map was undertaken to determine the closest sensitive ecological receptors. The closest highly dependent groundwater ecosystem was the Georges River, located approximately 1.3 km south-west of the site. The closest sensitive human receptors are the residential properties surrounding the site's boundary and any future onsite construction workers / builders.

4 PREVIOUS ASSESSMENTS

The following reports were reviewed during the project. SE note that Coffey (2011), Noel Arnolds and Associates (NAA 2011), EIS (2016) and JBS&G (2018) were not provided for review by SE. As such, SE have relied on the information outlined within AG (2022) for a summary of the works undertaken.

- Coffey (Coffey 2011), 'Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus', dated 25 August 2011, Ref: GEOTLCOV24163AG-AB;
- Noel Arnolds and Associates (NAA 2011), 'Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW', dated October 2011, Ref: SJ0085:95458;
- Environmental Investigation Services (EIS 2016), 'Preliminary Contamination Screening and Waste Classification, Proposed Oval Facilities, UWS Bankstown Campus, 2 Bullecourt Avenue, Milperra' dated 7 April 2016, no report ref provided;
- JBS&G (JBS&G 2018), 'Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;
- Alliance Geotechnical (AG 2020), 'Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1; and
- Alliance Geotechnical (AG 2022), 'Remedial Action Plan, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-2-1.

A summary of the previous contamination assessments is provided in **Sections 4.1** to **4.6** below.

4.1 Coffey 2011, Phase 2 Environmental Site Assessment

For the purposes of this Phase 2 Environmental Site Assessment (P2 ESA), Coffey assumed the site boundary comprised approximately 1.5ha. At the time of reporting, it was subsequently understood that the proposed student residence development was to extend further to the east and cover an area of approximately 3ha.

Coffey understood that UWS required a P2 ESA to support a development application (DA) to Bankstown City Council.

The objectives of the assessment were to:

- Assess the acid sulfate soil status of the site based on a review of risk map and field observations;
- Assess the contamination status of the site by undertaking sampling and testing of soil; and
- Provide recommendations for further investigation/remediation requirements (if any) for the site to be suitable for the proposed student accommodation development.

The scope of work undertaken included:

- Fieldwork including soil sampling;
- Laboratory testing; and
- Data assessment and reporting.

Based on the site history information and visual observations, a number of Areas of Environmental Concern (AECs) and Chemicals of Potential Concern (COPCs) were identified. The identified AECs and associated CoPCs are presented in **Table 4.1.1** overleaf.

Table 4.1.1 AECs and associated COPC

Potential Areas of Concern	Chemicals of Potential Concern	Extent of Contamination
Southern end of the site – building rubble burial	TPH, PAH, Metals, Asbestos	Building rubble was buried up to 3 m to 4 m below the site surface.
Former farm dam – potential contaminated fill	TPH, BTEX, PAH, OCP, Metals, Asbestos	Potentially contaminated fill could have been used to backfill the dam
Whole site – use of pesticides for pest/weed control	OCP, Metals	Chemical application (such as pesticides) was commonly used in historical farming activities. Contamination, if present, is likely to be localised near the surface and minor.
Whole site – hazardous building materials	Asbestos, Lead	Historical fam sheds/houses could contain asbestos and lead paint. Weathering, leaching and spreading (during demolition) of material would likely to be localised in the near surface.
Existing Building Footprints (inaccessible)	Uncontrolled Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos

A total of twenty-five (25) boreholes were cored across the site on 11 and 12 July 2011, and samples submitted to a NATA accredited laboratory for analysis of CoPC.

Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- Asbestos, which was detected at six (6) locations across the site.

Coffey recommended additional assessment to be undertaken to further characterise the asbestos impact and to assist in the selection of remedial/management options.

4.2 NAA 2011, Soil Contamination Investigation

NAA was commissioned by JDH Architects to undertake a Soil Contamination Investigation (SCI) in an area in the northeast of the Bankstown Campus at the University of Western Sydney - Bankstown Campus located at Bullecourt Avenue, Milperra NSW (the site). The portion of the site investigated in NAA (2011) was approximately 2,500m2 in area and resided to the north of the existing P2 car park at the Bankstown Campus. The proposed redevelopment comprised construction of a single storey childcare facility with adjacent car parking facilities.

The objectives of the SCI were to provide information on the extent and nature of contamination (if any) within the fill/soil material at the site and to assess the suitability of the site for the proposed land-use as a childcare facility.

NAA undertook the following scope of works to achieve the project objectives:

- Prepare a safe work method statement for works to be conducted at the site;
- Complete a site inspection and a comprehensive site walkover;
- Conduct grid-based sampling pattern by the hand augering of eight locations within the boundaries of the site. Hand augering was undertaken to a maximum depth of approximately 1.2m below ground surface with sampling conducted at varying depths through the fill/soil profile;
- Collect seventeen (17) soil samples;
- Conduct NATA-certified laboratory-based analysis of soil; and
- Prepare a SCI report.

Based on the findings of the investigation, NAA concluded the following:

- Hotspots of lead contamination at locations BH3 0.0-0.2m and S2 0.0-0.1m were identified during an intrusive investigation previously undertaken by Coffey (AG were not provided this report);
- Concentrations of cadmium (BH3 0.0-0.2m) and zinc (BH3 0.0-0.2m, S2 0.0-0.1m and S7 0.0-0.1m) have been found to exceed the adopted Provisional Phytotoxicity Investigation Levels (PPIL);
- The site was unsuitable for the proposed land use as a childcare facility due to the presence of hotspots of lead contamination which may present a risk to human health if not appropriately managed;
- Exceedances of PPILs have also been reported at these locations and can be addressed as part of the management of the lead hotspots; and
- A marginal exceedance of zinc concentrations when compared with the PPIL was recorded at S7 0.0-0.1m. Given the marginal nature of this exceedance, it does not impact upon the suitability of the site for the proposal land use as a childcare facility.

Based on these conclusions, NAA 2011 made the following recommendations:

- Given the shallow nature of the impacted material, it was assumed that this material will be excavated and removed from site during the course of site preparation works (e.g. stripping back of topsoil material) for the purposes of redevelopment;
- Fill/soils to be removed offsite for disposal should be classified in accordance with NSW EPA Waste Classification Guidelines (2014) and should be disposed of at an appropriately licenced landfill facility;
- Following site preparation works, a suitably qualified Environmental Consultant should return to site to collect validation samples of the area of concern (in vicinity of BH3, S2 and S7) in order to confirm acceptable residual concentrations of heavy metals are present with respect to the adopted HIL and PPIL and that the site is suitable for the intended land use; and
- If it is determined that site preparation works will not result in the excavation and removal of the shallow material at BH3 0.0-0.2m and S2 0.0-0.1m, remediation works will be required. In this event, it is recommended that a Remedial Action Plan (RAP) be developed to address remediation of the hotspots of contamination identified.

4.3 EIS 2016, Preliminary Contamination Screening and Waste Classification

Burtenshaw Scoufis Architecture + Interiors commissioned Environmental Investigation Services (EIS) to assign a waste classification to in-situ soil adjacent to the west of the athletics track located at 2 Bullecourt Avenue, Milperra NSW.

The aim of the investigation was to assess soil contamination issues at the site and to provide a waste classification for the material to be excavated for the proposed oval development.

The scope of work included the following:

- Review of available geological information;
- Soil sampling from three boreholes;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC); and
- Preparation of a letter report presenting the results of the investigation.

All results were below the site assessment criteria (SAC) adopted for the site. Overlying fill soils were classified as General Solid Waste (Non-putrescible) and underlying natural soils were classified as Virgin Excavated Natural Material (VENM). Based on this data, EIS concluded that the risk of widespread significant soil contamination in the development area was relatively low. The fill and natural soil material assessed was considered by EIS to be suitable for re-use on the subject site, provided it meets geotechnical and earthwork requirements.

4.4 JBS&G 2018, Phase 1 Environmental Assessment Report

JBS&G Australia Pty Ltd (JBS&G) were engaged by Western Sydney University (WSU) (the client) to prepare a Phase 1 Environmental Assessment Report for the WSU Milperra Campus located off Bullecourt Avenue, Milperra NSW (the site). Based on current Master Plan concepts for the Milperra Campus, JBS&G understood

WSU intends to create an integrated living and working precinct with a range of land uses including medium to high density residential, mixed use, retail, community, open space and conservation areas at the site.

The objective of the investigation was to assess the potential for contamination relating to historical and current land use activities at the site to constrain the intended development objectives, and to make recommendations for further investigations and or remediation to achieve intended land uses of the development.

To meet the project objectives, JBS&G carried out the following scope of works:

- Review of available council documentation, aerial photographs, legal title information, EPA records and heritage records to identify areas of environmental concern (AECs) and associated contaminants of potential concern (CoPC);
- Review of site setting including topography, hydrology, hydrogeology and geology;
- Review of records of environmental incidents or former environmental licenses held by the NSW EPA;
- A detailed site inspection of accessible areas to identify potential AECs and CoPC not identified in the historical record review;
- Development and documentation of a conceptual site model (CSM);
- Limited soil sampling and analysis of soil samples for a range of CoPC;
- Assessment of soil sampling and analysis results against EPA endorsed guideline criteria for residential land use; and
- Preparation of the Phase 1 Environmental Site Assessment report in general accordance with guidelines made or approved by the NSW EPA.

Surrounding land use at the time of JBS&Gs site walk over was comprised of the following:

- North: Bullecourt Avenue with commercial / industrial land-use beyond including a service station to the north-west;
- East: Mount Saint Joseph's High School and Horsley Road with commercial / industrial land-use beyond;
- South: The South Western Motorway (M5) with Kelso Landfill beyond; and
- West: Ashford Avenue with residential land-use beyond.

A SafeWork NSW search of the Stored Chemical Information Database (SCID) and the microfiche records held by SafeWork was requested. Information provided by SafeWork NSW included details on a number of abandoned (2) underground storage tanks (USTs) formerly located in the central eastern section of the site. Review of the SafeWork NSW documentation indicated the 2 x 2,500L USTs were removed on Friday 19 December 1997 by Email Petroleum Systems.

Based on site history review and observations during the site walkover, JBS&G identified the following AEC and associated CoPC presented in **Table 4.4.1** below.

Table 4.4.1 AECs and associated COPCs

Areas of Environmental Concern (AECs)	Contaminants of Potential Concern (CoPCs)
Demolition of historical site structure that may have contained hazardous building materials	Heavy metals, lead and asbestos
Surface soils impacted with herbicides/pesticides due to the maintenance of site from noxious weeds/pests	OCPs
Fill materials across the site, potential imported to site	Heavy metals, TRH, BTEX, PAH, OCPs, PCBs and asbestos
Burial area (fill material)	Heavy metals, TRH, BTEX, PAH, VOCs
Landfill gas along the southern boundary adjacent the Kelso Landfill	Methane and other landfill gases (LFG)

Based on the unidentified sources of fill material potentially imported to the site to backfill/raise topographic features and the potential for fill material at the site to contain waste materials associated with demolition of historical buildings potentially containing asbestos and/or lead paint, fill materials must be considered a potential contaminated medium. Due to the age of some existing site structures, it is possible that they may contain hazardous building materials including asbestos and lead based paints. Soils immediately surrounding buildings are considered as potentially contaminated medium.

In addition, buildings containing asbestos and / or lead paint which may have been demolished without appropriate controls may have also impacted surface soils. Surface soils must also therefore be considered a potential contaminated medium.

Based on the suspected depth of groundwater >8 m bgs, the likelihood of contamination of groundwater as a result of activities at the site is considered to be low. Based on the presence of the landfill site to the south and the nearby commercial/industrial properties to the north and east, there is potential for groundwater to be impacted as a result of offsite activities.

Given the relatively close proximity of the landfill to the south of the site, landfill gas has the potential to be a contaminated medium in the southern portion of the site.

JBS&G carried out a limited detailed site inspection and investigation. During the detailed site inspection JBS&G noted the observation of topography for potential adjustments in ground levels due to filling, presence of waste material such as asbestos containing material (ACM) on the ground surface and on external surfaces of structures and potential chemical/fuel storage, use or spillage.

On 23 August 2017, ten surface samples were collected from the site using a hand auger and forwarded to a NATA accredited laboratory for analysis of heavy metals, PAH, asbestos (NEPM 500ml) and OCPs. During soil sampling, a geotechnical fabric layer was identified below the ground surface at sampling point SS10.

Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- SS10 – asbestos fibres/fibrous asbestos (AF/FA) detected at 0.02% w/w above the adopted HSL site criteria 0.001% w/w.

Based on the findings of this investigation, JBS&G made the following conclusions:

- The site has historically been used for a combination of agricultural and residential uses prior to development of the university;
- There is the potential for impacts to soil as a result of the demolition of former building structures potentially containing hazardous building materials, including asbestos and lead paint. This was confirmed by the identification of asbestos at sampling point SS10 and review of the Coffey 2011 Phase 2 Environmental Site Assessment Report, which also identified and recommended management of asbestos in soil;
- There is the potential for presence of imported fill material of unknown origin to have been used during historical construction activities at the site; and
- Based on the presence of the landfill site to the south and the nearby commercial industrial properties to the north, northwest and east, there is considered to be a potential for contaminated groundwater and landfill gas migration to have impacted the site.

Based on these conclusions, JBS&G recommended a detailed site investigation (DSI) is undertaken for the site in order to assess the extent and degree of contamination at the site and to provide an assessment of risk posed by site contaminants to human and environmental health. In addition to the DSI, JBS&G recommended a hazardous building material survey be completed prior to commencement of redevelopment works such that materials identified as comprising lead paint and or asbestos may be appropriately managed with regard to exposure risks to site workers and future building occupants.

4.5 AG 2020, Detailed Site Investigation

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Pty Ltd to conduct a Stage 2 Detailed Site Investigation (DSI) for the property located at Western Sydney University – Milperra Campus, Milperra NSW.

AG had the following project appreciation:

- The site was an active campus of Western Sydney University;
- The investigation was limited to areas outside of building structures and discretion was required in active areas of the site;
- The site was proposed for rezoning and subdivision to facilitate residential development. It was understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and
- A Detailed Site Investigation was required to accompany the development application.

The primary objectives of this investigation were;

- To assess the potential for contamination to be present on the site in available / accessible areas as a result of past and current land use activities;
- To provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- To provide recommendations for further investigation, management and/or remediation (if warranted).

AG undertook the following activities to address the project objectives:

- A desktop review of relevant information pertaining to the site;
- A site walkover to understand current site conditions;
- Conduct an intrusive site investigation via hydraulic excavator, drill rig and hand auger to establish ground conditions, facilitate the collection of representative soil and groundwater samples and install groundwater monitoring wells;
- Laboratory analysis of selected soil and groundwater samples collected during the field investigation; and
- An assessment of the contamination status of the site and preparation of a DSI in accordance with the Guidelines for Consultants Reporting on Contaminated Sites, 2011.

Based on evidence assessed as part of the investigation, AG made the following conclusions;

- The detected concentrations of contaminants of potential concern in groundwater are considered unlikely to present a risk to surrounding aquatic environments;
- The detected concentrations of contaminants of potential concern in groundwater are considered unsuitable for discharge to municipal stormwater without further treatment / assessment;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable direct contact human health exposure risk;
- The detected concentrations of asbestos fines / friable asbestos and non-friable asbestos containing materials in the soil samples analysed are considered likely to present a risk an unacceptable direct contact human health exposure risk;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable inhalation / vapour intrusion exposure risk;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable TPH management limit exposure risk; and
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable aesthetic risk.

The following areas of environmental concern were identified:

Table 4.5.1 Areas of Environmental Concern (AG 2020)

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC01	Friable / Non-Friable Asbestos and Heavy Metal impacted Surficial and Fill Soils	Uncontrolled Filling	Asbestos, Lead, Cadmium and Zinc
AEC02	Friable Asbestos impacted Fill Soils	Uncontrolled Filling	Asbestos
AEC03	Non-Friable Asbestos impacted Surficial and Fill Soils	Uncontrolled Filling	Asbestos
AEC04	Potential Underground Storage of Petroleum Products Onsite (JBS&G 2018)	Uncontrolled Fuel / Oil Spillage	Metals, PAH, BTEX and TRH
AEC05	Existing Building Footprints (inaccessible)	Uncontrolled Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos

Based upon conclusions made, AG recommended the following;

- A further supplementary contamination assessment should be considered to further understanding of nature and extent of contamination identified onsite and address data gaps presented by building footprints, inaccessible areas and building footprints;
- Preparation of a Remedial Action Plan (RAP) is required to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination risk;
- If groundwater is expected to be encountered during the proposed development, a groundwater management plan would be required;
- The preparation of any supplementary contamination assessments, remedial action plans and/or groundwater management plans should be completed by an appropriately experienced environmental consultant;
- As per NSW WHS Regulations, any removal of friable asbestos requires the engagement of a Class A licensed asbestos removalist and a pre-notification to SafeWork NSW, with accompanying air monitoring during the works and clearances post completion to be conducted by a licensed asbestos assessor (LAA);
- Following remediation of the identified contamination, validation sampling and a site validation report will be required to confirm the effectiveness of the remedial works; and
- Any soil proposed for disposal should be classified and disposed of as per the NSW EPA Waste Classification Guidelines, 2014 with all disposal documentation retained by the client for inclusion within the site validation report.

4.6 AG 2022 – Remedial Action Plan

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Pty Ltd to prepare a Remedial Action Plan (RAP) for the property located at Western Sydney University – Milperra Campus, Milperra NSW.

AG had the following project appreciation:

- The site was an active campus of Western Sydney University;
- The investigation was limited to areas outside of building structures and discretion was required in active areas of the site;
- The site was proposed for rezoning and subdivision to facilitate residential development. It was understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and
- A Detailed Site Investigation (DSI) was carried out for the site by AG in 2020, which recommended a supplementary contamination assessment to understand the nature and extent of contamination

identified onsite and address data gaps presented by building footprints, previous contamination assessments and inaccessible areas of environmental concern; and

- The DSI also concluded that a RAP be prepared in order to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination assessment.

The following Sampling Analysis Quality Plan (SAQP) was prepared for the data gap assessment required prior to remediation works.

Table 4.6.1 Data Gap Assessment SAQP (AG 2022)

ID	Area of Environmental Concern	Area (m^2)	Methodology	Analytes
Detailed Asbestos Gravimetric Assessment				
AEC01	Friable / Non-Friable Asbestos impacted Surficial and Fill Soils	12,800	Forty-six (46) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
AEC02	Friable Asbestos impacted Fill Soils	17,100	Fifty-four (54) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
AEC03	Non-Friable Asbestos impacted Surficial and Fill Soils	18,240	Eighty-four (84) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
Remaining areas of site	Potential Asbestos impacted Soils	80,000	Forty-seven (47) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
Heavy Metal / Asbestos Gravimetric Assessment				
AEC01a	Heavy Metal impacted Surficial and Fill Soils	1,000	Six (6) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Lead, Cadmium and Zinc
Chemical Characterisation / Asbestos Gravimetric Assessment				
AEC05	Post Demolition Assessment	37,000		

Based on the data reviewed during the preparation of the RAP, AG concluded the land could be made suitable for the proposed future land use subject to completion of the following;

- Preparation of a SAQP prior to commencement of data gap assessment;
- Implementation of the strategies, methodologies and measures set out in this RAP;
- Should newly identified unacceptable land contamination risks be identified during supplementary assessment works, an addendum to this RAP may be required. The addendum should be prepared by a suitably experienced environmental consultant;
- Prior to any removal of soils from site for offsite disposal during remedial works, waste classification for those soils should be prepared by a suitably experienced environmental consultant. Residual impacted fill materials must also be appropriately characterised as per the strategy outlined in this RAP;
- AG recommends that any waste classifications, remediation monitoring and validation works be undertaken by a suitably experienced environmental consultant; and

- It is recognised that contamination risks may remain on the site. If so, a LT-EMP will document areas where residual contamination is present on the site, and information on management measures that have been adopted. Provisions contained in the LT-EMP will need to have a mechanism to be legally enforceable and will be publicly notified. A revised RAP will be prepared to document where and how management measures will be implemented, and how a LTEMP can be made legally enforceable.

5 DATA INTEGRITY ASSESSMENT

SE has relied on the following sources of data while undertaking this investigation:

- SE field observations during the site walkover;
- City of Canterbury-Bankstown;
- Department of Land and Water Conservations;
- Department of Minerals and Energy;
- Department of Primary Industries – Water;
- Australian Soil Resource Information System;
- Google Earth;
- National Environment Protection Council;
- Nearmap;
- NSW Environment Protection Authority;
- NSW Land and Property Information; and
- Previous Contamination Assessments.

Based on SE's experience and professional judgement, the data obtained from the sources relied upon, is considered to be adequately precise, accurate, representative, complete and comparable within the objectives of this investigation and for the purpose of drawing conclusions regarding land contamination risks at the site.

6 CONCEPTUAL SITE MODEL DEVELOPMENT

6.1 Potential Areas of Environmental Concern

The review of site history, previous contamination assessments and site walkover observations were assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AEC) and contaminants of potential concern (COPC) which have the potential to be present on site. The AEC identified and associated COPC are presented in **Table 6.1.1.**

Table 6.1.1 PAEC and COPC

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC01	Friable / Non-Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Asbestos
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	Uncontrolled Filling	Lead, Cadmium and Zinc
AEC02	Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Asbestos
AEC03	Non-Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Asbestos

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during redevelopment by site workers; and
- Direct contact, ingestion or inhalation of soil by future site inhabitants.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Onsite flora and fauna;
- Groundwater and surface water;
- Future residents/end users; and
- Neighbouring residential land users.

6.2 Land Use Setting

SE understands that the site currently utilised as an educational establishment with on-site residential facilities. The site is proposed for demolition and redevelopment within a low-density residential land use setting.

As the proposed future site use is redevelopment under a low-density residential land use setting, SE considers it reasonable to adopt the 'HIL A – Low-Density Residential' per guidance provided in Section 2.2 of Schedule B (1) of the National Environment Protection Measure (Assessment of Site Contamination) 2013 (NEPM ASC 2013), in order to conservatively assess the site for any future proposed land use as well as the current land use.

6.3 Drinking Water Use

There are no groundwater bores onsite or within a 500 m radius of the site, registered for drinking water use. Therefore, further assessment of this groundwater drinking water value is considered not warranted.

6.4 Recreational Water Use

Surface water courses proximal to the site includes Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site.

Based on the previous contamination assessments, there is limited concern for contaminants of concern reaching nearby waterways and as such, this value will not be considered further during this assessment.

6.5 Aquatic Ecosystems

Surface water courses proximal to the site includes Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site.

Based on the previous contamination assessments, there is limited concern for contaminants of concern reaching nearby waterways and as such, this value will not be considered further during this assessment.

6.6 Direct Contact – Human Health

SE notes that the proposed development includes building footprints and hardstand pavement areas across some of the site, which would act as a direct contact barrier between potential land contamination and onsite receptors during operation of the site. However, it is understood that majority of the site will remain as open space / landscaping areas.

The open space turfed / landscaping areas would act as a direct contact barrier assuming intrusive disturbance of the physical barrier was not undertaken following installation. During construction, the public and construction employees, may complete the direct contact exposure pathway between potential contamination and receptors. Based on the presence of heavy metals exceedances present within soil, further consideration of this value is considered warranted.

Following demolition at the site, further consideration of this value will be considered warranted.

SE recommends a pragmatic approach during the course of any required intrusive / excavation works. If contamination is suspected, works should stop, an unexpected finds protocol should be followed and further investigation of the fill materials should be carried out by a suitably qualified environmental consultant.

6.7 Inhalation / Vapour Intrusion – Human Health

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) must be present onsite. Review of the previous contamination assessments indicated a moderate to high likelihood for a potential primary source to be present immediately adjacent to the site associated with Kelso Landfill. This will be further assessed and/or managed during remedial works at the site.

The historical evidence reviewed indicated a high likelihood for the presence of asbestos containing materials to be present at the site in the form of friable and non-friable asbestos. As such, further investigation is warranted as part of this data gap assessment, to determine the presence and extent of the asbestos contamination at the site.

6.8 Aesthetics

Section 3.6.3 of NEPM ASC 2013 advises that there are no specific numeric aesthetic guidelines, however site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

SE notes that the proposed development includes building footprints and hardstand pavement areas across some of the site, which would act as a direct contact barrier. The open space turfed areas would act as a direct contact barrier assuming intrusive disturbance of the physical barrier was not undertaken following installation.

During construction, the public and construction employees, may complete an aesthetics exposure pathway between potential contamination and receptors.

Due to the known presence of asbestos containing materials on-site within surficial and fill soils, further consideration of this value is warranted.

6.9 Ecological Health - Terrestrial Ecosystems

Section 3.4.2 of Schedule B1 NEPM ASC 2013, advises a pragmatic risk-based approach should be taken in applying ecological investigation levels and ecological screening levels in residential and commercial / industrial land use settings.

SE notes that the proposed development would include landscaped areas on site as it is understood majority of the site will remain undeveloped.

Due to the presence of these areas and the presence of elevated heavy metals within soil materials at the site, further consideration to onsite and adjacent ecological receptors is warranted.

6.10 Management Limits for Petroleum Hydrocarbon Compounds

NEPM ASC 2013 notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosive hazards; and
- Effects on buried infrastructure (e.g. penetration of or damage to, in-ground services by hydrocarbons).

Schedule B1 of NEPM ASC 2013 includes ‘management limits’ to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum depth to which the limits should apply. NEPM ASC 2013 also notes that management limits may have less relevance at operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

7 SITE ASSESSMENT CRITERIA

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 6** of this project, the following assessment criteria have been adopted for this project:

- Human health direct contact – HILs in Table 1A (1) in NEPM ASC 2013 and HSLs in Table B4 of Friebel, E & Nadebaum, P (2011);
- Human health inhalation/vapour intrusion – HSLs in Table 1 (A) in NEPM ASC 2013;
- Human health (asbestos) – absence / presence for preliminary screening, and no visible ACM on surface;
- Petroleum hydrocarbon compounds (management limits) – Table 1 B (7) of NEPM ASC 2013;
- Ecological Investigation and Screening Levels as calculated per NEPM ASC 2013 Table 1 (B) 1-6; and
- Aesthetics – no highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds), no hydrocarbon sheen on surface water, no discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature, no large monolithic deposits of otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust), no presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste, and no soils containing residue from animal burial (e.g. former abattoir sites).

A summary of the site adopted criteria utilised for this assessment, is presented in **Appendix B**.

8 DATA QUALITY OBJECTIVES

NEPM ASC 2013 provides guidance on the development of data quality objectives (DQO) using a seven-step process. The DQO for this project are set out in **Sections 8.1** to **8.7** of this report. SE note AG (2022) outlined Validation Data Quality Objectives for validation works and as such, SE have adopted DQO for the supplementary detailed site investigation.

8.1 Step 1: State the problem

The first step involves summarising the contamination problem that requires new environmental data and identifying resources available to solve the problem.

The objectives of this project are to:

- Assess the potential for contamination to be present on the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

The project is being undertaken because:

- The site is proposed for low-density residential development, comprising removal of existing structures and redevelopment; and
- Asbestos containing materials have been detected within previous contamination assessments and the full extent and condition of the materials is currently unknown;
- A Supplementary Contamination Assessment to address data gaps identified within AG (2022) to further inform remediation strategies.

The project team identified for this project consists of suitably experienced environmental consultants from SE.

The regulatory authorities identified for this project include NSW EPA and City of Canterbury-Bankstown.

8.2 Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this project include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- Do the concentrations of identified contaminants of potential concern (COPC) present an unacceptable exposure risk to identified receptors, for the proposed land use setting?
- Is the site suitable for the proposed land use setting, in the context of land contamination?

8.3 Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 8.2** for this project, will include:

- Data obtained during searches of the site's history;
- The nature and extent of sampling at the site, including both density and distribution;
- Samples of relevant site media;
- The measured physical and/or chemical parameters of the site media samples (including field screening and laboratory analysis, where relevant); and

- Assessment criteria adopted for each of the media sampled.

The site adopted criteria is presented in **Section 7** and **Appendix B**.

8.4 Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the subject investigation area as defined by its boundaries (refer **Figure 2**).

The temporal boundaries of the project include:

- The project timeframe presented in the SE proposal for this project;
- Unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- Access availability of the site (to be defined by the site owner/representative); and
- Availability of SE field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC).

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model and the project scope, is likely to be limited to shallow soils and fill material within the site.

The scale of the decisions required will be based on the entire site.

Constraints which may affect the carrying out of this project may include access limitations, presence of above and below ground infrastructure, and hazards creating health and safety risks.

8.5 Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

8.5.1 Rinsate Blanks

No rinsate blank samples will be collected as the assessment will be subject to asbestos analysis only.

8.5.2 Trip Spikes and Trip Blank Samples

No trip spike and trip blank samples will be collected as the assessment will be subject to asbestos analysis only.

8.5.3 Field Duplicates and Field Triplicates

No field duplicate and field triplicate samples will be collected as the assessment will be subject to asbestos analysis only.

8.5.4 Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

8.5.5 If/Then Decision Rules

SE has adopted the following 'if/then' decision rules for this project:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this project; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this project (refer **Section 8.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then SE will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this project (refer **Section 8.3**), SE will undertake an assessment of the exceedance in the context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

8.6 Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

SE will mitigate the risk of decision error by:

- Assignment of fieldwork tasks to suitably experienced SE consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories; and
- Assignment of data interpretation tasks to suitably experienced SE consulting staff and outsourcing to technical experts where required.

SE will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Table 8.6.1 Performance and Acceptance Criteria Summary

Completeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Critical locations sampled	Refer **Section 8.7.1**	Critical samples analysed according to DQO	Refer **Section 8.7.6**
Critical samples collected	Refer **Section 8.7.1**	Analytes analysed according to DQO	Refer **Section 8.7.6**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 8.7.6**
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis
		Sample extraction and holding times complied with	Refer **Section 8.7.7**
Comparability			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer **Section 8.7.7**
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	Same LORs at primary laboratory	Refer **Section 8.7.7**
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	Same laboratory for primary sample analysis	All primary samples to Eurofins | MGT
		Same analytical measurement units	Refer **Section 8.7.7**
Representativeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to DQO	Refer **Section 8.7.6**	Samples analysed according to DQO	Refer **Section 8.7.6**
Media identified in DQO sampled	Refer **Section 8.7.6**		
Precision			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates No limit for analytical results <10 times LOR 50% for analytical results 10-20 times LOR 30% for analytical results >10 times LOR	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%		
Accuracy (bias)			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field trip spikes	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of laboratory acceptance criteria
Field trip blanks	Analyte concentration <LOR	Surrogate spike recovery	No exceedances of laboratory acceptance criteria

8.7 Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

8.7.1 Sampling Point Density and Locations

Table A in NSW EPA *Sampling Design Guidelines* (2022) provides guidance on minimum sampling point densities required for site characterisation, based on detecting circular hot spots by using a systematic sampling pattern. This guidance assumes the investigator has little knowledge about the probable locations of the contamination, the distribution of the contamination is expected to be random (e.g. land fill sites) or the distribution of the contamination is expected to be fairly homogenous (e.g. agricultural lands).

However, Section 3.1 of NSW EPA *Sampling Design Guidelines* (2022) states that a judgemental sampling pattern can be used where there is enough information on the probable locations of contamination. Further to this, Section 6.2.1 of NEPM ASC 2013 states that the number and location or sampling points is based on knowledge of the site and professional judgement. Sampling should be localised to known or potentially contaminated areas identified from knowledge of the site either from site history or an earlier phase of site investigation. Judgemental sampling can be used to investigate sub-surface contamination issues in site assessment.

Table 1 in the *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009*, Western Australia Department of Health (DOH (2009)) indicates that where the 'likelihood of asbestos' is assessed as "possible" or "suspect", the investigation regimen should include a sampling density that is either judgemental or the same as that set out in Table A of NSW EPA *Sampling Design Guidelines* (2022) for assessing asbestos.

Sampling densities outlined within AG (2020) were amended to meet a double density of areas known to be asbestos-impacted and as such, the following sampling densities were met for each AEC assessed:

- Twenty-three (23) samples will be collected from AEC01 to address an area of 12,800 m^2;
- Fifty-four (54) samples will be collected from AEC02 to address an area of 17,100 m^2;
- Eighty-four (84) samples will be collected from AEC03 to address an area of 31,740 m^2; and
- Six (6) samples will be collected from AEC01a to address an area of 1,000 m^2.

The locations of the sampling points are set out in **Figure 3**.

8.7.2 Sampling Methodology

The sampling point methodology presented in **Table 8.7.1** will be used for this project. The methodology is based on a range of factors considered relevant to this project, including:

- The identified contaminants of potential concern;
- The suspected laydown mechanisms for those contaminants of concern;
- The suspected likely depth of contamination; and
- Site specific constraints which affect the type of sampling techniques suited to the site.

Table 8.7.1 Proposed Sampling Methodology

AEC	Area	Sampling Point ID	Method	Target Depth of Sampling Point (m bgl)
AEC01	Friable / Non-Friable Asbestos impacted Surficial and Fill Soils	'AEC01-TP01' to 'AEC01-TP23'	3.5 t Excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.
AEC01a	Heavy Metal impacted Surficial and Fill Soils	'AEC01a-TP01' to 'AEC01a-TP06'	3.5 t Excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.
AEC02	Friable Asbestos impacted Fill Soils	'AEC02-TP01' to 'AEC02-TP54'	3.5 t Excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.
AEC03	Non-Friable Asbestos impacted Surficial and Fill Soils	'AEC03-TP01' to 'AEC03-TP84'	3.5 t Excavator	1.0 m bgl, practical refusal or 0.3 m into inferred natural material, whichever occurs first.

Reference will also be made to Table 5 in WA DOH (2009) for the sampling and screening of fill soils for the presence of asbestos, where practical. The application of asbestos screening criteria published in NEPM ASC 2013 may be limited.

8.7.3 Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the sampling point number and the depth/interval the sample was collected from, e.g. a sample collected from TP03 at a depth of 0.2m below ground level, would be identified as TP03-0.2.

Project samples will be stored in laboratory prepared glass and plastic containers (and zip lock bags if collected for asbestos or acid sulfate soil assessment).

Soil samples analysed for organic contaminants of concern (and acid sulfate soil samples) will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- SE project identification number;
- Each sample identifier;
- Date each sample was collected;
- Sample type (e.g. soil or water);
- Container type/s for each sample collected;
- Preservation method used for each sample (e.g. ice);
- Analytical requirements for each sample and turnaround times; and
- Date and time of dispatch and receipt of samples (including signatures).

8.7.4 Decontamination

All sampling equipment used during the soil investigation consisted of location specific nitrile gloves, as such decontamination was deemed unnecessary. To avoid cross contamination via the excavator bucket, samples were collected from the centre of the soil formation, ensuring to avoid sampling materials which had come into contact with the excavator bucket.

Non-disposable equipment (if required) used during the investigation will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

8.7.5 Laboratory Selection

The analytical laboratories used for this project will be National Association of Testing Australia (NATA) accredited for the analysis undertaken.

8.7.6 Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled; and
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

8.7.7 Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 8.7.2** below.

Table 8.7.2 Laboratory Holding Times (Primary Laboratory - Eurofins)

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos	No limit	AS4964:2004	0.01 % w/w (qualitative)
Asbestos	No limit	Inhouse Method	0.001% w/w

9 DETAILED SITE INVESTIGATION METHODOLOGY

Soil sampling and analysis were undertaken with reference to the following documents:

- NSW EPA 2022. *Contaminated Sites Sampling Design Guidelines,* NSW Environment Protection Authority.
- NEPM ASC 2013 *'National Environment Protection (Assessment of Site Contamination) Measure. Schedule B (2) Guideline on Data Collection, Sample Design and Reporting.'* National Environmental Protection Council, Adelaide.
- ASC NEPM 2013 *National Environment Protection (Assessment of Site Contamination) Measure 2013 Schedule B (1) Investigation Levels for Soil and Groundwater*.

9.1 Scope of Fieldworks

To clarify and quantify the existence of the potential contaminants, an indicative sampling analysis and quality plan (SAQP) was developed. The site works were performed on 9, 10, 11, 12 and 19 January 2024 in accordance with the SAQP and supervised by SE environmental scientist at all times.

The scope of the investigation was developed based upon the findings of the previous contamination assessments and the SAQP subsequently developed. Based upon this approach the following scope of works was performed:

- Completion of a site-specific Safe Work Method Statement in accordance with SE health and safety policy;
- Collection of a 10 L sample screened for asbestos containing materials greater than 7 mm from each sampling location;
- Completion of one-hundred and thirty-six (136) soil sampling locations within the cleared subject area (via 3.5 tonne excavator);
- Collection of discrete soil samples every 1.0 m recovered or change of strata from the soil test pits; and
- Analysis of one-hundred and thirty-six (136) primary soil samples.

9.2 Laboratory Analysis

All soil samples will be forwarded to a NATA accredited laboratory for analysis of the analytes listed below. Eurofins Laboratory shall be used for the analysis of primary samples.

10 FIELDWORK

10.1 Soil Sampling

Soil sampling was undertaken by SE on 9, 10, 11, 12 & 19 January 2024. A total of one-hundred and thirty-six (136) test pits were advanced across the accessible areas within the AEC01 (TP01, TP04–TP11, TP13–16, TP19-20, TP23), AEC02 (TP01-TP52) and AEC03 (TP02-TP10, TP18-TP24,TP27-30, TP32-34, TP 57-58, TP60-64, TP70-73, TP75-80, TP84) using a 3.5 tonne excavator to a depth of 1.0 m bgs. A grid-based inspection walkover was undertaken during the assessment to determine whether asbestos was present within the uppermost 10 cm of the soil stratigraphy within each AEC.

Samples for potential quantitative asbestos analysis were collected from the near surface, and in areas of observed contamination, varying in depth from 0.1 m to 0.4 m below ground surface level (BGSL) in line with the recommended sampling density outlined within the Western Australia Department of Health, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009).

A 10L bulk soil sample was collected from each test pit. Each 10 L soil sample was screened using a 7 mm aperture sieve. Oversized materials retained in sieve were visually assessed for potential asbestos containing materials (ACM). Potential ACM greater than 7mm was weighed and placed in separate laboratory supplied zip lock bags. A separate additional 500 mL sample was also collected from unaltered soils and placed in separate laboratory supplied zip lock bags.

Samples were collected at each sampling point and placed in laboratory supplied zip lock bags. The bags were labelled with the project number, sample identifier and date the samples were collected on. The location of each sampling point established was marked on a site plan set out in **Figures 3, 4** and **5**.

Upon completion of the sampling, each test pit was backfilled with excavated soils at the completion of the sampling task at each sampling point. Soil test pit logs were maintained in the field by an SE environmental scientist for all exploratory locations. Field observations such as lithology, odours, staining, depth of water etc. were noted on the logs. The logs are presented in **Appendix A**.

At the time of fieldworks, AEC01a was not investigated due to the proximity to sensitive receptors (active onsite childcare facility). AEC01a will require investigation in a future data gap assessment.

Roads and services within the site were to be preserved for accessibility during the demolition process. As such, SE could not access / sample where hardstand or potential services were located.

Each sampling point established was marked on a site plan. The locations of these sampling points are presented in **Figures 3, 4** and **5**.

10.2 Site Geology

Observations were made of soils encountered during sampling field work. These observations were recorded on environmental test pit logs. A copy of these logs is presented in **Appendix A**.

Inferred natural material was encountered within every *in-situ* sampling / investigative location.

Widespread filling was observed across the site ranging from depths of 0.0 – 1.7 m. Soils generally consisted of FILL: 0.0 – 1.7 m BGL – Clayey SAND, coarse grained, medium to dark brown, dry to moist OR CLAY, medium plasticity, grey, dry to moist.

Refusal / bedrock was not encountered at any test pit prior to reaching termination depth between 0.6 m and 1.7 m bgs.



Site Photograph 10.2.1. General soil stratigraphy encountered within AEC02, as observed within 'TP28' on 9 January 2024.



Site Photograph 10.2.2. General soil stratigraphy encountered within AEC02, as observed within 'TP06' on 11 January 2024.



Site Photograph 10.2.3. General soil stratigraphy encountered within AEC03, as observed within 'TP06' on 11 January 2024.

10.3 Odours

Olfactory evidence of contamination was not observed across the site or within any soil materials encountered during the investigation.

10.4 Staining

Visual evidence of staining was not observed across the site or within any of the soil samples collected.

10.5 Potential Asbestos Containing Materials

A Hazardous Building Material Survey was undertaken prior to this assessment and as such, potential asbestos containing materials within building structures on-site have been identified and outlined.

Visual evidence of potential asbestos containing materials (PACM) in the form of fibre cement fragments were observed within test pits advanced across all three (3) areas of environmental concern accessible and assessed as part of this assessment. PACM was limited to the soils within the 0.0 – 0.6 m below ground level. A summary of sampling locations where PACM was observed is presented in **Table 10.5.1**.

Table 10.5.1 Locations of observed PACM

Areas of Environmental Concern	Sampling Location
AEC01	TP17
AEC02	TP01, TP06, TP11, TP19, TP20, TP22, TP27, TP35, TP38, TP39, TP47, TP48
AEC03	TP19, TP28, TP42, TP57, TP68, TP70, TP72

11 LABORATORY ANALYSIS

All samples collected were transported to the analytical laboratory, using chain of custody (COC) protocols. A selection of these samples was scheduled for analysis, with reference to the relevant COPC identified for the AEC that the samples were collected from.

All soil samples were forwarded to the NATA accredited laboratory for analysis of the analytes listed below. Eurofins Environment were used for the analysis of primary samples.

Table 10.5.1 details the analysis undertaken for samples collected during the investigation.

Table 10.5.1 Laboratory Analytical Schedule

Sample ID	Analytical Suite	
	Asbestos Bulk ID	Asbestos WA DOH (0.001%)
AEC01 TP17-0.2-0.3, TP18-0.2-0.3, TP21-0.2-0.3, TP22-0.2-0.3 (*collected 11/01/2024*) TP01-0.2-0.3, TP04-0.2-0.3, TP05-0.2-0.3, TP06-0.2-0.3, TP07-0.2-0.3, TP08-0.2-0.3, TP09-0.2-0.3, TP10-0.2-0.3, TP11-0.2-0.3, TP13-0.2-0.3, TP14-0.2-0.3, TP15-0.2-0.3, TP16-0.2-0.3, TP19-0.2-0.3, TP20-0.2-0.3, TP23-0.2-0.3 *(collected 19/01/2024)*		X
AEC02 TP01-0.2-0.3, TP02-0.2-0.3, TP03-0.2-0.3, TP04-0.2-0.3, TP05-0.2-0.3, TP06-0.2-0.3, TP07-0.2-0.3, TP08-0.2-0.3, TP09-0.2-0.3, TP10-0.2-0.3, TP11-0.2-0.3, TP12-0.2-0.3 *(collected 11/01/2024)* TP13-0.2-0.3, TP14-0.2-0.3, TP15-0.2-0.3, TP16-0.2-0.3, TP17-0.2-0.3, TP18-0.2-0.3, TP19-0.2-0.3, TP20-0.2-0.3, TP21-0.2-0.3, TP22-0.2-0.3, TP23-0.2-0.3, TP24-0.2-0.3, TP25-0.2-0.3, TP26-0.2-0.3, TP27-0.2-0.3, TP28-0.2-0.3, TP29-0.2-0.3, TP30-0.2-0.3, TP31-0.2-0.3, TP32-0.2-0.3, TP33-0.2-0.3, TP34-0.2-0.3, TP35-0.2-0.3, TP36-0.2-0.3, TP37-0.2-0.3, TP38-0.2-0.3, TP39-0.2-0.3, TP40-0.2-0.3, TP41-0.2-0.3, TP42-0.2-0.3, TP43-0.2-0.3, TP44-0.2-0.3, TP45-0.2-0.3, TP46-0.2-0.3, TP47-0.2-0.3, TP48-0.2-0.3, TP49-0.2-0.3, TP50-0.2-0.3, TP51-0.2-0.3, TP52-0.2-0.3 *(collected 12/01/2024)*		X
AEC03 TP02-0.2-0.3, TP03-0.2-0.3, TP04-0.2-0.3, TP05-0.2-0.3, TP06-0.2-0.3, TP07-0.2-0.3, TP08-0.2-0.3, TP09-0.2-0.3, TP10-0.2-0.3, TP12-0.2-0.3, TP18-0.2-0.3, TP19-0.2-0.3, TP20-0.2-0.3, TP21-0.2-0.3, TP22-0.2-0.3, TP23-0.2-0.3, TP24-0.2-0.3, TP27-0.2-0.3, TP28-0.2-0.3 (*collected 9/01/2024)* TP29-0.2-0.3, TP30-0.2-0.3, TP32-0.2-0.3, TP33-0.2-0.3, TP34-0.2-0.3, TP35-0.2-0.3, TP39-0.2-0.3, TP40-0.2-0.3, TP41-0.2-0.3, TP42-0.2-0.3, TP43-0.2-0.3, TP44-0.2-0.3, TP57-0.2-0.3, TP58-0.2-0.3, TP60-0.2-0.3, TP61-0.2-0.3, TP62-0.2-0.3, TP63-0.2-0.3, TP64-0.2-0.3, TP66-0.2-0.3, TP67-0.2-0.3, TP68-0.2-0.3, TP70-0.2-0.3, TP71-0.2-0.3, TP72-0.2-0.3, TP73-0.2-0.3, TP75-0.2-0.3 (*collected 10/01/2024*) TP76-0.2-0.3, TP77-0.2-0.3, TP78-0.2-0.3, TP79-0.2-0.3, TP80-0.2-0.3, TP84-0.2-0.3 (*collected 11/01/2024*)		X
AEC02-TP35-FC	X	

A copy of the analytical laboratory certificates of analysis, is presented in **Appendix C.**

The sample analytical results were tabulated and presented in the attached **Results Tables**.

12 DATA QUALITY INDICATOR ASSESSMENT

12.1 Completeness

An assessment of the completeness of data collected was undertaken, and the results presented in **Table 12.1.1**.

Table 12.1.1 Completeness DQI

Field Considerations	Target	Actual	Comment
Critical locations sampled	167	132	Test pits omitted during fieldworks due to the presence of buried service alignment and existing hardstand barriers. AEC01a not assessed due to presence of a childcare centre. Performance against indicator considered acceptable.
Critical samples collected	167	132	Performance against indicator considered acceptable.
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	All sampling point logs, calibration logs and chain of custody forms	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Critical samples analysed according to DQO	Refer **Section 8.7.6**	100%	Performance against indicator considered acceptable.
Analytes analysed according to DQO	Refer **Section 8.7.6**	100%	Performance against indicator considered acceptable.
Appropriate laboratory analytical methods and LORs	Refer **Section 8.7.7**	100%	Performance against indicator considered acceptable.
Sample documentation complete	All sample receipt advices, all certificates of analysis	100%	Performance against indicator considered acceptable.
Sample extraction and holding times complied with	Refer **Section 8.7.7**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

12.2 Comparability

An assessment of the comparability of data collected was undertaken, and the results presented in **Table 12.2.1**

Table 12.2.1 Comparability DQI

Field Considerations	Target	Actual	Comment
Same SOPs used on each occasion	100%	100%	Performance against indicator considered acceptable.
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	100%	Performance against indicator considered acceptable.
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Same analytical methods used by primary laboratory	Refer **Section 8.7.7**	100%	Performance against indicator considered acceptable.
Same LORs at primary laboratory	Refer **Section 8.7.7**	100%	Performance against indicator considered acceptable.
Same laboratory for primary sample analysis	All primary samples to Eurofins MGT	100%	Performance against indicator considered acceptable.
Same analytical measurement units	Refer **Section 8.7.7**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately comparable within the objectives and constraints of the project.

12.3 Representativeness

An assessment of the representativeness of data collected was undertaken, and the results presented in **Table 12.3.1.**

Table 12.3.1 Representativeness DQI

Field Considerations	Target	Actual	Comment
Appropriate media sampled according to DQO	Refer **Section 8.7.2**	100%	Performance against indicator considered acceptable.
Media identified in DQO sampled	Refer **Section 8.7.2**	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Samples analysed according to DQO	Refer **Section 8.7.6**	Refer comments	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

12.4 Precision

An assessment of the precision of data collected was undertaken, and the results presented in **Table 12.4.1.**

Table 12.4.1 Precision DQI

Field Considerations	Target	Actual	Comment
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates	N/A	No field duplicates / triplicates collected as samples were submitted for quantitative asbestos analysis.
	No limit for analytical results <10 times LOR	N/A	
	50% for analytical results 10-20 times LOR	N/A	
	30% for analytical results >20 times LOR	N/A	
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Laboratory duplicates	No exceedances of laboratory acceptance criteria	Nil	Performance against indicator considered acceptable.

The data collected is considered to be adequately precise within the objectives and constraints of the project.

12.5 Accuracy

An assessment of the precision of data collected was undertaken, and the results presented in **Table 12.5.1.**

Table 12.5.1 Accuracy DQI

Field Considerations	Target	Actual	Comment
Field trip blanks	Analyte concentration <LOR	Nil	No field blanks submitted as samples were not submitted for TRH/BTEXN analytes.
Field trip spike	Recoveries between 60% and 140%	Nil	No field spikes submitted as samples were not submitted for TRH/BTEXN analytes.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Laboratory method blank	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Matrix spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Surrogate spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Laboratory control sample recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.

The data collected is considered to be adequately accurate within the objectives and constraints of the project.

13 DISCUSSION

A discussion on comparison of laboratory analytical results and field observations, in the context of the assessment criteria adopted for this project, is presented in **Sections 13.1** to **13.1.2**.

13.1 AEC01

13.1.1 Human Health (Residential A) – Asbestos

Asbestos Fines and Friable Asbestos

Friable Asbestos (FA) / Asbestos Fines (AF was detected in samples 'AEC01-TP05-0.2-0.3' (0.00022%) and AEC01-TP17-0.2-0.3' (0.00032%), however, AF / FA was not detected in soil samples above the laboratory limit of reporting or adopted health screening level (0.001 % w/w). However, friable asbestos was detected within previous sampling locations 'BH39' (0.043 % w/w, AG 2020), 'EBH1', 'EBH2', 'EBH3', 'EBH5' (Coffey 2011) and 'SS10' (0.02 % w/w, JBS&G 2018). The concentrations of AF detected within Coffey (2011) were not provided to SE at the time of the assessment and as such, the conservative assumption that the concentrations were above the adopted site criteria (0.001 % w/w) has been adopted.

Non-Friable Asbestos

Non-Friable Asbestos was not detected in the soil samples above the laboratory limit of reporting or adopted health screening level (0.01 % w/w) with the exception of sample 'AEC01-TP23-0.2-0.3' (0.058%).

Non-friable asbestos containing materials (ACM) were observed within shallow fill soils within the investigation areas. Following a review of the site history, SE attributes ACM contamination across the site to be the legacy of historic uncontrolled filling. Chrysotile and crocidolite asbestos was detected within the one (1) representative fibre cement sample collected and submitted to the laboratory for analysis ('AEC02-TP35-FC') which is considered to be representative of the fragments identified within 'AEC01-TP23-0.2-0.3'.

The gravimetric approach set out in Section 4.10 of NEPM (2013) was used to quantify the concentrations of non-friable asbestos containing materials in soil. To calculate the weight (%w/w of asbestos in soil), SE assumed 15% asbestos by weight in cement bonded asbestos fragments, and an assumed soil density of 1.65kg/L. These assumed values are considered to be adequately conservative within the context of this project. The sample size was 10 L, based on guidance in Section 4.10 of NEPM (2013). The estimation formula in Section 4.10 of NEPM (2013) is:

$$\%\ w/w\ asbestos\ in\ soil = \frac{\%\ asbestos\ content \times Non\text{-}friable\ ACM\ (kg)}{soil\ volume\ (L) \times soil\ density\ (kg/L)}$$

Presumed asbestos fibre cement fragments were observed within the following sample locations. The results of the calculations performed using this formula, are presented in **Table 13.1.1** below.

Table 13.1.1 Results of gravimetric estimation of non-friable asbestos contamination in soil.

Sample ID	Weight of non-friable ACM (g)	% w/w asbestos in soil	Health Screening Level (0.01% w/w)
AEC01-TP17-0.2-0.3	25	0.03	Unacceptable

13.1.2 Asbestos Contamination Extent within AEC01

The extents of the friable asbestos contamination within AEC01 covers an area of approximately 3,315 m^2 to an approximate depth of 0.5 m bgsl. SE note that during remediation works at the site, visual observations and results of validation sampling may indicate the presence of asbestos which may increase the extent of the AEC, however, are of the opinion that the extents outlined within **Figure 6** are representative of the extents expected on-site.

13.1.3 Aesthetics

There was no evidence of waste storage or aesthetic risk observed during fieldworks. Based on the presence of AF/FA within surficial soils at former sampling location 'SS10' (JBS&G 2018), further aesthetics management is warranted.

13.2 AEC02

13.2.1 Human Health (Residential A) – Asbestos

Asbestos Fines and Friable Asbestos
Friable Asbestos (FA) / Asbestos Fines (AF was detected in sample 'AEC02-TP11-0.2-0.3' (0.00023%), however, AF / FA was not detected in soil samples above the laboratory limit of reporting or adopted health screening level (0.001 % w/w). However, friable asbestos was detected within previous sampling locations 'BH21' (< 0.001 % w/w, AG 2020) and 'EBH24', 'EBH25' (Coffey 2011).

Non-Friable Asbestos
Non-Friable Asbestos was not detected in the soil samples above the laboratory limit of reporting or adopted health screening level (0.01 % w/w).

Non-friable asbestos containing materials (ACM) were observed within shallow fill soils within the investigation areas. Following a review of the site history, SE attributes ACM contamination across the site to be the legacy of historic uncontrolled filling. Chrysotile and crocidolite asbestos was detected within the one (1) representative fibre cement sample collected and submitted to the laboratory for analysis ('AEC02-TP35-FC').

The gravimetric approach set out in Section 4.10 of NEPM (2013) was used to quantify the concentrations of non-friable asbestos containing materials in soil. To calculate the weight (%w/w of asbestos in soil), SE assumed 15% asbestos by weight in cement bonded asbestos fragments, and an assumed soil density of 1.65kg/L. These assumed values are considered to be adequately conservative within the context of this project. The sample size was 10 L, based on guidance in Section 4.10 of NEPM (2013). The estimation formula in Section 4.10 of NEPM (2013) is:

$$\%\ w/w\ asbestos\ in\ soil = \frac{\%\ asbestos\ content \times Non\text{-}friable\ ACM\ (kg)}{soil\ volume\ (L) \times soil\ density\ (kg/L)}$$

Presumed asbestos fibre cement fragments were observed within the following sample locations. The results of the calculations performed using this formula, are presented in **Table 13.2.1** below.

Table 13.2.1 Results of gravimetric estimation of non-friable asbestos contamination in soil.

Sample ID	Weight of non-friable ACM (g)	% w/w asbestos in soil	Health Screening Level (0.01% w/w)
AEC02-TP01-0.2-0.3	130	**0.15**	**Unacceptable**
AEC02-TP06-0.2-0.3	4	0.004	Acceptable
AEC02-TP11-0.2-0.3	321	**0.37**	**Unacceptable**
AEC02-TP19-0.2-0.3	6	**0.01**	**Unacceptable**
AEC02-TP20-0.2-0.3	28	**0.03**	**Unacceptable**
AEC02-TP22-0.2-0.3	3	0.003	Acceptable
AEC02-TP27-0.2-0.3	27	**0.03**	**Unacceptable**
AEC02-TP35-0.2-0.3	3	0.003	Acceptable
AEC02-TP38-0.2-0.3	10	**0.01**	**Unacceptable**
AEC02-TP39-0.2-0.3	16	**0.02**	**Unacceptable**
AEC02-TP47-0.2-0.3	276	**0.30**	**Unacceptable**
AEC02-TP48-0.2-0.3	18	**0.02**	**Unacceptable**

13.2.2 Asbestos Contamination Extent within AEC02

The extents of the AF/FA asbestos contamination within AEC02 covers an area of approximately 200 m^2 to an approximate depth of 0.5 m bgsl within the vicinity of 'EBH25' (Coffey 2011) and 1.2 m bgsl within the vicinity of 'EBH24' (Coffey 2011). The extents of non-friable asbestos contamination within AEC02 covers an area of approximately 10,425 m^2 and extends to an approximate depth of 0.5m bgsl. SE note that during remediation works at the site, visual observations and results of validation sampling may indicate the presence of asbestos which may increase the extent of the AEC, however, are of the opinion that the extents outlined within **Figure 7** are representative of the extents expected on-site.

13.2.3 Aesthetics

There was no evidence of waste storage or aesthetic risk observed during fieldworks. Based on the presence of asbestos containing materials within surficial soil materials 'TP09' and 'TP/BH101' (AG 2020), further aesthetics management is warranted.

13.3 AEC03

13.3.1 Human Health (Residential A) – Asbestos

Asbestos Fines and Friable Asbestos
Friable Asbestos (FA) / Asbestos Fines (AF) was not detected within any soil samples within AEC03.

Non-Friable Asbestos
Non-Friable Asbestos was not detected in the soil samples above the laboratory limit of reporting or adopted health screening level (0.01 % w/w).

Non-friable asbestos containing materials (ACM) were observed within shallow fill soils within the investigation areas. Following a review of the site history, SE attributes ACM contamination across the site to be the legacy of historic uncontrolled filling. Chrysotile and crocidolite asbestos was detected within the one (1) representative fibre cement sample collected and submitted to the laboratory for analysis ('AEC02-TP35-FC') which is considered to be representative of the fragments identified during this assessment.

The concentrations of ACM detected within AG (2020) were not provided to SE at the time of the assessment and as such, the conservative assumption that the concentrations were above the adopted site criteria (0.01 % w/w) has been adopted.

The gravimetric approach set out in Section 4.10 of NEPM (2013) was used to quantify the concentrations of non-friable asbestos containing materials in soil. To calculate the weight (%w/w of asbestos in soil), SE assumed 15% asbestos by weight in cement bonded asbestos fragments, and an assumed soil density of 1.65kg/L. These assumed values are considered to be adequately conservative within the context of this project. The sample size was 10 L, based on guidance in Section 4.10 of NEPM (2013). The estimation formula in Section 4.10 of NEPM (2013) is:

$$\%\ w/w\ asbestos\ in\ soil = \frac{\%\ asbestos\ content \times Non\text{-}friable\ ACM\ (kg)}{soil\ volume\ (L) \times soil\ density\ (kg/L)}$$

Presumed asbestos fibre cement fragments were observed within the following sample locations. The results of the calculations performed using this formula, are presented in **Table 13.3.1** below.

Table 13.3.1 Results of gravimetric estimation of non-friable asbestos contamination in soil.

Sample ID	Weight of non-friable ACM (g)	% w/w asbestos in soil	Health Screening Level (0.01% w/w)
AEC03-TP19-0.2-0.3	66	**0.08**	**Unacceptable**
AEC03-TP28-0.2-0.3	209	**0.19**	**Unacceptable**
AEC03-TP42-0.2-0.3	5	**0.01**	**Unacceptable**
AEC03-TP57-0.2-0.3	51	**0.05**	**Unacceptable**
AEC03-TP68-0.2-0.3	310	**0.34**	**Unacceptable**
AEC03-TP70-0.2-0.3	152	**0.16**	**Unacceptable**
AEC03-TP72-0.2-0.3	2	0.002	Acceptable

13.3.2 Asbestos Contamination Extent within AEC03

The extent of non-friable asbestos contamination within AEC03 covers an area of approximately 1,185 m^2 to a depth of approximately 0.5 m bgsl. SE note that during remediation works at the site, visual observations and results of validation sampling may indicate the presence of asbestos which may increase the extent of the AEC, however, are of the opinion that the extents outlined within **Figure 8** are representative of the extents expected on-site.

13.3.3 Aesthetics

There was no evidence of waste storage or aesthetic risk observed during fieldworks. Based on the presence of asbestos containing materials within surficial soil materials 'BH59' (AG 2020), further aesthetics management is warranted.

14 REVISED CONCEPTUAL SITE MODEL

14.1 Areas of Environmental Concern

Following a review of site history and subsequent intrusive field analysis, the extent of previously identified areas of environmental concern (AEC) and contaminants of potential concern (COPC) have been identified. The AECs identified and associated COPC are presented in **Table 14.1.1** and **Figures 4, 5 & 6.**

Table 14.1.1 Revised AEC and COPC following assessment

ID	Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk	Remedial Volumes
AEC01	Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Friable Asbestos	Soil	Human Health & Aesthetics	3,315 m^2 x 0.5 m bgsl 1,658 m^3 / 2,985 tonnes
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	Uncontrolled Filling	Lead, Cadmium and Zinc	Soil	Human Health and Ecological Health	TBC[a]
AEC02	Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Friable Asbestos	Soil	Human Health & Aesthetics	100 m^2 x 0.5 m bgsl (EBH24, Coffey 2011) 100 m^2 x 1.2 m bgsl (EBH25, Coffey 2011) 170 m^3 / 306 tonnes
	Non-Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Non-Friable Asbestos	Soil	Human Health & Aesthetics	10,425 m^2 x 0.5 m bgsl 5,212.5 m^3 / 9,382.5 tonnes
AEC03	Non-Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Asbestos	Soil	Human Health & Aesthetics	1,815 m^2 x 0.5 m bgsl 910 m^3 / 1,645 tonnes

Notes to Table: Tonnage calculated using a bulking factor of 1.8 tonnes/m^3, A – AEC not assessed as part of this assessment due to the presence of adjacent sensitive receptors. AEC01a will require further assessment in an additional data gap assessment.

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during future development by site workers; and
- Inhalation of contaminants during future use by site occupiers.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Future residents/end users; and
- Neighbouring residential land users.

15 CONCLUSIONS AND RECOMMENDATIONS

Based on SE's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, SE makes the following conclusions:

- AEC01a was not accessible at the time of this data gap assessment and requires assessment within a future assessment prior to the start of remediation works;
- Friable Asbestos Containing Materials (ACM) were identified within AEC01 during this assessment and previous contamination assessments undertaken;
- Friable and Non-Friable Asbestos Containing Materials (ACM) were identified within AEC02 during this assessment and previous contamination assessments undertaken;
- Non-Friable Asbestos Containing Materials (ACM) were identified within AEC03 during this assessment and previous contamination assessments undertaken;
- Surficial asbestos identified within all three (3) AECs assessed currently present an unacceptable aesthetics risk and require further management/remediation;
- Based on the assessments undertaken as part of this investigation, SE has concluded that the site has friable and non-friable asbestos impacted soil materials requiring remediation and further management; and
- An addendum to the existing Remedial Action Plan (AG 2022) is required to outline the remediation methodologies required to remediate the newly identified extents of contamination identified.

Based on the conclusions stated above and the background data gathered during the course of this investigation, SE recommends:

- An addendum to the existing Remedial Action Plan prepared by AG (2022) is required to outline the remediation methodologies required to remediate the newly identified extents of asbestos contamination identified.
- Following removal of hazardous building materials (if identified) and subsequent demolition of the onsite structures, a clearance inspection should be carried out by an appropriately qualified occupational hygienist / NSW LAA;
- A supplementary contamination assessment is required within AEC01a prior to the start of remedial works at the site;
- Additional contamination assessments are required to be undertaken per the site RAP (AG 2022) prior to the start of remediation works at the site; and
- A waste classification assessment should be carried out on any soil materials proposed for disposal off-site as per the NSW EPA Waste Classification Guidelines (2014).

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 16.**

16 STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed, and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Sydney Environmental Group Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, SE reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to SE's engagement. The report must not be used for any purpose other than the purpose specified at the time SE was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual SE consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, SE reserves the right to review and amend this report.

17 REFERENCES

Coffey (Coffey 2011), 'Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus', dated 25 August 2011, Ref: GEOTLCOV24163AG-AB;

Noel Arnolds and Associates (NAA 2011), 'Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW', dated October 2011, Ref: SJ0085:95458;

Environmental Investigation Services (EIS 2016), 'Preliminary Contamination Screening and Waste Classification, Proposed Oval Facilities, UWS Bankstown Campus, 2 Bullecourt Avenue, Milperra' dated 7 April 2016, no report ref provided;

JBS&G (JBS&G 2018), 'Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;

Alliance Geotechnical (AG 2020), 'Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1; and

Alliance Geotechnical (AG 2022), 'Remedial Action Plan, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-2-1

NEPM ASC 2013, '*National Environmental Protection (Assessment of Site Contamination) Measure'*.

NSW EPA 2017, '*Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition)'.*

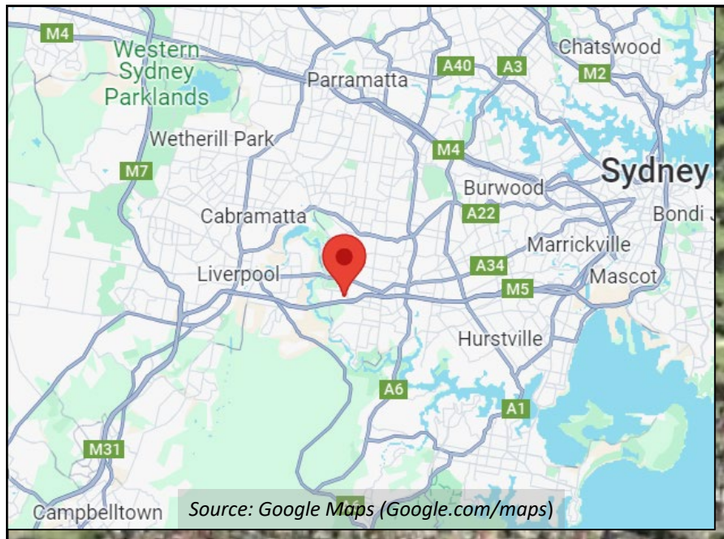
NSW EPA 2012, *'Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases'*

NSW EPA 2020, '*Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'*.

NSW EPA 2022, '*Contaminated Sites: Sampling Design Guidelines'.*

WA DOH 2009, '*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia'* dated May 2009.

FIGURES



Source: Google Maps (Google.com/maps)

Site

Subject Site
Western Sydney University - Milperra Campus, Milperra NSW

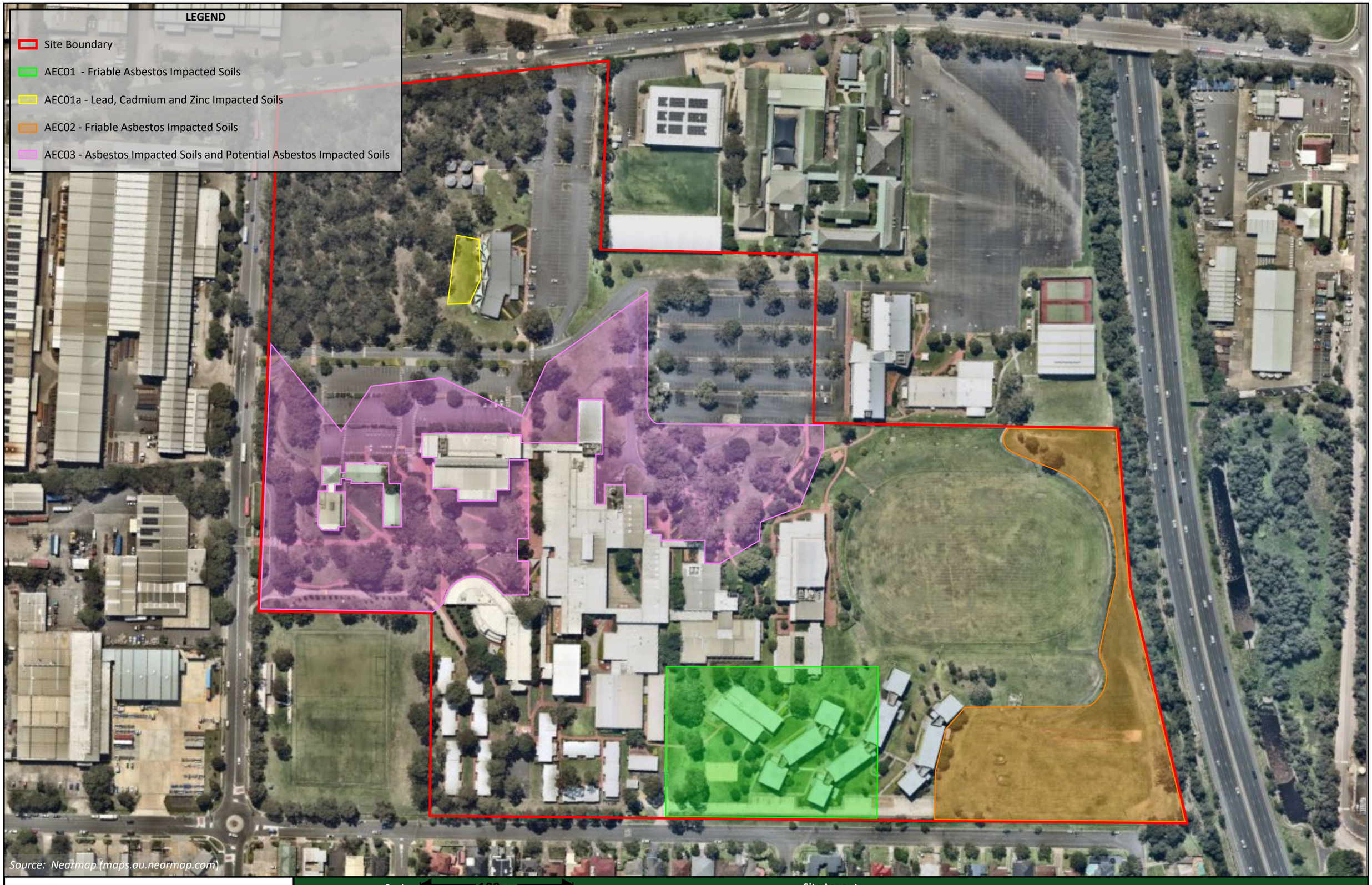
Source: Nearmap (maps.au.nearmap.com)

Sydney Environmental Group

Site Locality

Client Name:	**Mirvac Pty Ltd**	**Figure Number:**	**1**
Project Name:	**Supplementary Detailed Site Investigation**	**Figure Date:**	**22 February 2024**
Project Location:	**Western Sydney University – Milperra Campus, Milperra NSW**	**Report Number:**	**2300-DSI-01-220224.v1d**

N



Sydney Environmental Group	Scale:	100 m	Site Layout	
	Client Name:	Mirvac Pty Ltd	N	Figure Number: 2
	Project Name:	Supplementary Detailed Site Investigation		Figure Date: 22 February 2024
	Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number: 2300-DSI-01-220224.v1d



Source: Nearmap (maps.au.nearmap.com)

Sydney Environmental Group

Scale:	25 m	Figure Number:	3
Client Name:	Mirvac Pty Ltd	Figure Date:	22 February 2024
Project Name:	Supplementary Detailed Site Investigation	Report Number:	2300-DSI-01-220224.v1d
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		

Sampling Plan - AEC01



Source: Nearmap (maps.au.nearmap.com)

Sydney Environmental Group

Scale:	25 m	Sampling Plan - AEC02	
Client Name:	Mirvac Pty Ltd	Figure Number:	4
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

N



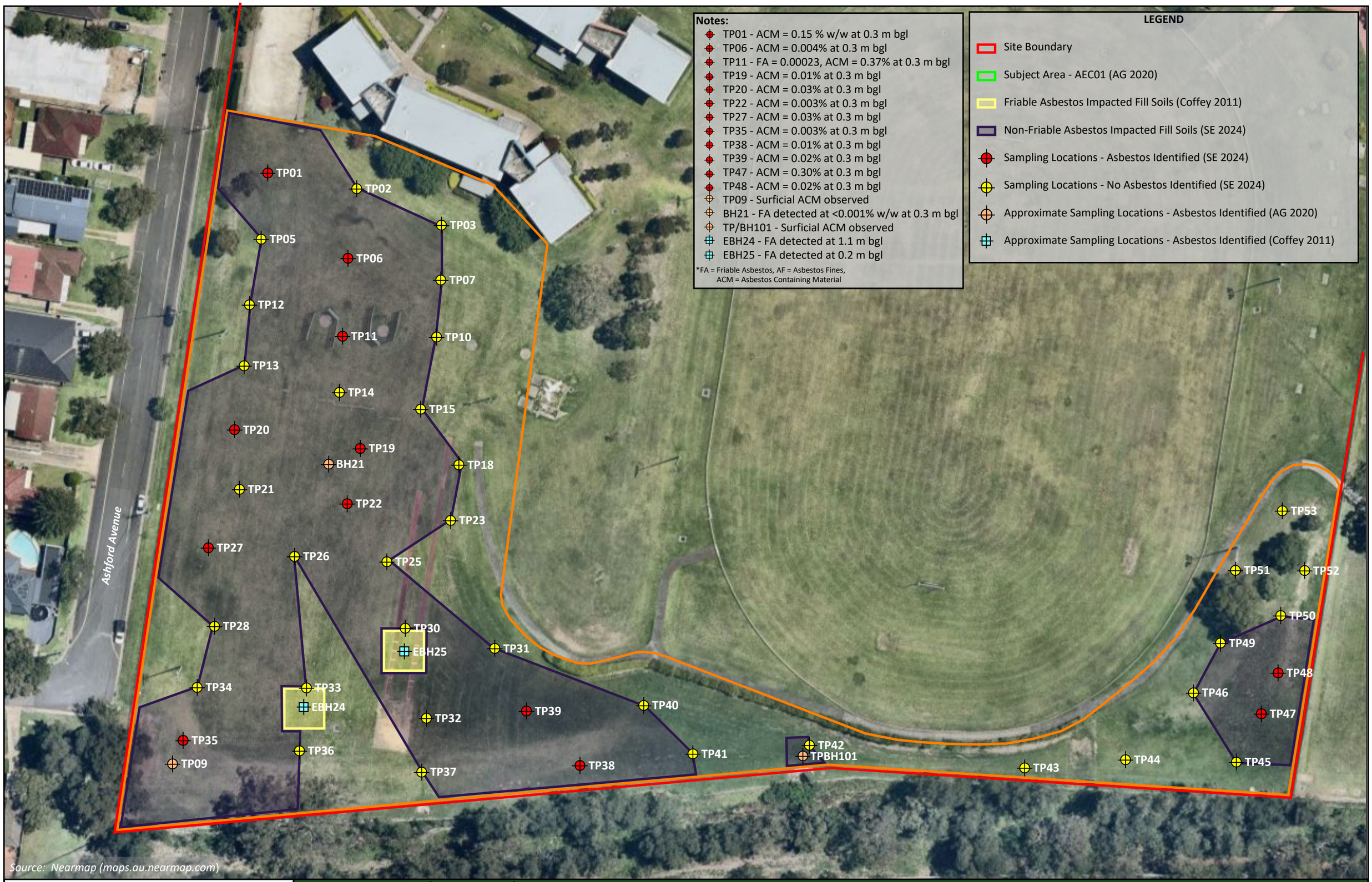
Scale:	50 m	Sampling Plan - AEC03	
Client Name:	Mirvac Pty Ltd	Figure Number:	5
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

Sydney Environmental Group



Scale:	25 m	Asbestos Extent within AEC01	
Client Name:	Mirvac Pty Ltd	Figure Number:	6
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

Sydney Environmental Group



Scale:	25 m	Asbestos Extent within AEC02	
Client Name:	Mirvac Pty Ltd	Figure Number:	7
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

Sydney Environmental Group

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Notes:

- TP19 - ACM = 0.085 % w/w at 0.3 m bgl
- TP28 - ACM = 0.191 % w/w at 0.3 m bgl
- TP42 - ACM = 0.006 % w/w at 0.3 m bgl
- TP57 - ACM = 0.053 % w/w at 0.3 m bgl
- TP68 - ACM = 0.344 % w/w at 0.3 m bgl
- TP70 - ACM = 0.156 % w/w at 0.3 m bgl
- TP71 - ACM = 0.002 % w/w at 0.3 m bgl
- TP53 - ACM = > 0.01 % w/w at 0.3 m bgl
- TP56 - ACM = > 0.01 % w/w at 0.3 m bgl
- BH59 - Surficial ACM observed

*FA = Friable Asbestos, AF = Asbestos Fines, ACM = Asbestos Containing Material

LEGEND

- Site Boundary
- Subject Area - AEC03 (AG 2020)
- AEC05 - Building Footprints (AG 2020)
- Inaccessible Areas
- Non-Friable Asbestos Impacted Fill Soils
- Sampling Locations - Asbestos Identified (SE 2024)
- Sampling Locations - No Asbestos Identified (SE 2024)
- Approximate Sampling Locations - Asbestos Identified (AG 2020)
- Approximate Sampling Locations - Asbestos Identified (Coffey 2011)

Sydney Environmental Group

Scale:	50 m	Asbestos Extent within AEC03	
Client Name:	Mirvac Pty Ltd	Figure Number:	5
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

TABLES

Sample ID	Date Sampled	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL A - FA/AF	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL A - Bonded ACM	Laboratory Results	Laboratory Results		On-site gravimetric results			
				Asbestos Detected/ Non-Detected	Percentage of AF/FA <7mm, %w/w	Percentage of Bonded ACM >7mm (500ml), %w/w	Weight of Sample (10L), g	Onsite weight of ACM fragment >7mm, g	Asbestos	Percentage of Bonded ACM >7mm (10L), %w/w
AEC01-TP01-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC01-TP04-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC01-TP05-0.2-0.3	19/01/2024	0.001%	0.01%	Asbestos Detected	**0.00022%**	<0.01%	13600	-	-	-
AEC01-TP06-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC01-TP07-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC01-TP08-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC01-TP09-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC01-TP10-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC01-TP11-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC01-TP13-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC01-TP14-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC01-TP15-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12900	-	-	-
AEC01-TP16-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC01-TP17-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	**0.00032%**	<0.01%	11500	25	3.75	**0.033%**
AEC01-TP18-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC01-TP19-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13300	-	-	-
AEC01-TP20-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC01-TP21-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11800	-	-	-
AEC01-TP22-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15000	-	-	-
AEC01-TP23-0.2-0.3	19/01//2024	0.001%	0.01%	Asbestos Detected	<0.001%	**0.058%**	12700	-	-	-
AEC02-TP01-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	130	19.5	**0.150%**
AEC02-TP02-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11000	-	-	-
AEC02-TP03-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC02-TP04-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP05-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13300	-	-	-
AEC02-TP06-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13400	4	0.6	**0.004%**
AEC02-TP07-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC02-TP08-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP09-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC02-TP10-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP11-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	**0.00023%**	<0.01%	13000	321	48.15	**0.370%**
AEC02-TP12-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11300	-	-	-
AEC02-TP13-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP14-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP15-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC02-TP16-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC02-TP17-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC02-TP18-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP19-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13700	6	0.9	**0.007%**
AEC02-TP20-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	12800	28	4.2	**0.033%**
AEC02-TP21-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12900	-	-	-
AEC02-TP22-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13400	3	0.45	**0.003%**
AEC02-TP23-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13500	-	-	-
AEC02-TP24-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14400	-	-	-
AEC02-TP25-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP26-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP27-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	12600	27	4.05	**0.032%**
AEC02-TP28-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP29-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC02-TP30-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP31-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC02-TP32-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP33-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14800	-	-	-
AEC02-TP34-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP35-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14000	3	0.45	**0.003%**
AEC02-TP36-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP37-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC02-TP38-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13100	10	1.5	**0.011%**
AEC02-TP39-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13000	16	2.4	**0.018%**
AEC02-TP40-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC02-TP41-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP42-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP43-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC02-TP44-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12000	-	-	-
AEC02-TP45-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP46-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15000	-	-	-
AEC02-TP47-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13800	276	41.4	**0.300%**
AEC02-TP48-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14500	18	2.7	**0.019%**
AEC02-TP49-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-

Sample ID	Date Sampled	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL A - FA/AF	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL A - Bonded ACM	Laboratory Results	Laboratory Results		On-site gravimetric results			
				Asbestos Detected/ Non-Detected	Percentage of AF/FA <7mm, %w/w	Percentage of Bonded ACM >7mm (500ml), %w/w	Weight of Sample (10L), g	Onsite weight of ACM fragment >7mm, g	Asbestos	Percentage of Bonded ACM >7mm (10L), %w/w
AEC02-TP50-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	0.004%	13900	-	-	-
AEC02-TP51-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP52-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15100	-	-	-
AEC03-TP02-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC03-TP03-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12300	-	-	-
AEC03-TP04-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13500	-	-	-
AEC03-TP05-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC03-TP06-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP07-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP08-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC03-TP09-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15300	-	-	-
AEC03-TP10-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC03-TP12-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC03-TP18-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14700	-	-	-
AEC03-TP19-0.2-0.3	9/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	11700	66	9.9	**0.085%**
AEC03-TP20-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC03-TP21-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP22-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC03-TP23-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP24-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC03-TP27-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC03-TP28-0.2-0.3	9/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	16400	209	31.35	**0.191%**
AEC03-TP29-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14600	-	-	-
AEC03-TP30-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP32-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC03-TP33-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP34-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP35-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP39-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC03-TP40-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP41-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP42-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	11700	5	0.75	**0.006%**
AEC03-TP43-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC03-TP44-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14800	-	-	-
AEC03-TP57-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14500	51	7.65	**0.053%**
AEC03-TP58-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11000	-	-	-
AEC03-TP60-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12700	-	-	-
AEC03-TP61-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12700	-	-	-
AEC03-TP62-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC03-TP63-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP64-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP66-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP67-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC03-TP68-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13500	310	46.5	**0.344%**
AEC03-TP70-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14600	152	22.8	**0.156%**
AEC03-TP71-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13100	2	0.3	**0.002%**
AEC03-TP72-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12200	-	-	-
AEC03-TP73-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP75-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC03-TP76-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14900	-	-	-
AEC03-TP77-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP78-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC03-TP79-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP80-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP84-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-

Legend

	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 AF/FA
	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 Bonded ACM
ACM	Asbestos Containing Material
FA and AF	Fibrous Asbestos and Asbestos Fines
NL	Not Limiting
-	Detected at below the limit of reporting

APPENDIX A

TEST PIT LOGS

ENVIRONMENTAL TESTPIT AEC01 TP01

PROJECT NUMBER 2300	**DATE** 19 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.2 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP01-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5					
0.6			FILL	FILL: CLAY, low plasticity, grey with orange mottling, dry-moist.	
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

Disclaimer This log is intended for environmental not geotechnical purposes.
produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP04

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP04-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, low-medium plasticity, grey with yellow mottling, moist.	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1			CLS	NATURAL: CLAY, medium plasticity, grey with red mottling, moist.	
1.2					
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC01 TP05

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP05-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist, trace sandstone.	
0.3			FILL	FILL: CLAY, low-medium plasticity, grey with orange mottling, moist.	
1.1			CLS	NATURAL: CLAY, medium plasticity, grey with red mottling, moist.	
1.4				Termination Depth at: 1.4 m on compacted fill	

ENVIRONMENTAL TESTPIT AEC01 TP06

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra SCA
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.3 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP06-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5					
0.6					
0.7			FILL	FILL: Silty CLAY, low plasticity, red-brown, dry-moist.	
0.8					Foreign materials including potential concrete, brick, and glass observed.
0.9					
1					
1.1					No contamination indicators observed.
1.2					
1.3				Termination Depth at: 1.3 m on compacted fill	
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP07

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP07-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, red-brown, dry.	
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC01 TP08

PROJECT NUMBER 2300	**DATE** 19 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.3 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP08-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4			FILL	FILL: CLAY, low plasticity, red with grey mottling, moist.	
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP09

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP09-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, low plasticity, red with grey mottling, moist.	
1.2				Termination Depth at: 1.2 m on compacted fill	

ENVIRONMENTAL TESTPIT AEC01 TP10

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP10-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5					
0.6			FILL	FILL: Sandy CLAY, low plasticity, red-brown with grey mottling, dry.	
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC01 TP11

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, grey-brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP11-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, grey-brown, dry-moist.	
0.3					
0.4			FILL	FILL: CLAY, low plasticity, red-brown with grey mottling, dry.	
0.5					
0.6					
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP13

PROJECT NUMBER 2300	**DATE** 19 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 0.9 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, brown, dry.	No contamination indicators observed.
0.2	AEC01-TP13-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, brown, dry.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, red-brown, dry.	
0.6					
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP14

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, grey-brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP14-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, grey-brown, dry-moist.	
0.3					
0.4			FILL	FILL: CLAY, low plasticity, red-brown, dry.	Foreign materials including Asbestos Containing Material (ACM) observed.
0.5					
0.6					No contamination indicators observed.
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP15

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, grey-brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP15-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, grey-brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, red-brown, moist.	
0.6					
0.7					
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP16

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP16-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					Foreign materials including Asbestos Containing Material (ACM) observed.
0.4			FILL	FILL: CLAY, low plasticity, orange with red and brown mottling, dry.	
0.5					
0.6					No contamination indicators observed.
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP17

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP17-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					Foreign materials including Asbestos Containing Material (ACM), wood, and textile observed.
0.4					
0.5					No contamination indicators observed.
0.6					
0.7			FILL	FILL: CLAY, low plasticity, orange with red and yellow mottling, dry.	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill.	
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP18

PROJECT NUMBER 2300	**DATE** 11 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP18-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, pale brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low-medium plasticity, orange with grey mottling, dry.	
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC01 TP19

PROJECT NUMBER 2300	**DATE** 19 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra SCA	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.1 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP19-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, red-orange, dry.	
0.6					
0.7					
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP20

PROJECT NUMBER 2300	**DATE** 11 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP20-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, orange with grey mottling, dry.	
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 23 Feb 2024

ENVIRONMENTAL TESTPIT AEC01 TP21

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.7 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP21-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					Foreign materials including brick, glass, and plastic observed.
0.4			FILL	FILL: CLAY, low plasticity, orange with grey mottling, dry.	
0.5					No contamination indicators observed.
0.6					
0.7				Termination Depth at: 0.7 m refusal on stormwater conduit	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC01 TP22

PROJECT NUMBER 2300	**DATE** 11 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP22-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, red-brown, dry.	
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC01 TP23

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 19 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC01-TP23-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					Foreign materials including Asbestos Containing Material (ACM) observed.
0.4					
0.5			FILL	FILL: CLAY, low plasticity, red-brown, dry.	No contamination indicators observed.
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP01

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP01-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including potential Asbestos Containing Material (ACM), terracotta, and asphalt observed.
0.3					
0.4					
0.5					
0.6			FILL	FILL: CLAY, low-medium plasticity, grey with yellow mottling, moist.	No contamination indicators observed.
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP02

PROJECT NUMBER 2300	**DATE** 11 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP02-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, low-medium plasticity, grey with yellow mottling, moist.	
1				Termination Depth at: 1.0 m on compacted fill	

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ENVIRONMENTAL TESTPIT AEC02 TP03

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP03-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, low-medium plasticity, grey with yellow mottling, moist.	
0.4					Foreign materials including glass observed.
0.5					No contamination indicators observed.
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP04

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP04-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					Foreign materials including brick observed.
0.5					
0.6					
0.7			FILL	FILL: CLAY, low-medium plasticity, grey with yellow mottling, moist.	No contamination indicators observed.
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP05

PROJECT NUMBER 2300	**DATE** 11 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP05-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist, trace sandstone.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low-medium plasticity, grey with orange and yellow mottling, moist.	
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP06

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP06-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including potential Asbestos Containing Material (ACM) and glass observed.
0.5			FILL	FILL: CLAY, low-medium plasticity, grey with orange and yellow mottling, moist.	No contamination indicators observed.
1				Termination Depth at: 1.0 m on compacted fill	

ENVIRONMENTAL TESTPIT AEC02 TP07

PROJECT NUMBER 2300	**DATE** 11 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.1 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP07-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					Foreign materials including plastic observed.
0.5					No contamination indicators observed.
0.6					
0.7			FILL	FILL: CLAY, low-medium plasticity, orange with yellow mottling, moist.	
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP08

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP08-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, grey with orange and yellow mottling, moist.	
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP09

PROJECT NUMBER 2300	**DATE** 11 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.1 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP09-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: SAND, fine-coarse grained, grey-brown, dry-moist.	
0.4					
0.5			FILL	FILL: CLAY, low plasticity, grey with orange and yellow mottling, moist.	
0.6					
0.7					
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP10

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP10-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including terracotta observed.
0.3			FILL	FILL: Sandy CLAY, low plasticity, red-brown with grey mottling, dry.	
0.4					
0.5			FILL	NATURAL: CLAY, low plasticity, yellow-grey, moist.	No contamination indicators observed.
0.6					
0.7					
0.8				Termination Depth at: 0.8 m on compacted fill	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP11

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.7 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, grey-brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP11-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, grey-brown, dry-moist.	Foreign materials including potential Asbestos Containing Material (ACM), and terracotta observed.
0.3					
0.4			FILL	FILL: CLAY, low plasticity, yellow-grey, moist.	No contamination indicators observed.
0.5					
0.6					
0.7				Termination Depth at: 0.7 m on compacted fill	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP12

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.7 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, grey-brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP12-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, grey-brown, dry-moist.	Foreign materials including Asbestos Containing Material (ACM), and terracotta observed.
0.3					
0.4			FILL	FILL: CLAY, low-medium plasticity, yellow-grey, moist.	No contamination indicators observed.
0.5					
0.6					
0.7				Termination Depth at: 0.7 m on compacted fill	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP13

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, brown, dry.	No contamination indicators observed.
0.2	AEC02-TP13-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, brown, dry.	
0.3					
0.4			FILL	FILL: CLAY, medium plasticity, yellow-grey, moist.	
0.5					
0.6					
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP14

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.7 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, grey-brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP14-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, grey-brown, dry-moist.	
0.3			FILL	FILL: CLAY, low plasticity, yellow-grey, moist.	
0.4					
0.5					
0.6					
0.7				Termination Depth at: 0.7 m on compacted fill	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP15

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.7 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, grey-brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP15-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, grey-brown, dry-moist.	
0.3			FILL	FILL: CLAY, low plasticity, yellow-grey, moist.	
0.4					
0.5					
0.6					
0.7				Termination Depth at: 0.7 m on compacted fill	
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP16

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.5 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2			FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3	AEC02-TP16-0.2-0.3		FILL	FILL: CLAY, low plasticity, orange with red and brown mottling, moist, trace gravels.	
0.4					
0.5				Termination Depth at: 0.5 m on compacted fill	
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP17

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP17-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, low plasticity, orange with grey mottling, dry.	
0.4					
0.5					
0.6					
0.7					
0.8			FILL	FILL: CLAY, low plasticity, orange, dry, trace gravels.	
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP18

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP18-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, pale brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, medium plasticity, yellow-grey, dry-moist.	
0.6			FILL	FILL: CLAY, medium plasticity, red-brown, moist.	
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP19

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP19-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including Geotextile Fabric, Asbestos Containing Material (ACM), plastic, tile, and ceramics observed.
0.3					
0.4					
0.5			FILL	FILL: CLAY, medium plasticity, red-orange, moist.	No contamination indicators observed.
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP20

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP20-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including Geotextile fabric, Asbestos Containing Material (ACM), and glass observed.
0.3					
0.4					
0.5			FILL	FILL: CLAY, medium plasticity, yellow-orange, moist.	No contamination indicators observed.
0.6					
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP21

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP21-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5					
0.6					
0.7					Foreign materials including metal observed.
0.8					
0.9					
1			FILL	FILL: CLAY, low-medium plasticity, red-brown with yellow and orange mottling, moist, trace sand.	No contamination indicators observed.
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP22

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP22-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including geotextile fabric, Asbestos Containing Material (ACM), glass, brick, terracotta, and plastic observed.
0.8			FILL	FILL: CLAY, low-medium plasticity, dark grey-brown, moist, trace rocks and shale.	No contamination indicators observed.
1.4				Termination Depth at: 1.4 m on compacted fill	

ENVIRONMENTAL TESTPIT AEC02 TP23

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP23-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					Foreign materials including road base, asphalt, and concrete observed.
0.5			FILL	FILL: CLAY, low plasticity, red-orange, moist.	No contamination indicators observed.
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP24

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.2 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP24-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, low plasticity, grey with orange mottling, moist.	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP25

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP25-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4			FILL	FILL: CLAY, low plasticity, grey, dry.	
0.5					
0.6			FILL	FILL: CLAY, medium plasticity, red-orange, moist.	
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP26

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.6 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP26-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, dark brown, dry-moist.	Foreign materials including geotextile fabric, plastic, glass, and brick observed.
0.3			FILL	FILL: CLAY, low plasticity, grey with brown and orange mottling, dry.	No contamination indicators observed.
1			FILL	FILL: CLAY, low-medium plasticity, dark grey, moist, trace gravels.	
1.6				Termination Depth at: 1.6 m on compacted fill	

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP27

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP27-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, dark brown, dry-moist.	Foreign materials including geotextile fabric, Asbestos Containing Material (ACM), plastic, glass, shade cloth, metal, and terracotta observed.
0.3					
0.4					
0.5					
0.6			FILL	FILL: CLAY, low-medium plasticity, yellow-brown, moist.	No contamination indicators observed.
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP28

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP28-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including geotextile fabric, Asbestos Containing Material (ACM), terracotta, and glass observed.
0.3			FILL	FILL: CLAY, low plasticity, grey, moist, with trace shale.	No contamination indicators observed.
1.1	AEC02-TP28-1.1-1.2				
1.4				Termination Depth at: 1.4 m on compacted fill	

ENVIRONMENTAL TESTPIT AEC02 TP29

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP29-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4			FILL	FILL: CLAY, low plasticity, grey with orange mottling, dry.	
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1			FILL	FILL: CLAY, medium plasticity, grey, moist.	
1.2	AEC02-TP29-1.2-1.3				
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP30

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP30-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8			FILL	FILL: CLAY, low plasticity, orange with grey mottling, moist, trace rocks.	
0.9					
1					
1.1					
1.2	AEC02-TP30-1.1-1.2				
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

Disclaimer This log is intended for environmental not geotechnical purposes.

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ENVIRONMENTAL TESTPIT AEC02 TP31

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP30-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					Foreign materials including metal and glass observed.
0.4					
0.5					No contamination indicators observed.
0.6					
0.7					
0.8			FILL	FILL: CLAY, low plasticity, orange with grey mottling, moist, trace rocks.	
0.9					
1					
1.1					
1.2					
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP32

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP32-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, low plasticity, grey with orange mottling, moist, trace sand.	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

Disclaimer This log is intended for environmental not geotechnical purposes.
produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP33

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.3 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP33-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5					
0.6			FILL	FILL: CLAY, low plasticity, orange-brown with grey mottling, moist.	
0.7					
0.8					
0.9					
1					
1.1	AEC02-TP33-1.1-1.2				
1.2					
1.3				Termination Depth at: 1.3 m - Refusal due to bedrock.	
1.4					
1.5					
1.6					
1.7					
1.8					

Disclaimer This log is intended for environmental not geotechnical purposes.

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ENVIRONMENTAL TESTPIT AEC02 TP34

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.3 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP34-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including geotextile fabric, plastic, and metal observed.
0.3					
0.4			FILL	FILL: CLAY, low plasticity, orange with grey mottling, moist, trace shale.	No contamination indicators observed.
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1	AEC02-TP34-1.2-1.3				
1.2					
1.3				Termination Depth at: 0.9 m - Refusal due to claystone bedrock.	
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP35

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP35-0.2-0.3		FILL	FILL: Clayey Silty SAND, coarse grained, grey-orange, dry, with rocks.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1	AEC02-TP35-1.2-1.3				Foreign materials including potential Asbestos Containing Material (ACM) observed.
1.2					No contamination indicators observed.
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP36

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 0.9 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP36-0.2-0.3		FILL	FILL: Clayey Silty SAND, coarse grained, grey-orange, dry, with rocks.	
0.3			FILL	FILL: CLAY, low plasticity, grey with orange mottling, moist, trace claystone and shale.	Foreign materials including terracotta and metal observed.
0.4					No contamination indicators observed.
0.5					
0.6					
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP37

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP37-0.2-0.3		FILL	FILL: CLAY, low-medium plasticity, red-orange with grey mottling, moist.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8				Termination Depth at: 0.8 m on compacted fill	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP38

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2			FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including geotextile fabric and Asbestos Containing Material (ACM) observed.
0.3	AEC02-TP38-0.2-0.3		FILL	FILL: Sandy CLAY, low plasticity, red-orange with grey mottling, moist.	No contamination indicators observed.
0.4					
0.5					
0.6					
0.7					
0.8				Termination Depth at: 0.8 m on compacted fill	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP39

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP39-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist, trace gravel.	Foreign materials including geotextile fabric, plastic and metal observed.
0.3			FILL	FILL: CLAY, low plasticity, pale grey-brown, dry, trace sand.	
0.4					No contamination indicators observed.
0.8					Foreign materials including potential Asbestos Containing Material (ACM) observed.
0.9					No contamination indicators observed.
1			FILL	NATURAL: CLAY, low plasticity, orange with grey-brown mottling, moist.	
1.4				Termination Depth at: 1.4 m on compacted fill	

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ENVIRONMENTAL TESTPIT AEC02 TP40

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.3 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP40-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including geotextile fabric and metal observed.
0.3					No contamination indicators observed.
0.4					
0.5			FILL	FILL: CLAY, low plasticity, orange-brown, moist, trace sandstone and sand, with claystone.	
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2	AEC02-TP40-1.2-1.3				
1.3				Termination Depth at: 1.3 m on compacted fill	
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP41

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP41-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, low plasticity, orange-brown, moist.	Foreign materials including metal observed.
0.4					No contamination indicators observed.
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2	AEC02-TP41-1.2-1.3				
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP42

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.3 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP42-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	Foreign materials including Asbestos Containing Material (ACM) observed.
0.3					
0.4			FILL	FILL: CLAY, low plasticity, orange-brown, moist, trace sand.	No contamination indicators observed.
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3				Termination Depth at: 1.3 m on compacted fill	
1.4					
1.5					
1.6					
1.7					
1.8					

Disclaimer This log is intended for environmental not geotechnical purposes.
produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP43

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, red-brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP43-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, red-brown, dry-moist.	
0.3			FILL	FILL: CLAY, low-medium plasticity, red-brown with grey mottling, moist.	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

Disclaimer This log is intended for environmental not geotechnical purposes.

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ENVIRONMENTAL TESTPIT AEC02 TP44

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 0.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, red-brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP44-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, red-brown, dry-moist.	
0.3					
0.4				Termination Depth at: 0.4 m - Refusal due to retaining wall.	
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP45

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.2 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Sandy Silty CLAY with high organics, low plasticity, orange with grey mottling, dry, trace claystone.	No contamination indicators observed.
0.2	AEC02-TP45-0.2-0.3		FILL	FILL: Sandy Silty CLAY, low plasticity, orange with grey mottling, dry, with claystone.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m - Refusal due to claystone bedrock.	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP46

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry.	No contamination indicators observed.
0.2	AEC02-TP46-0.2-0.3		FILL	FILL: CLAY, low plasticity, grey with orange mottling, dry.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP47

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry.	No contamination indicators observed.
0.2	AEC02-TP47-0.2-0.3		FILL	FILL: CLAY, low plasticity, grey with orange mottling, dry.	Foreign material including geotextile fabric, potential Asbestos Containing Material (ACM), and brick observed.
0.3					
0.4					No contamination indicators observed.
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m - Refusal due to excavator limit.	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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Sydney Environmental Group

ENVIRONMENTAL TESTPIT AEC02 TP48

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.7 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry.	No contamination indicators observed.
0.2	AEC02-TP48-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, medium brown, dry.	Foreign materials including potential Asbestos Containing Material (ACM) observed.
0.3			FILL	FILL: CLAY, low plasticity, orange with grey mottling, dry, with shale.	No contamination indicators observed.
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2	AEC02-TP48-1.2-1.3				
1.3					
1.4			FILL	FILL: CLAY, medium plasticity, grey, dry-moist.	
1.5					
1.6					
1.7				Termination Depth at: 1.7 m. Refusal due to excavator limit.	
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP49

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry.	No contamination indicators observed.
0.2	AEC02-TP49-0.2-0.3		FILL	FILL: CLAY, low plasticity, grey with orange mottling, dry.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

Disclaimer This log is intended for environmental not geotechnical purposes.

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ENVIRONMENTAL TESTPIT AEC02 TP50

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.5 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry.	No contamination indicators observed.
0.2	AEC02-TP50-0.2-0.3		FILL	FILL: CLAY, low plasticity, grey with orange mottling, dry.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5				Termination Depth at: 1.5 m on compacted fill	
1.6					
1.7					
1.8					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC02 TP51

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.1 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry.	No contamination indicators observed.
0.2	AEC02-TP51-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, medium brown, dry.	
0.3			FILL	FILL: CLAY, low plasticity, red-brown, dry.	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					

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ENVIRONMENTAL TESTPIT AEC02 TP52

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 12 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LM

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry.	No contamination indicators observed.
0.2	AEC02-TP52-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine-coarse grained, medium brown, dry.	
0.3			FILL	FILL: CLAY, low plasticity, orange with grey motting, dry.	
0.7			FILL	FILL: Sandy Silty CLAY, low plasticity, grey-brown, dry.	
1.2				Termination Depth at: 1.2 m on compacted fill	

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ENVIRONMENTAL TESTPIT AEC03 TP02

PROJECT NUMBER 2300	**DATE** 9 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.2 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP02-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					Foreign materials including tile, ceramics and brick observed.
0.5					
0.6					No contamination indicators observed.
0.7					
0.8					
0.9			FILL	FILL: CLAY, low plasticity, orange brown, moist.	
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP03

PROJECT NUMBER 2300	**DATE** 9 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.1			FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist, trace shale.	
0.2	AEC03-TP03-0.2-0.3				
0.3					
0.4					
0.5			FILL	FILL: CLAY with low organics, low plasticity, orange brown, moist.	
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP04

PROJECT NUMBER 2300	**DATE** 9 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP04-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, dark brown, dry-moist.	
0.3					
0.4					
0.5			FILL	NATURAL: CLAY, low plasticity, orange brown, moist.	
0.6					
0.7					
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP05

PROJECT NUMBER 2300	**DATE** 9 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP05-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, pale brown, dry-moist.	
0.3					
0.4					Foreign materials including glass and terracotta observed.
0.5					
0.6					No contamination indicators observed.
0.7					
0.8					
0.9					
1					
1.1			CL	NATURAL: CLAY, low plasticity, red brown, dry.	
1.2					
1.3					
1.4				Termination Depth at: 1.4 m	
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP06

PROJECT NUMBER 2300	**DATE** 9 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.8 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP06-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, pale brown, dry-moist.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8				Termination Depth at: 1.8 m - Excavation limit	
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP07

PROJECT NUMBER 2300	**DATE** 9 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.5 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP07-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, pale brown, dry-moist, trace sand.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2			FILL	FILL: CLAY, low plasticity, pale orange brown, dry.	
1.3					
1.4					
1.5				Termination Depth at: 1.5 m on compacted fill	
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP08

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP08-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, pale brown, dry-moist, trace sand, gravel.	
0.3					
0.4					
0.5			FILL	FILL: Clayey SAND, coarse grained, pale brown, dry-moist, trace sand, gravel.	
0.6					
0.7					
0.8					
0.9			CL	NATURAL: CLAY, low plasticity, orange brown with pale brown mottling, dry.	
1					
1.1					
1.2				Termination Depth at: 1.2 m	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP09

PROJECT NUMBER 2300	**DATE** 9 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.2 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP09-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, pale brown, dry-moist, trace sand, gravel.	
0.3					
0.4					
0.5			FILL	FILL: Clayey SAND, coarse grained, pale brown, dry-moist, trace sand, gravel.	
0.6					
0.7					
0.8					
0.9			CL	NATURAL: CLAY, low plasticity, orange brown with pale brown mottling, dry.	
1					
1.1					
1.2				Termination Depth at: 1.2 m	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP10

PROJECT NUMBER 2300	**DATE** 9 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP10-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, pale brown, dry-moist, trace sand, gravel.	
0.3					
0.4					
0.5					
0.6					
0.7			CL	NATURAL: CLAY, low plasticity, orange brown with pale brown mottling, dry.	
0.8					
0.9					
1				Termination Depth at: 1.0 m	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP12

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP12-0.2-0.3		FILL	FILL: Clayey SAND with low organics, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5			CL	NATURAL: CLAY, low plasticity, orange brown, dry-moist.	
0.6					
0.7					
0.8				Termination Depth at: 0.8 m	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP18

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP18-0.2-0.3		FILL	FILL: Clayey SAND, coarse grained, medium brown, dry-moist.	
0.3					
0.4					
0.5			CL	NATURAL: CLAY, medium plasticity, orange brown, moist.	
0.6					
0.7					
0.8				Termination Depth at: 0.8 m	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP19

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry.	No contamination indicators observed.
0.2	AEC03-TP19-0.2-0.3		FILL	FILL: Clayey SAND, coarse grained, pale brown, dry.	Foreign materials including potential Asbestos Containing Material (ACM), concrete, and terracotta observed.
0.3					
0.4					
0.5			CL	NATURAL: CLAY, low plasticity, orange brown, dry-moist.	No contamination indicators observed.
0.6					
0.7					
0.8				Termination Depth at: 0.8 m	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Disclaimer This log is intended for environmental not geotechnical purposes.
produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP20

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry.	No contamination indicators observed.
0.2	AEC03-TP20-0.2-0.3		FILL	FILL: Clayey SAND, coarse grained, pale brown, dry, gravels.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, orange brown, dry-moist.	
0.6					
0.7					
0.8				Termination Depth at: 0.8 m on compacted fill	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP21

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP21-0.2-0.3		FILL	FILL: Clayey SAND, coarse grained, pale brown, dry, gravels.	Foreign materials including glass, ceramics, and plastic observed.
0.8			CL	NATURAL: CLAY, low plasticity, orange brown, dry-moist.	No contamination indicators observed.
1.1				Termination Depth at: 1.1 m	

ENVIRONMENTAL TESTPIT AEC03 TP22

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP22-0.2-0.3		FILL	FILL: Clayey SAND, coarse grained, pale brown, dry, trace gravels.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8			FILL	FILL: CLAY, low plasticity, orange brown, moist-dry.	
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP23

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP23-0.2-0.3		FILL	FILL: Clayey SAND, coarse grained, pale brown, dry, trace gravels.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8			FILL	FILL: CLAY, low plasticity, orange brown with pale brown mottling, dry-moist.	
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP24

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP24-0.2-0.3		FILL	FILL: Clayey SAND, coarse grained, pale brown, dry, trace gravels.	
0.3					Foreign materials including concrete observed.
0.4					No contamination indicators observed.
0.5					
0.6					
0.7					
0.8			FILL	FILL: CLAY, low plasticity, orange brown with pale brown mottling, dry-moist.	
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP27

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	Foreign materials including brick observed.
0.2	AEC03-TP27-0.2-0.3				
0.3			FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	No contamination indicators observed.
0.4					
0.5			CL	NATURAL: Sandy CLAY, low medium plasticity, orange with brown mottling, dry-moist.	
0.6					
0.7					
0.8				Termination Depth at: 0.8 m	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP28

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 9 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP28-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	
0.3					Foreign materials including potential Asbestos Containing Material (ACM), terracotta and brick observed.
0.4					
0.5					
0.6					
0.7			CL	NATURAL: CLAY, low plasticity, orange brown with pale brown mottling, dry.	No contamination indicators observed.
0.8					
0.9					
1				Termination Depth at: 1.0 m	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP29

PROJECT NUMBER 2300	**DATE** 10 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 0.9 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP29-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry-moist.	
0.3					
0.4			FILL	FILL: SAND, pale yellow, fine grained, dry-moist.	
0.5					
0.6			FILL	FILL: CLAY, low plasticity, orange, moist.	
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

ENVIRONMENTAL TESTPIT AEC03 TP30

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP30-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry-moist.	
0.3					
0.4			FILL	FILL: SAND, pale yellow, fine grained, dry-moist.	
0.5					
0.6					
0.7			FILL	FILL: CLAY, low plasticity, orange, moist.	
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP32

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.3 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, grey brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP32-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, grey brown, dry-moist.	
0.3				Termination Depth at: 0.3 m - Inaccessible due to service lines	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP33

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.3 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, grey brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP33-0.2-0.3		FILL	FILL: Clayey SAND, with low organics, fine grained, grey brown, dry-moist.	
0.3				Termination Depth at: 0.3 m - Inaccessible due to service lines	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP34

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, grey brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP34-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, grey brown, dry-moist.	
0.3					
0.4					
0.5					
0.6			FILL	FILL: CLAY, low plasticity, red brown, dry.	
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP35

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, grey brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP35-0.2-0.3		FILL	FILL: Clayey SAND, with low organics, fine grained, grey brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: SAND, fine grained, grey yellow, dry-moist.	
0.6					
0.7					
0.8			FILL	FILL: CLAY, low plasticity, red brown, dry.	
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP39

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP39-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry-moist.	
0.3					
0.4			FILL	FILL: SAND, fine grained, grey yellow, dry-moist.	
0.5					
0.6					
0.7			FILL	FILL: CLAY, low plasticity, orange, dry.	
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP40

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP40-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry-moist.	
0.3					
0.4			FILL	FILL: SAND, fine grained, grey yellow, dry-moist.	
0.5					
0.6			FILL	FILL: CLAY, low plasticity, orange, dry.	
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP41

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP41-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry-moist.	
0.3					
0.4					
0.5					
0.6			FILL	FILL: CLAY, low plasticity, orange, dry.	
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP42

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP42-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine grained, medium brown, dry-moist, trace sand.	
0.3					
0.4					
0.5					
0.6					
0.7			FILL	FILL: CLAY, low plasticity, orange, dry.	
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

Disclaimer This log is intended for environmental not geotechnical purposes.
produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP43

PROJECT NUMBER 2300	**DATE** 10 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 0.9 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP43-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry-moist.	
0.3					
0.4					Foreign materials including brick and plastic observed.
0.5					No contamination indicators observed.
0.6			FILL	FILL: CLAY, low plasticity, orange with yellow brown mottling, dry.	
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP44

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP44-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine grained, medium brown, dry-moist.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, orange with yellow brown mottling, dry.	
0.6					
0.7					
0.8				Termination Depth at: 0.8 m on compacted fill	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP57

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.3 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, dark brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP57-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine grained, dark brown, dry-moist.	
0.3					
0.4			FILL	FILL: Silty CLAY, low plasticity, orange with yellow brown mottling, dry-moist, trace rocks.	Foreign materials including potential Asbestos Containing Material (ACM), metal, and plastic observed.
0.5					
0.6					No contamination indicators observed.
0.7					
0.8					
0.9					
1			FILL	FILL: CLAY, low plasticity, grey with yellow mottling, dry-moist.	
1.1					
1.2					
1.3				Termination Depth at: 1.3 m on compacted fill	
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP58

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.0 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, pale brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP58-0.2-0.3		FILL	FILL: Clayey SAND with low organics, fine grained, pale brown, dry-moist.	
0.3					
0.4					
0.5					
0.6					
0.7			FILL	FILL: CLAY, low plasticity, orange with yellow mottling, dry.	
0.8					
0.9					
1				Termination Depth at: 1.0 m on compacted fill	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP60

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.8 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP60-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, pale brown, dry.	
0.3					
0.4					
0.5			FILL	FILL: CLAY, low plasticity, orange brown with yellow mottling, dry.	
0.6					
0.7					
0.8				Termination Depth at: 0.8 m on compacted fill	
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP61

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP61-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, pale brown, dry.	
0.3			FILL	FILL: Sandy CLAY, low plasticity, orange brown, dry.	
0.4					
0.5					
0.6			FILL	FILL: CLAY, low plasticity, orange brown, dry.	
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP62

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.6 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP62-0.2-0.3		FILL	FILL: Clayey SAND, with low organics, fine grained, medium brown, dry.	
0.3			FILL	FILL: CLAY with low organics, low plasticity, orange brown, dry.	
0.4					
0.5					
0.6				Termination Depth at: 0.6 m on compacted fill	
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP64

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.9 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP64-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	
0.3			FILL	FILL: CLAY, low plasticity, orange brown, dry, trace sand.	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9				Termination Depth at: 0.9 m on compacted fill	
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP66

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP66-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry, trace gravels and rocks.	
0.3			FILL	FILL: CLAY, low plasticity, orange brown, dry, trace sand.	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP67

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 0.6 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, fine-coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP67-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry-moist.	
0.3			FILL	FILL: CLAY, medium plasticity, orange with yellow mottling, dry-moist.	
0.4					
0.5					
0.6				Termination Depth at: 0.6 m on compacted fill	
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP68

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.4 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP68-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	Foreign materials including potential Asbestos Containing Material (ACM), glass, brick, metal, and cable were observed.
0.5			FILL	FILL: CLAY, high plasticity, orange with grey mottling, moist.	
1.4				Termination Depth at: 1.4 m on compacted fill	

ENVIRONMENTAL TESTPIT AEC03 TP70

PROJECT NUMBER 2300	**DATE** 10 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.0 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP70-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	Foreign materials including potential Asbestos Containing Metal (ACM), plastic, metal and terracotta observed.
0.6			FILL	FILL: CLAY, low plasticity, orange with grey mottling, dry.	
1				Termination Depth at: 1.0 m on compacted fill	

ENVIRONMENTAL TESTPIT AEC03 TP71

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra SCA
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.3 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP71-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	
0.3					
0.4			FILL	FILL: CLAY, low plasticity, orange, dry.	
0.5					
0.6					
0.7					Foreign materials including metal and glass observed.
0.8					
0.9					No contamination indicators observed.
1					
1.1					
1.2					
1.3				Termination Depth at: 1.3 m - Refusal due to tree root	
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP72

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.5 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP72-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, pale brown, dry.	
0.3					
0.4			FILL	FILL: CLAY, low plasticity, orange brown, dry.	
0.5					Foreign materials including potential Asbestos Containing Material (ACM), tar, metal and glass observed.
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					No contamination indicators observed.
1.3					
1.4					
1.5				Termination Depth at: 1.5 m on compacted fill	
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP73

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 10 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP73-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	
0.3					Foreign materials including brick observed.
0.4					
0.5					No contamination indicators observed.
0.6			FILL	FILL: CLAY with claystone inclusion, low plasticity, orange brown, dry.	
0.7					
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m - Refusal due to claystone bedrock	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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ENVIRONMENTAL TESTPIT AEC03 TP75

PROJECT NUMBER 2300	**DATE** 10 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.5 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP75-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, pale brown, dry, trace gravels.	
0.3					Foreign materials including timber observed.
0.4					
0.5					No contamination indicators observed.
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2			FILL	FILL: CLAY, low plasticity, red with grey mottling, dry.	
1.3					
1.4					
1.5				Termination Depth at: 1.5 m on compacted fill	
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP76

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP76-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, pale brown, dry.	
0.3					
0.4					
0.5					
0.6					
0.7			FILL	FILL: CLAY, low plasticity, grey with orange mottling, dry.	
0.8					
0.9					Foreign materials including tile observed.
1					
1.1					No contamination indicators observed.
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP77

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP77-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, brown, dry, trace rocks.	
0.3					
0.4					
0.5					Foreign materials including terracotta observed.
0.6			FILL	FILL: CLAY, low plasticity, red brown, dry.	
0.7					No contamination indicators observed.
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m - Refusal due to bedrock.	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP78

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, moist.	No contamination indicators observed.
0.2	AEC03-TP78-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, brown, moist-dry.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8			FILL	FILL: CLAY, high plasticity, orange, moist.	
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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Sydney Environmental Group

ENVIRONMENTAL TESTPIT AEC03 TP79

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP79-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, brown, dry.	
0.3					Foreign materials including terracotta observed.
0.4					
0.5					No contamination indicators observed.
0.6			FILL	FILL: CLAY, low plasticity, red brown, dry.	
0.7					
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m - Refusal due to bedrock.	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP80

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.2 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP80-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, brown, dry.	
0.3					
0.4					
0.5					
0.6					
0.7			FILL	FILL: CLAY, low plasticity, red brown, dry.	
0.8					
0.9					
1					
1.1					
1.2				Termination Depth at: 1.2 m on compacted fill	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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produced by ESlog.ESdat.net on 21 Feb 2024

ENVIRONMENTAL TESTPIT AEC03 TP84

PROJECT NUMBER 2300
PROJECT NAME WSU Milperra DSI
CLIENT Mirvac Group Pty Ltd
ADDRESS Western Sydney University, Milperra Campus

DATE 11 January 2024
EXCAVATION CO. Smartscan Locators
OPERATOR Tyler
EXCAVATION METHOD 3.5 t Excavator
TOTAL DEPTH 1.1 m

LOGGED BY LL
CHECKED BY LH

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP84-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, brown, dry.	
0.3					
0.4					
0.5					
0.6			FILL	FILL: CLAY, low plasticity, red brown, dry.	
0.7					
0.8					
0.9					
1					
1.1				Termination Depth at: 1.1 m on compacted fill	
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					

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APPENDIX B

SITE ADOPTED CRITERIA

1 SITE ADOPTED ASSESSMENT CRITERIA

Assessment criteria considered appropriate for the site were derived from a number of sources including the RAP, and relevant legislation and guidelines.

1.1 Soil Criteria

The assessment of potentially contaminated land involves the evaluation of potential human health hazards and environmental impacts. The receptors (or potential receptors) of concern may be within the site being assessed, or outside the site boundaries due to potential off-site migration of contaminants.

The subject site is proposed for low-density residential use. Consequently, the issues of concern for contamination within the site are considered to be the risk of harm to human health and ecological systems.

Table 1.1.1 Health Screening Levels for Asbestos – Residential A

Analyte	Health Screening Level – Residential A (% w/w)
Non-friable Asbestos	0.01
Friable Asbestos (Asbestos Fines / Fibrous Asbestos)	0.001
All Forms of Asbestos	No visible asbestos on surface soils

SE note however that all soils where non-friable and friable asbestos is identified will be considered to pose an unacceptable risk and need to be removed from the site. The reasoning behind this assessment is as follows:

- NATA does not accredit laboratories with a detection less than 0.01%, which is more than the friable asbestos criteria provided in the NEPM (2013) guidelines of 0.001%;
- Allowing small amounts of known bonded asbestos to remain at the Site (i.e. at concentrations below the NEPM Commercial/Industrial D criteria of 0.05%), would mean a risk remained that visible asbestos may occur by future excavation work and the NEPM (2013) criteria of 'No visible asbestos for surface soil' would not be met; and
- Allowing small amounts of known asbestos to remain at the Site would mean that such contaminated soil would need to be classified as 'Special Waste – Asbestos' if ever soil needed to be excavated and removed from Site in the future, such as may occur for a swimming pool excavation.

APPENDIX C

LABORATORY DOCUMENTATION

Sydney Environmental Group Pty Ltd
Unit 63/45 Huntley St
Alexandria
NSW 2015

Attention:	Mitchell Kirby
Report	1058859-AID
Project Name	WSU MILPERRA CAMPUS SCA
Project ID	2300
Received Date	Jan 11, 2024
Date Reported	Jan 16, 2024

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name WSU MILPERRA CAMPUS SCA
Project ID 2300
Date Sampled Jan 09, 2024 to Jan 11, 2024
Report 1058859-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC03-TP29-0.2-0.3	24-Ja0010505	Jan 10, 2024	Approximate Sample 821g Sample consisted of: Brown coarse-grained sandy soil, brick and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP30-0.2-0.3	24-Ja0010506	Jan 10, 2024	Approximate Sample 829g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP32-0.2-0.3	24-Ja0010507	Jan 10, 2024	Approximate Sample 925g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP33-0.2-0.3	24-Ja0010508	Jan 10, 2024	Approximate Sample 734g Sample consisted of: Brown coarse-grained sandy soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP34-0.2-0.3	24-Ja0010509	Jan 10, 2024	Approximate Sample 820g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP35-0.2-0.3	24-Ja0010510	Jan 10, 2024	Approximate Sample 843g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP39-0.2-0.3	24-Ja0010514	Jan 10, 2024	Approximate Sample 633g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP40-0.2-0.3	24-Ja0010515	Jan 10, 2024	Approximate Sample 773g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC03-TP41-0.2-0.3	24-Ja0010516	Jan 10, 2024	Approximate Sample 674g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP42-0.2-0.3	24-Ja0010517	Jan 10, 2024	Approximate Sample 757g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP43-0.2-0.3	24-Ja0010518	Jan 10, 2024	Approximate Sample 834g Sample consisted of: Brown coarse grained sandy clayey soil, corroded metal, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP44-0.2-0.3	24-Ja0010519	Jan 10, 2024	Approximate Sample 771g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP60-0.2-0.3	24-Ja0010520	Jan 10, 2024	Approximate Sample 920g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP61-0.2-0.3	24-Ja0010521	Jan 10, 2024	Approximate Sample 823g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP62-0.2-0.3	24-Ja0010522	Jan 10, 2024	Approximate Sample 714g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP64-0.2-0.3	24-Ja0010524	Jan 10, 2024	Approximate Sample 991g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP57-0.2-0.3	24-Ja0010525	Jan 10, 2024	Approximate Sample 610g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP58-0.2-0.3	24-Ja0010526	Jan 10, 2024	Approximate Sample 677g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP66-0.2-0.3	24-Ja0010527	Jan 10, 2024	Approximate Sample 835g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP02-0.2-0.3	24-Ja0010528	Jan 09, 2024	Approximate Sample 811g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP03-0.2-0.3	24-Ja0010529	Jan 09, 2024	Approximate Sample 661g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC03-TP04-0.2-0.3	24-Ja0010530	Jan 09, 2024	Approximate Sample 894g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP05-0.2-0.3	24-Ja0010531	Jan 09, 2024	Approximate Sample 841g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP06-0.2-0.3	24-Ja0010532	Jan 09, 2024	Approximate Sample 774g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP07-0.2-0.3	24-Ja0010533	Jan 09, 2024	Approximate Sample 833g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP08-0.2-0.3	24-Ja0010534	Jan 09, 2024	Approximate Sample 813g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP09-0.2-0.3	24-Ja0010535	Jan 09, 2024	Approximate Sample 1052g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP10-0.2-0.3	24-Ja0010536	Jan 09, 2024	Approximate Sample 781g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP12-0.2-0.3	24-Ja0010537	Jan 09, 2024	Approximate Sample 774g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP18-0.2-0.3	24-Ja0010538	Jan 09, 2024	Approximate Sample 764g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP19-0.2-0.3	24-Ja0010539	Jan 09, 2024	Approximate Sample 755g Sample consisted of: Brown coarse grained sandy clayey soil, brick, coal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP20-0.2-0.3	24-Ja0010540	Jan 09, 2024	Approximate Sample 746g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP21-0.2-0.3	24-Ja0010541	Jan 09, 2024	Approximate Sample 600g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP22-0.2-0.3	24-Ja0010542	Jan 09, 2024	Approximate Sample 792g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC03-TP23-0.2-0.3	24-Ja0010543	Jan 09, 2024	Approximate Sample 759g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP24-0.2-0.3	24-Ja0010544	Jan 09, 2024	Approximate Sample 818g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP27-0.2-0.3	24-Ja0010545	Jan 09, 2024	Approximate Sample 561g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP28-0.2-0.3	24-Ja0010546	Jan 09, 2024	Approximate Sample 768g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP67-0.2-0.3	24-Ja0010547	Jan 10, 2024	Approximate Sample 880g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP68-0.2-0.3	24-Ja0010548	Jan 10, 2024	Approximate Sample 870g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP70-0.2-0.3	24-Ja0010549	Jan 10, 2024	Approximate Sample 760g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP71-0.2-0.3	24-Ja0010550	Jan 10, 2024	Approximate Sample 739g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP72-0.2-0.3	24-Ja0010551	Jan 10, 2024	Approximate Sample 848g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP73-0.2-0.3	24-Ja0010552	Jan 10, 2024	Approximate Sample 778g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP75-0.2-0.3	24-Ja0010553	Jan 10, 2024	Approximate Sample 793g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP76-0.2-0.3	24-Ja0010554	Jan 11, 2024	Approximate Sample 800g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP77-0.2-0.3	24-Ja0010555	Jan 11, 2024	Approximate Sample 943g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC03-TP78-0.2-0.3	24-Ja0010556	Jan 11, 2024	Approximate Sample 738g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP79-0.2-0.3	24-Ja0010557	Jan 11, 2024	Approximate Sample 893g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP80-0.2-0.3	24-Ja0010558	Jan 11, 2024	Approximate Sample 779g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC03-TP84-0.2-0.3	24-Ja0010559	Jan 11, 2024	Approximate Sample 839g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC01-TP17-0.2-0.3	24-Ja0010560	Jan 11, 2024	Approximate Sample 722g Sample consisted of: Brown coarse grained sandy clayey soil, brick, cement and rocks	AF: Chrysotile and amosite asbestos detected in fibre cement material. Approximate raw weight of AF = 0.023g* Estimated asbestos content in AF = 0.0023g* Total estimated asbestos concentration in AF = 0.00032% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC01-TP18-0.2-0.3	24-Ja0010561	Jan 11, 2024	Approximate Sample 928g Sample consisted of: Brown coarse grained sandy clayey soil, brick, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC01-TP21-0.2-0.3	24-Ja0010562	Jan 11, 2024	Approximate Sample 858g Sample consisted of: Brown coarse grained sandy clayey soil, brick, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC01-TP22-0.2-0.3	24-Ja0010563	Jan 11, 2024	Approximate Sample 851g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP01-0.2-0.3	24-Ja0010564	Jan 11, 2024	Approximate Sample 738g Sample consisted of: Brown coarse grained sandy clayey soil, coal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP02-0.2-0.3	24-Ja0010565	Jan 11, 2024	Approximate Sample 727g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP03-0.2-0.3	24-Ja0010566	Jan 11, 2024	Approximate Sample 765g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC02-TP04-0.2-0.3	24-Ja0010567	Jan 11, 2024	Approximate Sample 817g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP05-0.2-0.3	24-Ja0010568	Jan 11, 2024	Approximate Sample 803g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP06-0.2-0.3	24-Ja0010569	Jan 11, 2024	Approximate Sample 802g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP07-0.2-0.3	24-Ja0010570	Jan 11, 2024	Approximate Sample 884g Sample consisted of: Brown coarse grained sandy clayey soil, coal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP08-0.2-0.3	24-Ja0010571	Jan 11, 2024	Approximate Sample 836g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP09-0.2-0.3	24-Ja0010572	Jan 11, 2024	Approximate Sample 813g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP10-0.2-0.3	24-Ja0010573	Jan 11, 2024	Approximate Sample 917g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP11-0.2-0.3	24-Ja0010574	Jan 11, 2024	Approximate Sample 869g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	FA: Chrysotile asbestos detected in weathered fibre cement material. Approximate raw weight of FA = 0.0068g Estimated asbestos content in FA = 0.0020g* Total estimated asbestos concentration in FA = 0.00023% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP12-0.2-0.3	24-Ja0010575	Jan 11, 2024	Approximate Sample 651g Sample consisted of: Brown coarse grained sandy clayey soil, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP14-0.2-0.3	24-Ja0010576	Jan 11, 2024	Approximate Sample 861g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP15-0.2-0.3	24-Ja0010577	Jan 11, 2024	Approximate Sample 820g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC02-TP16-0.2-0.3	24-Ja0010578	Jan 11, 2024	Approximate Sample 841g Sample consisted of: Brown coarse grained sandy clayey soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jan 12, 2024	Indefinite

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+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Company Name: Sydney Environmental Group Pty Ltd
Address: Unit 63/45 Huntley St
Alexandria
NSW 2015

Project Name: WSU MILPERRA CAMPUS SCA
Project ID: 2300

Order No.:
Report #: 1058859
Phone: 1300 884 164
Fax:

Received: Jan 11, 2024 5:18 PM
Due: Jan 16, 2024
Priority: 3 Day
Contact Name: Mitchell Kirby

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	AEC03-TP29-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010505	X		
2	AEC03-TP30-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010506	X		
3	AEC03-TP32-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010507	X		
4	AEC03-TP33-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010508	X		
5	AEC03-TP34-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010509	X		
6	AEC03-TP35-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010510	X		
7	AEC03-TP36-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010511		X	
8	AEC03-TP37-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010512		X	

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
9	AEC03-TP38-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010513		X	
10	AEC03-TP39-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010514	X		
11	AEC03-TP40-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010515	X		
12	AEC03-TP41-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010516	X		
13	AEC03-TP42-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010517	X		
14	AEC03-TP43-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010518	X		
15	AEC03-TP44-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010519	X		
16	AEC03-TP60-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010520	X		
17	AEC03-TP61-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010521	X		
18	AEC03-TP62-	Jan 10, 2024		Soil	S24-Ja0010522	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
18	AEC03-TP62-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010522			
19	AEC03-TP63-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010523		X	
20	AEC03-TP64-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010524	X		
21	AEC03-TP57-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010525	X		
22	AEC03-TP58-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010526	X		
23	AEC03-TP66-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010527	X		
24	AEC03-TP02-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010528	X		
25	AEC03-TP03-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010529	X		
26	AEC03-TP04-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010530	X		
27	AEC03-TP05-	Jan 09, 2024		Soil	S24-Ja0010531	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
	0.2-0.3							
28	AEC03-TP06-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010532	X		
29	AEC03-TP07-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010533	X		
30	AEC03-TP08-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010534	X		
31	AEC03-TP09-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010535	X		
32	AEC03-TP10-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010536	X		
33	AEC03-TP12-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010537	X		
34	AEC03-TP18-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010538	X		
35	AEC03-TP19-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010539	X		
36	AEC03-TP20-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010540	X		

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Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
37	AEC03-TP21-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010541	X		
38	AEC03-TP22-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010542	X		
39	AEC03-TP23-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010543	X		
40	AEC03-TP24-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010544	X		
41	AEC03-TP27-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010545	X		
42	AEC03-TP28-0.2-0.3	Jan 09, 2024		Soil	S24-Ja0010546	X		
43	AEC03-TP67-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010547	X		
44	AEC03-TP68-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010548	X		
45	AEC03-TP70-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010549	X		
46	AEC03-TP71-	Jan 10, 2024		Soil	S24-Ja0010550	X		

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Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
	0.2-0.3							
47	AEC03-TP72-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010551	X		
48	AEC03-TP73-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010552	X		
49	AEC03-TP75-0.2-0.3	Jan 10, 2024		Soil	S24-Ja0010553	X		
50	AEC03-TP76-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010554	X		
51	AEC03-TP77-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010555	X		
52	AEC03-TP78-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010556	X		
53	AEC03-TP79-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010557	X		
54	AEC03-TP80-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010558	X		
55	AEC03-TP84-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010559	X		

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Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
56	AEC01-TP17-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010560	X		
57	AEC01-TP18-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010561	X		
58	AEC01-TP21-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010562	X		
59	AEC01-TP22-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010563	X		
60	AEC02-TP01-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010564	X		
61	AEC02-TP02-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010565	X		
62	AEC02-TP03-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010566	X		
63	AEC02-TP04-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010567	X		
64	AEC02-TP05-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010568	X		
65	AEC02-TP06-	Jan 11, 2024		Soil	S24-Ja0010569	X		

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Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
	0.2-0.3							
66	AEC02-TP07-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010570	X		
67	AEC02-TP08-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010571	X		
68	AEC02-TP09-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010572	X		
69	AEC02-TP10-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010573	X		
70	AEC02-TP11-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010574	X		
71	AEC02-TP12-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010575	X		
72	AEC02-TP14-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010576	X		
73	AEC02-TP15-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010577	X		
74	AEC02-TP16-0.2-0.3	Jan 11, 2024		Soil	S24-Ja0010578	X		

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Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X
75	AEC03-TP06-1.1-1.2	Jan 09, 2024		Soil	S24-Ja0010579			X
Test Counts						70	4	1

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V = r x t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_X}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix may be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**). This estimate is not NATA-accredited.
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to “non-bonded / friable”.
AFM	Airborne Fibre Monitoring, e.g., by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total %w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w**).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
Sampling	Unless otherwise stated Eurofins are not responsible for sampling equipment or the sampling process.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average %w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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1/4

RECORD

ABN 50 005 085 521

☑ Sydney Laboratory — Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066 — 02 9900 8400 — EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory — Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172 — 07 3902 4600 — EnviroSampleQLD@eurofins.com

☐ Melbourne Laboratory — 2 Kingston Town Close, Oakleigh, VIC 3166 — 03 8564 5000 — EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №	2300	Project Manager	Mitch Kirby
Address	U63, 45 Huntley Street Alexandria NSW	Project Name	WSU Milperra Campus SCA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Lachlan Mulhearn			Sampler(s)	LM & LL
Phone №	1300 884 164			Handed over by	LM & LL
Special Directions				Primary Email	enviro@sydneyenvironmental.com.au
Purchase Order				Secondary Email	Mitch@ "Lachlan@ "Lawrence@
Quote ID №					

Analyses (Note: Where metals are required, please specify "Total" or "Filtered"). SUITE code must be used to advise SUITE analysis.

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggresivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	AECO3-TP29-0.2-0.3	10/1/24	S							X											
2	" - TP30-0.2-0.3																				
3	" - TP32-0.2-0.3																				
4	" - TP33-0.2-0.3																				
5	" - TP34-0.2-0.3																				
6	" - TP35-0.2-0.3																				
7	" - TP39-0.2-0.3																				
8	" - TP40-0.2-0.3																				
9	" - TP41-0.2-0.3																				
10	" - TP42-0.2-0.3																				
11	" - TP43-0.2-0.3																				
12	" - TP44-0.2-0.3																				
13	" - TP60-0.2-0.3																				
14	" - TP61-0.2-0.3																				
15	" - TP62-0.2-0.3																				
16	" - TP63-0.2-0.3																				
17	" - TP64-0.2-0.3																				
18	" - TP57-0.2-0.3																				
19	" - TP58-0.2-0.3																				
20	" - TP66-0.2-0.3	V																			
	Total Counts								20												

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight ☐ Same Day ☐ 1 Day ☐ 2 Day ☑ 3 Day ☐ 5 Day ☐ Other (

Method of Shipment	☑ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Lachlan Mulhearn	Signature		Date	11/01/24	Time	16:30
Eurofins | mgt Laboratory Use Only	Received By	Ribom AJ	SYD | BNE | MEL | PER | ADL |	Signature		Date	11/1	Time	5:48	Temperature	N/A
	Received By	Smaydi	SYD | BNE | MEL | PER | ADL |	Signature		Date		Time	PM	Report №	

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

1058859

2/4

RECORD

ABN 50 005 085 521

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02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
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07 3902 4600 EnviroSampleQLD@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №	2300	Project Manager	MK
Address	U63, 45 Huntley Street Alexandria NSW	Project Name	WSH Milperra Campus SCA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Lachlan Mulhearn			Sampler(s)	LM & LL
Phone №	1300 884 164			Handed over by	LM & LL
Special Directions				Primary Email	enviro@sydneyenvironmental.com.au
Purchase Order				Secondary Email	"Mitch@... Lachlan@... "Lawrence@...
Quote ID №					

Analyses (Note: Where metals are required, please specify "Total" or "Dissolved" | Note: Hold this sample for analysis: SUITE ###)

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggresivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)	HOLD
1	AECO3-TP02-0.2-0.3	9/10/24	S							X			
2	" -TP03-0.2-0.3												
3	" -TP04-0.2-0.3												
4	" -TP05-0.2-0.3												
5	" -TP06-0.2-0.3												
6	" -TP06-1.0-1.2												X
7	" -TP07-0.2-0.3									X			
8	" -TP08-0.2-0.3												
9	" -TP09-0.2-0.3												
10	" -TP10-0.2-0.3												
11	" -TP12-0.2-0.3												
12	" -TP18-0.2-0.3												
13	" -TP19-0.2-0.3												
14	" -TP20-0.2-0.3												
15	" -TP21-0.2-0.3												
16	" -TP22-0.2-0.3												
17	" -TP23-0.2-0.3												
18	" -TP24-0.2-0.3												
19	" -TP27-0.2-0.3												
20	" -TP28-0.2-0.3												
	Total Counts								19	1			

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964, WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

- ☐ Overnight ☐ Same Day
- ☐ 1 Day ☐ 2 Day
- ☒ 3 Day ☐ 5 Day
- ☐ Other (

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☐ Courier (#) ☐ Hand Delivered	☐ Postal	Name	Lachlan Mulhearn	Signature		Date	11/1/24	Time	16:30
Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL |	Signature		Date		Time		Temperature	
	Received By	SYD | BNE | MEL | PER | ADL |	Signature		Date		Time		Report №	

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Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

3/9

RECORD

☑ Sydney Laboratory
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07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №	2300	Project Manager	Mitchell Kirby
Address	U63, 45 Huntley Street Alexandria NSW	Project Name	WSU Milperra Campus SCA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Lawrence			Sampler(s)	Lawrence
Phone №	1300 884 164			Handed over by	
Special Directions				Primary Email	enviro@sydneyenvironmental.com.au
Purchase Order				Secondary Email	mitchell@ lawrence@ lachlan@
Quote ID №					

Analyses (Tick which suites to analyse, please specify "Filtered" or "Filtered" SUITE (please indicate in Sample Comments section below))

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggresivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)
1	AEC03-TP67-0.2-0.3	10/1/24	S							X		
2	AEC03-TP68-0.2-0.3											
3	AEC03-TP70-0.2-0.3											
4	AEC03-TP71-0.2-0.3											
5	AEC03-TP72-0.2-0.3											
6	AEC03-TP73-0.2-0.3											
7	AEC03-TP75-0.2-0.3											
8	AEC03-TP76-0.2-0.3	11/1/24										
9	AEC03-TP77-0.2-0.3											
10	AEC03-TP78-0.2-0.3											
11	AEC03-TP79-0.2-0.3											
12	AEC03-TP80-0.2-0.3											
13	AEC03-TP84-0.2-0.3											
14												
15												
16												
17												
18												
19												
20												
	Total Counts											

Containers: 1L Plastic | 250mL Plastic | 125mL Amber Glass | 200mL VOA Vial | 40mL VOA Vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS 4964 (Geotubes))

Turnaround Time (TAT) Requirements (Default will be 5 days if not Ticked)
☐ Overnight ☐ Same Day
☐ 1 Day ☐ 2 Day
☐ 3 Day ☐ 5 Day
☐ Other (

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☐ Courier ( ) ☐ Hand Delivered	☐ Postal	Name	Lawrence	Signature		Date	11/1/24	Time		
Eurofins | mgt Laboratory Use Only	Received By	Bibam AJ	SYD | BNE | MEL | PER | ADL |	Signature		Date	11/1	Time	5:48	Temperature	N/A
	Received By	Smaggi	SYD | BNE | MEL | PER | ADL |	Signature		Date		Time	pm	Report №	

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Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

Q4

RECORD

Sydney Laboratory
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02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №	2300	Project Manager	Mitchell Kirby
Address	U63, 45 Huntley Street Alexandria NSW	Project Name	WSU Milperra Campus SCA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Lawrence				
Phone №	1300 884 164				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Lawrence
Hande Loverby	Lawrence
Primary Email	enviro@sydneyenvironmental.com.au
Secondary Email	mitchell@ lawrence@ lachlan@

Analyses (Note: Where metals are to be analysed, please specify "Total" or "Filtered". Suite name must be used to avoid ambiguity.)

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggressivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)
1	AEC01-TP17-0.2-0.3	11/1/24	S							X		
2	AEC01-TP18-0.2-0.3											
3	AEC01-TP21-0.2-0.3											
4	AEC01-TP22-0.2-0.3											
5	AEC02-TP01-0.2-0.3											
6	AEC02-TP02-0.2-0.3											
7	AEC02-TP03-0.2-0.3											
8	AEC02-TP04-0.2-0.3											
9	AEC02-TP05-0.2-0.3											
10	AEC02-TP06-0.2-0.3											
11	AEC02-TP07-0.2-0.3											
12	AEC02-TP08-0.2-0.3											
13	AEC02-TP09-0.2-0.3											
14	AEC02-TP10-0.2-0.3											
15	AEC02-TP11-0.2-0.3											
16	AEC02-TP12-0.2-0.3											
17	AEC02-TP14-0.2-0.3											
18	AEC02-TP15-0.2-0.3											
19	AEC02-TP16-0.2-0.3	✓	✓							✓		
20												
	Total Counts											

Containers

1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Please list & specify WAC/Container)	Sample Comments / Dangerous Goods Hazard Warning

Turnaround Time (TAT) Requirements (Default will be 5 days if not defined)

☐ Overnight ☐ Same Day
☐ 1 Day ☐ 2 Day
☐ 3 Day ☐ 5 Day
☐ Other (

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Lawrence	Signature		Date	11/1/24	Time
Eurofins | mgt Laboratory Use Only	Received By	Bikram Al	SYD | BNE | MEL | PER | ADL	Signature		Date	11/1	Time	5:18	Temperature
	Received By	Sanyadi	SYD | BNE | MEL | PER | ADL	Signature		Date		Time	pm	Report №

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Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Sydney Environmental Group Pty Ltd
Unit 63/45 Huntley St
Alexandria
NSW 2015

Attention:	Lachlan Mulhearn
Report	1059273-AID
Project Name	WSU MILPERRA CAMPUS SCA
Project ID	2300
Received Date	Jan 12, 2024
Date Reported	Jan 18, 2024

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name WSU MILPERRA CAMPUS SCA
Project ID 2300
Date Sampled Jan 12, 2024
Report 1059273-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC02-TP13_0.2_0.3	24-Ja0013279	Jan 12, 2024	Approximate Sample 977g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP17_0.2_0.3	24-Ja0013280	Jan 12, 2024	Approximate Sample 798g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP18_0.2_0.3	24-Ja0013281	Jan 12, 2024	Approximate Sample 918g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP19_0.2_0.3	24-Ja0013282	Jan 12, 2024	Approximate Sample 834g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP20_0.2_0.3	24-Ja0013283	Jan 12, 2024	Approximate Sample 923g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP21_0.2_0.3	24-Ja0013284	Jan 12, 2024	Approximate Sample 756g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP22_0.2_0.3	24-Ja0013285	Jan 12, 2024	Approximate Sample 921g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP23_0.2_0.3	24-Ja0013286	Jan 12, 2024	Approximate Sample 721g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC02-TP24_0.2_0.3	24-Ja0013287	Jan 12, 2024	Approximate Sample 847g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP25_0.2_0.3	24-Ja0013288	Jan 12, 2024	Approximate Sample 865g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP26_0.2_0.3	24-Ja0013289	Jan 12, 2024	Approximate Sample 828g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP27_0.2_0.3	24-Ja0013290	Jan 12, 2024	Approximate Sample 795g Sample consisted of: Brown coarse grained sandy clayey soil, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP28_0.2_0.3	24-Ja0013291	Jan 12, 2024	Approximate Sample 748g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP28_1.1_1.2	24-Ja0013292	Jan 12, 2024	Approximate Sample 719g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP29_0.2_0.3	24-Ja0013293	Jan 12, 2024	Approximate Sample 833g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP29_1.2_1.3	24-Ja0013294	Jan 12, 2024	Approximate Sample 653g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP30_0.2_0.3	24-Ja0013295	Jan 12, 2024	Approximate Sample 895g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP30_1.1_1.2	24-Ja0013296	Jan 12, 2024	Approximate Sample 717g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP31_0.2_0.3	24-Ja0013297	Jan 12, 2024	Approximate Sample 791g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP32_0.2_0.3	24-Ja0013298	Jan 12, 2024	Approximate Sample 731g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP33_0.2_0.3	24-Ja0013299	Jan 12, 2024	Approximate Sample 885g Sample consisted of: Brown coarse-grained sandy soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC02-TP33_1.1_1.2	24-Ja0013300	Jan 12, 2024	Approximate Sample 731g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP34_0.2_0.3	24-Ja0013301	Jan 12, 2024	Approximate Sample 810g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP34_1.2_1.3	24-Ja0013302	Jan 12, 2024	Approximate Sample 767g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP35_0.2_0.3	24-Ja0013303	Jan 12, 2024	Approximate Sample 752g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP35_1.2_1.3	24-Ja0013304	Jan 12, 2024	Approximate Sample 682g Sample consisted of: Brown coarse grained sandy clayey soil, coal and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP36_0.2_0.3	24-Ja0013305	Jan 12, 2024	Approximate Sample 755g Sample consisted of: Brown coarse grained sandy clayey soil, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP37_0.2_0.3	24-Ja0013306	Jan 12, 2024	Approximate Sample 647g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP38_0.2_0.3	24-Ja0013307	Jan 12, 2024	Approximate Sample 743g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP39_0.2_0.3	24-Ja0013308	Jan 12, 2024	Approximate Sample 821g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP40_0.2_0.3	24-Ja0013309	Jan 12, 2024	Approximate Sample 756g Sample consisted of: Brown coarse grained sandy clayey soil, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP40_1.2_1.3	24-Ja0013310	Jan 12, 2024	Approximate Sample 799g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP41_0.2_0.3	24-Ja0013311	Jan 12, 2024	Approximate Sample 736g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP41_1.2_1.3	24-Ja0013312	Jan 12, 2024	Approximate Sample 756g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
AEC02-TP42_0.2_0.3	24-Ja0013313	Jan 12, 2024	Approximate Sample 750g Sample consisted of: Brown coarse grained sandy clayey soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP43_0.2_0.3	24-Ja0013314	Jan 12, 2024	Approximate Sample 687g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP44_0.2_0.3	24-Ja0013315	Jan 12, 2024	Approximate Sample 736g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP45_0.2_0.3	24-Ja0013316	Jan 12, 2024	Approximate Sample 719g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP46_0.2_0.3	24-Ja0013317	Jan 12, 2024	Approximate Sample 772g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP47_0.2_0.3	24-Ja0013318	Jan 12, 2024	Approximate Sample 742g Sample consisted of: Brown coarse grained sandy clayey soil, cement, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP48_0.2_0.3	24-Ja0013319	Jan 12, 2024	Approximate Sample 869g Sample consisted of: Brown coarse grained sandy clayey soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP48_1.2_1.3	24-Ja0013320	Jan 12, 2024	Approximate Sample 756g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP49_0.2_0.3	24-Ja0013321	Jan 12, 2024	Approximate Sample 736g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP50_0.2_0.3	24-Ja0013322	Jan 12, 2024	Approximate Sample 764g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP51_0.2_0.3	24-Ja0013323	Jan 12, 2024	Approximate Sample 806g Sample consisted of: Brown coarse grained sandy clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
AEC02-TP52_0.2_0.3	24-Ja0013324	Jan 12, 2024	Approximate Sample 826g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jan 15, 2024	Indefinite

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
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NSW 2015

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Project ID: 2300

Order No.:
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Phone: 1300 884 164
Fax:

Received: Jan 12, 2024 6:27 PM
Due: Jan 18, 2024
Priority: 3 Day
Contact Name: Lachlan Mulhearn

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Asbestos - WA guidelines
Sydney Laboratory - NATA # 1261 Site # 18217						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	AEC02-TP13_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013279	X
2	AEC02-TP17_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013280	X
3	AEC02-TP18_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013281	X
4	AEC02-TP19_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013282	X
5	AEC02-TP20_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013283	X
6	AEC02-TP21_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013284	X
7	AEC02-TP22_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013285	X
8	AEC02-TP23_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013286	X

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Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Asbestos - WA guidelines
Sydney Laboratory - NATA # 1261 Site # 18217						X
9	AEC02-TP24_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013287	X
10	AEC02-TP25_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013288	X
11	AEC02-TP26_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013289	X
12	AEC02-TP27_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013290	X
13	AEC02-TP28_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013291	X
14	AEC02-TP28_1.1_1.2	Jan 12, 2024		Soil	S24-Ja0013292	X
15	AEC02-TP29_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013293	X
16	AEC02-TP29_1.2_1.3	Jan 12, 2024		Soil	S24-Ja0013294	X
17	AEC02-TP30_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013295	X
18	AEC02-	Jan 12, 2024		Soil	S24-Ja0013296	X

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Sample Detail						Asbestos - WA guidelines
Sydney Laboratory - NATA # 1261 Site # 18217						X
18	AEC02-TP30_1.1_1.2	Jan 12, 2024		Soil	S24-Ja0013296	
19	AEC02-TP31_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013297	X
20	AEC02-TP32_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013298	X
21	AEC02-TP33_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013299	X
22	AEC02-TP33_1.1_1.2	Jan 12, 2024		Soil	S24-Ja0013300	X
23	AEC02-TP34_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013301	X
24	AEC02-TP34_1.2_1.3	Jan 12, 2024		Soil	S24-Ja0013302	X
25	AEC02-TP35_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013303	X
26	AEC02-TP35_1.2_1.3	Jan 12, 2024		Soil	S24-Ja0013304	X
27	AEC02-	Jan 12, 2024		Soil	S24-Ja0013305	X

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Sample Detail						Asbestos - WA guidelines
Sydney Laboratory - NATA # 1261 Site # 18217						X
	TP36_0.2_0.3					
28	AEC02-TP37_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013306	X
29	AEC02-TP38_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013307	X
30	AEC02-TP39_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013308	X
31	AEC02-TP40_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013309	X
32	AEC02-TP40_1.2_1.3	Jan 12, 2024		Soil	S24-Ja0013310	X
33	AEC02-TP41_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013311	X
34	AEC02-TP41_1.2_1.3	Jan 12, 2024		Soil	S24-Ja0013312	X
35	AEC02-TP42_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013313	X
36	AEC02-TP43_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013314	X

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Sample Detail						Asbestos - WA guidelines
Sydney Laboratory - NATA # 1261 Site # 18217						X
37	AEC02-TP44_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013315	X
38	AEC02-TP45_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013316	X
39	AEC02-TP46_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013317	X
40	AEC02-TP47_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013318	X
41	AEC02-TP48_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013319	X
42	AEC02-TP48_1.2_1.3	Jan 12, 2024		Soil	S24-Ja0013320	X
43	AEC02-TP49_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013321	X
44	AEC02-TP50_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013322	X
45	AEC02-TP51_0.2_0.3	Jan 12, 2024		Soil	S24-Ja0013323	X
46	AEC02-	Jan 12, 2024		Soil	S24-Ja0013324	X

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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Sydney Environmental Group Pty Ltd
Address: Unit 63/45 Huntley St
Alexandria
NSW 2015

Project Name: WSU MILPERRA CAMPUS SCA
Project ID: 2300

Order No.:
Report #: 1059273
Phone: 1300 884 164
Fax:

Received: Jan 12, 2024 6:27 PM
Due: Jan 18, 2024
Priority: 3 Day
Contact Name: Lachlan Mulhearn

Eurofins Analytical Services Manager : Asim Khan

Sample Detail						Asbestos - WA guidelines
Sydney Laboratory - NATA # 1261 Site # 18217						X
	TP52_0.2_0.3					
Test Counts						46

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported. Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V = r x t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix may be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**). This estimate is not NATA-accredited.
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to “non-bonded / friable”.
AFM	Airborne Fibre Monitoring, e.g., by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total %w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w**).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
Sampling	Unless otherwise stated Eurofins are not responsible for sampling equipment or the sampling process.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average %w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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RECORD

ABN 50 005 085 521

☑ Sydney Laboratory
Unit F3 Bld F, 16 Mars Rd. Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
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07 3902 4600 EnviroSampleQLD@eurofins.com

☐

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №	2300	Project Manager	Mitch Kirby
Address	U63, 45 Huntley Street Alexandria NSW	Project Name	WSU Milperra Campus SCA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Lachlan Mulhearn				
Phone №	1300 884 164				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	LM & LL
Handed over by	LM & LL
Primary Email	enviro@sydneyenvironmental.com.au
Secondary Email	"Lachlan@... "Mitch@... "Lawrence@...

Analyses (Note: where results are requested please specify 'Total' or 'Filtered'.) SUITE add's must be used to attract SUITE pricing.

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA Vial | 500mL PFAS Bottle | Jar (Glass or HDPE) | Other (Asbestos AS4964, WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not stated)
☐ Overnight ☐ Same Day
☐ 1 Day ☐ 2 Day
☒ 3 Day ☐ 5 Day
☐ Other (

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggressivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)	Sample Comments / Dangerous Goods Hazard Warning
1	AECOL-TP13-0.2-0.3									X			
2	" - TP17-0.2-0.3												
3	" - TP18-0.2-0.3												
4	" - TP19-0.2-0.3												
5	" - TP20-0.2-0.3												
6	" - TP21-0.2-0.3												
7	" - TP22-0.2-0.3												
8	" - TP23-0.2-0.3												
9	" - TP24-0.2-0.3												
10	" - TP25-0.2-0.3												
11	" - TP26-0.2-0.3												
12	" - TP27-0.2-0.3												
13	" - TP28-0.2-0.3												
14	" - TP28-1.1-1.2												
15	" - TP29-0.2-0.3												
16	" - TP29-1.2-1.3												
17	" - TP30-0.2-0.3												
18	" - TP30-1.1-1.2												
19	" - TP31-0.2-0.3												
20	" - TP32-0.2-0.3												
	Total Counts									20			

Method of Shipment	☐ Courier (#) ☐ Hand Delivered ☐ Postal	Name	Lachlan Mulhearn	Signature		Date	12/1/24
Eurofins | mgt Laboratory Use Only	Received By	SYD | BNE | MEL | PER | ADL |		Signature		Date	
	Received By	SYD | BNE | MEL | PER | ADL |		Signature		Date	

Time	17:00	Temperature	21.4
Time		Report №	
Time			

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

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Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

10594273

2/3

RECORD

ABN 50 005 085 521

Sydney Laboratory
Unit F3 Bld F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

Brisbane Laboratory
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07 3902 4600 EnviroSampleQLD@eurofins.com

Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №	2300	Project Manager	Mitch Kirby
Address	U63, 45 Huntley Street Alexandria NSW	Project Name	WSU Milperra Campus SCA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Lachlan Mulhearn			Sampler(s)	LM + ZL
Phone №	1300 884 164			Handed over by	LM 3LL
Special Directions				Primary Email	enviro@sydneyenvironmental.com.au
Purchase Order				Secondary Email	"Lachlan@" "Mitch@" "Lawrence@"
Quote ID №					

Analyses (Note: Where multiple are requested, please specify "Total" or "Filtered") SUITE codes must be used to attach SUITE groups.

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggresivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)
1	AEC02 - TP33 - 0.2-0.3	12/1/24	S							X		
2	" - TP33 - 1.1-1.2											
3	" - TP34 - 0.2-0.3											
4	" - TP34 - 1.2-1.3											
5	" - TP35 - 0.2-0.3											
6	" - TP35 - 1.2-1.3											
7	" - TP36 - 0.2-0.3											
8	" - TP37 - 0.2-0.3											
9	" - ~~TP38~~ TP38 - 0.2-0.3											
10	" - TP39 - 0.2-0.3											
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
	Total Counts											

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA Vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964, WA Guidelines); Sample Comments / Dangerous Goods Hazard Warning

Turnaround Time (TAT) Requirements (Default will be 5 days if not stated)

- ☐ Overnight ☐ Same Day
- ☐ 1 Day ☐ 2 Day
- ☑ 3 Day ☐ 5 Day
- ☐ Other (

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Lachlan Mulhearn	Signature		Date	12/1/23	Time	17:00
Eurofins | mgt Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL |	Signature		Date		Time		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL |	Signature		Date		Time		Report №	

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Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

1059273

3/3

RECORD

ABN 50 005 085 521

☒ Sydney Laboratory
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02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
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☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Sydney Environmental Group	Project №	2300	Project Manager	Mitchell Kirby
Address	U63, 45 Huntley Street Alexandria NSW	Project Name	WSU Milperra campus SCA	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	Lawrence			Sampler(s)	Lawrence
Phone №	1300 884 164			Handed over by	
Special Directions				Primary Email	enviro@sydneyenvironmental.com.au Mitchell P
Purchase Order				Secondary Email	Lawrence & Lachlan P
Quote ID №					

Analyses (Note: Where multiple tests requested, please specify "Total" or "Filtered". SUITE codes must be used to select SUITE analysis)

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other (Asbestos AS4964, WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not stated): ☐ Overnight ☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 5 Day ☐ Other (

№	Client Sample ID	Sampled Date (dd/mm/yy)	Matrix (Solid (S) Water (W))	SEG Contam Suite 1 (TRH, BTEX, PAH, Metals, Asbestos ID)	SEG Contam Suite 2 (TRH, BTEX, PAH, Metals, OCP, PCB, Asbestos ID)	SEG Contam Suite 3 (TRH, BTEX, PAH, Metals, OCP, OPP, PCB, Asbestos ID)	SEG ENM Suite 1 (TRH, BTEX, PAH, Metals, pH, EC, Asbestos ID)	Salinity Assessment Suite (L2 Aggresivity Suite, ESP %)	Asbestos ID AS4964 (0.01%)	Asbestos ID NEPM & WA (0.001%)	B7 Suite (TRH, BTEX, PAH, Metals)	B13 Suite (OCP, PCB)	Sample Comments / Dangerous Goods Hazard Warning
1	AEC02-TP40-0.2-0.3	12/1/24	S							X			
2	AEC02-TP40-1.2-1.3												
3	AEC02-TP41-0.2-0.3												
4	AEC02-TP41-1.2-1.3												
5	AEC02-TP42-0.2-0.3												
6	AEC02-TP43-0.2-0.3												
7	AEC02-TP44-0.2-0.3												
8	AEC02-TP45-0.2-0.3												
9	AEC02-TP46-0.2-0.3												
10	AEC02-TP47 0.2-0.3												
11	AEC02-TP48-0.2-0.3												
12	AEC02-TP48-1.2-1.3												
13	AEC02-TP49-0.2-0.3												
14	AEC02-TP50-0.2-0.3												
15	AEC02-TP51-0.2-0.3												
16	AEC02-TP52-0.2-0.3												
17													
18													
19													
20													
	Total Counts												

Method of Shipment: ☐ Courier ( ) ☐ Hand Delivered ☐ Postal — Name: Lawrence — Signature: — Date: 12/1/24 — Time: — Temperature: 3.1.3

Eurofins | mgt Laboratory Use Only

Received By: [illegible] — SYD | BNE | MEL | PER | ADL | — Signature: — Date: 12/1 — Time: 6.24 — Temperature: 0.0

Received By: — SYD | BNE | MEL | PER | ADL | — Signature: — Date: — Time: — — Report №: 1059273

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Note: Metals = As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn), TRH = Total Recoverable Hydrocarbons, PAH = Polycyclic Aromatic Hydrocarbons, PCB = Polychlorinated Biphenyls, BTEX = Benzene, Toluene, Ethylbenzene, and Xylene

APPENDIX M: REMEDIAL ACTION PLAN BY ALLIANCE GEOTECHNICAL

Remedial Action Plan

Project

Western Sydney University – Milperra Campus
Horsley Rd & Bullecourt Ave, Milperra, NSW 2214

Prepared for

Mirvac Residential (NSW) Developments Pty Ltd

Date

15/09/2022

Report No

9996-ER-2-1_Rev03



alliance
geotechnical & environmental solutions

Alliance Geotechnical Pty Ltd

Address: 8-10 Welder Road
Seven Hills, NSW
Phone: 1800 288 188
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Document Control

Revision	Date	Author	Technical Reviewer	Project Manager
0	04/12/2020	Mehran Asadabadi	Aidan Rooney	Mehran Asadabadi
01	14/12/2020	Mehran Asadabadi	Aidan Rooney	Mehran Asadabadi
02	02/09/2022	Sam Scully	C. Cowper	Sam Scully
03	15/09/2022	Sam Scully	C.Cowper	Sam Scully

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This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to Alliance's engagement. The report must not be used for any purpose other than the purpose specified at the time Alliance was engaged to prepare the report.

The findings presented in this report are based on specific data and information made available during the course of this project. To the best of Alliance's knowledge, these findings represent a reasonable interpretation of the general condition of the site at the time of report completion.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Alliance.

Logs, figures, and drawings are generated for this report based on individual Alliance consultant interpretations of nominated data, as well as observations made at the time fieldwork was undertaken.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, Alliance reserves the right to review and amend this report.

Executive Summary

Alliance Geotechnical Pty Ltd (Alliance) was engaged by Mirvac Residential (NSW) Developments Pty Ltd (the client) to prepare a remedial action plan (RAP) for Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW (refer **Figure 1,** with the 'site' boundaries outlined in **Figure 2**)**.** This RAP has been prepared to assist the planning process by outlining the requirements of a future data gap closure assessment prior to remediation works and to generally guide remediation works, to assist the client in making the site suitable for the proposed residential land use.

At the commencement of the project, Alliance had the following project appreciation:

- the site is an active campus of Western Sydney University;
- the site is proposed for rezoning and subdivision to facilitate residential development. It is understood that this will comprise demolition of the existing university campus and construction of a low-density residential development;
- a Detailed Site Investigation (DSI) (ref: 9996-ER-1-1, dated January 2020) was undertaken by AG (AG 2020) and a recommendation included for a supplementary contamination assessment to understand the nature and extent of contamination identified onsite and address data gaps presented by building footprints, previous contamination assessments and inaccessible areas of environmental concern; and
- the DSI also concluded that a RAP be prepared in order to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination risk.

It is the ultimate intention of the client to redevelop the site into a low-density residential development. This is deemed as a change of land-use from "SP2 Infrastructure" to a residential land use scenario. The site currently falls within Infrastructure (SP2) in accordance with Bankstown Local Environment Plan (2015). Currently under State Environmental Planning Policy (SEPP) Hazards and Resilience (2021), a consent authority must not consent to the carrying out of any development unless it has considered whether the land is contaminated. This report has been prepared to facilitate the client addressing relevant aspects of State Environmental Planning Policy (SEPP) Hazards and Resilience (2021) and Canterbury Bankstown Council planning policies. Development plans for the proposed development are appended to this report as **Appendix A**.

In the context of NEPC (2013a), this is considered to be a land use scenario[1] comprising:

- Residential with accessible soil, including garden with home grown produce contributing less than 10% fruit and vegetable intake (excluding home grown poultry and/or eggs), and includes children's day care centres, preschools and primary schools.

Primary contamination remaining on completion of the previous contamination assessments includes:

- ***NAA 2011*** - Localised lead contamination recorded in surface soils (0m to 0.2m), exceeding residential human health and cadmium and zinc exceeding ecological criteria, at BH03 and S2. The contamination was vertically delineated soil type (i.e. sandy silt topsoil up to 0.25m depth) and by the deeper soil sample BH03 0.6-0.8, with contaminants in the sample below human health and ecological criteria. Based on the soil logs and available results indicate that lead, cadmium and copper are restricted to the upper 250mm of soil lack mobility.

[1] Adopted from Section 2.2 of NEPC (2013a) and Section 3 of NEPC (2013f)

- ***Coffey 2011*** – Friable asbestos was detected in six samples collected at depths ranging 0.2m to 1.1m, in the following boreholes:
    - EBH1, EBH2 and EBH3 (located in the vicinity of the former farm buildings and shed);
    - EBH5 (located in the vicinity of the historical dam area); and
    - EBH24 and EBH25 (located in the southern part of the previous filling of building rubble).
- ***JBS&G 2018*** – Asbestos fines/ friable asbestos (AF/FA) was detected in surface sample SS10 (located in the vicinity of the former farm buildings and shed).
- ***AG 2020*** – Asbestos Containing Materials (ACM) were encountered on the surface at the following borehole/ test pit locations:
    - BH59;
    - TP101/BH101; and
    - TP09.
- Asbestos Containing Materials (ACM) were encountered in the fill materials (at depth) at the following borehole/ test pit locations:
    - BH53; and
    - TP56.
- Friable asbestos (FA) was encountered in the fill materials at the following borehole locations:
    - BH53; and
    - TP56.

Contaminants of concern identified in soil by the DSI are priority metals (lead, cadmium and zinc) and asbestos (AF/FA). These contaminants are expected given the conceptual site model (CSM) that was developed for the site and presented in the DSI. Exposure routes for the identified contaminants relate to dermal contact, inhalation and/or ingestion, and uptake (biota only).

The CSM is presented in **Appendix B.** Refer to **Figure 3** which indicate the areas which will be subject to remediation and the remedial strategy for each area to mitigate the risks to human health and the wider environment.

Potential remediation options associated with impacted soil is extensive.

Consequently, only remediation strategies considered relevant to this site have been assessed, which include the following:

- Institutional controls / do nothing.
- Capping and Isolation.
- Excavation and off-site disposal.

AG notes that the remediation strategy will be reassessed upon completion of the additional assessments, as the lateral and vertical extents of impacted fill materials have not yet been delineated. Based on AG's understanding of the project objectives and taking into consideration the proposed development plans, the modified site-wide selected remedial strategy may comprise a combination of 'excavation and offsite disposal', and possibly some 'capping and isolation' of impacted soils (if appropriate, noting that the opportunity for containment on site may be limited and likely require further assessment once final development plans have been prepared).

Based on the information presented in the historical contamination assessment reports and AG's observations on site, AG concludes that the remedial strategies and goals can be achieved and the site made suitable in informing future land use planning and rendering the site suitable for proposed land use, subject to:

- Preparation of a SAQP prior to commencement of data gap assessment.
- Implementation of the strategies, methodologies and measures set out in this RAP.
- Should newly identified unacceptable land contamination risks be identified during supplementary assessment works, an addendum to this RAP may be required. The addendum should be prepared by a suitably experienced environmental consultant.
- Prior to any removal of soils from site for offsite disposal during remedial works, waste classification for those soils should be prepared by a suitably experienced environmental consultant. Residual impacted fill materials must also be appropriately characterised as per the strategy outlined in this RAP.
- AG recommends that any waste classifications, remediation monitoring and validation works be undertaken by a suitably experienced environmental consultant.
- It is recognised that contamination risks may remain on the site. If so, a LT-EMP will document areas where residual contamination is present on the site, and information on management measures that have been adopted. Provisions contained in the LT-EMP will need to have a mechanism to be legally enforceable and will be publicly notified. A revised RAP will be prepared to document where and how management measures will be implemented, and how a LTEMP can be made legally enforceable.

This report must be read in conjunction with the ***Important Information About This Report*** statements at the front of this report.

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1 Introduction

1.1 Background

Alliance Geotechnical Pty Ltd (Alliance) was engaged by Mirvac Residential (NSW) Developments Pty Ltd (the client) to prepare a remedial action plan (RAP) for Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW (refer **Figure 1,** with the 'site' boundaries outlined in **Figure 2**)**.** This RAP has been prepared to assist the planning process by outlining the requirements of a future data gap closure assessment prior to remediation works and to generally guide remediation works, to assist the client in making the site suitable for the proposed residential land use.

At the commencement of the project, Alliance had the following project appreciation:

- the site is an active campus of Western Sydney University;
- the site is proposed for rezoning and subdivision to facilitate residential development. It is understood that this will comprise demolition of the existing university campus and construction of a low-density residential development;
- a Detailed Site Investigation (DSI) (ref: 9996-ER-1-1, dated January 2020) was undertaken by AG (AG 2020) and a recommendation included for a supplementary contamination assessment to understand the nature and extent of contamination identified onsite and address data gaps presented by building footprints, previous contamination assessments and inaccessible areas of environmental concern; and
- the DSI also concluded that a RAP be prepared in order to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination risk.

1.2 Proposed Development

It is the ultimate intention of the client to redevelop the site into a low-density residential development. This is deemed as a change of land-use from "SP2 Infrastructure" to a residential land use scenario. The site currently falls within Infrastructure (SP2) in accordance with Bankstown Local Environment Plan (2015). Currently under State Environmental Planning Policy (SEPP) Hazards and Resilience (2021), a consent authority must not consent to the carrying out of any development unless it has considered whether the land is contaminated. This report has been prepared to facilitate the client addressing relevant aspects of State Environmental Planning Policy (SEPP) Hazards and Resilience (2021) and Canterbury Bankstown Council planning policies. Development plans for the proposed development are appended to this report as **Appendix A**.

In the context of NEPC (2013a), this is considered to be a land use scenario[2] comprising:

- Residential with accessible soil, including garden with home grown produce contributing less than 10% fruit and vegetable intake (excluding home grown poultry and/or eggs), and includes children's day care centres, preschools and primary schools.

[2] Adopted from Section 2.2 of NEPC (2013a) and Section 3 of NEPC (2013f)

1.3 Objectives

The objectives of this project were to prepare:

- a conceptual RAP for the site to outline the requirements of a data gap closure assessment and to address potentially unacceptable land contamination exposure risks identified for the site during previous site investigations completed, in the context of informing future land use planning;
- a strategy to mitigate these potential exposure risks, by exploring available remediation options that will effectively and efficiently provide this outcome; and
- a risk-based clean-up strategy to achieve an outcome that is technically, logistically, and financially feasible, and that facilitates making the site suitable for rezoning and subsequent residential land use.

1.4 Scope of Work

The following scope of works was undertaken address the project objectives:

- A desktop review of the previous contamination assessments;
- Preparation of a RAP with reference to the relevant sections of NSW EPA (2020a), including the following:
    - Outline key roles and responsibilities of key staff responsible for implementation of the works.
    - Define the remedial works required, assess the options available and plan a strategy to achieve site suitability for the proposed use.
    - A sampling and analysis quality plan (SAQP) to guide the collection of future soil and groundwater samples.
    - Appropriate requirements for the validation and verification of the remediation strategy, including soil and groundwater criteria to measure the success of the remediation.
    - Appropriate procedures to manage unexpected finds throughout remediation works.
    - Details of the appropriate environmental measures to be implemented to mitigate adverse effects that may occur because of the remediation.
    - Work Health and Safety (WH&S) procedures to facilitate the remediation works being conducted in a manner that will not pose an unacceptable risk to the health and safety of site workers or site users.

2 Site Identification

2.1 Site Details

Site identification details are presented in **Table 2.1**.

Table 2.1 Site Identification Details

Cadastral Identification	Lot 105 DP 1268911 and Lot 1 DP 101147
Geographic Coordinates (Google Earth)	33°56’25” S and 150°59’27” E
Site Area	Approximately 20 hectares (ha)
Local Government Authority	City of Canterbury Bankstown
Current Zoning	SP2 Infrastructure

2.2 Site Layout

The layout of the site including site boundary and access points is present in **Figure 2**.

2.3 Site History

The site has been used for agricultural and residential uses prior to redevelopment for a university. There is the potential for impacts to soil as a result of the demolition of former building structures potentially containing hazardous building materials, including asbestos and lead paint. This was confirmed by the identification of asbestos at sampling point SS10 and review of the Coffey 2011 Phase 2 Environmental Site Assessment Report, which also identified and recommended management of asbestos in soil.

There is the potential for presence of imported fill material of unknown origin to have been used during historical construction activities at the site.

Based on the presence of the landfill site to the south and the nearby commercial industrial properties to the north, northwest and east, it was considered that there is potential for contaminated groundwater and landfill gas migration to have impacted the site.

3 Site Environmental Setting

3.1 Geology

A review of the Sydney 1:250,000 Geological Series Sheet (3rd Edition) 1966, indicated that the site is likely to be underlain by a combination of:

- 'Triassic, Wiannamatta Group, Liverpool Sub-group (Rwl), defined as shale with some sandstone beds', located within the central and northern portions of the site; and
- Quaternary (Qa), characterised as alluvium, gravel, sand, silt and clay', located within the southern portion of the site.

3.2 Site Topography and Elevation

The site topography was observed to be undulating and sloped downwards towards the south southwest. Review of a contour plan provided by the client indicated the site resides at an elevation ranging between approximately 3m to 22.5m AHD. The contour plan is presented in **Appendix B.**

3.3 Hydrogeology and Beneficial Use of Groundwater

Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the site is considered likely to be towards the south southwest.

As part of the AG (2020) investigation, surveying points were established from the top of each monitoring well casing, to provide an understanding of groundwater movement onsite. Following the survey evaluation, AG assessed each monitoring well using an interface probe to measure the depth to standing water level (SWL) from the top of casing (TOC). The depth to groundwater measured during the well gauging task.

Based on the results of the survey, AG 2020 considered reasonable to assume groundwater onsite is flowing from the northeast corner to the west and south.

No beneficial use of groundwater was identified in AG (2020).

3.4 Visual Observations of Contamination (AG 2020)

Visual evidence of potential asbestos containing materials (ACM) in the soil samples collected, was detected at sampling points:

- TP09;
- TP53;
- TP56;
- BH59; and
- TP101.

The locations of the sampling points above are displayed in **Figure 4**. Visual evidence of staining in the soil samples collected, was not detected. Olfactory evidence of odours in the soil samples collected, was not detected.

4 Previous Contamination Assessments and Results

The previous investigations identified areas of land which pose a risk to future site users:

- Coffey 2011, 'Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus', Report dated 25 August 2011 ref: GEOTLCOV24163AG-AB (Coffey 2011).
- Noel Arnolds and Associates, 2011 'Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW', Report dated October 2011. ref: SJ0085:95458 (NAA 2011).
- Environmental Investigation Services, 2016 'Preliminary Contamination Screening and Waste Classification, Proposed Oval Facilities, UWS Bankstown Campus, 2 Bullecourt Avenue, Milperra' dated 7 April 2016.
- JBS&G Australia Pty Ltd 2018, '*Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW'*, Report ref: 54086-110124 (Rev 1), dated 7 February 2018.
- Alliance Geotechnical Pty Ltd, 2020 '*Detailed Site Investigation, Bullecourt Avenue, Milperra NSW* ', Report ref: 9996-ER-1-1, dated 30 January 2020.

Relevant information regarding the site was obtained from the above reports and summarised within **sub sections 4.1** to **4.5**.

4.1 Coffey (2011)

For the purposes of this Phase 2 Environmental Site Assessment (P2 ESA), Coffey assumed the site boundary comprised approximately 1.5ha. At the time of reporting, it was subsequently understood that the proposed student residence development was to extend further to the east and cover an area of approximately 3ha. Coffey understood that UWS required a P2 ESA to support a development application (DA) to Bankstown City Council.

The objectives of the assessment were to:

- Assess the acid sulfate soil status of the site based on a review of risk map and field observations;
- Assess the contamination status of the site by undertaking sampling and testing of soil; and
- Provide recommendations for further investigation/remediation requirements (if any) for the site to be suitable for the proposed student accommodation development.

The scope of work undertaken included:

- Fieldwork including soil sampling;
- Laboratory testing; and
- Data assessment and reporting.

Based on the site history information and visual observations, a number of Areas of Environmental Concern (AECs) and Chemicals of Potential Concern (COPCs) were identified. The identified AECs and associated CoPCs are presented in **Table 4.1.**

Table 4.1 - AECs and associated CoPC

Potential Areas of Concern	Chemicals of Potential Concern	Chemicals of Potential Concern
Southern end of the site – building rubble burial	TPH, PAH, Metals, Asbestos	Building rubble was buried up to 3m to 4m below the site surface.
Former farm dam – potential contaminated fill	TPH, BTEX, PAH, OCP, Metals, Asbestos	Potentially contaminated fill could have been used to backfill the dam.
Whole site – use of pesticides for pest/weed control	OCP, Metals	Chemical application (such as pesticides) was commonly used in historical farming activities. Contamination, if present, is likely to be localised near the surface and minor.
Whole site – hazardous building materials	Asbestos, Lead	Historical farm sheds/houses could contain asbestos and lead paint. Weathering, leaching and spreading (during demolition) of material would likely to be localised in the near surface.

A total of 25 boreholes were cored across the site on 11 and 12 July 2011, and samples submitted to a NATA accredited laboratory for analysis of CoPC.

Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- Asbestos, which was detected at six locations across the site.

Coffey recommended additional assessment to be undertaken to further characterise the asbestos impact and to assist in the selection of remedial/management options.

4.2 NAA (2011)

NAA was commissioned by JDH Architects to undertake a Soil Contamination Investigation (SCI) in an area in the northeast of the Bankstown Campus at the University of Western Sydney - Bankstown Campus located at Bullecourt Avenue, Milperra NSW (the site). The portion of the site investigated in NAA (2011) was approximately 2,500m^2 in area and resided to the north of the existing P2 car park at the Bankstown Campus. The proposed redevelopment comprised construction of a single storey childcare facility with adjacent car parking facilities.

The objectives of the SCI were to provide information on the extent and nature of contamination (if any) within the fill/soil material at the site and to assess the suitability of the site for the proposed land-use as a childcare facility.

NAA undertook the following scope of works to achieve the project objectives:

- Prepare a safe work method statement for works to be conducted at the site;
- Complete a site inspection and a comprehensive site walkover;
- Conduct grid-based sampling pattern by the hand augering of eight locations within the boundaries of the site. Hand augering was undertaken to a maximum depth of approximately 1.2m below ground surface with sampling conducted at varying depths through the fill/soil profile;

- Collect seventeen soil samples;
- Conduct NATA-certified laboratory-based analysis of soil; and
- Prepare a SCI report.

Based on the findings of the investigation, NAA 2011 concluded the following:

- Hotspots of lead contamination at locations BH3 0.0-0.2m and S2 0.0-0.1m were identified during an intrusive investigation previously undertaken by Coffey (AG were not provided this report);
- Concentrations of cadmium (BH3 0.0-0.2m) and zinc (BH3 0.0-0.2m, S2 0.0-0.1m and S7 0.0-0.1m) have been found to exceed the adopted Provisional Phytotoxicity Investigation Levels (PPIL);
- The site was unsuitable for the proposed land use as a childcare facility due to the presence of hotspots of lead contamination which may present a risk to human health if not appropriately managed;
- Exceedances of PPILs have also been reported at these locations and can be addressed as part of the management of the lead hotspots; and
- A marginal exceedance of zinc concentrations when compared with the PPIL was recorded at S7 0.0-0.1m. Given the marginal nature of this exceedance, it does not impact upon the suitability of the site for the proposal land use as a childcare facility.

Based on these conclusions, NAA 2011 made the following recommendations:

- Given the shallow nature of the impacted material, it was assumed that this material will be excavated and removed from site during the course of site preparation works (e.g. stripping back of topsoil material) for the purposes of redevelopment;
- Fill/soils to be removed offsite for disposal should be classified in accordance with NSW EPA Waste Classification Guidelines (2014) and should be disposed of at an appropriately licenced landfill facility;
- Following site preparation works, a suitably qualified Environmental Consultant should return to site to collect validation samples of the area of concern (in vicinity of BH3, S2 and S7) in order to confirm acceptable residual concentrations of heavy metals are present with respect to the adopted HIL and PPIL and that the site is suitable for the intended land use; and
- If it is determined that site preparation works will not result in the excavation and removal of the shallow material at BH3 0.0-0.2m and S2 0.0-0.1m, remediation works will be required. In this event, it is recommended that a Remedial Action Plan (RAP) be developed to address remediation of the hotspots of contamination identified.

4.3 EIS (2016)

Burtenshaw Scoufis Architecture + Interiors commissioned Environmental Investigation Services (EIS) to assign a waste classification to in-situ soil adjacent to the west of the athletics track located at 2 Bullecourt Avenue, Milperra NSW.

The aim of the investigation was to assess soil contamination issues at the site and to provide a waste classification for the material to be excavated for the proposed oval development.

The scope of work included the following:

- Review of available geological information;
- Soil sampling from three boreholes;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC); and

- Preparation of a letter report presenting the results of the investigation.

All results were below the site assessment criteria (SAC) adopted for the site. Overlying fill soils were classified as General Solid Waste (Non-putrescible) and underlying natural soils were classified as Virgin Excavated Natural Material (VENM). Based on this data, EIS concluded that the risk of widespread significant soil contamination in the development area was relatively low. The fill and natural soil material assessed was considered by EIS to be suitable for re-use on the subject site, provided it meets geotechnical and earthwork requirements.

4.4 JBS&G (2018)

JBS&G Australia Pty Ltd (JBS&G) were engaged by Western Sydney University (WSU) (the client) to prepare a Phase 1 Environmental Assessment Report for the WSU Milperra Campus located off Bullecourt Avenue, Milperra NSW (the site). Based on current Master Plan concepts for the Milperra Campus, JBS&G understood WSU intends to create an integrated living and working precinct with a range of land uses including medium to high density residential, mixed use, retail, community, open space and conservation areas at the site.

The objective of the investigation was to assess the potential for contamination relating to historical and current land use activities at the site to constrain the intended development objectives, and to make recommendations for further investigations and or remediation to achieve intended land uses of the development.

To meet the project objectives, JBS&G carried out the following scope of works:

- Review of available council documentation, aerial photographs, legal title information, EPA records and heritage records to identify areas of environmental concern (AECs) and associated contaminants of potential concern (CoPC)
- Review of site setting including topography, hydrology, hydrogeology and geology;
- Review of records of environmental incidents or former environmental licenses held by the NSW EPA;
- A detailed site inspection of accessible areas to identify potential AECs and CoPC not identified in the historical record review;
- Development and documentation of a conceptual site model (CSM);
- Limited soil sampling and analysis of soil samples for a range of CoPC;
- Assessment of soil sampling and analysis results against EPA endorsed guideline criteria for residential land use; and
- Preparation of the Phase 1 Environmental Site Assessment report in general accordance with guidelines made or approved by the NSW EPA.

Surrounding land use at the time of JBS&Gs site walk over was comprised of the following:

- North: Bullecourt Avenue with commercial / industrial land-use beyond including a service station to the north-west;
- East: Mount Saint Joseph’s High School and Horsley Road with commercial / industrial land-use beyond;
- South: The South Western Motorway (M5) with Kelso Landfill beyond; and
- West: Ashford Avenue with residential land-use beyond.

A SafeWork NSW search of the Stored Chemical Information Database (SCID) and the microfiche records held by SafeWork was requested. Information provided by SafeWork NSW included details on a number of abandoned (2) underground storage tanks (USTs) formerly located in the central eastern section of the site. Review of the SafeWork NSW documentation indicated the 2 x 2,500L USTs were removed on Friday 19 December 1997 by Email Petroleum Systems.

Based on site history review and observations during the site walkover, JBS&G identified the following AEC and associated CoPC presented in **Table 4.4.**

Table 4.4- AECs and associated CoPCs

Areas of Environmental Concern (AECs)	Contaminants of Potential Concern (CoPCs)
Demolition of historical site structure that may have contained hazardous building materials	Heavy metals, lead and asbestos
Surface soils impacted with herbicides/pesticides due to the maintenance of site from noxious weeds/pests	OCPs
Fill materials across the site, potential imported to site	Heavy metals, TRH, BTEX, PAH, OCPs, PCBs and asbestos
Burial Area (fill material)	Heavy Metals, PAH, OCPs and asbestos
Groundwater along the northern and eastern boundaries adjacent commercial / industrial properties	Heavy metals, TRH, BTEX, PAH, VOCs
Landfill gas along the southern boundary adjacent the Kelso Landfill	Methane and other landfill gases (LFG)

Based on the unidentified sources of fill material potentially imported to the site to backfill/raise topographic features and the potential for fill material at the site to contain waste materials associated with demolition of historical buildings potentially containing asbestos and/or lead paint, fill materials must be considered a potential contaminated medium. Due to the age of some existing site structures, it is possible that they may contain hazardous building materials including asbestos and lead based paints. Soils immediately surrounding buildings are considered as potentially contaminated medium.

In addition, buildings containing asbestos and / or lead paint which may have been demolished without appropriate controls may have also impacted surface soils. Surface soils must also therefore be considered a potential contaminated medium.

Based on the suspected depth of groundwater >8 m bgs, the likelihood of contamination of groundwater as a result of activities at the site is considered to be low. Based on the presence of the landfill site to the south and the nearby commercial/industrial properties to the north and east, there is potential for groundwater to be impacted as a result of offsite activities.

Given the relatively close proximity of the landfill to the south of the site, landfill gas has the potential to be a contaminated medium in the southern portion of the site.

JBS&G carried out a limited detailed site inspection and investigation. During the detailed site inspection JBS&G noted the observation of topography for potential adjustments in ground levels due to filling, presence of waste material such as asbestos containing material (ACM) on the ground surface and on external surfaces of structures and potential chemical/fuel storage, use or spillage.

On 23 August 2017, ten surface samples were collected from the site using a hand auger and forwarded to a NATA accredited laboratory for analysis of heavy metals, PAH, asbestos (NEPM 500ml) and OCPs. During soil sampling, a geotechnical fabric layer was identified below the ground surface at sampling point SS10. Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- SS10 – asbestos fibres/fibrous asbestos (AF/FA) detected at 0.02% w/w above the adopted HSL site criteria 0.001% w/w.

Based on the findings of this investigation, JBS&G made the following conclusions:

- The site has historically been used for a combination of agricultural and residential uses prior to development of the university;
- There is the potential for impacts to soil as a result of the demolition of former building structures potentially containing hazardous building materials, including asbestos and lead paint. This was confirmed by the identification of asbestos at sampling point SS10 and review of the Coffey 2011 Phase 2 Environmental Site Assessment Report, which also identified and recommended management of asbestos in soil;
- There is the potential for presence of imported fill material of unknown origin to have been used during historical construction activities at the site; and
- Based on the presence of the landfill site to the south and the nearby commercial industrial properties to the north, northwest and east, there is considered to be a potential for contaminated groundwater and landfill gas migration to have impacted the site.

Based on these conclusions, JBS&G recommended a detailed site investigation (DSI) is undertaken for the site in order to assess the extent and degree of contamination at the site and to provide an assessment of risk posed by site contaminants to human and environmental health. In addition to the DSI, JBS&G recommended a hazardous building material survey be completed prior to commencement of redevelopment works such that materials identified as comprising lead paint and or asbestos may be appropriately managed with regard to exposure risks to site workers and future building occupants.

4.5 AG (2020)

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Homes NSW Pty Ltd, to undertake a Stage 2 Detailed Site Investigation for a site located at Western Sydney University – Milperra Campus Bullecourt Avenue, Milperra, NSW 2214.

AG had the following project appreciation:

- the site was an active campus of Western Sydney University;
- the investigation was to be limited to areas outside of building structures and discretion was required in active areas of the site (roads, ovals and carparking areas);
- the site was proposed for rezoning and subdivision to facilitate residential development. It was understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and
- a Detailed Site Investigation was required, in accordance with State Environmental Planning Policy No. 55 – Remediation of Land, to accompany the development application.

It was the intention of the client to redevelop the site into a low-density residential development. This was deemed as a change of land-use from commercial / industrial to a residential land use scenario. The site was zoned as Infrastructure (SP2) in accordance with Canterbury Bankstown Local Environment Plan (2015). The report was prepared to facilitate the client addressing relevant requirements of State Environmental Planning Policy (SEPP) Hazards and Resilience (2021) and Canterbury Bankstown Council planning policies.

The objectives of the investigation were to:

- assess the potential for contamination to be present on the site in available/ accessible areas as a result of past and current land use activities;
- provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- provide recommendations for further investigation, management and/or remediation (if warranted).

AG undertook the following scope of works to address the project objectives:

- A desktop review of the previous investigation reports and other relevant information relating to the site;
- A site walkover to understand current site conditions and conduct underground utility locating;
- An intrusive site investigation using a track-mounted hydraulic drill rig, hand auger and/or track-mounted excavator to assess subsurface ground conditions and install groundwater monitoring wells;
- Collect representative soil and groundwater samples;
- Facilitate laboratory analysis of selected soil and groundwater samples for contaminates of potential concern (CoPC);
- Assess the results in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 (NEPM 2013); and
- Prepare a DSI in accordance with the Guidelines for Consultants Reporting on Contaminated Sites, 2011.

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical results, in the context of the proposed redevelopment scenario, AG made the following conclusions:

Soil Assessment

- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable direct contact human health exposure risk;
- the detected concentrations of asbestos fines/ friable asbestos and non-friable asbestos containing material in the soil samples analysed are considered likely to present an unacceptable human health exposure risk;
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable inhalation / vapour intrusion exposure risk;
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable TPH management limit exposure risk; and
- the detected concentrations of identified contaminants of potential concern in the soil samples analysed are considered unlikely to present an unacceptable aesthetics risk.

Groundwater Assessment

- the detected concentrations of contaminants of potential concern in groundwater are considered unlikely to present a risk to surrounding aquatic environments;

- All groundwater samples returned concentrations less than the adopted Groundwater Health Screening Levels for vapour intrusion (clay 2 - 4m) for a residential land use setting as per Table 1A (4) of NEPM 2013
- the detected concentrations of contaminants of potential concern in the groundwater samples analysed is considered unsuitable for discharge to municipal stormwater without further assessment/treatment due to the detected concentrations of the contaminants of concern analysed.

Based on the above conclusions, AG made the following recommendations:

- Consideration should be given to the preparation of a supplementary contamination assessment, to further understand the nature and extent of contamination identified onsite and address data gaps presented by building footprints, previous contamination assessments and inaccessible areas of environmental concern;
- Preparation of a remedial action plan (RAP) will be required to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination risk;
- If groundwater is expected to be encountered during the proposed development, a groundwater management plan would be required;
- The preparation of any supplementary contamination assessments, remedial action plans and/or groundwater management plans should be completed by an appropriately experienced environmental consultant;
- As per NSW WHS Regulations, any removal of friable asbestos requires the engagement of a Class A licensed asbestos removalist and a pre-notification to SafeWork NSW, with accompanying air monitoring during the works and clearances post completion to be conducted by a licensed asbestos assessor (LAA);
- Following remediation of the identified contamination, validation sampling and a site validation report will be required to confirm the effectiveness of the remedial works; and
- Any soil proposed for disposal should be classified and disposed of as per the NSW EPA Waste Classification Guidelines, 2014 with all disposal documentation retained by the client for inclusion within the site validation report.

4.6 Contamination Summary

Primary contamination remaining on completion of the previous contamination assessments includes:

- ***NAA 2011*** - Localised lead contamination recorded in surface soils (0m to 0.2m), exceeding residential human health and cadmium and zinc exceeding ecological criteria, at BH03 and S2. The contamination was vertically delineated soil type (i.e. sandy silt topsoil up to 0.25m depth) and by the deeper soil sample BH03 0.6-0.8, with contaminants in the sample below human health and ecological criteria. The soil logs and available results indicate that lead, cadmium and copper are restricted to the upper 250mm of soil.
- ***Coffey 2011*** – Friable asbestos was detected in six samples collected at depths ranging 0.2m to 1.1m, in the following boreholes:
    - EBH1, EBH2 and EBH3 (located in the vicinity of the former farm buildings and shed);
    - EBH5 (located in the vicinity of the historical dam area); and
    - EBH24 and EBH25 (located in the southern part of the previous filling of building rubble).
- ***JBS&G 2018*** – Asbestos fines/ friable asbestos (AF/FA) was detected in surface sample SS10 (located in the vicinity of the former farm buildings and shed).

- ***AG 2020*** – Asbestos Containing Materials (ACM) were encountered on the surface at the following borehole/ test pit locations:
    - BH59;
    - TP101/BH101; and
    - TP09.
- Asbestos Containing Materials (ACM) were encountered in the fill materials (at depth) at the following borehole/ test pit locations:
    - BH53; and
    - TP56.
- Friable asbestos (FA) was encountered in the fill materials at the following borehole locations:
    - BH53; and
    - TP56.

Contaminants of concern identified in soil by the DSI are priority metals (lead, cadmium and zinc) and asbestos (AF/FA). These contaminants are expected given the conceptual site model (CSM) that was developed for the site and presented in the DSI. Exposure routes for the identified contaminants relate to dermal contact, inhalation and/or ingestion, and uptake (biota only).

The CSM is presented in **Appendix C.**

5 Remediation Criteria

Taking into consideration the objectives of this project, and the conceptual site model and land use setting, the following soil investigation criteria relevant to the proposed land use setting have been adopted for this project:

Table 5-1 Remediation Criteria

Exposure Pathway	Land Use Setting[3]	Reference
Dermal contact and ingestion	HIL A	Table 1A(1) in ASC NEPM (2013a) Table B4 in Friebel, E & Nadebaum P (2011) Table 2 in HEPA (2020)
Inhalation of dust	HSL A / Residential A	Table 1A(2) in ASC NEPM (2013a)[4] Table 1A(3) in ASC NEPM (2013a) Table 1A(4) in ASC NEPM (2013a) Table 1A(5) in ASC NEPM (2013a)
Inhalation via release of airborne fibres	Residential A	Table 7 in ASC NEPM (2013a)[5]
Inhalation of vapour	HSL A & HSL B	Table 1A(5) in ASC NEPM (2013a)
Human health (aesthetics)	All	Characteristics and processes in Section 3.6.2 and 3.6.3 in ASC NEPM (2013a)
Uptake by plants and terrestrial organisms in root zones.	Urban residential / public open space	Table 1B(6) in ASC NEPM (2013a)[1,2] Table 3 in HEPA (2020) Table 11 in CRC CARE (2017)
Ground gases including methane	-	Section 3.6.2 in NSW EPA (2020a)

[3] Consideration will be given to soil type, soil texture, soil depth, groundwater depth and appropriate species protection levels.

[4] Residential and other associated buildings within the site to be assessed using the Residential A HSLs for vapour intrusion purposes.

[5] A depth of up to 10cm below ground level is adopted to define ‘surface soil’.

6 Results and Site Characterisation

A discussion on comparison of all laboratory analytical results exceedances to date and field observations, in the context of the assessment criteria adopted for this project, is presented in **Sections 6.1 to 6.4.**

Results summary tables for soil and groundwater are included in AG 2020 whilst the exceedances against the site remediation criteria are presented in **Figure 4.**

6.1 AEC01 – Asbestos in soil

In all investigations to date, asbestos was detected (absence presence) in four locations (Coffey 2011) and exceeding HSL A criteria in two locations (JBS&G 2018 and AG 2020). The locations are as follows:

Table 6.1 Asbestos exceeding site remediation criteria (HSL-A) of 0.001% (w/w) for AF/FA and 0.01% (w/w) for Bonded ACM

Sample Locations/ Depth (m)	Asbestos Concentration (% w/w)	Asbestos in soil (absence/presence)
EBH1/ 0.5m	-	Asbestos detected
EBH2/ 0.5m	-	Asbestos detected
EBH3/ 0.5m	-	Asbestos detected
EBH5/ 0.5m	-	Asbestos detected
SS10/ 0-0.1m	0.02	-
BH39/ 0-0.2m	0.043	-

Based on the above results, AG considers that remediation will be required for AEC01. AG recommends a detailed asbestos gravimetric assessment to be conducted (double the minimum required density, based on known asbestos), in order to potentially reduce/ delineate the area to be remediated.

6.2 AEC01a – Lead, Cadmium & Zinc exceeding site remediation criteria

In all investigations to date, lead was detected exceeding HIL A criteria in two locations (Coffey 2011). The locations are as follows:

Table 6.2.1. Lead exceeding site remediation criteria (HIL-A) of 300mg/kg

Sample Locations/ Depth (m)	Lead Concentration (mg/kg)
BH3/ 0.0-0.2	4400
S-2/ 0.0-0.1	1800

The 95% UCL was not considered for the above recorded exceedances, due to the concentration of both soil samples being greater than 250% of adopted site criteria (300mg/kg).

As a result, AG considers that remediation will be required for AEC01a.

In relation to Ecological Investigation Levels (EILs), in all investigations to date, lead and zinc was detected exceeding EIL criteria in two locations (Coffey 2011). The locations are as follows:

Table 6.2.2. Lead & Zinc exceeding site remediation criteria (EIL)

Sample Locations/ Depth (m)	Lead Concentration (mg/kg)	Zinc Concentration (mg/kg)	Site Criteria (mg/kg)
BH3/ 0.0-0.2	4400	6,800	1100 (lead) & 320 (Zinc)
S-2/ 0.0-0.1	1800	-	1100 (lead)

The 95% UCL was not considered for the above recorded exceedances, due to the lead and zinc concentration in soil sample BH3/0.0m-0.2m being greater than 250% of adopted site criteria.

As a result, AG considers that remediation will be required for AEC01a.

6.3 AEC02 – Asbestos in soil

In all investigations to date, asbestos was detected in five locations, in relation to AEC02. The locations are as follows:

Table 6.3. Asbestos detections in soil and on surface

Sample Locations/ Depth (m)	Asbestos Concentration (% w/w)	Asbestos in soil (absence/presence)
EBH24/ 1.1	-	Asbestos detected
EBH25/ 0.2	-	Asbestos detected
TP101-FCS/ 0.0m	-	Asbestos detected (ACM)
TP09-FCS/ 0.0m	-	Asbestos detected (ACM)
BH21/ 0.1-0.3m	0.00021	-

AG notes that friable asbestos (FA) was detected in soil sample BH21/ 0.1m-0.3m at concentration of 0.00021% w/w, which was below the site remediation criteria (0.001% w/w) for AF/FA.

Based on the above, AG considers that remediation of asbestos contaminated soils will be required for AEC02. AG recommends a detailed asbestos gravimetric assessment to be conducted (double the minimum required density, based on known asbestos), in order to appropriately characterise the contamination and potentially reduce/ delineate the area to be remediated.

6.4 AEC03 – Asbestos in soil

In all investigations to date, asbestos was detected in five locations, in relation to AEC03. The locations are as follows:

Table 6.4 Asbestos exceeding site criteria for bonded ACM (HIL-A) of 0.01% and FA/AF (HIL-A) of 0.001%

Sample Locations/ Depth (m)	Asbestos Concentration (% w/w)	Asbestos in soil (absence/presence)
TP53-FCS/ 1.2m	-	ACM in soil
TP56-FCS/ 0.0 – 2.2	-	ACM visible within the entire fill profile (>2.2m)
BH59/ 0.0m (FCS_59)	-	ACM on surface
TP09-FCS/ 0.0m	-	Asbestos detected (ACM)

Based on the above, AG considers that remediation of asbestos contaminated soils will be required for AEC03. AG recommends a detailed asbestos gravimetric assessment to be conducted (double the minimum required density, based on known asbestos), in order to appropriately characterise the contamination and potentially reduce/ delineate the area to be remediated.

7 Data Gap Closure Assessment (prior to remediation)

Prior to commencing data gap assessment, a detailed Sampling Analysis Quality Plan (SAQP) should be prepared and reviewed by a suitably qualified certified contaminated land consultant.

7.1 Detailed Asbestos Gravimetric Assessment

Site conditions and restrictions encountered including inaccessible areas (i.e. structures, hardstand areas) in the previous investigations limited AG to borehole drilling at the site and therefore appropriate asbestos gravimetric assessment, in accordance with ASC NEPM (2013), could not be conducted.

In lieu of the above and in an attempt to delineate (vertically and horizontally) the extent of contamination, the underlying fill materials at the site are assessed to require gravimetric assessment.

The objectives of the asbestos gravimetric assessment are to:

- Characterise the likely nature and extent of asbestos in surface and fills soils onsite;
- Assess whether the detected concentrations of asbestos in soil presents an unacceptable human health exposure risk, in the context of the proposed land use scenario; and
- Assess the inferred extents of asbestos in soils that require management or remediation.

The below **Sections 7.1.1 to 7.1.5** discuss the requirements of the detailed asbestos gravimetric assessment.

7.1.1 AEC01 (Area ≈ 12,800m^2)

Based on the above and in accordance with ASC NEPM (2013) and Western Australia, Department of Health 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites' May 2009 (WA DOH 2009), AG proposes the following additional assessment/ sampling plan for the site:

- The collection of 10L samples, which is required every 1m from surface (commencing with the top 100mm of soil) to the base of the fill materials in nominated areas. At every sampling point the materials will be spread/ screened onsite to observe ACM. The fragments observed will be collected and weighed onsite and subsequently sent to the laboratory for asbestos content. A 500mL sub-sample will be collected separately to the 10L bucket for asbestos quantification testing (AF/FA);
- A grid-based walkover to assess whether the top 10cm of site is visually free of asbestos;
- Based on Appendix A of WA DOH, 2009, a minimum of twenty-three (23) sampling points is required for assessment of asbestos contamination based on an area of approximately 12,800m^2. However, based on Table 1 of WA DOH 2009 (Triggers and Types of Asbestos Investigations), if there is known asbestos at the site, the sampling density is then doubled to account for confirmation and delineation of the asbestos concern;
- Intrusive investigation to the base of the fill layer in forty-six (46) sampling points using an appropriately sized excavator with bucket attachment; and
- The findings of the assessment will address the data gaps and inform an addendum to the RAP prior to commencement of remediation works.

7.1.2 AEC02 (Area ≈ 17,100m^2)

Based on the above and in accordance with ASC NEPM (2013) and (WA DOH 2009), AG proposes the following additional assessment/ sampling plan for the site:

- The collection of 10L samples, which is required every 1m from surface (commencing with the top 100mm of soil) to the base of the fill materials in nominated areas. At every sampling point the materials will be spread/ screened onsite to observe ACM. The fragments observed will be collected and weighed onsite and subsequently sent to the laboratory for weight confirmation and asbestos content. A 500mL sub-sample will be collected separately to the 10L bucket for asbestos quantification testing (AF/FA);
- A grid-based walkover to assess whether the top 10cm of site is visually free of asbestos;
- Based on Appendix A of WA DOH, 2009, a minimum of twenty-seven (27) sampling points is required for assessment of asbestos contamination based on an area of approximately 17,100m^2. However, based on Table 1 of WA DOH 2009 (Triggers and Types of Asbestos Investigations), if there is known asbestos at the site, the sampling density is then doubled to account for confirmation and delineation of the asbestos concern;
- Intrusive investigation to the base of the fill layer in fifty-four (54) sampling points using an appropriately sized excavator with bucket attachment; and
- The findings of the assessment will address the data gaps and inform an addendum to the RAP prior to commencement of remediation works.

7.1.3 AEC03 (Area ≈ 13,500m^2 known asbestos impacted + Area ≈ 18,240m^2 potential asbestos impacted)

Based on the above and in accordance with ASC NEPM (2013) and (WA DOH 2009), AG proposes the following additional assessment/ sampling plan for the site:

- The collection of 10L samples, which is required every 1m from surface (commencing with the top 100mm of soil) to the base of the fill materials in nominated areas. At every sampling point the materials will be spread/ screened onsite to observe ACM. The fragments observed will be collected and weighed onsite and subsequently sent to the laboratory for weight confirmation and asbestos content. A 500mL sub-sample will be collected separately to the 10L bucket for asbestos quantification testing (AF/FA);
- A grid-based walkover to assess whether the top 10cm of site is visually free of asbestos;
- Based on Appendix A of WA DOH, 2009, a minimum of forty-two (42) sampling points is required for assessment of asbestos contamination based on an area of approximately 31,740m^2. However, based on Table 1 of WA DOH 2009 (Triggers and Types of Asbestos Investigations), if there is known asbestos at the site, the sampling density is then doubled to account for confirmation and delineation of the asbestos concern;
- Intrusive investigation to the base of the fill layer in eighty-four (84) sampling points using an appropriately sized excavator with bucket attachment; and
- The findings of the assessment will address the data gaps and inform an addendum to the RAP prior to commencement of remediation works.

7.1.4 AEC01a (Area ≈ 1,000m^2 known lead, cadmium and zinc) with the potential for asbestos impacted soils

Asbestos sampling was not undertaken by NNA (2011) within AEC01a. Therefore, the risk of asbestos to be present in fill soils at the site, exceeding the adopted land use criteria cannot be precluded and confirmatory test pits would be required. Based on the above and in accordance with ASC NEPM (2013) and (WA DOH 2009), AG proposes the following additional assessment/ sampling plan for the site:

- The collection of 10L samples, which is required every 1m from surface (commencing with the top 100mm of soil) to the base of the fill materials in nominated areas. At every sampling point the materials will be spread/ screened onsite to observe ACM. The fragments observed will be collected and weighed

onsite and subsequently sent to the laboratory for asbestos content. A 500mL sub-sample will be collected separately to the 10L bucket for asbestos quantification testing (AF/FA);

- A grid-based walkover to assess whether the top 10cm of site is visually free of asbestos;
- Based on Appendix A of WA DOH, 2009, a minimum of six (6) sampling points is required for assessment of asbestos contamination based on an area of approximately 1,000m^2. However, based on Table 1 of WA DOH 2009 (Triggers and Types of Asbestos Investigations), if there is known asbestos at the site, the sampling density is then doubled to account for confirmation and delineation of the asbestos concern;
- Intrusive investigation to the base of the fill layer in six (6) sampling points using an appropriately sized (5-tonne) excavator with 600mm diameter bucket attachment; and
- The findings of the assessment will address the data gaps and inform an addendum to the RAP prior to commencement of remediation works.

7.1.5 Areas of the Site Outside of AEC01, AEC02 & AEC03 (Area ≈ 80,000m^2) with the potential for asbestos impacted soils

Alliance note that asbestos was not identified by laboratory analysis, in the soil samples analysed within areas outside of AEC01, AEC02 & AEC03 onsite. However, the use of soil bores instead of test pits limits the consultant's ability to visually inspect the materials and does not align with guidance provided in ASC NEPM (2013) and (WA DOH 2009) for asbestos in-soil suitability assessments. Therefore, the risk of asbestos to be present in fill soils at the site, exceeding the adopted land use criteria cannot be precluded and confirmatory test pits would be required.

Based on the above and in accordance with ASC NEPM (2013) and (WA DOH 2009), AG proposes the following additional assessment/ sampling plan for the site:

- The collection of 10L samples, which is required every 1m from surface (commencing with the top 100mm of soil) to the base of the fill materials in nominated areas. At every sampling point the materials will be spread/ screened onsite to observe ACM. The fragments observed will be collected and weighed onsite and subsequently sent to the laboratory for weight confirmation and asbestos content. A 500mL sub-sample will be collected separately from the 10L bucket for asbestos quantification testing (AF/FA);
- A grid-based walkover to assess whether the top 10cm of site is visually free of asbestos;
- Based on Appendix A of WA DOH, 2009 and noting the sampling point density previously completed within these areas of the site, a minimum of forty-two (47) sampling points is considered suitable for assessment of asbestos contamination based on an area of approximately 80,000m^2. However, based on Table 1 of WA DOH 2009 (Triggers and Types of Asbestos Investigations), if there is known asbestos at the site, the sampling density is then doubled to account for confirmation and delineation of the asbestos concern;
- Intrusive investigation to the base of the fill layer in forty-seven (47) sampling points using an appropriately sized excavator with bucket attachment; and
- The findings of the assessment will address the data gaps and inform an addendum to the RAP prior to commencement of remediation works.

7.2 Post Demolition Assessment

7.2.1 AEC05 (Area ≈ 37,000m^2)

Once all structure onsite has been demolished, a post demolition assessment will be required to assess the associated footprints. Based on the area occupied by structures and in accordance NSW EPA *Sampling Design Guidelines 1995*, a minimum of forty-seven (47) sampling points are required to be conducted.

Discrete soil samples should be recovered from 47 test pit locations. Each soil sample will be collected using a new clean pair of nitrile gloves and placed in the appropriate sample containers provided by the laboratory.

The test pits will be excavated to 0.3m into natural soils. Samples for potential analysis will be collected from the near surface, at ~0.5 m interval within the soil profile or with change of strata.

The soil jars will be labelled with sample identification (sample location and depth), date and name of sampler.

In relation to potential asbestos contamination, all proposed sampling locations will require collection of 10L samples, which is required every 1m from surface (commencing with the top 100mm of soil) to the base of the fill materials in nominated areas. The top 100mm of site must be visually free of asbestos. At every sampling point the materials will be spread/ screened onsite to observe ACM. The fragments observed will be collected and weighed onsite and subsequently sent to the laboratory for weight confirmation and asbestos content. A 500mL sub-sample will be collected separately to the 10L bucket for asbestos quantification testing (AF/FA). In relation to proposed asbestos assessment, AG makes the following comments:

- Based on the field observations and /or test results, the lateral and vertical extent may need to be increased; and
- If asbestos contamination is observed and/or identified, further sampling points will be required to adequately delineate the horizontal and vertical extent.

Upon completion the test pits will be backfilled and track rolled.

Soil test pit logs will be maintained in the field by an experienced AG environmental scientist for all exploratory pits. Field observations such as lithology, odours, staining, depth of water etc. will be noted on the logs.

As a minimum requirement, the following COPCs will be considered for the investigation:

- TRH;
- BTEX;
- PAHs;
- Metals (As, Cd, Cr, Cr (VI), Cu, Ni, Pb, Zn);
- OCPs; and
- Asbestos 0.001% (WA/ NEPM – 10L Gravimetric samples);

7.2.2 AEC04 – Previously Decommissioned Underground Storage Tanks (JBS&G 2018)

Based on review of JBS&G 2018 and in relation to previously decommissioned UST's, AG makes the following comments:

- There were two (2) underground fuel tanks located at the site. The tanks were understood not be in use and decommissioned;
- The removal and associated works for the decommissioning of the 2 USTs were conducted on Friday 19 December 1997 by 'Email Petroleum Systems'. The validation report was not provided to AG; and

- AG understands that the USTs comprised storage capacity 2,500L and one of the tanks contained Unleaded Petrol and the other Diesel product.

Based on the above and in the absence of a UST validation report, AG recommends that confirmation testing be carried out in the vicinity of the former USTs. Discrete soil samples should be recovered from 6 test pit/ borehole locations with two locations to be drilled for installation of groundwater monitoring wells (1 upgradient and the other down gradient). Samples will be collected using a new clean pair of nitrile gloves and placed in the appropriate sample containers provided by the laboratory.

The soil bores will be excavated/ drilled to a maximum depth of at least 4.0m bgl and the groundwater wells drilled to a target depth of 6m, 2m below inferred standing water level or practical refusal, whichever occurs first. Monitoring wells will be constructed using 50mm Class 18 PVC machine slotted screen and casing, gravel pack from the base to approximately 0.2m above the top of the screen, followed by approximately 0.5m of hydrated bentonite, grout to the surface and a lockable cast iron road box or lockable monument

Soil samples for potential analysis will be collected from the near surface, at ~0.5 m interval within the soil profile or with change of strata. Soil samples will be subjected to field screening for ionisable volatile organic compounds (VOC), using a photo-ionisation detector (PID). The results of field screening will be recorded on sampling point log.

Low flow sampling – low flow sampling should be adopted and groundwater to be extracted from the well at a rate so that drawdown of water is minimised (ideally less than 10cm below standing water level). Water quality meters will be used for stability to indicate the change from stagnant well water to representative formation water. The depth of sampling will be the mid-way point of the water column. Field filtering will be undertaken using 0.45 micron filters for metals analysis.

The sample jars/bottles will be labelled with sample identification (sample location and depth), date and name of sampler.

Upon completion of the soil boring, where applicable, the test pits/ boreholes will be backfilled.

Soil test pit/ borehole logs will be maintained in the field by an experienced AG environmental scientist for all exploratory pits. Field observations such as lithology, odours, staining, depth of water etc. will be noted on the logs.

As a minimum requirement, the following COPCs will be considered for the investigation:

- TRH;
- PAHs;
- Metals (As, Cd, Cr, Cr (VI), Cu, Ni, Pb, Zn); and
- VOCs/ SVOCs; and
- Phenols.

7.3 Hazardous Ground Gas

7.3.1 AEC06 – Adjacent Landfill at Southern Boundary of Site

Based on review of JBS&G 2018, there is potential for landfill gases to be migrating onto the southern boundary of the site, from the adjacent the Kelso Landfill.

Hazardous ground gas (HGG) generated by methanogenic degradation typically contains approximately 55 %v/v methane, 45 %v/v carbon dioxide and typically over 100 trace gaseous compounds termed Volatile Organic Compounds (VOCs).

NSW EPA (2020a) provides advice on ground gases that if present in the pore space of soils and rocks, and can adversely impact human health and safety or the integrity of structures. The ground gases that are generally of concern in this context are:

- Bulk ground gases, including methane, carbon dioxide, carbon monoxide, hydrogen, hydrogen sulphide, and petroleum vapours; and

Trace ground gases including radon, volatile organic compounds and mercury vapour.

The driving force of HGG is affected by a number of variables and for HGG to migrate away from the fill mass a pathway must be available and for migration to be sustained the source of gas must be replenished. CIRIA C665 2007 ‘Assessing risks posed by hazardous ground gases to buildings’ describe the following main factors that influence HGG migration:

- Pressure differential;
- Diffusion;
- Flow in dissolved form in liquids; and
- A combination of any of the three mechanisms.

The proposed redevelopment of the site is considered likely to include structural piers, construction of on-grade buildings. It is considered that ground gases (if present in sufficient concentration and with an adequate migration mechanism) may intrude into buildings and ancillary structures (especially confined spaces, small rooms and service cupboards) via pathways formed by wall cavities, joints formed during construction process, service ducts and trenches, etc

AG considers that a hazardous ground gas exposure pathway may be potentially complete and further assessment of presence of, and the risk posed by, hazardous ground gas, in the context of this project, may be warranted.

Sampling locations for ground gas investigations are based upon the guidelines for the assessment and management of sites affected by hazardous ground gases (NSW EPA, 2020b). The following strategy will be considered for the establishment of a ground gas monitoring well and the ground gas assessment at each gas well location:

- Gas wells are to be drilled in locations appropriate to assess inferred worst-case conditions, and peripheral locations to confirm the extent of the source.
- Boreholes are to be able to assess potential migration pathways.
- The depth of investigation will take into account the likely construction methods, such as service trenching and/or piling.
- The sensitivity of the planned site use, the nature of the gas source and the heterogeneity of ground conditions, as well as the assessed robustness of the conceptual site model.

Based on the above, it is considered reasonable to adopt a sampling plan comprising of 2 gas wells drilled as per below **table 7.3.1.1**:

Table 7.3.1.1. Location and justification of proposed monitoring locations

Well ID	Location	Depth (m bgl)	Method	Justification
GW01 & GW02	Southern boundary of site, adjacent to Kelso Landfill	~3.5 to 6.0 depending upon gauged depth to groundwater within MW02 and MW03 prior to installation (~0.5-1.0m above SWL).	Mechanical drilling using a drill rig fitted with auger, 50mm uPVC class 18 screen and casing, gravel pack, hydrated bentonite seal, concrete and standpipe sticking above ground with gas cap tapped to take a quick-connect nipple.	Measurement of potential gas from adjacent landfill (significantly filled)

Each gas well will be constructed using 50mm Class 18 PVC machine slotted screen and casing, gravel pack from the base to approximately 0.1m above the top of the screen, followed by approximately 0.3m of hydrated bentonite, grout to the surface and standpipe sticking above ground with gas cap tapped to take a quick-connect nipple.

Ground gas monitoring bores will be drilled to nominally 1m above standing water level (with consideration given to seasonal / tidal variations in standing water level) Target depths will also consider changes in lithology and geological formations, in the context of the CSM, targeting relevant permeable horizons, and avoiding creating pathways between potential gas sources (e.g. thick layers of fill material), with highly permeable horizons that may be subject to pressure fluctuations due to barometric or tidal effects.

The monitoring wells will be developed using a landfill gas meter (or similar). Each well will be developed for a minimum of 3 minutes.

Prior to gas sampling, each monitoring well will be subjected to leak testing (typically a minimum of 48 hours after well construction, to provide time for the bentonite seal to have cured).

The ground gas monitoring should be conducted during falling atmospheric pressure. Sampling will be scheduled to occur within 48 hours after falling atmospheric pressure and / or during low atmospheric pressure (e.g. less 101.3 kPa).

It should be noted that existing groundwater wells within the associated AEC, may also be assessed for the presence of HGG, if the gas wells (GW01 and GW02) identify HGG. In this instance, ex-caps can be installed on the groundwater wells for assessment of HGG across the site.

The ground gas monitoring should be undertaken during falling atmospheric pressure using a calibrated landfill gas analyser. Selection of measuring equipment will consider the need to collect the following data:

- Static gas pressure in the borehole;
- Dynamic gas pressure at the sampling flow rate;
- Atmospheric pressure;
- Differential pressure;
- Combined gas flow rate; and

- Concentration (as % v/v) of each hazardous ground gas.

The ground gas meter will be run (without brass fittings) for approximately one minute in ambient air and ambient air readings recorded (generally <0.1% methane, <0.1% carbon dioxide, ~21.0% oxygen, ~79% balance (nitrogen plus trace gases)).

The ground gas meter transducers will then be zeroed and the meter then attached to the monitoring well (with brass fittings), and the relative and atmospheric pressure readings recorded.

The ground gas parameters shown in **Table 7.3.1.2** should be recorded to derive a gas screening value (GSV) and characteristic gas situation (CS) in accordance with NSW EPA (2020b).

The monitoring should be undertaken by tapping a quick-connect nipple fitted with airtight tubes onto the gas cap at each well. Readings should be taken every 30 seconds for approximately 5 minutes at each gas well location or until the concentrations stabilise. If readings are still fluctuating, the pump will continue to be run and concentration readings recorded at one minute intervals until equilibrium is reached. If after two minutes, the readings do not stabilise, the final gas concentrations will be recorded, along with the direction of rate of change (rapidly or slowly increasing or decreasing), and a note made that the readings are 'non stabilised' final readings.

If high ground gas concentrations are recorded on the meter (>30% v/v methane and/or 30% v/v carbon dioxide), then monitoring of the bore will be extended a further two minutes to further assess the persistence of the gas detected within the bore.

Table 7.3.1.2. Gas monitoring parameters

Ground Gas	Unit of Measurement
Methane	% v/v
Carbon dioxide	% v/v
Oxygen	% v/v
Carbon monoxide	ppm
Hydrogen sulphide	ppm
VOCs	ppm
Differential pressure	Millibar
Borehole gas flowrate	l/hr

At completion of monitoring on a ground gas well, the gas meter will be purged in open air (until ambient readings are achieved, (generally <0.1% methane, <0.1% carbon dioxide, ~21.0% oxygen, ~79% balance (nitrogen plus trace gases)), to mitigate risk of cross contamination with the next monitoring well. The gas meter will be switched off between monitoring wells.

Should ground gas monitoring data be required beyond that which would be collected as part of his preliminary assessment, the number of monitoring events will take into consideration advice provided in Section 3.4.6 of NSW EPA (2020a), which may include 6-12 monitoring rounds over a period of 2 months to 24 months, to facilitate capturing worse case meteorological scenarios.

7.4 Groundwater

7.4.1 AEC07 – Adjacent Industrial land use to the north and northeast of the site

Based on review of AG (2020), there is potential for groundwater contamination to be migrating onto the site from adjacent industrial land use to the north and northeast of the site.

A total of eight (8) groundwater monitoring wells were installed on 16, 17 and 18 December 2019 by Epoca Environmental Drilling, under the supervision of AG, at sampling points BH01/MW01 to BH08/MW08. Each well location was drilled using a track mounted drilling rig fitted with push tube and solid stem rotary augers.

Drilling depths were extended to a nominal depth ranging between 5m to 10m bgl. A monitoring well was then constructed using 50mm uPVC Class 18 screen and casing, PVC end cap, gravel pack, hydrated bentonite seal, lockable torque cap and a cast iron gatic lid.

On 18 December 2019, each monitoring well was developed using a battery-operated submersible pump or bailer, with groundwater removed from each well until dry.

Surveying points were established by Affinity Survey from the top of each monitoring well casing, to provide a comprehensive understanding of groundwater movement onsite. Following the survey evaluation, AG assessed each monitoring well using an interface probe to measure the depth to standing water level (SWL) from the top of casing (TOC). The depth to groundwater measured during the well gauging task, is presented in the table below.

Sampling Point	Top of Casing (TOC) Level (m AHD)	Gauged Depth to Groundwater (m) from (TOC)	Standing Water Level (m AHD)
MW01	7.374	0.875	6.499
MW02	5.475	3.800	1.675
MW03	7.494	5.960	1.534
MW04	16.672	4.503	12.169
MW05	21.697	5.385	16.312
MW06	18.711	Well Dry	Not Applicable
MW07	20.557	Well Dry	Not Applicable
MW08	16.641	4.335	12.306

Based on the survey results and gauged depth to groundwater, it is considered reasonable to assume groundwater onsite is flowing from the northeast corner to the west and south.

The locations of the monitoring well sampling points (MW01 to MW08) established on site, are presented in **Figure 5**.

Given that the two groundwater monitoring wells located in the northeast corner of the site (MW06 and MW07) were observed to be dry and no groundwater samples were collected and/or laboratory tested, the risk of groundwater contamination from adjacent industrial land use to the north and northeast of the site cannot be precluded.

Based on the above and in accordance with ASC NEPM (2013), AG proposes the following additional assessment of groundwater for the site:

- all site groundwater monitoring wells (MW01 to MW08) will be purged, tested and sampled with reference to relevant Australian Standards, NSW EPA and NEPM 2013 Guidelines.

- Prior to groundwater sampling, the groundwater level in each monitoring well will be measured using an oil / water interface meter. This will adequately assess the depth to groundwater and whether light non-aqueous phase liquids (LNAPL) are present in the water column. Groundwater will then be sampled using a disposable bailer to make a visual assessment of the potential presence of LNAPL.
- A water quality meter will be used to measure pH, electrical conductivity (EC), redox potential, dissolved oxygen (DO) and temperature (groundwater indicators). Purging will be undertaken until the field parameters are stable (generally within 10% or 0.1 for pH) for three consecutive readings taken 5 minutes apart.
- Groundwater will be sampled for COPC outlined in **Appendix C** and the groundwater stabilisation data will be recorded on groundwater sampling logs.

If groundwater monitoring wells (MW06 and MW07) are again observed to be dry and unable to be sampled, consideration will be given to the installation of additional groundwater monitoring wells onsite.

7.5 Review of RAP Strategy

The nature and extent of contamination onsite identified during this data gap closure assessment, will be assessed in the context of the final development design, and the RAP will be revised / updated to:

- address the nature and extent of relevant land contamination risks; and
- refine the remedial extents for the site.

The overarching remediation strategy proposed to be implemented for the site, is discussed in **Section 8**.

8 Remedial Strategy Options Discussion

The final remediation extent will be dependent on the outcomes of the data gap closure assessment in **Section 7**. The existing estimated extents of remediation are limited to the areas of contamination identified in the DSI and the previous investigations. Refer to **Figure 4** for sampling point locations of the exceedances recorded and refer to **Figure 3** for existing estimated extent of contamination associated with each AEC. A range of soil remediation options have been considered for the site. The options considered include only those which are proven to be effective on past remediation or related projects. The following sections review each of the soil remediation option considered and outline the selection process used.

8.1 Remediation Strategy Development Rationale

When assessing management of contamination, the preferred hierarchy[6] of options for site clean-up and/or management should be considered, which includes:

- on-site treatment of the contamination so that it is destroyed, or the associated risk is reduced to an acceptable level; and
- off-site treatment of excavated soil so that the contamination is destroyed, or the associated risk is reduced to an acceptable level, after which the soil is returned to the site; or

if the above are not practicable;

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

Based on the existing understanding of contaminants of concern at the site, remedial options have been considered soils impacted by asbestos and metals. However, given the data gap closure assessments (refer **Section 7**) are still to be undertaken to better understand the nature and distribution of contamination, various remediation options will remain open for consideration.

Due to the nature and potential distribution of the contamination in the underlying soil matrix, an effective remediation approach for the site will be tailored towards the key impacted source material which is the impacted reworked imported fill material. A discussion of remediation options for impacted soil is provided in the below sections.

[6] NEPC 2013, 'National Environment Protection (Assessment of Site Contamination) Measure 1999, Site Contamination Policy Framework, Section 6' dated May 2013

Further, the data gap closure assessment (**Section 7),** includes assessment of hazardous ground gas and groundwater risks. If the assessment of hazardous ground gas and/or groundwater indicates that remediation and/or management of ground gas or groundwater is required, preparation of a revised RAP setting out remedial/management options for those contamination risks will be undertaken, taking into consideration the measures set out in **Section 9**.

8.2 Remediation Options for Impacted Soils

Potential remediation options associated with impacted soil are extensive.

Consequently, only remediation strategies considered relevant to this site have been assessed, which include the following:

- Institutional controls / do nothing.
- Capping and Isolation.
- Excavation and off-site disposal.

A discussion on the merits and disadvantages of each option is discussed in **Table 8.1**.

Table 8.1. Remediation Options Assessment

Treatment Option	Description	Advantages			Disadvantages		
		Technical	Financial	Logistical	Technical	Financial	Logistical
Do Nothing Scenario	No remedial action taken. Impacted soil left in-situ.	Lowest greenhouse emissions. Not considered a significant human health risk as long as the site is not disturbed.	No short-term remedial costs incurred. No operation and maintenance required.	No disturbance to site required. Existing landscape can be retained. No odour or dust management is required.	As the site is to be developed for 'residential' purposes, direct access to soil will not be restricted. This option is not protective of human health including site development workers and future tenants of the site in the long term, given increased likelihood for adverse effects with prolonged exposure. On-going liabilities including human health and the environment would remain.	Potential for future liability (e.g. EPA notices and potential health impacts to site users if exposed to unsafe levels for a long period of time.)	A long-term environmental management plan will need to be developed for site users and potential future excavation or maintenance requirements. Impacted material would remain on-site indefinitely.
Capping and Isolation of impacted soils	Soil removal, capping and isolation to restrict direct access to soil. Some impacted soil left in-situ.	Protective of human health including construction/ maintenance workers. Direct access to soil will be restricted and can be isolated with the appropriate mitigation measures.	Potentially lower costs through greater confidence of delivery through strategic planning (no time delays).	Moderate excavation is required to remove all the identified AECs across the entire site.	Some impacted material would remain on-site indefinitely. A notation would be placed on the planning certificate/ certificate of title.	Moderate disposal costs incurred in addition to the cost of importing clean soil material.	A long-term environmental management plan will need to be developed for site users and potential future excavation or maintenance requirements. Impacted material would remain on-site indefinitely.

				Limited environmental management required during the works (e.g. dust, noise) ~ 2 months to remediate the site.	Consideration must be given to the existing drainage easements on site (if any) and the area will be required to be designed and constructed to a standard that satisfies Sydney Water/ Council development standards. Ecological impacts from loss of existing trees on the site.		Council must confirm and approve that the containment of contamination is a suitable strategy on land that is to be reverted to Council.
Excavation & Offsite Disposal	Removal of all identified contaminated soil to an EPA licensed waste facility. Validation sampling to demonstrate the conditions of the residual soil impact. Reinstatement of excavated areas with material validated as suitable for the intended land use.	Protective of human health including future tenants and construction workers. Facilitate future development of the entire site. No long-term EMP will be required.	No onsite operation and maintenance required.	No ongoing management required as the impacted soil will have been removed offsite.	Based on the soil investigation results, for off-site disposal purposes, the impacted soil to be excavated and removed offsite would require waste classification in accordance with the NSW EPA *Waste Classification Guidelines 2014.* Ecological impacts from loss of existing trees on the site.	Very high remedial cost incurred to remediate and backfill the entire site.	Major excavation works is required. Odour, vapour and dust management required during the excavation works. May increase truck traffic in area to transport contaminated soil for a short period of time.

8.3 Preferred Method and Extent

Given the nature of known contamination, impacted material must be either isolated or removed to limit risk. Therefore, two management options for this material are proposed, and decisions regarding selection of the appropriate methodology will ultimately lie with the site owner with input from the appointed environmental consultant.

Disposal to an approved facility, or onsite encapsulation with long term management by means of a management plan, are considered suitable and appropriate options for the management of the impacted fill. The areas of the site where encapsulation may be feasible are likely to be limited and adoption of this strategy will require revision of the RAP once:

- final development design is known;
- appropriate encapsulation areas identified; and
- approval from the planning authority has been received.

It is noted that there are limitations with onsite encapsulation with a long term management plan. Mechanisms to enforce the management plan, and obtaining confirmation from the local planning consent authority (City of Canterbury Bankstown Council) that contamination containment is acceptable, will need to be considered (in addition to public notification via notation on relevant planning certificates and/or certificates of title.

The remediation method/ strategy will be finalised once the full extent of contamination onsite has been quantified. This will be based on the additional (data gap closure) assessments to be conducted.

Staged demolition and bulk earthworks is proposed for site redevelopment works.

Alliance understand that data gap assessments (where required) and area/stage specific RAPs will be prepared and implemented to coincide with the proposed staged demolition and bulk earthworks plan for the site.

The proposed staged demolition and bulk earthworks plan for the site is presented in **Appendix D**.

8.4 Anticipated Volumes (prior to data gap closure assessment)

Known contamination at AEC01, AEC01a, AEC02 and AEC03 are unsuitable for the proposed use of the site, therefore will require remediation. Based on the results of investigations to date, the volume of material requiring management was calculated as follows:

AEC01 – Remediation area = 12,800 m^2 x 0.8m (avg. depth of fill) depth = **10,240 m^3** insitu asbestos impacted soil.

AEC01a – Remediation area = 1,000 m^2 x 0.25m depth = **250 m^3** metals (lead, cadmium and zinc) impacted soil.

AEC02 – Remediation area = 17,100 m^2 x 1.0m (avg. depth of fill) depth = **17,100 m^3** asbestos impacted soil.

AEC03 – Remediation area = 13,500 m^2 x 1.5m (avg. depth of fill) depth = **20,250 m^3** asbestos impacted soil.

AG notes that AEC04 and AEC05 are yet to be investigated, but will be once all structures onsite have been demolished and removed. AG also notes that the above approximate volume of contaminated soils may be amended by way of delineation (vertically and horizontally) and further assessment.

8.5 Timing of Works

Timing of the works is dependent on the data gap assessment and construction schedule of the development, but should be completed prior to any preparatory earthworks commencing at the site.

8.6 Deviations from RAP

While it may be possible to vary the sequence and/or details of the validation works to meet site constraints, a suitably experienced environmental consultant should be appointed to the project to ensure:

- Critical stages of the site remediation/validation process are appropriately monitored, implemented and documented, with the relevant data collected for environmental reporting purposes.
- Any deviations from the works specified in this RAP are properly documented and approved, as required under the NSW EPA (2020) *Contaminated Site Guidelines: Consultants Reporting on Contaminated Sites*.

Performing assessment works without the presence of a qualified environmental engineer/scientist when necessary may lead to project delays and extra costs due to additional environmental investigation requirements imposed by the qualified Environmental Consultant or the appointed Site Auditor to confirm the environmental status of the site. Revisions of the RAP or preparation of staged remedial works plans (RWPs) for the site will be subject to review and approval by the Site Auditor.

Furthermore, excess spoil removed from the site without proper characterisation and/or waste classification assessment, may lead to regulatory action and potential penalties, as described under the *Protection of the Environment Operations* (*Waste) Regulation 2014*, the *Protection of the Environment Operations Act 1997* and the *Contaminated Land Management Act 1997*.

9 Remedial Contingency Plan

9.1 Contingency Measures

It is possible that during works, unexpected conditions may be encountered, such as the discovery of different types of filling, aesthetic impacts, or soil conditions different to those currently understood. If encountered, it may be necessary to stop work and re-consider the proposed approach before continuing. **Table 9.1** presents a contingency plan for contamination related scenarios.

Table 9.1. Remediation Contingences

Scenario	Remedial Contingencies/Corrective Action
Contamination not identified during previous investigation is encountered.	Isolate material and classify for offsite disposal. Ensure no risk of residual contamination exists.
Chemical spill / exposure	Stop work, refer to Health and Safety Plan and immediately contact the Site Supervisor.
Excessive Rain	Cover those working areas not located under cover, where possible, with plastic during off-shifts. Inspect and maintain sediment controls.
Excessive Dust	Use water sprays, biodegradable dust sprays, cease dust-generating activity until better dust control is achieved, or apply interim capping systems. If necessary, install dust deposition gauges prior to and during works to monitor the effectiveness of dust controls implemented on-site.
Release of fuel/oil from machinery	Remove source, use spill kit to absorb oil and make any repairs as required. If necessary, implement temporary measures until booms can be deployed; (e.g. earth embankments) to prevent movement of spill into water courses.
Complaint Management	Notify site management and owners (if required) following complaint and record details as per management procedures. Implement control measures to address reason of complaint (if possible) and advise complainant of results.
Unexpected potential contamination or underground structures encountered during remediation (e.g. underground storage tank, underground pit)	Consider excavation of test pits / trenches to assess potential for contamination to be present. Remove underground structures (if required) and associated soil contamination (if required). Consider groundwater assessment, subject to nature and extent of identified contamination. Amendment to the preferred remedial strategy (if required), pending the outcomes of the assessment of the unidentified contamination.
Greater volume of soil than anticipated, requiring management or remediation	• Waste classification of the additional material, with excavation and offsite disposal; or • Increased onsite containment, with appropriate long term management strategy

Hazardous ground gas risks	Depending on the nature and extent of hazardous ground gas contamination, consideration may be given to the following remedial strategies: • passive measures, including vertical barrier installation, vertical sub-surface venting, building foundation and ventilation design amendments, floor slab joint and penetration sealing; gas proof membranes, and venting systems beneath buildings; and • active measures, including sub slab depressurisation, sub-slab venting systems, gas extraction wells or trenches, and over-pressurisation systems (for buildings and/or slabs). The preferred strategy will be incorporated into a revision of the RAP or preparation of an RWP, for review and approval by the Site Auditor.
Groundwater contamination risks	Depending on the nature and extent of groundwater contamination, consideration may be given to the following remedial strategies: • Point source removal; • In-situ air sparging to facilitate contaminant biodegradation, or be coupled with soil vapour extraction (SVE); • In-situ chemical oxidation (ISCO); • Skimming; • Monitored natural attenuation (MNA); • Barrier systems (either reactive barriers or impermeable walls); • Pump and treat systems; or • Long term management by way of embargoes on groundwater abstraction The preferred strategy will be incorporated into a revision of the RAP or preparation of an RWP, for review and approval by the Site Auditor.

10 Remedial Works

The sequence of remedial works is expected to occur as follows:

1. Review of Data Gap Closure Assessment and revision of RAP (with Site Auditor review and approval).
2. Notification / Planning.
3. Site Establishment.
4. Offsite Disposal and/or onsite encapsulation.
5. Site Validation and Reporting.

The following remediation works, is based on data available at the time of preparing this RAP.

10.1 Remedial Goal

The remedial goal for this site is to remediate potential soil contamination (where identified) to a level that does not present an unacceptable human health or ecological exposure risk, based on the proposed land use scenario.

10.2 Notification / Planning

Alliance understands that remedial works classified as Category 2 under State Environmental Planning Policy (SEPP) Hazards and Resilience (2021), do not require development consent. However, in the event that the proposed remedial works trigger the Category 1 criteria in the SEPP, including but not limited to issues related to:

- designated development under the Environmental Planning and Assessment Regulation;
- critical habitat under the Threatened Species Conservation Act;
- the works having a significant effect on threatened species, populations or ecological communities or their habitats;
- the works being located in areas of environmental significance; or
- requiring consent under another SEPP or a regional environmental plan (REP),

then development consent for the remedial works may be required.

Demolition works (if required) will be undertaken by a contractor holding an appropriate SafeWork NSW demolition licence. That licence will hold a chemical endorsement, in the event that demolition works include an underground and/or aboveground storage tank.

Approvals will be obtained (if required) from NSW Roads and Maritime Services (RMS) for works being undertaken adjacent to (or on) RMS identified assets.

A water access licence will be obtained (if required) from Water NSW, in the event remediation works requires water to be taken at specified times, rates and circumstances from specified areas or locations.

A water supply work and use approval will be obtained (if required) from Water NSW, in the event remediation works requires construction and use of a specific water supply at a specified location. Water supply works may include pumps, bores, spear points and wells.

Asbestos removal works (if required) will be notified to SafeWork NSW by the remediation contractor. The asbestos removal works will be undertaken by a contractor that will hold a:

- Class A licence for removal of friable asbestos / asbestos fines; and
- Class B licence for removal of bonded asbestos.

Within seven days of completion of underground storage tank abandonment / decommissioning / removal works (if applicable), a notification will be sent to SafeWork NSW by the remediation contractor.

Within 30 days of completion of all remediation and validation works, a notice of completion of the remedial works will be submitted to the relevant planning authority.

Site specific management plans will be developed to guide the development and ensure compliance with applicable legislation. Methods and procedures for minimising potential impacts to the environment, dust control, traffic movements, work health and safety and material stockpiling will be included. From a contamination perspective, the main issues requiring management are dust and sediment. Typical management measures for such issues include (but are not limited to):

- In dry conditions, soils can be covered with plastic sheeting to reduce dust generation.
- Locating stockpiles away from any open drainage systems, overland flow paths or exposure to rain, and reduce the movement of soil by placing haybales around the base of each stockpile.
- Soil for offsite disposal should be excavated by strata type (fill, clay, rock, etc.) to reduce mechanical transport of contaminants.
- Personal protective equipment and identifying the location of underground services.

The stability of structures (including, but not necessarily limited to footings, walls, buildings and roads), which may be impacted by the proposed remedial works) will be assessed by a suitably experienced structural consultant before commencing remedial works. Recommendations made by the structural consultant will be incorporated by the remediation contractor, into the execution of all relevant site works.

10.3 Site Establishment

Site establishment will involve communications between the Environmental Consultant, Remediation Contractor and Project Manager(s) and discuss the need for any further remedial measures, excavation plans, and environmental management requirements. Mitigation measures required under site management plans such as sedimentation control and hygiene facilities should also be installed.

The below sections will be updated in relation to remedial extent and strategy, based on the findings of the post demolition and additional assessments to be conducted at the site.

10.4 AEC01, AEC02 and AEC03 – Offsite Disposal and/or Onsite Encapsulation of Asbestos Impacted Soils

10.4.1 Offsite Disposal (Option 1)

Impacted soils within AEC01, AEC01a, AEC02 and AEC03 will be excavated to the base of fill materials, exposing underlying natural materials. The fill materials will be stockpiled within an AEC (to be updated, based on discussions with remediation contractor) and sampled for waste classification in accordance with the relevant waste classification and SafeWork NSW Codes of Practice.

AG notes that the remedial works for the associated AECs will result in remediation/ removal of asbestos impacted soils.

The validation strategy for the associated AECs are set out in **Section 11**.

10.4.2 Onsite Encapsulation (Option 2)

The feasibility of adopting on-site encapsulation as a strategy will be dependent on the final development design and approval by the planning authority. However, onsite encapsulation has been included here as an option if the data gap closure assessment and RAP revision considers it to be an appropriate and practical option.

Impacted soils within AEC01, AEC01a, AEC02 and AEC03 will be excavated and temporarily stockpiled, prior to capping the materials at a suitable location (to be selected by site owner and remediation contractor). The selected area within the site proposed for encapsulation will be excavated to an appropriate depth in order to accommodate the placement of the asbestos impacted materials and clean fill capping materials.

The capping strategy for the excavated materials has been prepared with reference to relevant sections of WA DOH (2009). The containment by capping strategy is primarily focussed on isolating the fill material using appropriate barriers to prevent the disturbance and generation of potentially harmful materials. This will be carried out by:

- placement of high visibility geo-textile membrane (marker layer) over contaminated fill material, ensuring the geotextile membrane comprises:
    - Water permeable;
    - Highly visible;
    - Rot-proof and chemically inert;
    - High tensile strength;
    - Covers contaminated area and 0.5m, beyond contaminated boundary (if practical); and
    - Parallel sheets to be fixed together or overlap by a minimum of 20cm.
- Ensure a capping layer of clean fill (ENM or VENM) is placed over geo-textile membrane to the nominal depth of up to 1.0m, with a minimum thickness of at least 0.5m cap for residential/commercial and an additional minimum of 0.2m of topsoil in landscaped areas, and minimum of 1m cap for open space area; and
- Vegetate/landscape the surface of the capping layer, to protect the clean fill capping layer from natural erosion and/or anthropogenic disturbances.

In addition to the above, areas proposed for installation of inground services, a capping layer of clean fill (ENM or VENM) is placed over geo-textile membrane to the nominal minimum depths (about 0.5m below proposed invert levels) below surface finished level.

The depth of clean fill capping may be reduced based on a presence of a hardstand (i.e. proposed courts, slabs, pavements).

10.4.3 Onsite Encapsulation for Tree Protection Zones (TPZ's)

If any significant trees are to be retained onsite and are located within asbestos impacted areas, the following remediation strategy is proposed for Tree Protection Zone Areas in order to preserve the ecological significance of native trees onsite:

- hand pick visible construction and demolition waste and potential asbestos containing material in selected areas under the tree canopies, where feasible;
- remove surface soils (150mm) using non-destructive excavation techniques such as dry vacuum (equipped with HEPA filtration system), hand held implements or water pressure in an attempt to reduce potential root damage to the trees;
- the lateral extent of capping of the TPZ's are dependent on the meter radius (mR) provided for specific tree species identified at the site. The lateral extent of the TPZ's will identified and surveyed by the remediation contractor prior to commencement of excavation/ remediation works onsite;
- placement of high-visibility geo-textile membrane (marker layer) over contaminated fill material, ensuring the geotextile membrane comprises:
    - Water permeable material;
    - Highly visible;
    - Rot-proof and chemically inert;
    - High tensile strength;
    - Covers contaminated area and 0.5m, beyond contaminated boundary (if practical); and
    - Parallel sheets to be fixed together or overlap by a minimum of 0.2m.
- place a minimum depth of 450mm of clean fill materials that is coarse in texture (i.e. 300mm of 20mm Gravel) surrounding the tree trunk and a course sandy loam material for the remainder of the capping.

The remediation strategy for TPZ areas will be assessed and the RAP revised following the results of the data gap closure assessment and preparation of the final development design. The encapsulation option may not be feasible based on the proposed land use.

Care shall be undertaken to preserve woody roots intact and undamaged during excavation. Any roots encountered of less than 0.05m in diameter may be cleanly severed with clean sharp pruning implements at the face of the excavation. The root zone in the vicinity of the excavation shall be kept moist following excavation for the duration of construction to minimise moisture stress on the tree. Where large woody roots (greater than 0.04m diameter) are encountered during excavations, further advice from a qualified arborist shall be sought prior to severance.

AG notes that the appointed Arborist along with the remediation contractor will assess and survey the lateral extents of all TPZ areas onsite. The survey will be used to inform the Long-Term Environmental Management Plan (LT-EMP).

10.4.4 Backfilling

Should remedial excavations require backfilling, then backfill soils will be limited to:

- Virgin excavated natural material (VENM);
- Excavated natural material (ENM);
- Inground Services Trench Backfilling - Other material that is the subject of a resource recovery exemption and the placement of that material is within the lawful constraints of the resource recovery

exemption (and does not present an unacceptable exposure risk to human health or the environment, within the context of the proposed land use setting);

- Landscaping materials that has been analysed and verified for importation and placement onsite; or
- Material that has been analysed and verified for beneficial re-use onsite**.**

Consideration will be given to geotechnical engineering requirements associated with backfilling; however, those requirements will be specified by others elsewhere.

10.4.5 Unexpected Finds Protocol

The contamination assessments to date have not indicated the presence of significant soil contamination that is unacceptable for the proposed land use beyond the area of remediation described in this RAP. However, it is possible that unexpected finds may be present within the fill material. To this end, an unexpected finds protocol has been compiled, and is summarised herein. Unexpected finds could include, but are not limited to:

- Other underground storage tanks that are previously not identified;
- Buried containers and drums;
- Phase separated hydrocarbons;
- Powders and other suspicious buried material;
- Potentially hazardous materials; and
- Evidence of contamination including significant staining, odours and discolouration.

In the event that any material suspected of containing potentially hazardous substances is found during remediation works, the unexpected finds protocol, included in **Appendix E** is to be followed.

10.5 Roles and Responsibilities

The remediation management team (RMT) is responsible for the decision making and ultimately, the success of the project. **Table 10.5** identifies current key roles and responsibilities required and those entities currently responsible. However, as development consent has not been granted, not all details can be provided. Details of the management team should be updated and remain current for the duration of the work.

Table 10.5. Remediation Management Team

Team Member	Organisation	Responsibilities
Property Owner or Site Developer	Mirvac Residential (NSW) Developments	• Overall responsibility of site and key liaison for council. Appoints site contractors, including all other members of the RMT.
Project Manager – Site Operations	TBA	• Overall site management and day to day decision maker. Key communicator between site and owner / developer • Ensure relevant control plans are developed and implemented.
Remediation Contractor	TBA	• Site preparation including establishment of management plan requirements, importation of suitable landscaping material (if required) waste classification and disposal, as well as ensuring the remediation is conducted in accordance with this plan. • Ensure consultant is up to date with work schedules and is engaged to complete key components of the work (i.e. waste classification). • Implementation of measures required to mitigate any adverse effects resulting from the remediation; • Ensure all spoil removed from site is classified by the environmental consultant and is disposed of at a suitable facility. • Tracking of waste between site and deposition facility, including collection of all waste documentation to be provided to the environmental consultant. • Reporting any environmental issues, complaints or unexpected finds to the project manager and environmental consultant.
Environmental Consultant	Alliance Geotechnical	• Development of the remediation objectives and strategy. • Support all other members of RMT in understanding the requirements of the RAP and the potential risk posed should measures not be implemented. • Monitoring of key remediation components, collection of all environmental samples, and provide guidance to ensure the remediation is understood, and effective. • Complete site validation tasks and detail the works in a validation report concluding on site suitability.
Local Government Authority	Canterbury Bankstown Council	• Responsible for the granting of all consents and ensuring the recommendations of environmental reports are implemented.

11 Validation Data Quality Objectives

11.1 Data Quality Objectives

Data Quality Objectives (DQO) were developed in a sequential manner as documented below

Table 11.1 Data Quality Objectives

Step	Description
State the Problem	The site is to be subdivided for residential use, with other site areas designated for ecological conservation and infrastructure. Historical information and site inspection identified the potential for localised contamination to be present in site soils. A conceptual site model has also been developed for the site and is present in **Appendix C**.
Identify the Decision	Based on the objectives, decisions that need to be made are • Is the sampling adequate to determine the risk of contamination at the site, including any potential offsite migration? • If the data does not provide enough information, what data gaps require closure to enable the suitability of the site to be determined, or selection and design of an appropriate remedial strategy
Identify Inputs to the Decision	Inputs to the decision process include: • Previous works and details of the proposed development; • Understanding of current site use and historic activities that have occurred; • Geological and hydrogeological data relevant to the area, including physicochemical parameters for calculating ecological criteria; • Site observations for the presence of visual/olfactory contamination indicators; • Contaminant concentrations in soil at the site indicating the distribution of contaminants; and • Further input to the decision will be sample collection and handling, field and laboratory QAQC and confirmation that data quality indicators (DQIs) were achieved.
Define the Boundary of the Assessment	Spatial – Works are limited to the site boundaries and to a depth below reported contamination. Temporal – The results will be valid on the day samples are collected and will remain valid if no changes to site use occur, and contamination (if present) does not migrate on to site from off-site sources. Constraints of sampling requiring consideration include access restrictions (due to site operations and/or conditions) and presence of both above and underground services / structures.
Develop a Decision Rule	• Is the site suitable for the proposed land use? *If the concentrations of contaminants in the soil that remains are below the relevant health-based and ecological criteria for the intended land use; then the site will be deemed suitable for the proposed development.*

	• Is additional information required to determine the suitability of the site for its proposed use? *Should additional information be required as determined by the conceptual site model (CSM), then appropriate recommendations will be provided.* Decision criteria for analytical data are defined by the Data Quality Indicators (DQI) in **Table 11.2**.
Specify Acceptable Limits on Decision Errors	Specific limits for this project are to be in accordance with NEPM, appropriate data quality indicators (DQIs) for assessing the useability of the data, and standard procedures for field sampling and handling. To assess the useability of the data, pre-determined DQIs for completeness, comparability, representativeness, precision and accuracy, as presented below in **Table 11.2.** If any of the DQIs are not met, further assessment will be necessary to determine whether the non-conformance will significantly influence the usability of the data. Corrective actions may include requesting further information from samplers and/or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of samples.
Optimise the Design for Obtaining Data	To achieve the DQOs, the following is required: • Soil sampling (waste classification and imported backfill material) is to be completed for validation of remedial excavations, and waste classification for offsite disposal and the suitability of any materials for site importation; and • Documentation of the condition of the site as being suitable for the proposed development

11.2 Data Quality Indicators

To ensure that the data collected is of an acceptable quality, the data set will be evaluated against the data quality indicators (DQI) outlined in **Table 11.2** which related to both field and laboratory-based procedures.

Table 11.2 Data Quality Indicators

Data Quality Objective	Data Quality Indicator	Acceptable Range
Accuracy	Field – Trip blank (laboratory prepared) Laboratory – Laboratory control spike and matrix spike	< laboratory limit of reporting (LOR) Prescribed by the laboratories
Precision	Field – Blind replicate and spilt duplicate Laboratory – Laboratory duplicate and matrix spike duplicate	< 30 % relative percentage difference (RPD [%]) Prescribed by the laboratories
Representativeness	Field – Trip blank (laboratory prepared) Laboratory – Method blank	< laboratory limit of reporting (LOR) Prescribed by the laboratories
Completeness	Completion (%)	-

11.3 Sampling Procedures

Based on the existing data and in-lieu of additional assessments to be conducted, sample collection is for validation purposes will to be required, and for waste classification (should material require offsite disposal). A conceptual site model derived for the site is presented in **Appendix C**. Procedures for the collection of samples is presented below.

Table 11.3. Sampling Procedures

Action	Description
Sample Collection	Soil sampling will be directly from within the centre of the excavator bucket or immediately from the exposed excavation surface. Sampling data shall be recorded to comply with routine chain of custody requirements. When collecting the sample, either in-situ or from an excavator bucket, the outside layer of soil is to be removed.
Sampling, handling, transport and tracking	Stainless steel sampling equipment (including hand tools or excavator parts) is to be washed in a 3% solution of phosphate free detergent (Decon 90), followed by a rinse with potable water prior to each sample being collected. Direct transfer of the sample is preferred, with each sample container sealed to eliminate cross contamination during transportation to the laboratory. Each sample is labelled with individual and unique identification including Project No., Sample No., Sampling depth, date and time of sampling then placed into a chilled, enclosed and secure container for transport to the laboratory; and Provide chain of custody documentation to ensure that sample tracking and custody can be cross-checked at any point in the transfer of samples from the field to the environmental laboratory.
Sample Containers & Holding Times	All sample containers should be supplied from respective laboratory. All containers are to be filled with sample to the brim, then capped and stored in ice-filled chests, until completion of the fieldwork and during sample transit to the laboratory.
Field QA/QC	Quality assurance (QA) and quality control (QC) procedures will be adopted throughout the field sampling programme to ensure sampling precision and accuracy, which will be assessed through the analysis of 10% field duplicate/replicate samples. • Appropriate sampling procedures will be undertaken to prevent cross contamination. This will ensure: o Standard operating procedures are followed; o Site safety plans are developed prior to works commencement; o Split duplicate field samples are collected and analysed; o Samples are stored under secure, temperature-controlled conditions; o Chain of custody documentation is employed for the handling, transport and delivery of samples to the contracted environmental laboratory; and o Contaminated media from the site area is disposed in accordance with relevant regulatory guidelines.

	In total, field QA/QC will include one in 10 samples to be tested as blind field duplicates, one in 20 samples to be tested as inter-laboratory duplicates (ILD), and one equipment wash blank sample per sample batch. No QA/QC samples will be collected for asbestos sampling.
Laboratory Quality Assurance and Quality Control	The contract laboratory will conduct in-house QA/QC procedures involving the routine analysis of: • Reagent blanks; • Spike recoveries; • Laboratory duplicates; • Calibration standards and blanks; • QC statistical data; and • Control standards and recovery plots.
Achievement of Data Quality Objectives	Based on the analysis of quality control samples (i.e. duplicates/replicates and in-house laboratory QA/QC procedures), the following data quality objectives are required to be achieved: • Conformance with specified holding times; and • Field and laboratory duplicates and replicates samples will have a precision average of +/- 30% relative percent difference (RPD). An assessment of the overall data quality should be presented in the final validation report, in accordance with the EPA (2017) *Guidelines for the NSW Site Auditor Scheme*.

11.4 Validation Sampling

Review of the draft NSW EPA Contaminated land guidelines, Sampling design – part 1 application (2020a) – Section 5.2.1 states that judgemental sampling is recommended for validation of the remediation of solid media and the removal of infrastructure. Further, Section 6.2.1 of NEPM ASC (2013) states that the number and location or sampling points is based on the knowledge of the site and professional judgement. Sampling should be localised to known or potentially contaminated areas identified from knowledge of the site either from the site history or an earlier phase of site investigation. Judgemental sampling can be used to investigate sub-surface contamination assessment issues in site assessment.

Validation should focus on collecting clear evidence to assess whether the key objectives have been met. Validation sampling programs should identify and delineate the lateral and vertical extent of contamination (if any) and arrive at a scientifically defensible and statistically valid data set which characterises the chemical concentrations and human health risk present at the site.

An appropriately experienced environmental consultant will be present onsite at all stages of the remediation works, to assess the extent of remediation required to render the site suitable for the proposed development. Site observations and field screening equipment can be used to assist in decision-making in relation to:

- The location and extent of any excavations to trace contamination or whether to remove additional soil;
- Create a more focused sample collection (number and location) and laboratory analysis; and
- The need to consider (or implement) any specific health and safety measures.

A judgemental validation sampling pattern will be carried for asbestos sampling in areas of natural soils, with one soil sample collected from the base of the excavation (1 per 50m^2 grid) and one soil sample collected from each wall (per 10 linear meters – at the approximate depth of the of the initial contamination) of the remedial excavation footprints. Additional sampling will be required for characterisation of fill as per the AEC requirements in **Table 11.4**.

Certification will be required for any importation of recycled materials to site, with reference to the relevant resource recovery exemption. Analysis and verification of the materials will also be conducted as per requirements in **Table 11.4**.

For areas considered for remediation via capping/ isolation, placement of the high visibility geotextile membrane must be validated in accordance with WA DOH (2009). A survey of site levels for the vertical and lateral extent of the capped areas will be conducted prior to placement of any capping materials at an appropriately spaced across the capping area. The spacing of survey spot levels must be agreed with the environmental consultant. Once capping of the subject remediation area is completed, a final survey (in the same spot levels as previous survey) must be conducted in order to confirm the appropriate capping thickness has been achieved.

The validation sampling arrangements for this project are presented in **Table 11.4**.

Table 11.4 Applicable Validation Sampling per validation scenario

Area of Environmental Concern	Validation Scenario	Validation Sampling
AEC01a	Excavation and removal of contaminated fill material and validation of excavation base.	A systematic visual assessment of the base of the excavation (exposing natural materials) will be undertaken by an environmental consultant. It is anticipated that all fill materials will be removed. If there are fill materials exposed on the walls of the excavation, collect one 250ml jar and one asbestos grab soil sample per 10 linear meters of excavation wall (minimum one per wall - at the approximate depth of the of the initial contamination, i.e. 0.0m to 0.25m from existing surface level). Collect one 250ml jar and one asbestos grab soil sample per 100m^2 from the base of the excavation footprint. Samples are to be analysed for Heavy Metals and asbestos (absence/presence) by a NATA accredited lab.
AEC01, AEC02 and AEC03	Excavation and removal of contaminated fill material and validation of excavation base and walls.	A systematic visual assessment of the base and walls of the excavation will be undertaken by an environmental consultant. Fill material within the AEC will be excavated down to natural soils. As there will be no fill materials remaining upon removal of asbestos impacted soils, and natural materials exposed, then a 500mL validation sample is required to be collected at a rate of 1 per 50m^2. One (1) 10 L sample collected and assessed for fragments of ACM >7 mm, per 10 linear meters of excavation wall (minimum one per wall for every vertical metre of exposed fill materials). One (1) 500 mL NEPM asbestos quantification (0.001%) (sealable plastic bag) sample per 10 linear meters of excavation wall (minimum one per wall for every vertical metre of exposed fill materials) be analysed for friable asbestos (FA)/asbestos fibres (AF) by a NATA accredited lab. A visual clearance and an asbestos clearance report issued by a licensed asbestos assessor upon removal of asbestos impacted soils.

AEC01, AEC02 and AEC03	Excavation and removal of contaminated fill material; Lateral and vertical survey pre and post cap installation to confirm the extent of each cell and the installation thickness for the overlying cap; Inspection of geotextile marker layer to confirm its adequacy as a high visibility layer, the extent of placement over fill materials and the integrity of the geotextile when placed; and Assessment of imported fill (VENM/ENM) prior to placement.	**Option A – in-situ isolation of impacted materials:** A systematic visual assessment of the base and walls of the excavation will be undertaken by an environmental consultant. Fill material within the AEC will be excavated down to a depth of 1m below ground surface and capped with 1m of imported (VENM/ENM) materials. Survey plans, photographic records of geo-textile marker layer and review and approval of documentation on imported fill (VENM/ENM) by appointed environmental consultant prior to delivery to site. One (1) 10 L sample collected and assessed for fragments of ACM >7 mm, per 10 linear meters of excavation wall (minimum one per wall for every vertical metre of exposed fill materials). One (1) 500 mL NEPM asbestos quantification (0.001%) (sealable plastic bag) sample per 10 linear meters of excavation wall (minimum one per wall for every vertical metre of exposed fill materials) be analysed for friable asbestos (FA)/asbestos fibres (AF) by a NATA accredited lab. For the purpose of characterising residual fill materials that are to capped, soil samples are required to be collected (frequency dependant on AEC area in accordance with NSW EPA *'Sampling Design Guidelines' 1995*) to the base of the residual fill layer. Samples are to be analysed for asbestos AF/FA quantification, metals and associated ASLP characteristics (where required) by a NATA accredited laboratory. **Option B – excavation and placement in a burial cell within the site (area to be selected by the site owner):** **Step 1** - A systematic visual assessment of the base and walls of the excavation will be undertaken by an environmental consultant. Fill material within the AEC will be excavated down to natural soils. As there will be no fill materials remaining upon removal of asbestos impacted soils, and natural materials exposed, then a 500mL validation sample is required to be collected at a rate of 1 per 100m^2. Collect one 10L sample (in accordance with WA DoH 2009) per 10 linear meters of excavation wall (minimum one per wall for every vertical metre of exposed fill materials). Samples are to be analysed for asbestos AF/FA quantification, by a NATA accredited lab. A visual clearance and an asbestos clearance report issued by a licensed asbestos assessor upon removal of asbestos impacted soils. **Step 2** – Excavation of the burial cell, allowing for the volume of impacted materials to be capped. The stockpiled fill materials will be backfilled within the burial cell and capped with a combination of proposed pavements/ hardstand. Details of the proposed

Table 11.4 Applicable Validation Sampling per validation scenario

Area of Environmental Concern	Validation Scenario	Validation Sampling
		hardstand and/or pavement will need to be included in the future versions of the RAP (if required). Survey plans, photographic records of geo-textile marker layer and review and approval of documentation on imported fill (VENM/ENM) by environmental consultant.
Waste Classification	-	Quantity dependent – refer to NSW EPA *Waste Classification Guidelines (2014)* and sample density based on Tables 1 and 2 of the *Excavated Natural Material Order 2014.* Auditor to be consulted once quantity is known.
Beneficial re-use of fill materials (if reused onsite and not subject to capping)	-	Collection of 1 sample per 25m^3. Samples are to analysed for Heavy Metals (where required) and 10L samples collected and assessed for fragments of ACM >7 mm (in accordance with WA DoH 2009) for asbestos quantification by a NATA accredited lab. One (1) 500 mL NEPM asbestos quantification (0.001%) (sealable plastic bag) sample per 25 m^3 of material. Soil samples will be analysed for friable asbestos (FA)/asbestos fibres (AF). Validation of material to include an assessment for aesthetics as per 3.6.2 and 3.6.3 of ASC NEPM 2013(a).
Contingency Areas	-	A systematic visual assessment of the base and walls of the excavation will be undertaken by an environmental consultant. All fill material within the AEC will be excavated down to inferred natural material. PID screening will be conducted on samples collected on areas of potential impact. Collect one 250 ml jar soil sample per 25 m^2 from the base of the excavation footprint. Collect one 250 ml jar soil samples per 5 linear metres of excavation wall (minimum one per wall). Samples are to be analysed for TRH, BTEXN, PAHs, VOC's, Metals, PCBs, OCP, and asbestos by a NATA accredited lab.

Table 11.4 Applicable Validation Sampling per validation scenario

Area of Environmental Concern	Validation Scenario	Validation Sampling
Imported Fill – VENM	-	One (1) per 1,000 m^3 or at least 3 samples per stockpile / site.
Imported Fill - ENM	-	Quantity dependent – refer to the Excavated Natural Material (ENM) order for further details.
Imported resource recovery order/ exemption material	Laboratory certification required to confirm imported engineering materials has been classified with reference to a relevant resource recovery order/exemption. Visual verification (by the client) of materials upon delivery to site for confirmation they are free of visible/olfactory indicators of contamination.	At least 3 samples per source site. For aggregates - samples are to be analysed for asbestos (absence/presence) by a NATA accredited lab; or If the material contains significant fines, asbestos testing to be conducted in accordance with NEPM (2013) w/w% for asbestos quantification by a NATA accredited lab. One (1) 500 mL NEPM asbestos quantification (0.001%) (sealable plastic bag) sample (minimum 3 samples).

NOTE: If the validation testing identifies contamination outside of the known AEC extent (lateral and vertical), AG will conduct delineation testing (targeting the depth of newly identified contamination) in order to identify the contamination extent (lateral and vertical).

The quantity and movement of all waste materials excavated and removed offsite will be closely tracked by the remedial contractor under the supervision of the appointed environmental consultant. This will include internal tracking of material for reuse on the site. All waste disposal dockets issued by the suitably licensed waste receiving facility will be retained by the remedial contractor for reconciliation against the material tracking records, and for inclusion in the final site validation report. This will demonstrate that the waste was appropriately disposed to licensed facilities.

The site validation report will be issued by a suitably experienced environmental consultant.

If visual or olfactory observations indicated a potential for soil contamination to be present, then collection of additional validation samples will be considered.

The location of each sampling point will be marked on a site plan.

11.4.1 Soil Sampling Methodology

Grab soil samples will be collected at each required sampling point directly from the base and walls (where appropriate) of the excavation, however for asbestos sampling of fill material (should fill materials remain) a 10L (bucket sample for bonded ACM) and a 500mL (quantification AF/FA) samples are required.

The asbestos sampling and analysis for assessment and validation of fill materials will be conducted in accordance with WA DOH (2009), and involves:

- Collection of a 10L sample from each test location;
- The 10L sample will be weighed and recorded;
- Samples shall be screened through a 7mm sieve or spread out on a contrasting colour fabric/ tarp;
- Observable ACM and FA weighed and calculated for asbestos soil concentration;
- One wetted 500mL sample will be collected from each test location; and

- Samples will be sent to the laboratory for asbestos quantification (AF/FA) testing.

Depending on the depth of the excavation footprint, an excavator may be required to obtain samples. In these instances, samples will be collected from soils in the centre of the excavator bucket, to avoid cross contamination from the excavator bucket.

For soil sampling in areas where potential VOC impacts may be present, a photo-ionisation detector (PID), fitted with a 10.9 eV lamp, will be used to screen selected discrete soil samples (collected at every 0.5m intervals) for the presence of potential volatile organic compounds. Soil vapour field screening results will be utilised for the selection of samples for laboratory analysis. Dedicated nitrile gloves were used for the collection of each soil sample.

Sampling will be guided by a combination of visual evidence (ACM) and olfactory evidence.

Observations of the materials encountered during sampling will be recorded on the relevant field observation log with photographic record.

11.4.2 Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the sampling point number and the depth/interval the sample was collected from, e.g. a sample collected from AEC04 from the excavation footprint base, would be identified as AEC04-Base.

Project samples will be stored in laboratory prepared glass jars or zip-lock bags if collected for asbestos).

Reference will also be made to Table 5 in WA DOH (2009) for the sampling and screening of fill soils for the presence of asbestos, where practical. Subsequently, application of asbestos screening criteria published in ASC NEPM (2013a) may be limited.

Soil samples in glass jars will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- AG project identification number;
- Each sample identifier;
- Date each sample was collected;
- Sample type (e.g. soil or water);
- Container type/s for each sample collected;
- Preservation method used for each sample (e.g. ice);
- Analytical requirements for each sample and turnaround times; and
- Date and time of dispatch and receipt of samples (including signatures).

11.4.3 Decontamination

In the event that non-disposable sampling equipment is used, that equipment will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

11.4.4 Laboratory Selection

The analytical laboratories used for this project will be NATA accredited for the analysis undertaken.

11.4.5 Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled;
- Headspace screening results (where available);
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on site history, AG has adopted the laboratory analytical schedule presented in **Table 11.4.5** for this project.

Table 11.4.5 Laboratory Analytical Schedule

AEC	Analytical Schedule	No. of samples
AEC01, AEC02 and AEC03	Asbestos (500mL – AF/FA)	As per Table 11.4
AEC01a	Heavy Metals and Asbestos (500mL – AF/FA)	As per Table 11.4
AEC04	TRH/BTEX/PAH, VOCs/SVOCs, phenols and metals	As per section 7.2.2
AEC05	TRH/BTEX/PAH, metals and Asbestos (500mL-AF/FA)	As per section 7.2.1
AEC06	Real time measurement for ground gases	As per section 7.3.1
AEC07	Heavy metals, TRH, BTEX, PAH, VOCs, OCP, PCB, PFAS and inorganic compounds	As per section 7.4.1
Contingency Areas	Asbestos (500mL-AF/FA) and metals, (if required, VOCs)	As per Table 11.4

11.4.6 Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 11.4.6**.

Table 11.4.6 Analytical Methods, Limits of Reporting and Holding Times

Analyte	Method	Limit of Reporting (mg/kg)	Limit of Reporting (µg/L)	Holding Time
BTEX and TRH C_6-C_{10}	USEPA 5030, 8260B and 8020	0.2-0.5	1-2 and 50	14 days
TRH C_{10}-C_{40}	USEPA 8015B & C	20-100	50-500	14 days
VOC	USEPA 8260	0.1-0.5	-	14 days
PAH	USEPA 8270	0.1-0.2	0.5-10	14 days
PCB	USEPA 8270	0.2	-	14 days
OCP	USEPA 8081	0.2	-	14 days
Metals (Hg and Cr^{vi})	USEPA 8015B & C	0.05-2	0.1-5	6 months (28 days)
PFAS Short Suite	In house based on USEPA 537 V1.1	5µg/kg	0.01-0.05	14 days (soils) 28 days (waters)
PFAS Extended Suite	In house based on USEPA 537 V1.1	5µg/kg	0.01-0.05	14 days (soils), 28 days (waters)
Asbestos ID	AS4926	Absence / presence	-	No limit
Asbestos (WA DOH)	Inhouse	0.001% w/w	-	No limit
pH	APHA 4500 pH	-	0.1 pH unit	24 hours (up to 7 days allowed)
Hardness	APHA 2340	-	5mg/L	6 months
pHF and pHFox	AN104	0.1 pH unit	-	24 hours
CRS / SPOCAS	AS 4969	0.005%	-	24 hours / 7 days if frozen/dried

12 Validation Reporting

Site validation reports will be prepared by the appointed environmental consultants as per the needs of the project and the client. At the completion of each stage of demolition, bulk earthworks and subsequent remedial works, a separate site validation report for each stage/area will be prepared with reference to the relevant sections of NSW EPA (2020). The site validation reports will include:

- An executive summary;
- The scope of reporting work undertaken;
- Site identification details;
- A summary of geology and hydrogeology;
- A summary of site condition and the surrounding environment;
- Information on supplementary contamination assessment works undertaken (if any);
- A pre-remediation conceptual site model;
- Summary of the remedial action plan;
- Remediation and validation activities undertaken;
- Information on waste management;
- Information on the remedial works undertaken;
- Information on imported material;
- An assessment of field and laboratory quality assurance / quality control data;
- Validation results and discussion;
- A post remediation conceptual site model; and
- Conclusions and recommendations.

It is recognised that the remedial strategy proposed potentially includes for contamination risks to remain on the site and as such, a long term – environmental management plan (LT-EMP) that documents all areas where residual contamination is still present on the site and all capping and isolation measures installed will likely be required. Any provisions contained in the LT-EMP as discussed in **Section 14**, will need to be legally enforceable and will need to be publicly notified.

13 Site Management Plan

The following site management plan will apply during undertaking of the remediation tasks. AG notes that the following management plans must be prepared and should be incorporated as a sub-plan of the site Construction Environmental Management Plan (CEMP):

- Asbestos Management Plan; and
- Asbestos & Dust Monitoring Plan.

13.1 Interim Site Management Measures

Based on the findings of previous contamination assessments undertaken at the site and the existing site activities, it is considered reasonable to suggest that the identified contamination risks to the identified receptors at the site are currently considered to be low and physical site management measures to reduce exposure risks to identified contamination onsite, is considered not warranted.

The site owner should be notified of the contamination risks that have been identified for the site and the asbestos management plan should be updated to include appropriate management controls.

13.2 Asbestos Management & Controls

13.2.1 Equipment

The following is an equipment register of required materials in preparation for works:

- Appropriate personal protective equipment; disposable suits, P2 and P3 respirators, disposable gloves and disposable boot covers;
- Asbestos warning signage and barricade taping;
- 200 µm thick polyethylene asbestos waste bags;
- Black 200µm plastic lining;
- Water system capable of generating a light mist at low pressure;
- General personal hygiene equipment (e.g. wipes, brushes etc);
- Airborne Asbestos Monitoring (AAM) equipment (provided by the qualified occupational hygienist); and
- Waste transport system.

13.2.2 Personal Protective Equipment

The following personal protective equipment (PPE) is required on the project:

- Steel capped safety boots / steel capped gum boots.
- Disposable gloves.
- Disposable boot covers (if required).
- Safety Hard Hat.
- Disposable coveralls (type 5, category 3 (EN ISO 13982–1) or equivalent that would meet this standard (if required).

- Coveralls worn should be made from either 100% synthetic material or a mixed natural / synthetic fabric capable of providing adequate protection against fibre penetration. All fabrics must be capable of preventing the penetration of asbestos fibres down to a diameter of 0.5µm and to a maximum 1% penetration of all airborne asbestos fibres. Once worn, disposable overalls are not to be reused or laundered.
- Disposable half-face particulate respirator (P2 or P3 rated dependant on type of removal): The respirator must conform to the requirements of AS/NZS 1716:2009 Selection, Use and Maintenance of Respiratory Protective Devices or its equivalent. These disposable respirators must be replaced at each decontamination event.

13.2.3 Bulk Excavation Works

In regard to excavation, soil movement and placement of asbestos contaminated soil within the site, AG recommends the following:

- At least 5 days prior to commencing works, a SafeWork NSW Notification for Friable Asbestos Removal Works will be lodged by the appointed Licensed Asbestos Removalist;
- All excavation, soil movement and capping of the asbestos contaminated soil should be carried out under the supervision of a LAA or suitably qualified occupational hygienist and Class A licensed removalist contractor team;
- The LAA or qualified occupational hygienist will supervise the removal works to ensure that all removal procedures are implemented in accordance with the NSW Code of Practice: How to Safely Remove Asbestos (2019) and requirements set out in this document;
- Asbestos Air Monitoring will be carried out for the entirety of the works to ensure adequacy of control measures within the work site;
- A nominated decontamination area for plant and machinery will be erected outside the boundary of the removal areas during any friable asbestos removal / handling works;
- At the end of each shift, the source area and any temporary placement will be made safe using geofabric or appropriate plastic sheeting;
- At the end of each shift, the LAA or qualified occupational hygienist shall undertake an asbestos clearance / make-safe inspection to ensure that each area has been made safe. Records of these inspections will be provided to Spaceframe Constructions by the LAA / qualified occupational hygienist once completed;
- Following the removal of all asbestos contaminated soil, interim validation inspections and sampling of the source area will be carried out by a LAA, qualified occupational hygienist and / or Environmental Consultant;
- At the completion of asbestos works, all plant and machinery used during the works are to be decontaminated by the licensed removalist contractor;
- At the completion of the works, a validation report will then be prepared and issued in accordance with the appropriate legislation and guidelines (where required).

AG anticipates that areas validated will be fenced off from the remaining areas to be remediated, in order to reduce the risk of contaminated materials being tracked onto validated areas.

13.3 Soil & Stormwater Management

13.3.1 Soil Access/ Egress

Vehicle access and egress to the site will be stabilised to prevent tracking of sediment onto roads and footpaths. Soil, mud and other similar materials will be removed from the roadway adjacent the access/egress point by sweeping, shovelling or a means other than washing, on a daily basis, or as required.

Trucks will be loaded adjacent to the nominated waste dispatch area or to the remediation excavation (where practical). Spills of excavated soil will be scraped / swept up and combined with the soil being disposed offsite.

Soil and sediment will be broomed or washed off vehicle/plant tyres and tracks, prior to vehicles/plant leaving the remediation works zone. This soil and sediment will be scraped / swept up and managed onsite or disposed of, depending on its contamination status.

AG recommends a site-specific sediment and erosion control plan be prepared and maintained by the remediation contractor, to suit staging of the remediation works. Erosion and sediment control measures will be maintained in a functional condition. Sediment laden stormwater runoff will be controlled using measures outlined in Landcom 2004, '*Managing Urban Stormwater – Soils and Construction'* (the Blue Book).

13.3.2 Stockpiles

Stockpiles of soil or other materials:

- will not be placed on footpaths or nature strips, unless approved by Council;
- will be placed away from gutters, stormwater pits and other drainage lines;
- will be kept moist at all time;
- will be stored in a secure area and be covered if remaining on site for more than 24 hours; and
- will generally be constructed as low elongated mounds on level surfaces.

The **remediation contractor** will retain following material tracking information in relation to stockpiles onsite. A stockpile register should be implanted which will include the following minimum information:

- stockpile identification (i.e. stockpile number);
- estimated volume of stockpile;
- tracking of materials source; and
- fate of stockpile (i.e. tipping facility it will be sent to).

For materials that are proposed for reuse on site, internal material movement and stockpile tracking shall be undertaken.

13.3.3 Excavation Pump Out

Should excavations require pumping out, water will be analysed for total suspended solids, pH, metals and petroleum hydrocarbons. Should analytical results be less than relevant marine water ecosystem groundwater investigation levels in ANZG 2018, and meets the Council requirements for stormwater discharge then the excavation water (if any) may be discharged to stormwater.

Should analytical results exceed ANZG 2018 criteria, other options for disposal will be considered, including:

- discharge to sewer (with prior approval from Sydney Water with a Trade Waste Agreement); and
- removal and offsite disposal by a liquid waste contractor.

13.3.4 Rehabilitation and Landscaping

Stabilisation of exposed areas on the site, where required, will be undertaken in a progressive manner, as stages of remediation works are completed. Stabilisation will be maintained until such time as site redevelopment works commence.

Site redevelopment works may be undertaken in conjunction with remediation works. In this instance, revegetation of the site is considered unlikely to be required.

13.4 Waste management

Removal of materials from site for recycling and/or disposal, will be undertaken with reference to the relevant provisions of the Protection of the Environment Operations Act 1997, SafeWork NSW (2019) and NSW EPA (2014).

The remediation contractor will maintain detailed records of materials removed from the site, including date/time of removal, quantities of materials, transport company details and vehicle registration details.

The remediation contractor will retain records verifying lawful disposal of the materials, including weighbridge / tipping dockets from the waste receiver.

The remediation contractor will retain following material tracking information, they are as follows.

For waste classification:

- Waste classification document;
- Material source and description;
- Sampling density, pattern, COPCs;
- Result summary, including appropriate table with comparison to acceptance criteria; and
- Waste classification.

For offsite disposal works:

- Source location;
- Estimated volume (based on excavation size);
- Actual volume of disposal;
- Waste classification;
- Transporter;
- Final destination, PoEO licence;
- Reconciliation of waste dockets with actual disposal volume; and
- Reconciliation of actual disposal volume and the estimated volume of disposal (based on excavation size).

For imported material:

Volume of imported material;

- Source site;

- VENM certificate or certificate applicable for NSW EPA exemptions (e.g. ENM certificate);
- Placement location; and
- Transporter.

13.5 Groundwater Management

Should dewatering of true groundwater be required, development consent may be required from the planning consent authority. Dewatering may also require approvals from the NSW Department of Primary Industry – Water and WaterNSW.

13.6 Noise Control

Noise levels from the site during the project will not exceed the limits indicated in AS2436-2010.

No 'offensive noise' as defined under the Protection of the Environment Operations Act 1997 will be created during remediation works/activities.

Plant and equipment will be fitted with noise attenuation devices (e.g. mufflers on exhausts). Consideration will be given to use of reversing alarms other than the standard pulsed tonal alarms.

Vehicle access roads will be designed in such a way to minimise the need for plant and vehicles to reverse (e.g. provision of a turning circle adjacent to the remediation works zone).

13.7 Dust Control

Dust may be generated during remediation works and associated tasks. To mitigate risk of dust emissions migrating beyond the site boundary, consideration will be given to implementing the following procedures:

- erection of dust screens around the perimeter of the site (e.g. fencing with shade cloth attached);
- securely covering all loads entering or exiting the site;
- use of water sprays across the site to suppress dust;
- covering stockpiles of contaminated soil remaining on site for more than 24 hours;
- keeping excavation surfaces moist;
- wetting down of placed fill material during spreading;
- sweeping of hardstand surfaces;
- minimising soil disturbance works during windy days; and
- retaining stabilised site access/egress points for vehicles.

Any remedial works associated with asbestos are to be carried out in accordance with SafeWork NSW (2019) Code of Practice – How to Safety Remove Asbestos.

13.8 Odour Control

Generation of significant odours during the remediation works is considered to be unlikely.

If odours are generated, odours will be monitored at the site boundary. Should unacceptable odours be detected at the site boundary, consideration will be given to implementing the following procedures:

- use of appropriate covering techniques such as plastic sheeting to cover excavation faces or stockpiles;
- use of fine mist sprays (which may incorporate deodorizing agents);
- use of hydrocarbon mitigating agents on impacted areas/materials; and
- adequate maintenance of equipment and machinery to minimise exhaust emissions.

A record of unacceptable odours and corrective/preventative action taken, will be maintained by the remediation contractor.

13.9 Traffic Management

Haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site will be selected by the remediation contractor and will meet the following objectives:

- compliance with all traffic road rules;
- minimisation of noise, vibration and odour to adjacent premises; and
- utilisation of state roads and minimisation of use of local roads.

The remediation contractor will ensure that site vehicles:

- conduct deliveries of soil, materials, equipment or machinery during the hours of remediation work identified in **Section 13.14**;
- securely cover all loads to prevent dust or odour emissions during transportation;
- exit the site in a forward direction; and
- do not track soil, mud or sediment onto the road.

13.10 Vibration Management

Vibration emissions during remediation works will be controlled to mitigate risk of potential damage to assets on adjacent properties, and to mitigate unreasonable loss of amenity to nearby residents.

13.11 Fill Importation

Material proposed to be imported to site as engineered fill, will be limited to materials certified as:

- Virgin Excavated Natural Material (VENM);
- Excavated Natural Material (ENM);
- Recycled aggregate (DGB20);
- Landscaping soil materials; and
- Landscaping pebbles (quarried).

VENM certification will be undertaken with reference to NSW EPA (1995). ENM certification will be undertaken with reference to NSW EPA Excavated Natural Material Exemption.

The concentrations of potential contaminants in VENM and ENM proposed to be imported to site, will be compared against NSW EPA Waste Classification Guidelines 2014 and NSW EPA Excavated Natural Material Order 2014.

Certification will be required to confirm imported engineering materials has been classified with reference to a relevant resource recovery exemption and is fit for purpose on site.

Imported fill will be compatible with existing soil characteristics for site drainage purposes.

The remediation contractor will maintain detailed records of all fill imported to the site, including details of the supplier, the source of the fill, the quantities of the fill, vehicle registration numbers and the dates/times the fill was received on site. Validation sampling as per **Table 11.4** to apply to each relevant material type.

13.12 Work Health and Safety

13.12.1 Safe Work Methos Statement

Each contractor and sub-contractor undertaking remediation works, or working within a remediation works zone, will prepare a project specific safe work method statement (SWMS), which will include, but not be limited to:

- the tasks to be undertaken;
- hazards identified for each of the tasks to be undertaken;
- an assessment of risk for each hazard, considering likelihood and consequence; and
- control measures to eliminate or mitigate risks associated with each identified hazard.

13.12.2 Personal Protective Equipment

Given that asbestos has been identified onsite, the following minimum personal protective equipment (PPE) should be worn by all persons working in or visiting these remediation works zone:

- long sleeves and long pants or overalls (when required);
- high visibility vests (or clothing);
- a dust mask or respirator (depending on the hazard) must be worn when hazardous substances are present;
- safety boots and boot covers (when required);
- hard hats
- gloves; and
- eye protection (e.g. safety glasses).

Additional PPE may be required in accordance with task specific control measures in SWMS (refer **Section 11.11.1**).

13.12.3 Decontamination of Personnel

Personnel undertaking remediation tasks, or entering the remediation works zone, be required to decontaminate upon exiting the remediation works zone. Decontamination procedures will include:

- cleaning down of protective footwear (including removal of soil from the soles); and

- washing of hands.

The following minimum personal protective equipment (PPE) should be worn by any persons the remediation works zone:

- gloves;
- safety boots;
- hard hats;
- high visibility vests or clothing; and
- safety glasses.

13.13 Site Signage

A sign will be posted on the boundary of the site, adjacent to the site access point, which will include 24-hour contact details of the remediation contractor. This sign will be maintained onsite until all remediation works are complete.

13.14 Site Security

Site security will be maintained throughout the duration of the remediation works, with appropriate boundary fencing and gate locks. This will include areas/ stages that are awaiting validation sign-off or have previously been validated.

Other security measures may be implemented, if the need arises.

13.15 Site Hours of Operation

Remediation works will be undertaken on Monday to Friday between the hours of 7:00am to 5:00pm, and Saturday between the hours of 8:00am and 1:00pm.

Remediation works will not be undertaken outside the hours stated above, or on Sundays or public holidays.

13.16 Community Relations and Complaints

Owners, occupants and tenants of properties adjoining the site and across the road from the site, will be provided with notification of remediation works, at least two days prior to those works commencing.

Personnel undertaking remediation works on the site, will direct all third-party communications and/or complaints to the Project Manager. The Project Manager will arrange for the communication/complaint to be assessed, a response prepared, corrective/preventative actions implemented (if necessary).

A register will be maintained on site for the recording of communications / complaints from third parties, including but not limited to, local residents and local businesses.

13.17 Emergency Preparedness

An emergency assembly point will be established at the site egress point. This point will be communicated to all site workers and visitors, during relevant site induction processes.

In the event of an emergency, site workers and visitors will assemble here and await further instructions from the site supervisor, project manager or emergency services.

In the event of soil and/or groundwater contamination as a result of a spill and/or fire, the steps described in **Appendix E** 'Unexpected Finds Protocol' Should be followed and implemented.

Spill control kits and fire extinguishers will be located on site, as and where required.

Contact details to be used in the event of an emergency, are presented in **Section 13.17**.

13.18 Register of Contacts

A register of contacts for the project is presented in **Table 13.17**

Table 13.17 Register of Contacts

Project Role	Person	Organisation	Contact
Emergency Services	-	Fire / Police / Ambulance	000
Site Owner	-	TBC	-
Principal Contractor	-	TBC	-
Planning Consent Authority		City of Canterbury-Bankstown	9707 9000
WHS Regulatory Authority	-	SafeWork NSW	131 050
Environment Protection Authority	-	NSW EPA	131 500
Remediation Contractor	-	TBC	-
Environmental Consultant	-	Alliance Geotechnical	1800 288 188

14 Long-term Environmental Management Plan Requirements

As discussed in **Section 8** and **Section 10**, the practicality and feasibility of containing contaminated soils on-site will be assessed in a revised RAP following the outcomes of the data gap closure assessment and once detailed development design is known and discussed with local Council.

Should it be required, a long-term Environmental Management Plan (LT-EMP) will be prepared (or modified) by the Environmental Consultant following completion of the remediation work. The LT-EMP will include a characterisation of the nature and location of contamination remaining on-site that requires management. The LT-EMP will outline how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

The LT-EMP will be required to be recorded on the planning certificate issued under Section 10.7 of the EP&A Act 1979 or a covenant registered on the title to land under section 88B of the Conveyancing Act 1919. The long-term EMP shall include the following:

- A summary of the location, nature and types of contamination remining at the site;
- The assumptions on which exposure settings and risk management protocols are based;
- A long-term maintenance and monitoring/inspection program to maintain the effectiveness of:
    - vegetation covers
    - isolation/capping layers
    - passive access restriction features
- Persons/entities responsible for the implementation of the LT-EMP;
- Controls and requirements during:
    - excavations and subsurface ground works that may penetrate the isolation/capping layer;
    - lawn mowing and landscaping activities; and
    - other unexpected penetration of isolation/capping layer.
- Signages and administrative controls;
- An unexpected-finds protocol; and
- Contingency management plan.

Specifically, the following items will need to be considered/incorporated:

- The practicality and/or mechanism for enforcing the LT-EMP at the site following the completion of the proposed redevelopment. Council must confirm that containment of contamination is a suitable strategy on land that is to be reverted to Council and the strategy developed to enforce the LT-EMP.
- An Asbestos Management Plan should be prepared by a Licensed Asbestos Assessor and be attached/incorporated into the LT-EMP. Given the presence of asbestos (bonded and friable), any future disturbance of the contaminated materials below the isolation/capping layer must be managed by a Class A Licensed Asbestos Removalist and verified by a Licensed Asbestos Assessor to provide air monitoring and asbestos clearances where applicable.
- Administrative controls will be required to prevent accidental penetration or damage of the isolation/capping layer. Appropriate signage will need to be erected and site rules will need to be displayed.

- A periodic maintenance and inspection program will be required to regularly assess the integrity of the vegetation layer and the ground cover. Dieback of vegetation will need to be reinstated with erosion or ground depressions repaired where required. Damages or cracks on pavements will also be required to be repaired.

It is recognised that contamination risks may remain on the site. If so, a LT-EMP will document areas where residual contamination is present on the site, and information on management measures that have been adopted. Provisions contained in the LT-EMP will need to have a mechanism to be legally enforceable and will be publicly notified. A revised RAP will be prepared to document where and how management measures will be implemented, and how a LTEMP can be made legally enforceable.

15 Conclusions

Based on the information presented in the historical contamination assessment reports and AG's observations on site, AG concludes that the remedial strategies and goals can be achieved and the site made suitable in informing future land use planning and rendering the site suitable for proposed land use, subject to:

- Preparation of a SAQP prior to commencement of data gap assessment.
- Implementation of the strategies, methodologies and measures set out in this RAP.
- Should newly identified unacceptable land contamination risks be identified during supplementary assessment works, an addendum to this RAP may be required. The addendum should be prepared by a suitably experienced environmental consultant.
- Prior to any removal of soils from site for offsite disposal during remedial works, waste classification for those soils should be prepared by a suitably experienced environmental consultant. Residual impacted fill materials must also be appropriately characterised as per the strategy outlined in this RAP.
- AG recommends that any waste classifications, remediation monitoring and validation works be undertaken by a suitably experienced environmental consultant.
- It is recognised that contamination risks may remain on the site. If so, a LT-EMP will document areas where residual contamination is present on the site, and information on management measures that have been adopted. Provisions contained in the LT-EMP will need to have a mechanism to be legally enforceable and will be publicly notified. A revised RAP will be prepared to document where and how management measures will be implemented, and how a LTEMP can be made legally enforceable.

This report must be read in conjunction with the ***Important Information About This Report*** statements at the front of this report.

16 References

AG 2020, 'Detailed Site Investigation, Bullecourt Avenue, Milperra NSW ', Report ref: 9996-ER-1-1, dated 30 January 2020;

Coffey 2011, 'Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus', Report ref: GEOTLCOV24163AG-AB, DATED 25 August 2011;

EIS 2016, 'Preliminary Contamination Screening and Waste Classification, Proposed Oval Facilities, UWS Bankstown Campus, 2 Bullecourt Avenue, Milperra', dated 7 April 2016;

HEPA 2020, 'PFAS National Environmental Management Plan', dated January 2020, version 2.0;

JBS&G 2018, 'Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW', Report ref: 54086-110124 (Rev 1), dated 7 February 2018;

NAA 2011, 'Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW', Report Ref: SJ0085:95458, dated October 2011;

National Environment Protection Council (NEPC) 2013a, *Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater*, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013;

National Environment Protection Council (NEPC) 2013b, *Schedule B(2) Guideline on Site Characterisation*, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013;

NSW EPA 1995, *Contaminated Sites: Sampling Design Guidelines*;

NSW EPA 2014, *Waste Classification Guidelines – Part 1: Classifying waste,* Environment Protection Authority of New South Wales, Doc. EPA 2014/0796, November 2014;

NSW EPA 2015, *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*, NSW EPA, Doc. EPA 2015/0164, September 2015;

NSW EPA 2017, *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme*;

NSW EPA 2020a, *Contaminated Land Management: Consultants Reporting on Contaminated Land*;

NSW EPA 2020b, Assessment and Management of Hazardous Ground Gases, Contaminated Land Guidelines;

WA DOH 2009, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, dated May 2009;

Contaminated Land Management Act 1997;

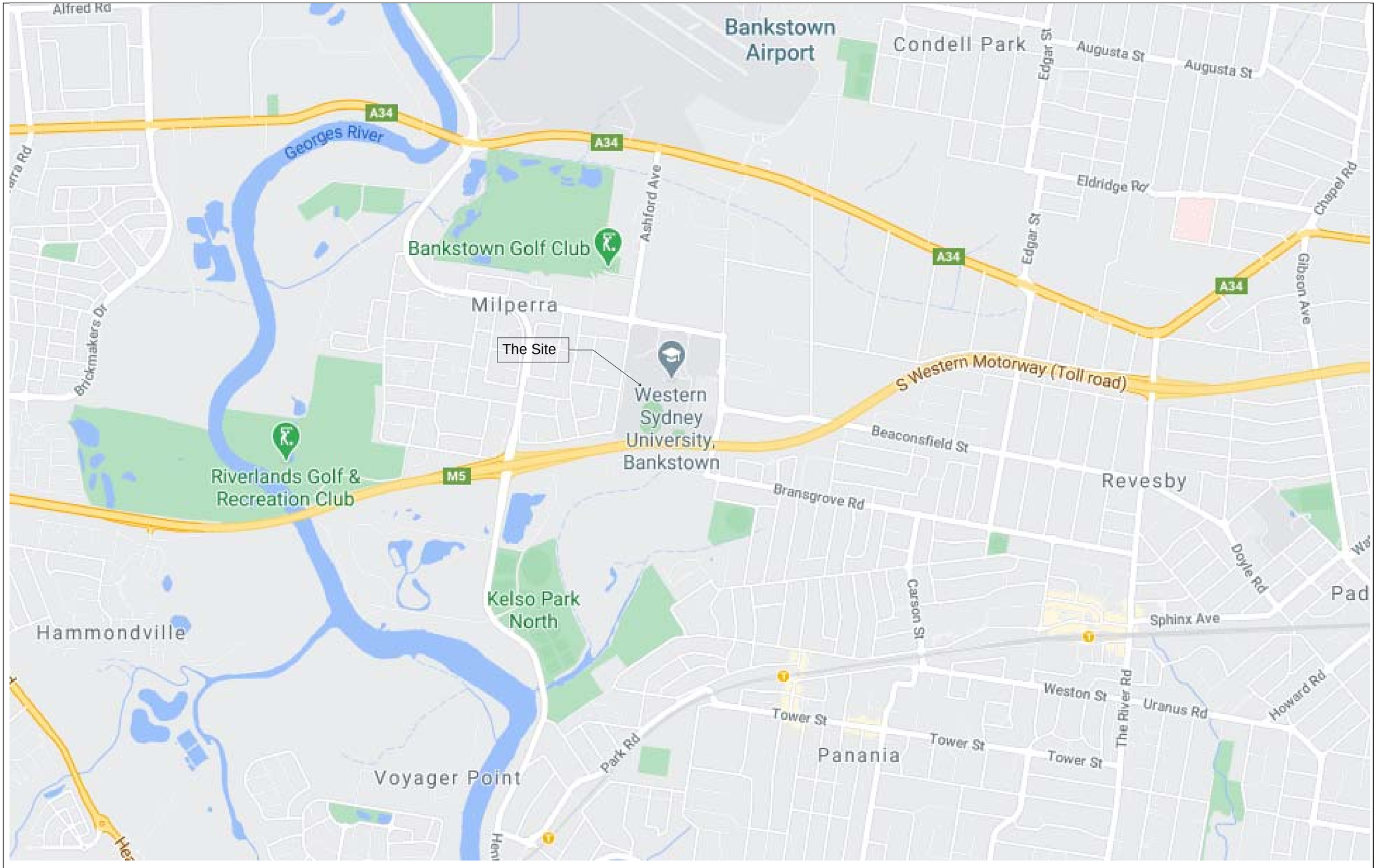
Protection of the Environment Operations Act 1997;

State Environmental Planning Policy (SEPP) Hazards and Resilience (2021);

Work Health and Safety Act 2011;

Work Health and Safety Regulation 2017.

FIGURES



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Site Locality

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	1
Project Name:	Remediation Action Plan	Figure Date:	23 November 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-2-1

N



Alliance Geotechnical ENGINEERING | ENVIRONMENTAL | TESTING Manage the earth, eliminate the risk	Site Layout Plan				
	Client Name:	Mirvac Homes NSW PTY Ltd	N	Figure Number:	2
	Project Name:	Remediation Action Plan		Figure Date:	23 November 2020
	Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW		Report Number:	9996-ER-2-1

LEGEND

AEC01 - Asbestos (Friable) Impacted Soils

AEC01a - Lead, Cadmium and Zinc Impacted Soils

AEC02 - Asbestos (Friable) Impacted Soils

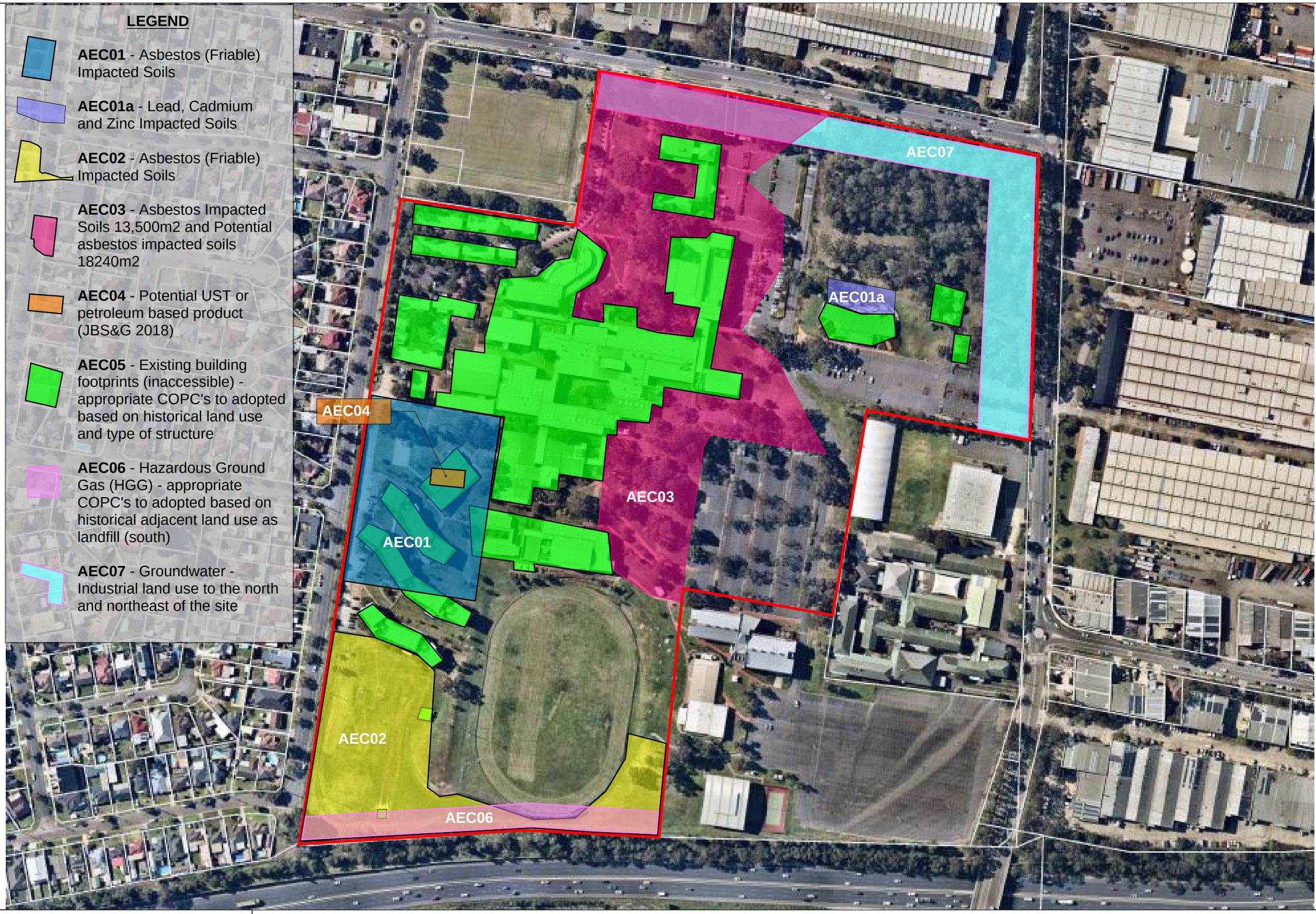
AEC03 - Asbestos Impacted Soils 13,500m2 and Potential asbestos impacted soils 18240m2

AEC04 - Potential UST or petroleum based product (JBS&G 2018)

AEC05 - Existing building footprints (inaccessible) - appropriate COPC's to adopted based on historical land use and type of structure

AEC06 - Hazardous Ground Gas (HGG) - appropriate COPC's to adopted based on historical adjacent land use as landfill (south)

AEC07 - Groundwater - Industrial land use to the north and northeast of the site



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Areas of Environmental Concern

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	3
Project Name:	Remediation Action Plan	Figure Date:	20 November 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-2-1

N

Legend

- Approximate Test Pit Locations (AG 2020)
- Approximate Borehole Locations (AG 2020)
- Approximate Sampling Point Locations (Coffey 2011)
- Approximate Sampling Point Locations (NAA 2011)
- Approximate Sampling Point Location (JBS&G 2018)

Lead at 4400mg/kg
Zinc at 6800mg/kg

Lead at 1800mg/kg

BH03

S-2

Friable asbestos detected at 0.8m bgl

ACM on surface

BH59

Friable asbestos detected at 0.5m bgl

AF/FA = 0.02%w/w at 0m to 0.1m

EBH1

EBH3

BH39

SS10

FA = 0.043%w/w at 0m to 0.2m

EBH2

Friable asbestos detected at 0.4m bgl

EBH5

Friable asbestos detected at 0.2m bgl

TP56

ACM in fill

TP53

Friable asbestos detected at 0.2m bgl

FA detected at <0.001% w/w

BH21

EBH25

EBH24

Friable asbestos detected at 1.1m bgl

TP101/ BH101

TP09

ACM on surface

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Exceedances of Criteria

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	4
Project Name:	Remediation Action Plan	Figure Date:	20 November 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-2-1

N

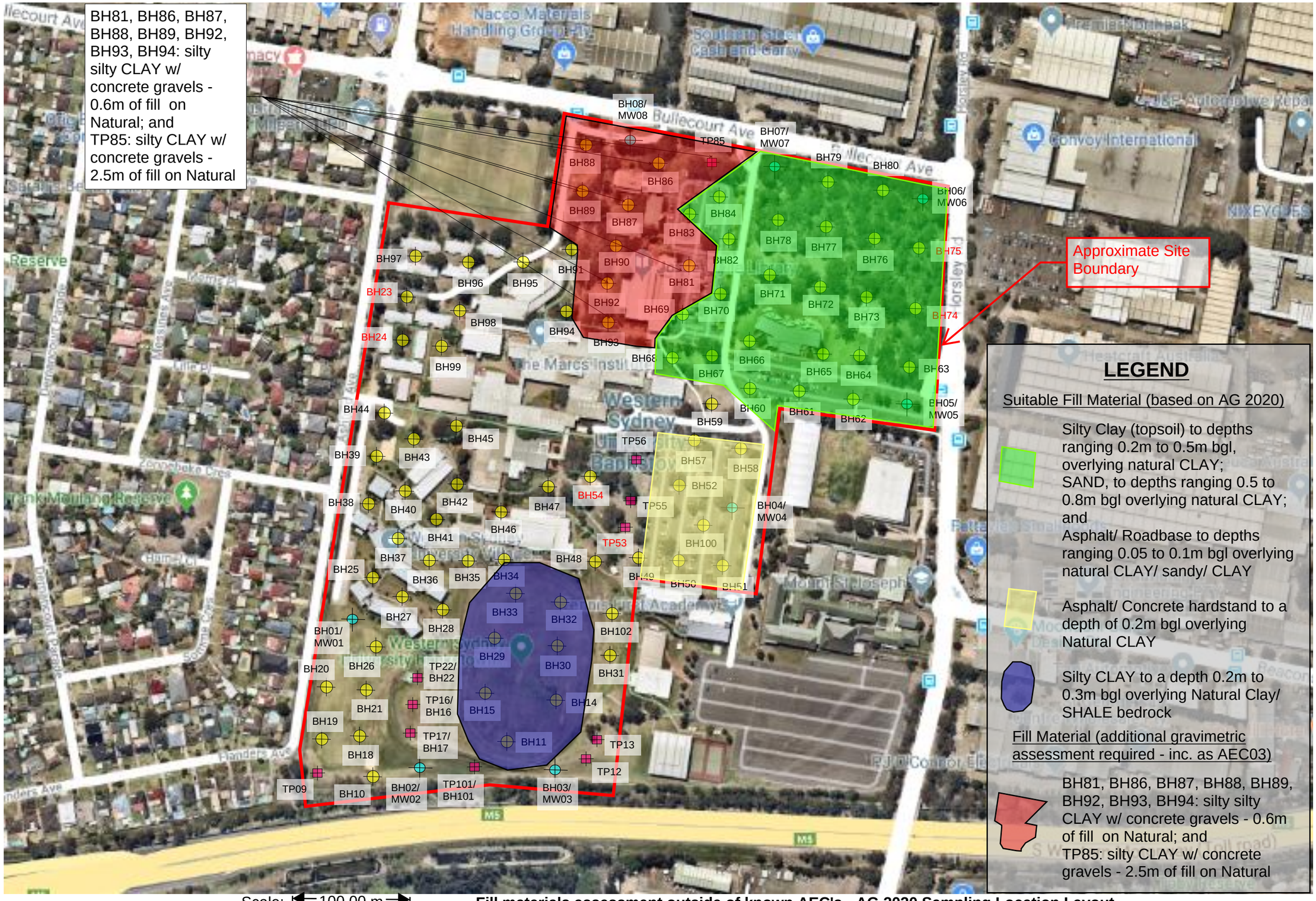


Scale: 100.00 m

AG 2020 Sampling Location Layout

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Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	5
Project Name:	Remediation Action Plan	Figure Date:	10 December 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-2-1



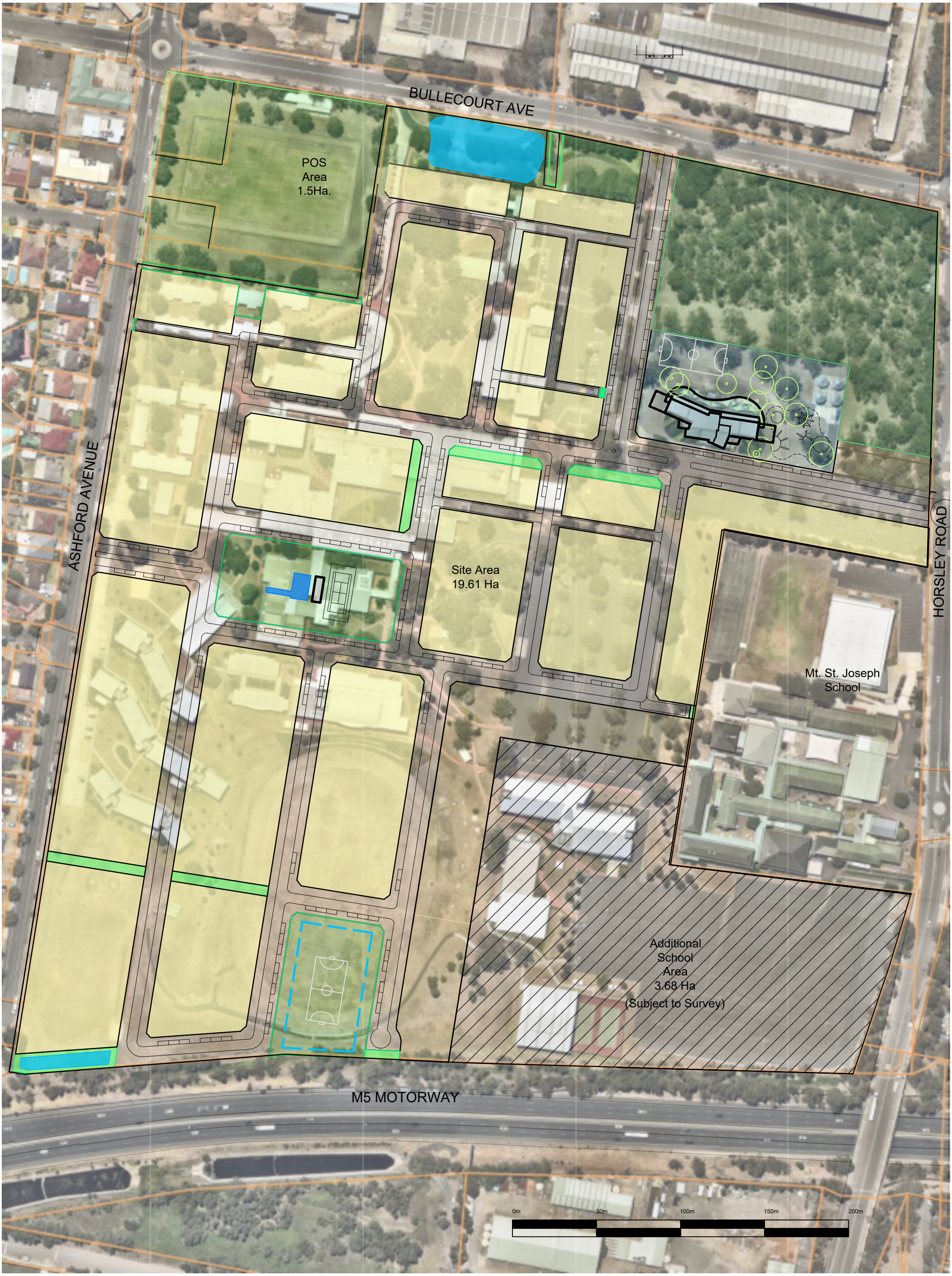
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Fill materials assessment outside of known AEC's - AG 2020 Sampling Location Layout

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Client Name:	Mirvac Homes NSW PTY Ltd	N	Figure Number:	6
Project Name:	Remediation Action Plan		Figure Date:	10 December 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW		Report Number:	9996-ER-2-1

APPENDIX A – PROPOSED DEVELOPMENT PLANS

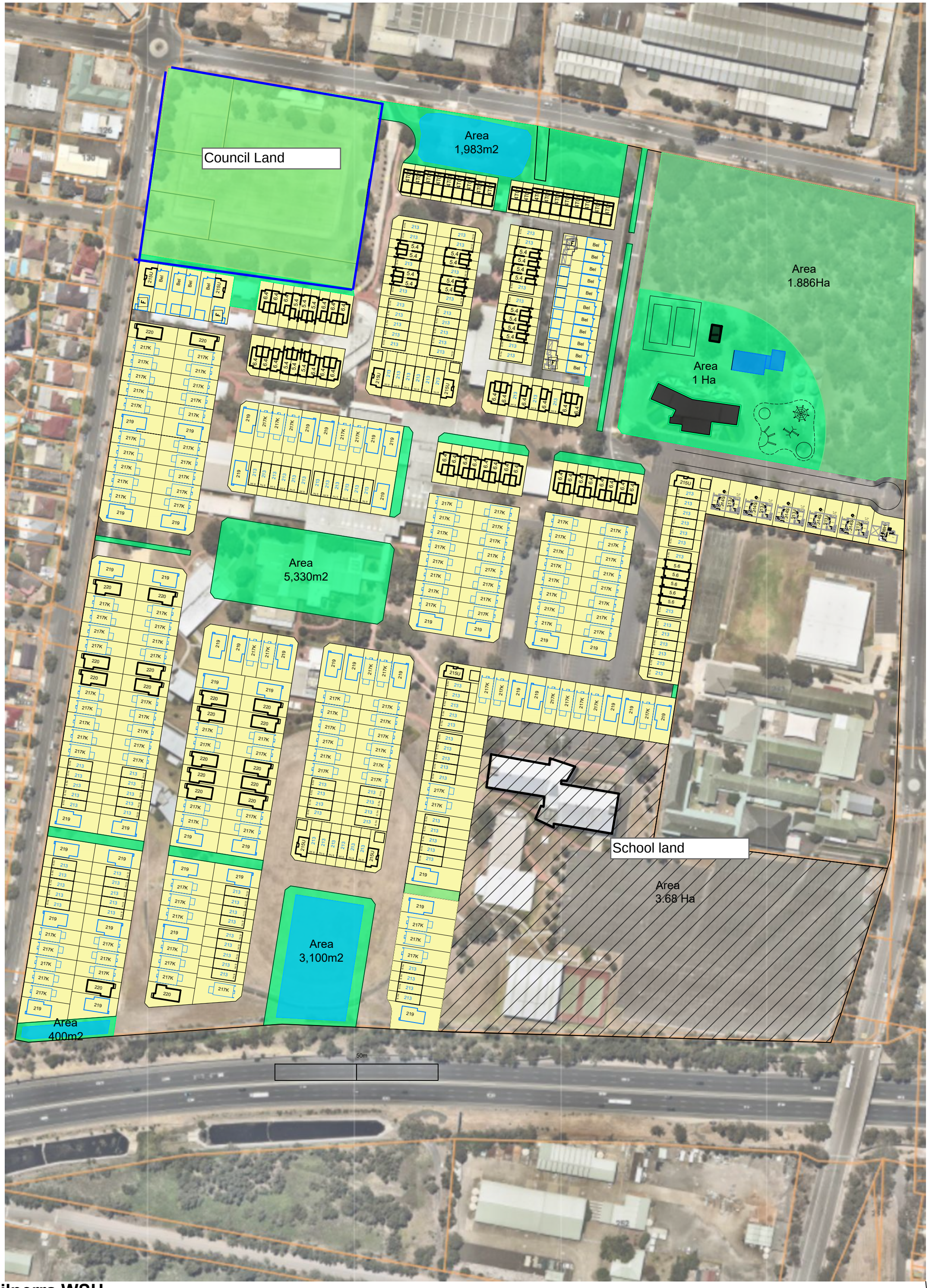


MILPERRA WSU

Current Masterplan

22.10.19

MIRVAC DESIGN



Milperra WSU

Layout- Option 1h8b

21.06.19

APPENDIX B – Conceptual Site Model

BULLECOURT AVE
Bus Bay
Hockey Club
DP 91953
SINAI AVE
Student Residence
DP 547674
FIRST AVENUE
IAN SMITH AVENUE
MERRIS PL
LILLE PL
MESSINES AVE
ASHFORD AVE
Student Residence
DERNANCOURT PDE
THIRD AVENUE
HORSLEY RD
ZONNEBEKE AVE
Volleyball Court
HAMEL CL
SOMME CR
Javelin, Hammer & Shot put fields
Storage Containers
Cricket Oval Football Field Running Track
Long Jump Fields
Covered Courts
Tennis Courts
Mt St Joseph Catholic School
FLANDERS AVE
SOUTH WESTERN MOTORWAY
DP 231721
DP 236028
DP 237192
DP 237191
DP 230101
DP 239008
DP 232889
DP 232608
DP 228751
DP 230022
DP 229631
DP 229888
DP 603074
DP 238384
DP 752013
SP 67073
DP 533380
DP 752013
DP 1093355
DP 1027307
DP 514918
DP 516522
DP 1096110
DP 526235
DP 228751
DP 225714
DP 512619
DP 1092293
DP 327986
DP 73
SP 64626
DP 16010
DP 132496
DP 554515
DP 16010
DP 16010
SP 62916
DP 16010
DP 732013
DP 221860
50 100 200

APPENDIX C – CONCEPTUAL SITE MODEL

Conceptual Site Model

With reference to NEPM (2013) *Schedule B2,* AG developed a conceptual site model (CSM) to provide a framework for the review of the reliability and useability of the data collected, and to identify data gaps in existing site characterisation.

Sources of Contamination

Potential sources of contamination that have been identified during review of site history records include:

- historical uncontrolled filling;
- historical uncontrolled demolition;
- historical farming practices;
- building rubble burial area;
- underground storage or petroleum-based product; and
- industrial land use to the north and northeast of the site.

Contaminants of Potential Concern

Potential sources of contamination were revealed, with potential to contaminate the site. Given the above sources, the COPC are:

- Soil – the eight priority heavy metals (HMs): arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc, total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), benzene, toluene, ethylbenzene, xylenes, and naphthalene (BTEXN), organochlorine pesticides (OCP), polychlorinated biphenyls (PCB), Volatile Organic Compounds (VOC's) and asbestos.

Source – Pathway – Receptor Linkages

A summary of potential source – pathway – receptor linkages identified for the site and proposed redevelopment is presented in **Table B-1**.

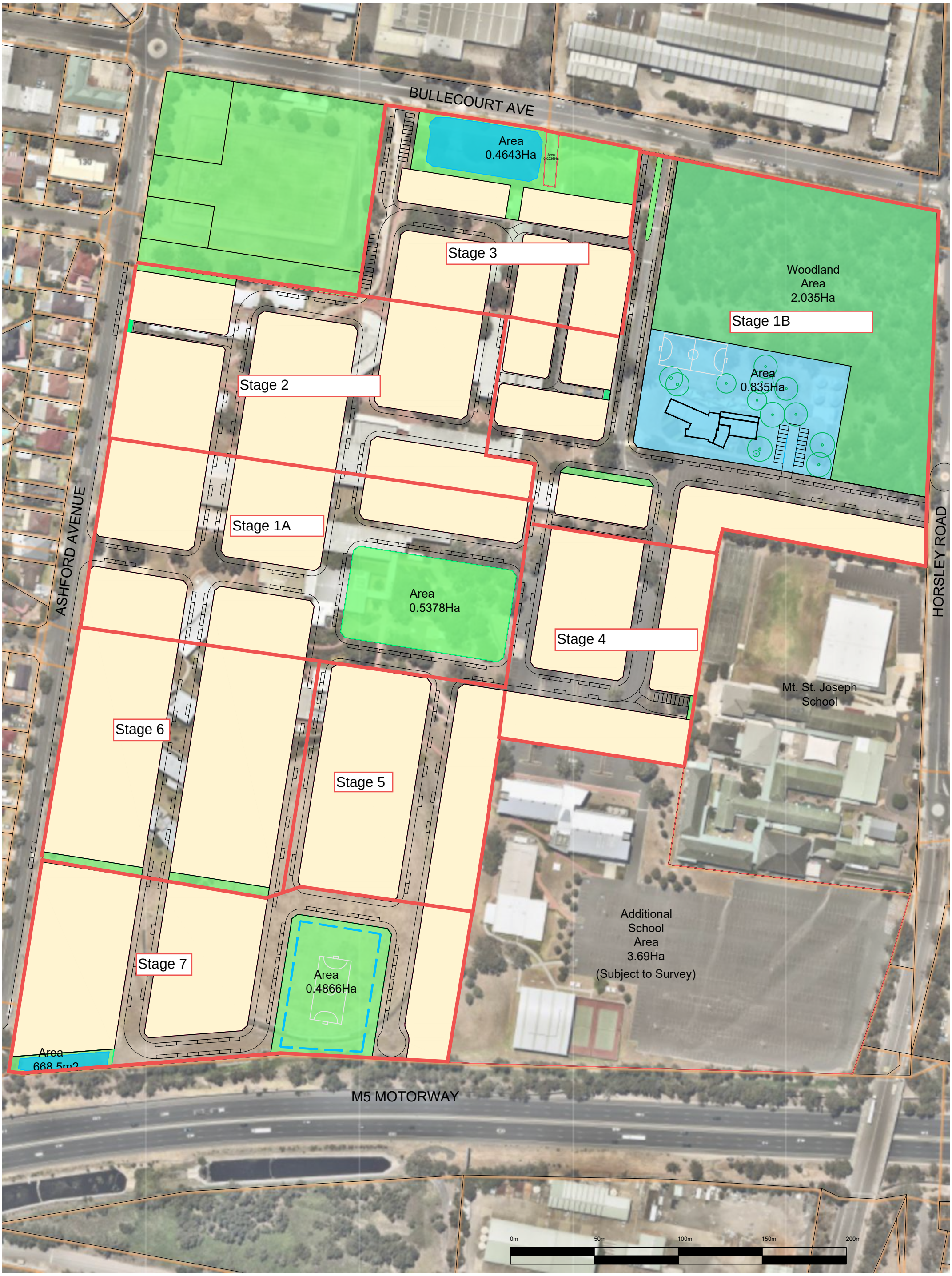
Table B-1. Source – Pathway – Receptor Linkages

AEC's	Potential Sources	Impacted Media	Contaminants of Potential Concern	Transport mechanism	Exposure Pathway	Potential Receptors
AEC01	historical uncontrolled demolition, uncontrolled filling and regrading, historical farming practices. BH39, EBH1, EBH2, EBH3, EBH5 and BH59	Soil	Asbestos (0.001%).	Disturbance of surface and subsurface soils during site redevelopment and future use of the site post-redevelopment	Ingestion Inhalation of dust particulates Mechanical transport	Construction workers End users of the site post-redevelopment

AEC01a	historical uncontrolled demolition, uncontrolled filling and regrading, historical farming practices. BH03 and S2	Soil	Metals – Lead, Cadmium and Zinc	Disturbance of surface and subsurface soils during site redevelopment, and future use of the site post-redevelopment. Plant uptake of contamination present in root zone	Ingestion Dermal contact Biota uptake	Construction workers End users of the site post-redevelopment Future ecological receptors (e.g., site vegetation in landscaped areas post redevelopment)
AEC02	Building Rubble Burial Area (refer Coffey 2011 & JBS&G 2018). BH21, EBH24 and EBH25	Soil	Asbestos (0.001%).	Disturbance of surface and subsurface soils during site redevelopment, and future use of the site post-redevelopment	Ingestion Inhalation of dust particulates Mechanical transport	Construction workers End users of the site post-redevelopment
AEC03	Uncontrolled large-scale filling/ bulk soil storage. BH/TP101, TP09, TP53, TP56	Soil	Asbestos (0.001%).	Disturbance of surface and subsurface soils during site redevelopment, and future use of the site post-redevelopment	Ingestion Inhalation of dust particulates Mechanical transport	Construction workers End users of the site post-redevelopment
AEC04	Underground storage or petroleum-based product onsite (refer JBS&G 2018).	Soil and Groundwater	Metals, TRH, BTEX, PAH and VOC's.	Disturbance of surface and subsurface soils during site redevelopment, and future use of the site post-redevelopment	Ingestion Dermal contact Inhalation/ vapour intrusion	Construction workers End users of the site post-redevelopment

AEC05	Existing Building Footprints (inaccessible)	Soil	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).	Disturbance of surface and subsurface soils during site redevelopment and future use of the site post-redevelopment	Ingestion Dermal contact Inhalation of dust particulates	Construction workers End users of the site post-redevelopment
AEC06	Deep uncontrolled filling adjacent the southern portion of the site – landfill activities	Soil	Methane, H2S, Carbon monoxide and Carbon dioxide	Deep filled areas could generate methane, hydrogen sulphide and other hazardous ground gases, which could potentially ingress into proposed buildings	Inhalation/ vapour intrusion	Construction workers in trenches End users of the site post-redevelopment
AEC07	Industrial land use to the north and northeast of the site	Groundwater	Heavy metals, TRH, BTEX, PAH, VOCs, OCP/OPP, PCB, PFAS and inorganic compounds	Encountering groundwater during site redevelopment (deep excavation) Vapour which could potentially ingress into proposed buildings	Direct Contact Inhalation/ vapour intrusion	Construction workers End users of the site post-redevelopment Aquatic ecosystems

APPENDIX D – STAGED DEMOLITION AND BULK EARTHWORKS PLAN



MILPERRA WSU

Masterplan - New Park

Rev 4b - 19.03.21

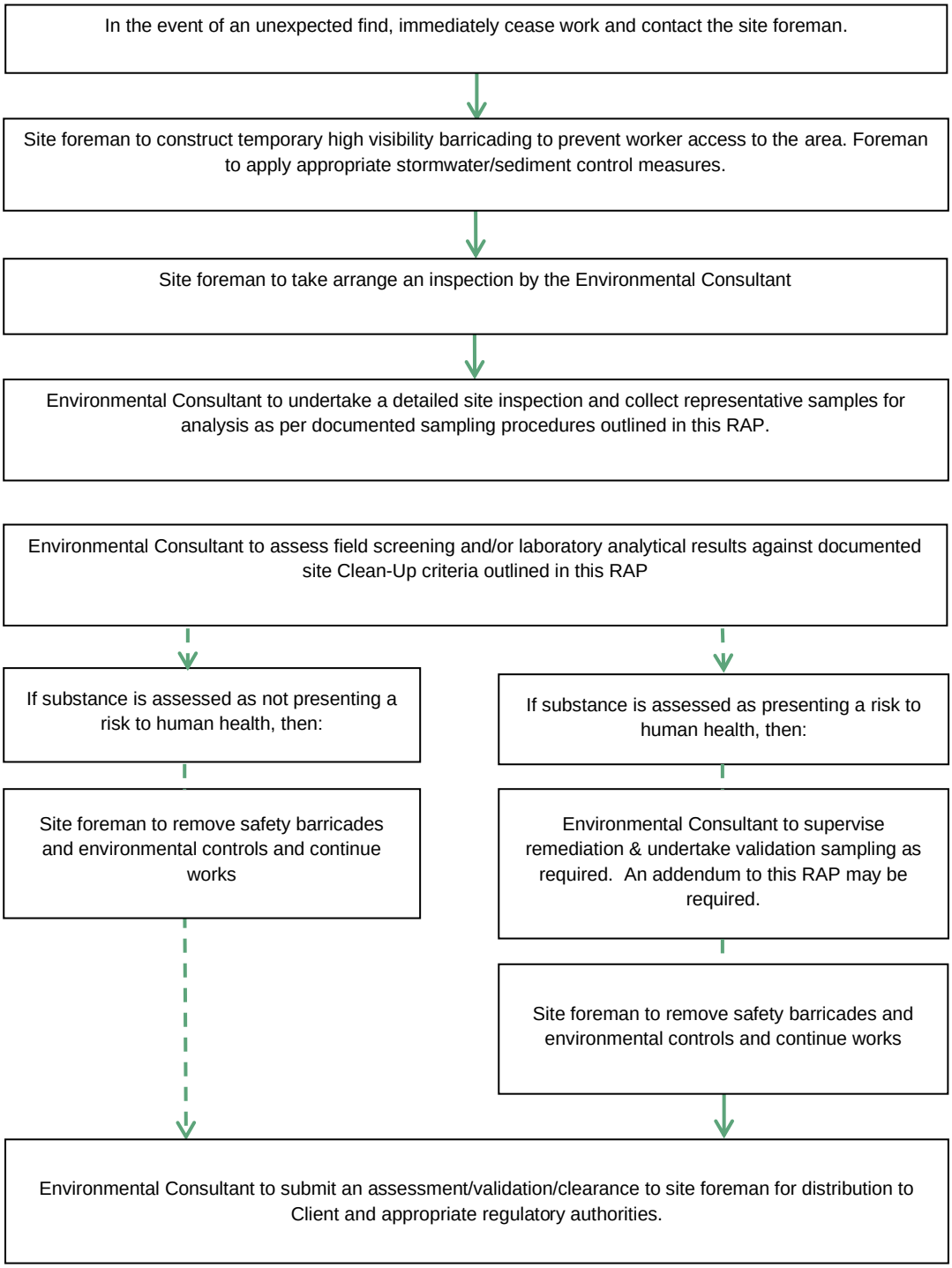
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Unexpected Finds Protocol



APPENDIX N: REMEDIAL ACTION PLAN BY SYDNEY ENVIRONMENTAL GROUP

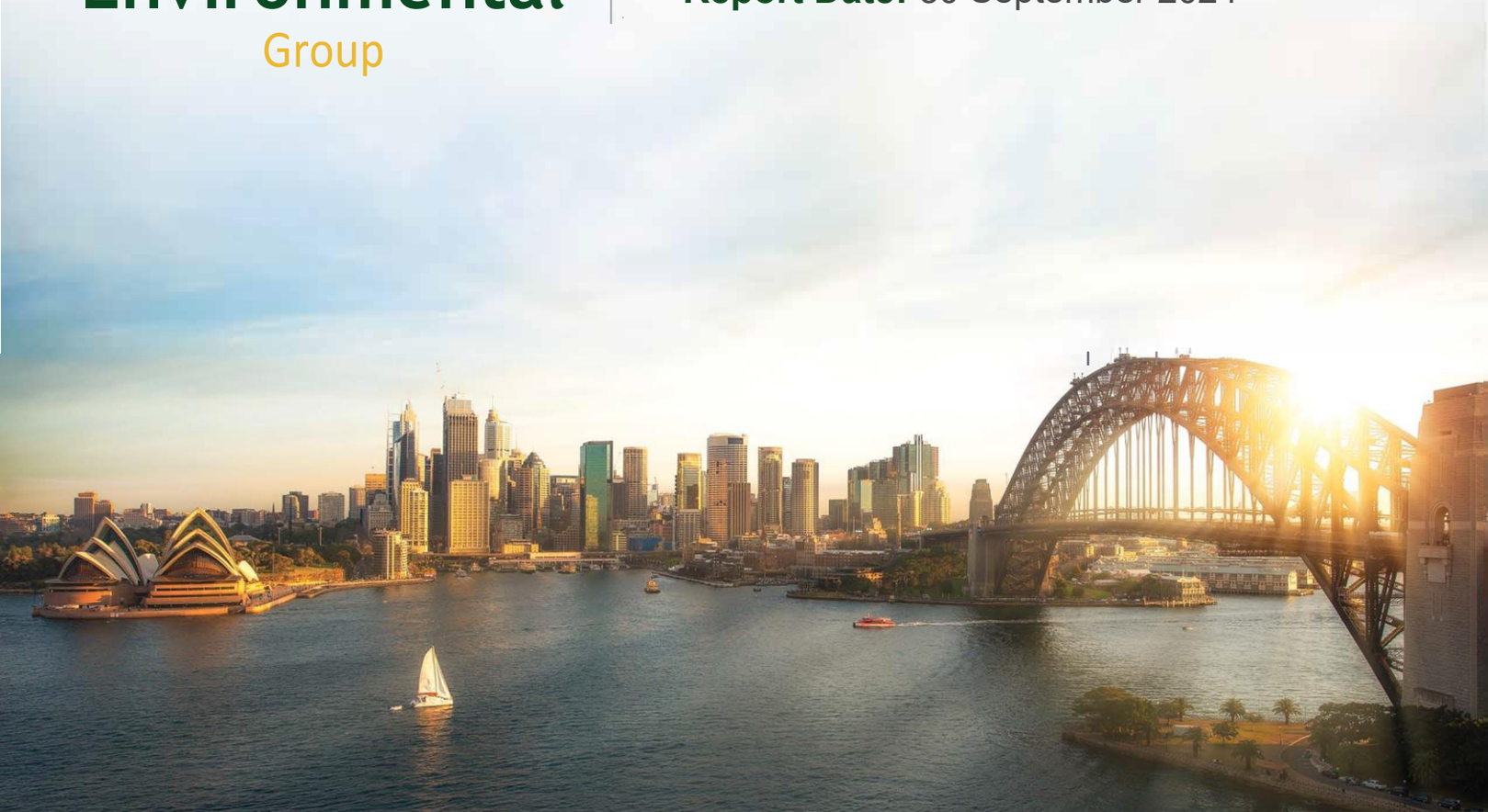
Sydney Environmental Group

Remedial Action Plan

Western Sydney University - Milperra Campus
Horsley Road & Bullecourt Avenue, Milperra NSW

Mirvac Pty Ltd

Report No: 2300-RAP-01-300924.v1f
Report Date: 30 September 2024



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DOCUMENT RECORD

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Document Title:	Remediation Action Plan, Stage 1, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW
Site Address:	Stage 1, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW
Client Name:	Mirvac Pty Ltd
Site Size:	6,030 m^2
Reference Number:	2300-RAP-01-300924.v1d
Project Type:	Remedial Action Plan
Project Type Abbreviation:	RAP
Document Draft:	DRAFT
Document Revision No.	v1

Prepared by Sydney Environmental Group Pty Ltd ABN: 14 631 026 214

EXECUTIVE SUMMARY

Sydney Environmental Group (SE) were engaged by Mirvac Pty Ltd, to prepare a Remedial Action Plan (RAP) for the proposed residential development within Stage 1 at Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

SE has the following project appreciation:

- The entire site boundary covers an area of approximately 18.83 ha, with Stage 1 covering an area of approximately 6,030 m^2;
- The site is proposed for redevelopment, comprising construction of low-density residential dwellings and associated roadways and infrastructure;
- A Phase 2 Environmental Site Assessment was undertaken within the student residence development area in 2011 by Coffey (Coffey 2011);
- A Soil Contamination Investigation was undertaken across the entire property by Noel Arnolds and Associates in 2011 (NAA 2011);
- A Preliminary Conamination Screening and Waste Classification Assessment was undertaken across the proposed oval facilitates within the property boundary by Environmental Investigation Services in 2016 (EIS 2016);
- A Phase 1 Environmental Assessment Report was undertaken across the entire property in 2020 by JBS&G Australia (JBS&G 2020);
- A Detailed Site Investigation was undertaken across the entire property in 2020 by Alliance Geotechnical in 2020 (AG 2020);
- A Remedial Action Plan was prepared for the entire property in 2020 by Alliance Geotechnical (AG 2022);
- A Supplementary Stage 2 Detailed Site Investigation was undertaken within portions of the property by SE in 2024 (SE 2024a);
- A Hazardous Building Material Survey was undertaken at the site in 2023 and reported by Sein 2024 (SE 2024b); and
- A Remedial Action Plan (RAP) is required to address the remediation and validation of identified Areas of Environmental Concern (AEC) within the Stage 1 Area of the site.

The objectives of this project are to:

- Undertake a supplementary contamination assessment to address data gaps identified in previous contamination assessments undertaken for the site;
- Prepare a Remedial Action Plan (RAP) to address the issues that have been identified on the site and to provide a strategy to mitigate the potential unacceptable human health and environmental risks from residual soil by exploring available remediation options that will effectively and efficiently provide this outcome; and
- Achieve an acceptable outcome that is technically, logistically and financially feasible.

The scope of the RAP has been established on the basis of findings from the previous contamination investigations completed, with the RAP aimed at providing:

- Provision to undertake a supplementary contamination assessment to address data gaps identified in previous contamination assessments;
- An appropriate draft remedial strategy (to be informed by the yet to be completed supplementary contamination assessment) to render the site suitable for the proposed urban residential land-use;
- Appropriate requirements for the validation and verification of the successful implementation of the remediation strategy and the remediation acceptance criteria to be adopted;
- Appropriate environmental safeguards required to conduct the remediation works in an environmentally acceptable manner; and
- OH&S procedures required to conduct the remediation works in a manner that will not pose a threat to the health of site workers or users.

The available site data was assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AECs) and contaminants of concern (COC) which have the potential to be present within the broader property and the site. The AECs identified are presented in attached **Figure 4** and associated contaminants of concern are presented in **Table 5.1.1.**

Table 1.1.1 AECs and COC

ID	Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk	Present within the Site (Y/N)
AEC01	Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Friable Asbestos	Soil	Human Health & Aesthetics	Y
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	Uncontrolled Filling	Lead, Cadmium and Zinc	Soil	Human Health and Ecological Health	N
AEC02	Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Friable Asbestos	Soil	Human Health & Aesthetics	N
	Non-Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Non-Friable Asbestos	Soil	Human Health & Aesthetics	Y
AEC03	Non-Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Asbestos	Soil	Human Health & Aesthetics	N

The available site data was assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified potential areas of environmental concern (PAECs) and contaminants of potential concern (COPC) which have the potential to be present within the broader property and the site and require further assessment. The PAECs identified are presented in attached **Figure 4** and associated contaminants of concern are presented in **Table 5.2.1.**

Table 1.1.2 PAECs and COPC

ID	Potential Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk	Present within the Site (Y/N)
AEC04	Underground Storage or Petroleum-Based Product Onsite	Unleaded Petrol & Diesel Tanks	Heavy Metals, TRH, PAH, VOC/SVOC, Phenols	Soil & Groundwater	Human Health, Ecological Health & Aesthetics	N
AEC05	Soil Materials Beneath Existing Building Footprints	Uncontrolled Demolition/Filling	Heavy Metals, TRH, BTEX, PAH, OCP, Asbestos (0.001%)	Soil	Human Health, Ecological Health & Aesthetics	Y
AEC06	Deep Uncontrolled Filling Adjacent to Southern Portion of the Site	Landfill Activities South of the Site	Methane, Carbon Dioxide, Carbon monoxide, Hydrogen sulphide	Ground Gas	Human Health	N[1]
AEC07	Adjacent Industrial Land Use to the North and North-East of the Site	Industrial Activities North and North-East of the Site	Heavy Metals, TRH, BTEX, PAH, VOC, OCP/OPP, PCB, PFAS, inorganic compounds	Groundwater	Human Health	N[1]

Notes to Table:
1 – Landfill Activities and subsequent ground gas monitoring well installation will occur within Stage 3 works within the property. Groundwater assessment will be undertaken within Stage 3 works within the site as access to the broader property will be provided then.

The remedial goal for this site is to remediate potential contamination (where identified) to a level that does not present an unacceptable human health exposure and environmental risks, based on the proposed land use setting. SE notes that the client, would prefer that the remedial works be undertaken in a manner that does not result in the need for:

- Notation on a planning certificate for the site;
- A covenant registered on the title to the land; or
- A long-term environmental management plan (EMP).

The extent of contamination within the site is presented within **Table 10.2.1** below.

Table 10.2.1 Approximate Remedial Extents

AEC ID	Area of Environmental Concern	Approximate Extent
AEC01	Friable Asbestos Impacted Fill Soils	Total Area: ≈ 195 m^2 x 0.5 m bgsl 100 m^3 / 180 tonnes
AEC02	Non-Friable Asbestos Impacted Fill Soils	Total Area: ≈ 1470 m^2 x 0.5 m bgsl 735 m^3 / 1,325 tonnes
AEC05	Soil Materials Beneath Hardstand Footprints	*TBC following supplementary assessment*

Refer to **Figure 4**, for an indication of the areas and lateral extents that will be subject to remediation.
It is noted that the lateral extent of remediation may be altered during remedial works based on site observations and validation soil sample analytical laboratory results.

Taking into consideration the client's objectives for the site, and the nature and extent of the proposed site redevelopment works, the preferred remedial options are outlined in **Table 9.3.1** below.

Table 9.3.1 Selected Remediation Strategies

AEC ID	Contamination Risk	Selected Remediation Strategy
AEC01	Soil materials impacted with friable asbestos	Excavation and disposal off-site
AEC01 **AEC02**	Soil materials impacted with non-friable asbestos	In-situ / Ex-situ Raking / Picking OR Excavation and Disposal off-site
AEC05	Direct contact risks in soil (Heavy Metals, BTEX, TRH, PAH, OCP, OPP) (*if identified*)	Excavation and disposal off-site OR Cap and Containment

Based on the information presented in the historical contamination assessment reports, SE concludes that the remedial goal can be achieved, and the site made suitable for the proposed land use setting, subject to:

- Implementation of the strategies, methodologies and measures set out in this remedial action plan;
- Should newly identified unacceptable land contamination risks be identified during the supplementary assessment and/or remediation works, a revision to this RAP may be required. The revision should be prepared by a suitably experienced environmental consultant;
- Prior to any removal of soils from site for offsite disposal during remedial works, a waste classification for those soils should be prepared by a suitably experienced environmental consultant;
- Future remedial works should be monitored and validated by a suitably experienced environmental consultant; and
- Following the completion of the remediation and validation work, the environmental consultant needs to prepare a site remediation and validation report that documents both the remediation and validation work as required by the EPA (2020) reporting guidelines.

This report must be read in conjunction with the limitations set out in **Section 15.**

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LIST OF ABBREVIATIONS

A list of the common abbreviations used throughout this report is provided below:

AHD	Australian Height Datum
AST	Aboveground storage tank
bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
Btoc	Below top of casing
CoC	Chain of Custody
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
EC	Electrical conductivity
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
HIL	Health Investigation Levels
HSL	Health Screening Levels
LOR	[Laboratory] Limit of reporting
NATA	National Association of Testing Laboratories
N/A	Not applicable
ND	Not detected
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW EPA	NSW Environment Protection Authority
OCP	Organochlorine Pesticide
OPP	Organophosphorus Pesticide
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photo-ionisation detector
PSI	Preliminary Site Investigation
QA/QC	Quality assurance/Quality control
RPD	Relative percentage difference
SAQP	Sampling Analysis and Quality Plan
SE	Sydney Environmental Group Pty Ltd
SVOC	Semi-volatile organic compound
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UST	Underground storage tank

1. INTRODUCTION

1.1. Background

Sydney Environmental Group (SE) were engaged by Mirvac Pty Ltd, to prepare a Remedial Action Plan (RAP) for the proposed residential development within Stage 1 at Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

SE has the following project appreciation:

- The entire site boundary covers an area of approximately 18.83 ha, with Stage 1 covering an area of approximately 6,030 m^2;
- The site is proposed for redevelopment, comprising construction of low-density residential dwellings and associated roadways and infrastructure;
- A Phase 2 Environmental Site Assessment was undertaken within the student residence development area in 2011 by Coffey (Coffey 2011);
- A Soil Contamination Investigation was undertaken across the entire property by Noel Arnolds and Associates in 2011 (NAA 2011);
- A Preliminary Conamination Screening and Waste Classification Assessment was undertaken across the proposed oval facilitates within the property boundary by Environmental Investigation Services in 2016 (EIS 2016);
- A Phase 1 Environmental Assessment Report was undertaken across the entire property in 2020 by JBS&G Australia (JBS&G 2020);
- A Detailed Site Investigation was undertaken across the entire property in 2020 by Alliance Geotechnical in 2020 (AG 2020);
- A Remedial Action Plan was prepared for the entire property in 2020 by Alliance Geotechnical (AG 2022);
- A Supplementary Stage 2 Detailed Site Investigation was undertaken within portions of the property by SE in 2024 (SE 2024a);
- A Hazardous Building Material Survey was undertaken at the site in 2023 and reported by Sein 2024 (SE 2024b); and
- A Remedial Action Plan (RAP) is required to address the remediation and validation of identified Areas of Environmental Concern (AEC) within the Stage 1 Area of the site.

1.2. Proposed Development

SE understands that the proposed development within the site will comprise demolition of existing campus structures and roadways, and construction of residential infrastructure within a low-density residential land use setting.

The redevelopment scenario is consistent with the definition of 'HIL A – Low-density residential with garden/accessible soil' per ASC NEPM 2013.

Currently under the *State Environmental Planning Policy (SEPP) No. 55 – Remediation of Land*, a consent authority must not consent to the carrying out of any redevelopment unless it has considered whether the land is contaminated.

1.3. Objectives

The objectives of this project are to:

- Undertake a supplementary contamination assessment to address data gaps identified in previous contamination assessments undertaken for the site;
- Prepare a Remedial Action Plan (RAP) to address the issues that have been identified on the site and to provide a strategy to mitigate the potential unacceptable human health and environmental risks from residual soil by exploring available remediation options that will effectively and efficiently provide this outcome; and
- Achieve an acceptable outcome that is technically, logistically and financially feasible.

1.4. Scope of Remedial Action Plan

The scope of the RAP has been established on the basis of findings from the previous contamination investigations completed, with the RAP aimed at providing:

- Provision to undertake a supplementary contamination assessment to address data gaps identified in previous contamination assessments;
- An appropriate draft remedial strategy (to be informed by the yet to be completed supplementary contamination assessment) to render the site suitable for the proposed urban residential land-use;
- Appropriate requirements for the validation and verification of the successful implementation of the remediation strategy and the remediation acceptance criteria to be adopted;
- Appropriate environmental safeguards required to conduct the remediation works in an environmentally acceptable manner; and
- OH&S procedures required to conduct the remediation works in a manner that will not pose a threat to the health of site workers or users.

SE note that this RAP is to be read and actioned in conjunction with the AG (2022) RAP.

2. SITE IDENTIFICATION

The site identification details and associated information are presented in **Table 2.1.**

Table 2.1 Site Identification Information

Attribute	Description
Street Address	Portion of 271 Horsley Road & 2 Bullecourt Avenue, Milperra NSW
Lot and Deposited Plan (DP)	Portion Lot 2 DP1291984
Geographical Coordinates	-33.941430547 S, 150.988789427 E (centre of site)
Site Area	Entire Site: 18.83 ha / Stage 1: 6,030 m^2
Current Owner(s) / Occupier(s)	Mirvac Pty Ltd
Local Government Area (LGA)	City of Canterbury-Bankstown
Parish	Bankstown
County	Cumberland
Zoning	R1 General Residential *Canterbury Bankstown Local Environmental Plan 2023*

The locality of the site is set out in **Figure 1**.

The general layout and boundary of the site is set out in **Figure 2**.

3. GEOLOGY, ACID SULFATE SOILS, TOPOGRAPHY AND HYDROGEOLOGY

Regional geology, topography, soil landscape and hydrogeological information are presented in **Table 3.1**.

Table 3.1 Regional Setting Information

Attribute	Description
Geology	A review of the Environment NSW 'eSpade V2.1' web application (environment.nsw.gov.au/eSpade2WebApp, accessed 30 September 2024), indicated that the site is likely to be underlain by Wianamatta Group Ashfield Shale defined as laminite and dark grey siltstone, Bringelly Shale defined as shale with occasional calcareous claystone, laminite and infrequent coal, and Minchinbury Sandstone defined as fine to medium-grained quartz lithic sandstone.
Acid Sulfate Soils	A review of the acid sulfate soil risk mapping layer accessed on the Environment NSW 'eSpade V2.1' web application (accessed 30 September 2024), indicated that the site lies in an area mapped as ***'No Known Occurrence'*** with respect to acid sulfate soils. This infers that land management activities are not likely to be affected by acid sulfate soil materials. Further assessment of acid sulfate soils in the context of this investigation is considered by SE as not warranted.
Topography	Generally, the local landscape consists of gently undulating rises on Wianamatta Group Shale with local relief 10 – 30 m and slopes generally >5% but occasionally up to 10%. The site topography slopes downwards from the north-east to south-west corner. SE understands that the site is located at an elevation approximately 3 m to 22 m Australian Height Datum (AHD).
Hydrology and Hydrogeology	Surface water courses proximal to the site include an unnamed tributary of Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site. Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the subject area within the site is considered likely to be towards the south-west. A review of the NSW Office of Water groundwater database undertaken on 30 September 2024 indicated there are seven (7) registered groundwater features located within a 500m radius of the north-eastern portion of the site; • GW113993 – groundwater monitoring bore, final drill depth 4.00 metres below ground level (mBGL), standing water level (SWL) not specified, located approximately 105 m east of the site; • GW113998 – groundwater monitoring bore, final drill depth 4.50 mBGL, SWL not specified, located approximately 150 m east of the site; • GW113994 – groundwater monitoring bore, final drill depth 5.20 mBGL, SWL not specified, located approximately 145 m east of the site; • GW113997 – groundwater monitoring bore, final drill depth 12.50 mBGL, SWL not specified, located approximately 240 m east of the site; • GW113999 – groundwater monitoring bore, final drill depth 7.00 mBGL, SWL not specified, located approximately 250 m east of the site; • GW113995 – groundwater monitoring bore, final drill depth 4.00 mBGL, SWL not specified, located approximately 278 m east of the site; and • GW113996 – groundwater monitoring bore, final drill depth 4.00 mBGL, SWL not specified, located approximately 307 m east of the site.
Adjacent Sensitive Receptors	A review of the Bureau of Meteorology Groundwater Dependent Ecosystem Map was undertaken to determine the closest sensitive ecological receptors. The closest highly dependent groundwater ecosystem was the Georges River, located approximately 1.3 km south-west of the site. The closest sensitive human receptors are the residential properties surrounding the site's boundary and any future onsite construction workers / builders.

4. PREVIOUS CONTAMINATION ASSESSMENTS

The following reports were reviewed during the project:

- Coffey (Coffey 2011), 'Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus', dated 25 August 2011, Ref: GEOTLCOV24163AG-AB;
- Noel Arnolds and Associates (NAA 2011), 'Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW', dated October 2011, Ref: SJ0085:95458;
- Environmental Investigation Services (EIS 2016), 'Preliminary Contamination Screening and Waste Classification, Proposed Oval Facilities, UWS Bankstown Campus, 2 Bullecourt Avenue, Milperra' dated 7 April 2016, no report ref provided;
- JBS&G (JBS&G 2018), 'Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;
- Alliance Geotechnical (AG 2020), 'Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;
- Alliance Geotechnical (AG 2022), 'Remedial Action Plan, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-2-1;
- Sydney Environmental Group (2024a), 'Supplementary Detailed Site Investigation, Western Sydney University – Milperra Campus, Milperra NSW', dated 22 February 2024, Ref: 2300-DSI-01-220224.v1f; and
- Sydney Environmental Group (2023b), 'Hazardous Building Material Survey, Western Sydney University – Milperra Campus, Milperra NSW', dated 27 February 2024, Ref: 2300-HBMS-01-081123.v1f.

A summary of the previous cotanmination assessments is provided in **Sections 4.1** to **4.8**.

4.1. Phase 2 Environmental Site Assessment (Coffey 2011)

For the purposes of the Phase 2 Environmental Site Assessment (P2 ESA), Coffey assumed the site boundary comprised approximately 1.5 ha. At the time of reporting, it was subsequently understood that the proposed student residence development was to extend further to the east and cover an area of approximately 3ha.

Coffey understood that UWS required a P2 ESA to support a development application (DA) to Bankstown City Council.

The objectives of the assessment were to:

- Assess the acid sulfate soil status of the site based on a review of risk map and field observations;
- Assess the contamination status of the site by undertaking sampling and testing of soil; and
- Provide recommendations for further investigation/remediation requirements (if any) for the site to be suitable for the proposed student accommodation development.

The scope of work undertaken included:

- Fieldwork including soil sampling;
- Laboratory testing; and
- Data assessment and reporting.

Based on the site history information and visual observations, a number of Areas of Environmental Concern (AECs) and Chemicals of Potential Concern (COPCs) were identified. The identified AECs and associated CoPCs are presented in **Table 4.1.1** overleaf.

Table 4.1.1 AECs and associated COPC

Potential Areas of Concern	Chemicals of Potential Concern	Extent of Contamination
Southern end of the site – building rubble burial	TPH, PAH, Metals, Asbestos	Building rubble was buried up to 3 m to 4 m below the site surface.
Former farm dam – potential contaminated fill	TPH, BTEX, PAH, OCP, Metals, Asbestos	Potentially contaminated fill could have been used to backfill the dam
Whole site – use of pesticides for pest/weed control	OCP, Metals	Chemical application (such as pesticides) was commonly used in historical farming activities. Contamination, if present, is likely to be localised near the surface and minor.
Whole site – hazardous building materials	Asbestos, Lead	Historical fam sheds/houses could contain asbestos and lead paint. Weathering, leaching and spreading (during demolition) of material would likely to be localised in the near surface.
Existing Building Footprints (inaccessible)	Uncontrolled Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos

A total of twenty-five (25) boreholes were cored across the site on 11 and 12 July 2011, and samples submitted to a NATA accredited laboratory for analysis of CoPC.

Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- Asbestos, which was detected at six (6) locations across the site.

Coffey recommended additional assessment to be undertaken to further characterise the asbestos impact and to assist in the selection of remedial/management options.

4.2. Soil Contamination Investigation (NAA 2011)

NAA was commissioned by JDH Architects to undertake a Soil Contamination Investigation (SCI) in an area in the northeast of the Bankstown Campus at the University of Western Sydney - Bankstown Campus located at Bullecourt Avenue, Milperra NSW (the site). The portion of the site investigated in NAA (2011) was approximately 2,500m^2 in area and resided to the north of the existing P2 car park at the Bankstown Campus. The proposed redevelopment comprised construction of a single storey childcare facility with adjacent car parking facilities.

The objectives of the SCI were to provide information on the extent and nature of contamination (if any) within the fill/soil material at the site and to assess the suitability of the site for the proposed land-use as a childcare facility.

NAA undertook the following scope of works to achieve the project objectives:

- Prepare a safe work method statement for works to be conducted at the site;
- Complete a site inspection and a comprehensive site walkover;
- Conduct grid-based sampling pattern by the hand augering of eight locations within the boundaries of the site. Hand augering was undertaken to a maximum depth of approximately 1.2 m below ground surface with sampling conducted at varying depths through the fill/soil profile;
- Collect seventeen (17) soil samples;
- Conduct NATA-certified laboratory-based analysis of soil; and
- Prepare a SCI report.

Based on the findings of the investigation, NAA concluded the following:

- Hotspots of lead contamination at locations BH3 0.0-0.2 m and S2 0.0-0.1 m were identified during an intrusive investigation previously undertaken by Coffey (AG were not provided this report);
- Concentrations of cadmium (BH3 0.0-0.2 m) and zinc (BH3 0.0-0.2 m, S2 0.0-0.1 m and S7 0.0-0.1 m) have been found to exceed the adopted Provisional Phytotoxicity Investigation Levels (PPIL);
- The site was unsuitable for the proposed land use as a childcare facility due to the presence of hotspots of lead contamination which may present a risk to human health if not appropriately managed;
- Exceedances of PPILs have also been reported at these locations and can be addressed as part of the management of the lead hotspots; and
- A marginal exceedance of zinc concentrations when compared with the PPIL was recorded at S7 0.0-0.1 m. Given the marginal nature of this exceedance, it does not impact upon the suitability of the site for the proposal land use as a childcare facility.

Based on these conclusions, NAA 2011 made the following recommendations:

- Given the shallow nature of the impacted material, it was assumed that this material will be excavated and removed from site during the course of site preparation works (e.g. stripping back of topsoil material) for the purposes of redevelopment;
- Fill/soils to be removed offsite for disposal should be classified in accordance with NSW EPA Waste Classification Guidelines (2014) and should be disposed of at an appropriately licenced landfill facility;
- Following site preparation works, a suitably qualified Environmental Consultant should return to site to collect validation samples of the area of concern (in vicinity of BH3, S2 and S7) in order to confirm acceptable residual concentrations of heavy metals are present with respect to the adopted HIL and PPIL and that the site is suitable for the intended land use; and
- If it is determined that site preparation works will not result in the excavation and removal of the shallow material at BH3 0.0-0.2 m and S2 0.0-0.1 m, remediation works will be required. In this event, it is recommended that a Remedial Action Plan (RAP) be developed to address remediation of the hotspots of contamination identified.

4.3. Preliminary Contamination Screening and Waste Classification (EIS 2016)

Burtenshaw Scoufis Architecture + Interiors commissioned Environmental Investigation Services (EIS) to assign a waste classification to in-situ soil adjacent to the west of the athletics track located at 2 Bullecourt Avenue, Milperra NSW.

The aim of the investigation was to assess soil contamination issues at the site and to provide a waste classification for the material to be excavated for the proposed oval development.

The scope of work included the following:

- Review of available geological information;
- Soil sampling from three boreholes;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC); and
- Preparation of a letter report presenting the results of the investigation.

All results were below the site assessment criteria (SAC) adopted for the site. Overlying fill soils were classified as General Solid Waste (Non-putrescible) and underlying natural soils were classified as Virgin Excavated Natural Material (VENM). Based on this data, EIS concluded that the risk of widespread significant soil contamination in the development area was relatively low. The fill and natural soil material assessed was considered by EIS to be suitable for re-use on the subject site, provided it meets geotechnical and earthwork requirements.

4.4. Phase 1 Environmental Assessment Report (JBS&G 2018)

JBS&G Australia Pty Ltd (JBS&G) were engaged by Western Sydney University (WSU) (the client) to prepare a Phase 1 Environmental Assessment Report for the WSU Milperra Campus located off Bullecourt Avenue, Milperra NSW (the site). Based on current Master Plan concepts for the Milperra Campus, JBS&G understood WSU

intended to create an integrated living and working precinct with a range of land uses including medium to high density residential, mixed use, retail, community, open space and conservation areas at the site.

The objective of the investigation was to assess the potential for contamination relating to historical and current land use activities at the site to constrain the intended development objectives, and to make recommendations for further investigations and or remediation to achieve intended land uses of the development.

To meet the project objectives, JBS&G carried out the following scope of works:

- Review of available council documentation, aerial photographs, legal title information, EPA records and heritage records to identify areas of environmental concern (AECs) and associated contaminants of potential concern (CoPC);
- Review of site setting including topography, hydrology, hydrogeology and geology;
- Review of records of environmental incidents or former environmental licenses held by the NSW EPA;
- A detailed site inspection of accessible areas to identify potential AECs and CoPC not identified in the historical record review;
- Development and documentation of a conceptual site model (CSM);
- Limited soil sampling and analysis of soil samples for a range of CoPC;
- Assessment of soil sampling and analysis results against EPA endorsed guideline criteria for residential land use; and
- Preparation of the Phase 1 Environmental Site Assessment report in general accordance with guidelines made or approved by the NSW EPA.

Surrounding land use at the time of JBS&Gs site walk over was comprised of the following:

- North: Bullecourt Avenue with commercial / industrial land-use beyond including a service station to the north-west;
- East: Mount Saint Joseph's High School and Horsley Road with commercial / industrial land-use beyond;
- South: The South Western Motorway (M5) with Kelso Landfill beyond; and
- West: Ashford Avenue with residential land-use beyond.

A SafeWork NSW search of the Stored Chemical Information Database (SCID) and the microfiche records held by SafeWork was requested. Information provided by SafeWork NSW included details on a number of abandoned (2) underground storage tanks (USTs) formerly located in the central eastern section of the site. Review of the SafeWork NSW documentation indicated the 2 x 2,500L USTs were removed on Friday 19 December 1997 by Email Petroleum Systems.

Based on site history review and observations during the site walkover, JBS&G identified the following AEC and associated CoPC presented in **Table 4.4.1** below.

Table 4.4.1 AECs and associated COPCs

Areas of Environmental Concern (AECs)	Contaminants of Potential Concern (CoPCs)
Demolition of historical site structure that may have contained hazardous building materials	Heavy metals, lead and asbestos
Surface soils impacted with herbicides/pesticides due to the maintenance of site from noxious weeds/pests	OCPs
Fill materials across the site, potential imported to site	Heavy metals, TRH, BTEX, PAH, OCPs, PCBs and asbestos
Burial area (fill material)	Heavy metals, TRH, BTEX, PAH, VOCs
Landfill gas along the southern boundary adjacent the Kelso Landfill	Methane and other landfill gases (LFG)

Based on the unidentified sources of fill material potentially imported to the site to backfill/raise topographic features and the potential for fill material at the site to contain waste materials associated with demolition of historical buildings potentially containing asbestos and/or lead paint, fill materials must be considered a potential contaminated medium. Due to the age of some existing site structures, it is possible that they may contain hazardous building materials including asbestos and lead based paints. Soils immediately surrounding buildings are considered as potentially contaminated medium.

In addition, buildings containing asbestos and / or lead paint which may have been demolished without appropriate controls may have also impacted surface soils. Surface soils must also therefore be considered a potential contaminated medium.

Based on the suspected depth of groundwater >8 m bgs, the likelihood of contamination of groundwater as a result of activities at the site is considered to be low. Based on the presence of the landfill site to the south and the nearby commercial/industrial properties to the north and east, there is potential for groundwater to be impacted as a result of offsite activities.

Given the relatively close proximity of the landfill to the south of the site, landfill gas has the potential to be a contaminated medium in the southern portion of the site.

JBS&G carried out a limited detailed site inspection and investigation. During the detailed site inspection JBS&G noted the observation of topography for potential adjustments in ground levels due to filling, presence of waste material such as asbestos containing material (ACM) on the ground surface and on external surfaces of structures and potential chemical/fuel storage, use or spillage.

On 23 August 2017, ten (10) surface samples were collected from the site using a hand auger and forwarded to a NATA accredited laboratory for analysis of heavy metals, PAH, asbestos (NEPM 500ml) and OCPs. During soil sampling, a geotechnical fabric layer was identified below the ground surface at sampling point SS10.

Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- SS10 – asbestos fibres/fibrous asbestos (AF/FA) detected at 0.02% w/w above the adopted HSL site criteria 0.001% w/w.

Based on the findings of this investigation, JBS&G made the following conclusions:

- The site has historically been used for a combination of agricultural and residential uses prior to development of the university;
- There is the potential for impacts to soil as a result of the demolition of former building structures potentially containing hazardous building materials, including asbestos and lead paint. This was confirmed by the identification of asbestos at sampling point SS10 and review of the Coffey 2011 Phase 2 Environmental Site Assessment Report, which also identified and recommended management of asbestos in soil;
- There is the potential for presence of imported fill material of unknown origin to have been used during historical construction activities at the site; and
- Based on the presence of the landfill site to the south and the nearby commercial industrial properties to the north, northwest and east, there is considered to be a potential for contaminated groundwater and landfill gas migration to have impacted the site.

Based on these conclusions, JBS&G recommended a detailed site investigation (DSI) is undertaken for the site in order to assess the extent and degree of contamination at the site and to provide an assessment of risk posed by site contaminants to human and environmental health. In addition to the DSI, JBS&G recommended a hazardous building material survey be completed prior to commencement of redevelopment works such that materials identified as comprising lead paint and or asbestos may be appropriately managed with regard to exposure risks to site workers and future building occupants.

4.5. Detailed Site Investigation (AG 2020)

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Pty Ltd to conduct a Stage 2 Detailed Site Investigation (DSI) for the property located at Western Sydney University – Milperra Campus, Milperra NSW.

AG had the following project appreciation:

- The site was an active campus of Western Sydney University;
- The investigation was limited to areas outside of building structures and discretion was required in active areas of the site;
- The site was proposed for rezoning and subdivision to facilitate residential development. It was understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and
- A Detailed Site Investigation was required to accompany the development application.

The primary objectives of this investigation were;

- To assess the potential for contamination to be present on the site in available / accessible areas as a result of past and current land use activities;
- To provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- To provide recommendations for further investigation, management and/or remediation (if warranted).

AG undertook the following activities to address the project objectives:

- A desktop review of relevant information pertaining to the site;
- A site walkover to understand current site conditions;
- Conduct an intrusive site investigation via hydraulic excavator, drill rig and hand auger to establish ground conditions, facilitate the collection of representative soil and groundwater samples and install groundwater monitoring wells;
- Laboratory analysis of selected soil and groundwater samples collected during the field investigation; and
- An assessment of the contamination status of the site and preparation of a DSI in accordance with the Guidelines for Consultants Reporting on Contaminated Sites, 2011.

Based on evidence assessed as part of the investigation, AG made the following conclusions;

- The detected concentrations of contaminants of potential concern in groundwater are considered unlikely to present a risk to surrounding aquatic environments;
- The detected concentrations of contaminants of potential concern in groundwater are considered unsuitable for discharge to municipal stormwater without further treatment / assessment;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable direct contact human health exposure risk;
- The detected concentrations of asbestos fines / friable asbestos and non-friable asbestos containing materials in the soil samples analysed are considered likely to present a risk an unacceptable direct contact human health exposure risk;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable inhalation / vapour intrusion exposure risk;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable TPH management limit exposure risk; and
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable aesthetic risk.

The following areas of environmental concern were identified:

Table 4.5.1 Areas of Environmental Concern (AG 2020)

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC01	Friable / Non-Friable Asbestos and Heavy Metal impacted Surficial and Fill Soils	Uncontrolled Filling	Asbestos, Lead, Cadmium and Zinc
AEC02	Friable Asbestos impacted Fill Soils	Uncontrolled Filling	Asbestos
AEC03	Non-Friable Asbestos impacted Surficial and Fill Soils	Uncontrolled Filling	Asbestos
AEC04	Potential Underground Storage of Petroleum Products Onsite (JBS&G 2018)	Uncontrolled Fuel / Oil Spillage	Metals, PAH, BTEX and TRH
AEC05	Existing Building Footprints (inaccessible)	Uncontrolled Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos

Based upon conclusions made, AG recommended the following;

- A further supplementary contamination assessment should be considered to further understanding of nature and extent of contamination identified onsite and address data gaps presented by building footprints, inaccessible areas and building footprints;
- Preparation of a Remedial Action Plan (RAP) is required to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination risk;
- If groundwater is expected to be encountered during the proposed development, a groundwater management plan would be required;
- The preparation of any supplementary contamination assessments, remedial action plans and/or groundwater management plans should be completed by an appropriately experienced environmental consultant;
- As per NSW WHS Regulations, any removal of friable asbestos requires the engagement of a Class A licensed asbestos removalist and a pre-notification to SafeWork NSW, with accompanying air monitoring during the works and clearances post completion to be conducted by a licensed asbestos assessor (LAA);
- Following remediation of the identified contamination, validation sampling and a site validation report will be required to confirm the effectiveness of the remedial works; and
- Any soil proposed for disposal should be classified and disposed of as per the NSW EPA Waste Classification Guidelines, 2014 with all disposal documentation retained by the client for inclusion within the site validation report.

4.6. Remedial Action Plan (AG 2022)

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Pty Ltd to prepare a Remedial Action Plan (RAP) for the property located at Western Sydney University – Milperra Campus, Milperra NSW.

AG had the following project appreciation:

- The site was an active campus of Western Sydney University;
- The investigation was limited to areas outside of building structures and discretion was required in active areas of the site;
- The property was understood to be proposed for rezoning and subdivision to facilitate residential development. It was understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and

- A Detailed Site Investigation (DSI) was carried out for the site by AG in 2020, which recommended a supplementary contamination assessment to understand the nature and extent of contamination identified onsite and address data gaps presented by building footprints, previous contamination assessments and inaccessible areas of environmental concern; and
- The DSI also concluded that a RAP be prepared in order to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination assessment.

The following Sampling Analysis Quality Plan (SAQP) was prepared for the data gap assessment required prior to remediation works.

Table 4.6.1 Data Gap Assessment SAQP (AG 2022)

ID	Area of Environmental Concern	Area (m^2)	Methodology	Analytes
Detailed Asbestos Gravimetric Assessment				
AEC01	Friable / Non-Friable Asbestos impacted Surficial and Fill Soils	12,800	Forty-six (46) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
AEC02	Friable Asbestos impacted Fill Soils	17,100	Fifty-four (54) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
AEC03	Non-Friable Asbestos impacted Surficial and Fill Soils	18,240	Eighty-four (84) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
Remaining areas of site	Potential Asbestos impacted Soils	80,000	Forty-seven (47) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
Heavy Metal / Asbestos Gravimetric Assessment				
AEC01a	Heavy Metal impacted Surficial and Fill Soils	1,000	Six (6) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Lead, Cadmium and Zinc
Chemical Characterisation / Asbestos Gravimetric Assessment				
AEC05	Post Demolition Assessment	37,000		

Based on the data reviewed during the preparation of the RAP, AG concluded the land could be made suitable for the proposed future land use subject to completion of the following;

- Preparation of a SAQP prior to commencement of data gap assessment;
- Implementation of the strategies, methodologies and measures set out in this RAP;
- Should newly identified unacceptable land contamination risks be identified during supplementary assessment works, an addendum to this RAP may be required. The addendum should be prepared by a suitably experienced environmental consultant;
- Prior to any removal of soils from site for offsite disposal during remedial works, waste classification for those soils should be prepared by a suitably experienced environmental consultant. Residual impacted fill materials must also be appropriately characterised as per the strategy outlined in this RAP;

- AG recommends that any waste classifications, remediation monitoring and validation works be undertaken by a suitably experienced environmental consultant;
- It is recognised that contamination risks may remain on the site. If so, a LT-EMP will document areas where residual contamination is present on the site, and information on management measures that have been adopted. Provisions contained in the LT-EMP will need to have a mechanism to be legally enforceable and will be publicly notified. A revised RAP will be prepared to document where and how management measures will be implemented, and how a LTEMP can be made legally enforceable.

4.7. Supplementary Detailed Site Investigation (SE 2024a)

Sydney Environmental Group (SE) was engaged by Mirvac Pty Ltd (the client), to undertake a Supplementary Detailed Site Investigation within the property located at Western Sydney University – Milperra Campus, Milperra NSW.

SE had the following project appreciation:

- The entirety of the property covers an area of approximately 18.83 ha;
- The site currently comprises of infrastructure with residential and education establishment purposes;
- The site proposed for redevelopment comprising a low-density residential land use setting;
- Historically the site has been utilised for agricultural activities with rural-residential structures;
- A Detailed Site Investigation (DSI) was carried out for the site in December 2019 and January 2020 by Alliance Geotechnical (AG), which identified five (5) areas of environmental concern;
- A Remedial Action Plan (RAP) was prepared for the site by AG in January 2020, which identified four (4) data gaps requiring further assessment; and
- A Supplementary Detailed Site Investigation is required to address data gaps identified within AG 2022.

The objectives of the project were to:

- Assess the potential for contamination to be present within the cleared portion of the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

SE undertook the following scope of works to achieve the project objective:

- Review of the previous contamination assessment prepared for the site;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Laboratory analysis of selected samples collected during the field investigation; and
- An assessment of the contamination status of the fill materials within the site and the recommendation of any further remedial requirements associated with the redevelopment of the site (if necessary).

Based on SE's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, SE made the following conclusions:

- AEC01a was not accessible at the time of this data gap assessment and requires assessment within a future assessment prior to the start of remediation works;
- Friable Asbestos Containing Materials (ACM) were identified within AEC01 during this assessment and previous contamination assessments undertaken;
- Friable and Non-Friable Asbestos Containing Materials (ACM) were identified within AEC02 during this assessment and previous contamination assessments undertaken;
- Non-Friable Asbestos Containing Materials (ACM) were identified within AEC03 during this assessment and previous contamination assessments undertaken;
- Surficial asbestos identified within all three (3) AECs assessed currently present an unacceptable aesthetics risk and require further management/remediation;

- Based on the assessments undertaken as part of this investigation, SE has concluded that the site has friable and non-friable asbestos impacted soil materials requiring remediation and further management; and
- An addendum to the existing Remedial Action Plan (AG 2022) is required to outline the remediation methodologies required to remediate the newly identified extents of contamination identified.

Based on the conclusions stated above and the background data gathered during the course of this investigation, SE recommended:

- An addendum to the existing Remedial Action Plan prepared by AG (2022) is required to outline the remediation methodologies required to remediate the newly identified extents of asbestos contamination identified.
- Following removal of hazardous building materials (if identified) and subsequent demolition of the onsite structures, a clearance inspection should be carried out by an appropriately qualified occupational hygienist / NSW LAA;
- A supplementary contamination assessment is required within AEC01a prior to the start of remedial works at the site;
- Additional contamination assessments are required to be undertaken per the site RAP (AG 2022) prior to the start of remediation works at the site; and
- A waste classification assessment should be carried out on any soil materials proposed for disposal off-site as per the NSW EPA Waste Classification Guidelines (2014).

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section** Error! Reference source not found.**.**

4.8. Hazardous Building Material Survey (SE 2024b)

Sydney Environmental Group Pty Ltd (SE) was engaged by Mirvac Pty Ltd (the client), to undertake a Hazardous Building Materials Survey of structures located within the Western Sydney University – Bankstown Campus, Milperra NSW prior to the commencement of demolition works.

SE has the following appreciation:

- The structures within the site are proposed for demolition; and
- A hazardous building material survey is required prior to demolition works to identify and document hazardous building materials within the structures situated within the site.

The objectives of the investigation were to:

- Identify hazardous building materials (HBM) within accessible areas of the structures on site;
- Provide a qualitative risk assessment of the hazardous building materials identified (if any);
- Provide recommendations on control measures and strategies for removal; and
- Prepare a Hazardous Materials Register for the site to ensure legislative compliance.

The scope of works undertaken to address the investigation objectives, included:

- Fieldwork, including investigation of subject areas;
- Collection of suspect hazardous building materials;
- Analysis of suspected hazardous building materials samples by a NATA accredited laboratory;
- Provide recommendations for the removal of hazardous building materials where identified; and
- Prepare a Hazardous Building Materials Register for the site, detailing location and type of HBMS present within the site.

For the report, HBM were limited to the following:

- Asbestos Containing Materials (ACM);

- Lead Containing Paint (LCP);
- Lead Containing Dust (LCD);
- Polychlorinated Biphenyls (PCBs);
- Synthetic Mineral Fibres (SMF); and
- Ozone Depleting Substances (ODS).

Table 4.8.1 Summary of Hazardous Building Materials Identified

Item	Areas Identified
Asbestos Containing Materials (ACM)	The following were inaccessible at the time of investigation for safety reasons and must be presumed to contain asbestos containing materials until further assessment is undertaken: • Building 05, exterior, white fibre cement panelling, asbestos containing fibre cement panelling; and • Buildings 01-05, 7-12, 20-24 interior, electrical distribution boxes, presumed non-friable asbestos containing fibre cement insulation board.
Lead Containing Paint (LCP)	LCP was identified, presumed, or suspected to be present on site withing the following locations: • Site-wide, exterior and interior, fire sprinkler system, lead based red paint system, 0.19% w/w; • Building 01 - room G.157, interior, railing, lead based white paint system, 0.14% w/w; • Building 01 - room G.157, interior, doorframes, lead based red paint system, 04% w/w; and • Building 05, exterior, beams, lead based yellow paint system, 1.1% w/w. All detected led were observed to be in good condition and low concentrations (< 2% w/w) and can be disposed of as general solid waste with no management required.
Lead Containing Dust (LCD)	No LCD was identified, presumed, or suspected to be present within the site
Polychlorinated Biphenyls (PCB)	All fluorescent light fittings are presumed to contain PCB capacitors. Any refurbishment works are to be undertaken by trained and licensed electricians. Fluorescent capacitors should be disposed of separately.
Synthetic Mineral Fibres (SMF)	SMF was identified, presumed, or suspected to be present on site withing the following locations: • Buildings 01-05, 7-12, 14, 20-24, fire door inner core, SMF detected; • Buildings 01-05, 7-12, 14, 20-24, air conditioning units, presumed to contain SMF insultation; and • Buildings 01-05, 7-12, 14, 20-24, hot water system, presumed to contain SMF insulation.
Ozone Depleting Substances (ODS)	All air conditioning units are presumed to contain ODS. Any refurbishment or removal works are to be undertaken by trained refrigerant technicians.

5. CONCEPTUAL SITE MODEL

5.1. Areas of Environmental Concern and Contaminants of Concern

The available site data was assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AECs) and contaminants of concern (COC) which have the potential to be present within the broader property and the site. The AECs identified are presented in attached **Figure 4** and associated contaminants of concern are presented in **Table 5.1.1.**

Table 5.1.1 AECs and COC

ID	Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk	Present within the Site (Y/N)
AEC01	Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Friable Asbestos	Soil	Human Health & Aesthetics	Y
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	Uncontrolled Filling	Lead, Cadmium and Zinc	Soil	Human Health and Ecological Health	N
AEC02	Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Friable Asbestos	Soil	Human Health & Aesthetics	N
	Non-Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Non-Friable Asbestos	Soil	Human Health & Aesthetics	Y
AEC03	Non-Friable Asbestos Impacted Fill Soils	Uncontrolled Filling	Asbestos	Soil	Human Health & Aesthetics	N

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during future development by site workers; and
- Inhalation of contaminants during future use by site occupiers.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Future residents/end users; and
- Neighbouring residential land users.

5.2. Potential Areas of Environmental Concern and Contaminants of Concern

The available site data was assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified potential areas of environmental concern (PAECs) and contaminants of potential concern (COPC) which have the potential to be present within the broader property and the site and require further assessment. The PAECs identified are presented in attached **Figure 4** and associated contaminants of concern are presented in **Table 5.2.1.**

Table 5.2.1 PAECs and COPC

ID	Potential Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk	Present within the Site (Y/N)
AEC04	Underground Storage or Petroleum-Based Product Onsite	Unleaded Petrol & Diesel Tanks	Heavy Metals, TRH, PAH, VOC/SVOC, Phenols	Soil & Groundwater	Human Health, Ecological Health & Aesthetics	N
AEC05	Soil Materials Beneath Existing Building Footprints	Uncontrolled Demolition/Filling	Heavy Metals, TRH, BTEX, PAH, OCP, Asbestos (0.001%)	Soil	Human Health, Ecological Health & Aesthetics	Y
AEC06	Deep Uncontrolled Filling Adjacent to Southern Portion of the Site	Landfill Activities South of the Site	Methane, Carbon Dioxide, Carbon monoxide, Hydrogen sulphide	Ground Gas	Human Health	N[1]
AEC07	Adjacent Industrial Land Use to the North and North-East of the Site	Industrial Activities North and North-East of the Site	Heavy Metals, TRH, BTEX, PAH, VOC, OCP/OPP, PCB, PFAS, inorganic compounds	Groundwater	Human Health	N[1]

Notes to Table:
1 – Landfill Activities and subsequent ground gas monitoring well installation will occur within Stage 3 works within the property. Groundwater assessment will be undertaken within Stage 3 works within the site as access to the broader property will be provided then.

5.3. Land Use Setting

SE understands that the site currently utilised as an educational establishment with on-site residential facilities. The site is proposed for demolition and redevelopment within a low-density residential land use setting.

As the proposed future site use is redevelopment under a low-density residential land use setting, SE considers it reasonable to adopt the 'HIL A – Low-Density Residential' per guidance provided in Section 2.2 of Schedule B (1) of the National Environment Protection Measure (Assessment of Site Contamination) 2013 (NEPM ASC 2013), in order to conservatively assess the site for any future proposed land use as well as the current land use.

5.4. Direct Contact – Human Health

SE understand that the site is proposed for development of low-density residential dwellings, associated roadways and infrastructure. SE further notes that demolition of structures within the site and importation of filling materials may complete a direct contact exposure pathway for residential receptors.

Direct contact human health exposure risks are present within AEC01a requiring further assessment prior to the start of remedial works within a future stage of the project. A supplementary contamination assessment is required beneath the existing building footprints following demolition works. As such, further consideration of this value is required.

SE recommends a pragmatic approach during the course of any required intrusive / excavation works. If contamination is suspected, works should stop, an unexpected finds protocol should be followed and further investigation of the fill materials should be carried out by a suitably qualified environmental consultant.

5.5. Inhalation / Vapour Intrusion – Human Health

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) must be present onsite. The historical evidence reviewed indicated a very low likelihood for a potential primary source to be present on the site.

Potential sources of groundwater contamination were observed immediately south and north/north-east of the site, associated with landfill activities to the south and industrial land use activities to the north/north-east of the site. These sources of groundwater contamination will be assessed in a future stage of the project.

Potential sources of vapour intrusion were observed within the western portion of the site, associated with former petroleum and diesel underground storage tanks that are understood to have been removed from the site, landfill activities south of the site and industrial land uses to the north/north-east of the site. As such, further vapour intrusion assessment is warranted within future stages of the project.

Asbestos containing materials are also understood to be present across the site footprint, requiring remediation and as such, further inhalation human health consideration is warranted during the remedial and validation works at the site.

SE recommends a pragmatic approach during the course of any required intrusive / excavation works. If contamination is suspected, works should stop, an unexpected finds protocol should be followed and further investigation of the fill materials should be carried out by a suitably qualified environmental consultant.

5.6. Management Limits for Petroleum Hydrocarbon Compounds

NEPM ASC 2013 notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosive hazards; and
- Effects on buried infrastructure (e.g. penetration of or damage to, in-ground services by hydrocarbons).

Schedule B1 of NEPM ASC 2013 includes ‘management limits’ to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum depth to which the limits should apply. NEPM ASC 2013 also notes that management limits may have less relevance at operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

Further consideration of this value is warranted with respect to the former petroleum underground storage tank assessment and in the event any unexpected finds are encountered as part of this assessment.

5.7. Aesthetics

Section 3.7 of Schedule B1 NEPM ASC 2013 advises that there are no specific numeric aesthetic guidelines, however site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

SE notes that the proposed development includes building footprints and hardstand pavement areas across some of the site, which would act as a direct contact barrier. The open space turfed areas would act as a direct contact barrier assuming intrusive disturbance of the physical barrier was not undertaken following installation. During construction, the public and construction employees, may complete an aesthetics exposure pathway between potential contamination and receptors.

As demolition works are yet to occur at the site and asbestos containing materials are understood to be present within the site, further consideration to aesthetics management is warranted.

5.8. Terrestrial Ecosystems – Ecological Health

Section 3.4.2 of Schedule B1 NEPM ASC 2013, advises a pragmatic risk-based approach should be taken when assessing ecological risks in residential and commercial / industrial land use settings.

SE understand that the proposed development would include a residential subdivision with comprising construction of low-density residential dwellings, associated roadways and infrastructure. The rest of the site would generally consist of open space and landscaped areas. In these areas, it is considered that a direct contact exposure pathway may be present between potential contamination and onsite receptors.

SE recommends a pragmatic approach during the course of any required intrusive / excavation works. If contamination is suspected, works should stop, an unexpected finds protocol should be followed and further investigation of the fill materials should be carried out by a suitably qualified environmental consultant.

5.9. Drinking Water Use

Expected poor regional water quality as a result of historical regional agricultural land use activities and disturbance, is considered likely to prevent groundwater from being a drinking water resource of value.

There are no groundwater bores onsite or down-gradient of the site, registered for drinking water use. It is noted that a reticulated mains potable water supply is available in the area. No further consideration of this value is deemed necessary as drinking water will not be sourced from the site as part of the future redevelopment plans.

5.10. Recreational Water Use

Surface water courses within and proximal to the site include an unnamed tributary of Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site.

Based on observations, it is considered unlikely that surface water courses within close proximity to the site would be used recreationally for swimming, fishing, consumption, or water sports. Potential receptors of groundwater extraction and subsequent recreational use as part of irrigation systems may include future residents, maintenance workers, and ecological receptors.

There is a potential, albeit low, that the usage of groundwater within the site, would be utilised for irrigation across the site footprint following redevelopment and as such, further consideration of this value may be warranted pending the findings of the supplementary contamination assessment.

5.11. Aquatic Ecosystems

Surface water courses within and proximal to the site include an unnamed tributary of Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site.

Based on the observations made by AG (2022) and SE (SE 2024), there is a moderate potential for groundwater contamination at the site, related to surrounding landfill and/or industrial activities. Further consideration of this value may be required pending the findings of a supplementary contamination to be undertaken within a future stage of the project.

6. SITE ASSESSMENT AND REMEDIATION ACCEPTANCE CRITERIA

6.1. Site Assessment Criteria

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 5** of this project, a summary of the assessment criteria adopted for this project are presented in **Table 6.1.1** below.

Table 6.1.1 Assessment Criteria

AEC ID	Risk	Criteria	Reference
AEC01a **AEC04** **AEC05** **AEC07**	Human Health Direct Contact	HIL A – Residential	Table 1A(1) in NEPC (2013) Table B4 in Friebel, E & Nadebaum P (2011) Table 2 in HEPA (2020)
AEC04 **AEC05** **AEC06** **AEC07**	Human Health Inhalation/Intrusion	HSL A – Residential	Table 1A(2) in NEPC (2013) Table 1A(3) in NEPC (2013) Table 1A(4) in NEPC (2013) Table 1A(5) in NEPC (2013)
AEC01 **AEC02** **AEC03** **AEC05**	Human Health (Asbestos)	HSL A – Residential	Table 7 in NEPC (2013)
AEC01 **AEC02** **AEC03** **AEC04** **AEC05**	Aesthetics	Residential	Characteristics and processes in Section 3.6.2 and 3.6.3 in NEPC (2013)
AEC01a **AEC04** **AEC05**	Soil – Ecological	Urban residential / public open space	Table 1B(1) in NEPC (2013) Table 1B(2) in NEPC (2013) Table 1B(3) in NEPC (2013) Table 1B(4) in NEPC (2013) Table 1B(5) in NEPC (2013) Table 1B(6) in NEPC (2013)
AEC04 **AEC05**	Management Limits (petroleum hydrocarbons)	Residential, parkland and public open space	Table 1B(7) in NEPC (2013)
AEC04 **AEC06** **AEC07**	Ground Gas	-	Section 3.6.2 in NSW EPA (2020a)

7. SUPPLEMENTARY CONTAMINATION ASSESSMENT

In light of data-gaps identified within AG (2022) and SE (2024), it has been concluded that a supplementary contamination assessment is required to sufficiently characterise the fill materials within the site and meet statutory requirements per relevant legislation and guidelines.

7.1. Objectives and Scope of Work

The objectives of the DSI are to:

- Assess data-gaps identified in previous contamination assessments undertaken for the site (AG 2022 & SE 2024);
- Undertake an intrusive site investigation to facilitate the collection of representative soil samples;
- Engage a NATA accredited laboratory to analyse selected samples collected during the field investigation;
- Provide a thorough and conclusive assessment of the contamination status of the fill materials within the site; and
- Provide updated advice to inform this RAP and detail any further investigation, management and/or remediation (if warranted).

7.2. Site Assessment Criteria

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section** Error! Reference source not found. of this project, the assessment criteria within **Section 6** have been adopted for this project.

8. SUPPLEMENTARY CONTAMINATION ASSESSMENT DATA QUALITY OBJECTIVES

Appendix B of NEPM ASC 2013 provides guidance on the development of data quality objectives (DQO) using a seven-step process.

The DQO for this project are set out in **Sections 8.1** to **8.7** of this report.

8.1. Step 1: State the problem

The first step involves summarising the contamination problem that will require new data and identifying the resources available to resolve the problem.

The objective of this project is to assess whether the remedial goal has been achieved, and whether the site presents an unacceptable human health exposure risk, for the proposed land use setting.

This project is being undertaken because:

- The site is the subject of proposed redevelopment works;
- Historically identified areas of environmental concern on within site, have the potential to present an unacceptable human health and ecological exposure risk in the context of the proposed land use setting; and
- Previous investigations undertaken within the site were considered insufficient to characterise the site.

The project team identified for this project includes Sydney Environmental Group Pty Ltd, the client and the planning consent authority.

The regulatory authorities identified for this investigation include NSW EPA and the Local Council.

8.2. Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this investigation include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- Do concentrations of identified contaminants of potential concern (COPC) present an unacceptable exposure risk to identified receptors, for the proposed land use setting?
- Have the contaminated soils been effectively isolated by the remedial strategy?
- Is the site suitable for the proposed land use setting, in the context of land contamination as a result of the chosen remedial strategy?

8.3. Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 8.2** for this investigation, will include:

- Data obtained in previous contamination assessments;
- The nature and extent of sampling at the site, including both density and distribution;
- Samples of relevant site media;
- The measured physical and/or chemical parameters of the site media samples (including field screening and laboratory analysis, where relevant); and
- Assessment criteria adopted for each of the media sampled.

8.4. Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the site as defined by its boundaries.

The temporal boundaries of the project include:

- The project timeframes by SE for this project, and subsequent remediation contractor works program;
- Unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- Access availability of the site (to be defined by the site owner/representative); and
- Availability of SE field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC) and may be altered based on the data collected during the supplementary contamination assessment.

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the previously identified areas of environmental concern (AEC) and may be altered based on the data collected during the supplementary contamination assessment.

The scale of the decisions required will be based on the entire site.

Constraints which may affect the carrying out of this investigation may include access limitations, presence of above and below ground infrastructure, and hazards creating health and safety risks.

8.5. Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

8.5.1 Rinsate Blank

One rinsate blank sample will be collected and scheduled for analysis, for each day of sampling undertaken, if non-disposable equipment is used during the sampling works. Rinsate blank samples will be analysed for at least one of the analytes that the parent sample is being scheduled for analysis for (with the exception of asbestos).

8.5.2 Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, for each day of sampling undertaken, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH C_6-C_{10}).

8.5.3 Intra-Laboratory and Inter-Laboratory Duplicates

Intra-laboratory and inter-laboratory field duplicates will be collected at a rate of one per twenty (5%) site samples collected. The duplicates collected will be analysed for at least one of the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relevant percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate will be calculated.

8.5.4 Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

8.5.5 If/Then Decision Rules

SE has adopted the following 'if/then' decision rules for this investigation:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this investigation; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this investigation (refer **Section 8.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then SE will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this investigation (refer **Section 7.2**), SE will undertake an assessment of the exceedance in the context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

8.6. Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

SE will mitigate the risk of decision error by:

- Calculation of the 95% upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern (excluding asbestos);
- Assignment of fieldwork tasks to suitably experienced SE consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories; and
- Assignment of data interpretation tasks to suitably experienced SE consulting staff, and outsourcing to technical experts where required.

SE will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Table 8.6.1 Performance and Acceptance Criteria Summary

Completeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Critical locations sampled	Refer **Section 8.4**	Critical samples analysed according to DQO	Refer **Section 8.7.2**
Critical samples collected	Refer **Section 8.4**	Analytes analysed according to DQO	Refer **Section 8.7.2**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 8.7.2**
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis
Sample Holding Times	Laboratory holding times provided by laboratory	Sample extraction and holding times complied with	Refer **Section 8.7.8**
Comparability			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer **Section 8.7.2**
Climatic conditions	Samples stored in 500ml zip-lock bags	Same LORs at primary laboratory	Refer **Section 8.7.2**
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in 500ml zip-lock bags	Same laboratory for primary sample analysis	All primary samples to Eurofins | Environmental Testing
Analytical measurement units consistent	All measurement units the same between same analytes	Same analytical measurement units	Refer **Section 8.7.8**
Representativeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to SAQP	Refer **Section 8.4**	Samples analysed according to SAQP	Refer **Section 8.7.2**
Media identified in SAQP sampled	Refer **Section 8.4**	Nil	Nil
Precision			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field duplicate / triplicate RPD (Metals & PAH only)	Minimum 5% duplicates No limit for results <10 times LOR 50% for results 10-20 times LOR 30% for results >20 times LOR	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%	Nil	Nil
Accuracy (bias)			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Rinsate blanks	Analyte concern <LOR None collected for asbestos.	Nil	No exceedances of acceptance criteria
Field trip spikes (BTEX only)	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of acceptance criteria
Field trip blanks (BTEX only)	Analyte concentration <LOR None collected for asbestos.	Surrogate spike recovery	No exceedances of acceptance criteria

8.7. Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

8.7.1 Supplementary Contamination Assessment Sampling and Methodology

Table A in NSW EPA (2022) provides guidance on minimum sampling point densities required for site characterisation, based on detecting circular hot spots of defined diameter using a systematic sampling pattern. This guidance assumes the investigator has little knowledge about the probable locations of the contamination, the distribution of the contamination is expected to be random (e.g. land fill sites) or the distribution of the contamination is expected to be fairly homogenous (e.g. agricultural lands).

However, Section 3.1 of NSW EPA (2022) states that a judgemental sampling pattern can be used where there is enough information on the probable locations of contamination. Further to this, Section 6.2.1 of NEPM ASC 2013 states that the number and location or sampling points is based on knowledge of the site and professional judgement. Sampling should be localised to known or potentially contaminated areas identified from knowledge of the site either from site history or an earlier phase of site investigation. Judgemental sampling can be used to investigate sub-surface contamination issues in site assessment.

Table 4 in WA DOH (2021) indicates that where the 'likelihood of asbestos' is assessed as "possible" or "suspect", the investigation regimen should include a sampling density that is either judgemental or the same as that set out in Table A of NSW EPA (2022) for assessing asbestos.

As this project has included gathering data which provides a reasonable understanding of site history (in the context of potential areas of environmental concern on the site) and taking into consideration Table 4 in WA DOH (2021), it is considered reasonable to adopt a judgemental sampling pattern. A preliminary sampling plan is provided in **Figure 5**.

The location of actual sampling points will be recorded by hand on a site plan.

The supplementary DSI assessment and hazardous building material survey sampling arrangements for this project are presented in **Table 8.7.1** below.

Table 8.7.1 Supplementary Contamination Assessment Methodology

AEC	Contamination Risk	Supplementary Contamination Assessment Methodology
AEC05	Fill Materials and Uncontrolled Demolition Materials Beneath Existing Building Footprints	Visual inspection by suitably experienced environmental consultant following removal of waste materials. Test Pit to 1.0 m, practical refusal or 0.3m into natural material, whichever occurs first. One (1) sample minimum per test-pit location and one (1) sample per stratigraphy prior to natural materials.

8.7.2 Sampling Methodology

Soil samples will be obtained by excavating test-pits with the use of a hydraulic excavator. Grab soil samples will be collected at each required sampling point directly from the base and walls of the excavation. Depending on the depth of the excavation footprint, an excavator may be required to obtain samples. In these instances, samples will be collected from soils in the centre of the excavator bucket, to avoid cross contamination from the excavator bucket.

Sampling will be guided by a combination of visual evidence (e.g. visible ACM, staining, etc), olfactory evidence (hydrocarbon odours) and field analytical instrumentation (e.g. portable PID soil headspace screening) where applicable.

Observations of the materials encountered during sampling will be recorded on the relevant field observation log with photographic record.

8.7.3 Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the AEC, the number of samples collected and the depth/interval the sample was collected from, e.g. a sample collected from AEC01 from the excavation footprint base, would be identified as AEC01-Base.

Project samples will be stored in laboratory prepared glass jars or zip-lock bags (if collected for asbestos).

Soil samples in glass jars will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- SE project identification number
- Each sample identifier
- Date each sample was collected
- Sample type (e.g. soil or water)
- Container type/s for each sample collected
- Preservation method used for each sample (e.g. ice)
- Analytical requirements for each sample and turnaround times
- Date and time of dispatch and receipt of samples (including signatures)

8.7.4 Headspace Screening

Where the contaminants of potential concern include volatiles, project soil samples will be subjected to field screening for ionisable volatile organic compounds (VOC), using a photo-ionisation detector (PID). The results of field screening will be recorded on a field sampling point log and presented in test-pit logs.

8.7.5 Decontamination

In the unlikely event that non-disposable sampling equipment is used, that equipment will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

8.7.6 Laboratory Selection

The analytical laboratories used for this project will be NATA accredited for the analysis undertaken.

8.7.7 Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled;
- Headspace screening results (where available); and
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on the site history, SE has adopted the laboratory analytical schedule for the supplementary contamination assessment. Project specific information is presented in **Table 8.7.2** below.

Table 8.7.2 Laboratory Analytical Schedule (Supplementary Contamination Assessment)

ID	Area of Environmental Concern	Analytical Schedule	No. of samples
AEC05	Soil Materials Beneath Existing Building Footprints	Heavy Metals, TRH, BTEX, PAH, OCP, Asbestos (0.001%)	Eight (8) soil samples

8.7.8 Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 8.7.3** and **Table 8.7.4** overleaf.

Table 8.7.3 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (Eurofins).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos Bulk ID	No limit	AS4964:2004	0.01% w/w
Asbestos Quantitative	No limit	WA DOH 2021 / NEPM 2013	0.001% w/w
BTEX and TRH C_6-C_{10}	14 days	NEPM Schedule B3	0.1-20
Metals	6 months	USEPA 6010, 6020	0.1-5
TRH >C_{10}-C_{40}	14 days	NEPM Schedule B3	20-100
OCP	14 days	USEPA 8081	0.2
PAH	14 days	USEPA 8270	0.1-0.5
VOC	14 days	USEPA 8260	0.1-0.5

Table 8.7.4 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (Secondary Lab - ALS).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Metals	6 months	EP075	0.5
PAH	14 days	EG005T	1-5

9. REMEDIATION STRATEGY OPTIONS DISCUSSION

A range of soil remediation options have been considered for the site. The options considered include only those which are proven to be effective on past remediation or related projects. The following section comprises a review of each of the soil remediation options considered and outlines the selection process used.

9.1. Remediation Strategy Development Rationale

Given the distribution of contamination is within defined areas and thus visually identifying and delineating the areas of contamination can be considered possible, it is recommended that various remediation options should be considered.

Due to the nature and distribution of the contaminants in the underlying soil matrix and building materials, an effective remediation approach for the site must be tailored towards the key impacted sources, which is the impacted / reworked / imported fill material. A discussion of remediation options for these areas is provided in the below sections.

9.2. Remediation Options for Impacted Soil

The potential list of remediation options associated with impacted soil is extensive. Consequently, only relevant remediation strategies that have been considered which include the following:

- On-site Treatment and Beneficial Reuse;
- On-site Containment and Management ("Cap and Contain"); and
- Off-site landfill disposal – excavation / removal and disposal.

A summary of the advantages and disadvantages to these remediation options is provided overleaf in **Table 9.3.2** overleaf.

9.3. Preferred Remediation Option

Based on SE's assessment detailed above, the most suitable remedial strategy will comprise of a combination of treatment options consistent the ultimate end land use of the site. **Table 9.3.1** below summarises the preferred remediation strategies with regards to the identified contamination within the site.

Table 9.3.1 Selected Remediation Strategies

AEC ID	Contamination Risk	Selected Remediation Strategy
AEC01	Soil materials impacted with friable asbestos	Excavation and disposal off-site
AEC01 **AEC02**	Soil materials impacted with non-friable asbestos	In-situ / Ex-situ Raking / Picking OR Excavation and Disposal off-site
AEC05	Direct contact risks in soil (Heavy Metals, BTEX, TRH, PAH, OCP, OPP) (*if identified*)	Excavation and disposal off-site OR Cap and Containment

Areas subject to remediation are provided in **Figure 4**.

Table 9.3.2 Remedial Options Summary

Treatment Option	Description	Advantages			Disadvantages		
		Technical	Financial	Logistical	Technical	Financial	Logistical
On-site Treatment	Soil raked and picked of physical contaminants. Treated and validated materials beneficially reused within the site.	Direct access to soil will be restricted by local roadways, foot paths and park areas with the appropriate mitigation measures	Potentially lower costs through with efficient / strategical methodology	Moderate excavation is required to remove all the AECs across the entire site Limited environmental management required during the works (e.g. dust, noise)	Treated and validated materials would remain on-site. Materials to be beneficially re-used within limited access areas (beneath roadways, parks, and footpaths)	Moderate to high labour costs during raking / picking of soils	Treated and validated material would remain on-site indefinitely.
Cap and Contain	Soil capping and isolation to restrict direct access to soil. Impacted soil buried in-situ within a design containment cell.	Protective of human health including construction / maintenance workers. Direct access to soil will be restricted and can be isolated with the appropriate mitigation measures.	Significantly lower costs with no off-site disposal costs (transport and waste levy fee).	Moderate excavation is required to remove all the AECs across the entire site (< 1 month remediation time). Limited environmental management required during the works (e.g. dust, noise)	Impacted material would remain on-site indefinitely.	Land value may be reduced to presence of residual contamination on-site.	Impacted material would remain on-site indefinitely. Future works may require additional measures if likely to intercept the containment cell.
Excavation and Offsite Disposal	Removal of contaminated soil to an EPA licensed facility. Validation sampling to demonstrate the conditions of the residual soil impact. Reinstatement of excavated areas with material validated as suitable for the intended land use.	Protective of human health including future tenants and construction workers. Facilitate future development of the entire site. No long-term EMP will be required.	No onsite operation and maintenance required.	No ongoing management required as the impacted soil will have been removed offsite.	Based on the soil investigation results, for off-site disposal purposes, the impacted soil to be excavated and removed offsite would require waste classification in accordance with the NSW EPA *Waste Classification Guidelines 2014.*	High remedial cost incurred to remediate the entire site.	Major excavation is potentially required. Odour, vapour and dust management required during the excavation works. May increase truck traffic in area to transport contaminated soil for a short period of time.

10. REMEDIAL ACTION PLAN

10.1. Remedial Goal

The remedial goal for this site is to remediate potential soil contamination (where identified) to a level that does not present an unacceptable human health exposure and environmental risks, based on the proposed land use setting. SE notes that the client would prefer that the remedial works be undertaken in a manner that does not result in the need for:

- Notation on a planning certificate for the site;
- A covenant registered on the title to the land; or
- A long-term environmental management plan (EMP).

10.2. Remediation Extents

The extent of contamination within the site is considered to is outlined within **Table 10.2.1** below.

Table 10.2.1 Approximate Remedial Extents

AEC ID	Area of Environmental Concern	Approximate Extent
AEC01	Friable Asbestos Impacted Fill Soils	Total Area: ≈ 195 m^2 x 0.5 m bgsl 100 m^3 / 180 tonnes
AEC02	Non-Friable Asbestos Impacted Fill Soils	Total Area: ≈ 1470 m^2 x 0.5 m bgsl 735 m^3 / 1325 tonnes
AEC05	Soil Materials Beneath Hardstand Footprints	*TBC following supplementary assessment*

Refer to **Figure 4**, which indicate the areas which will be subject to remediation and the remedial strategy for each area to mitigate the risks to human health and the wider environment.

The extent of remediation identified in **Table 10.2.1** represents the known contamination at the site based on the previous contamination assessments undertaken at the site. There may be a risk of additional, presently unknown contamination being present at the site that may need to be remediated. Unknown contamination may be uncovered during bulk earthworks and may need to be remediated.

It is noted that the lateral extent of remediation may be altered, during remedial works based on site observations and validation soil sample analytical laboratory results. SE further note that the extent of remediation required in AEC05 will be confirmed following the supplementary contamination assessment.

10.3. Phased Remediation Works

The remediation works will be separated into phases to allow for the remediation contractor and the environmental consultants to plan the work. The staged remediation works will be as follows:

- Phase 1: Early Works
- Phase 2: Demolition Works
- Phase 3: Remediation of asbestos contaminated soils
- Phase 4: Removal and remediation of dam sediments
- Phase 5: Remediation of septic system and the AST area
- Phase 6: Management of contamination risks during bulk earthworks

The phases are detailed below.

10.3.1. Phase 1: Early Works

Prior to any works being undertaken at the site, a site-specific Safe Work Method Statement (SWMS) will need to be developed for the site tasks. A site-specific Work Health & Safety (WHS) Plan will need to be prepared for the site by the Principal Contractor. A Construction Environmental Management Plan (CEMP) will need to be developed for the site as required by Condition 8.3.4 of the Land and Environment Court (LEC) approval.

All environmental and WHS measures will need to be established and implemented at the site (e.g. erosion sediment control measures). The Principal Contractor will also need to establish a material tracking system to track all contaminated soil and sediment materials from cradle-to-grave.

Based on the extent and complexity of soil materials treatment, an estimated timeframe for remedial works is considered to be 2 months following the commencement of works. Referral to a remediation contractor should be made to better estimate remediation timeframes. It is expected that remediation timeframes will be further refined following appointment of the remediation contractor, and the staging of the remediation tasks in the contractor's works program.

10.3.1.1. Notifications and Approvals

Notification of an intention to undertake remediation works on the site, will be submitted to the relevant planning consent authority, 30 days prior to remediation works commencing. The proposed remediation works would likely be classed as Category 2 under SEPP55, which do not require consent from the planning authority.

The following information will also be provided to the planning consent authority, 14 days prior to the commencement of remediation works:

- Copies of the contamination assessment report and this RAP; and
- Contact details of the contractor appointed to undertake the remediation works; and
- Contact details of the parties responsible (if not the remediation contractor) for ensuring remediation works comply with relevant regulatory requirements.

The Principal Contractor will need to obtain specific related approvals as necessary to implement the works. A notification will be submitted to SafeWork NSW at least 5 days in advance to undertaking any asbestos removal works. The removal works will be undertaken by a suitably licensed contractor.

It should be noted that:

- Removal of friable asbestos will require the contractor to hold a Class A licence; and
- Removal of non-friable asbestos will require the contractor to hold a Class B licence.

Within one month of completion of remediation and validation works, a notification will be submitted to the planning consent authority.

10.3.2. Phase 2: Demolition Works

Phase 1 will need to be completed prior to the start of phase 2 works.

A pre-demolition hazardous building materials survey was undertaken for the site by SE (2024b). Prior to the demolition of structures, the structures should be inspected by an occupational hygienist to confirm the removal of hazardous building materials. Written documentation (including photographs) should be provided by the occupational hygienist to the Principal Contractor and the Environmental Consultant.

Following written documentation by an occupational hygienist, demolition and removal off-site of the structures will be undertaken by the Principal Contractor or the Remediation Contractor. Transport and disposal records for all demolition wastes removed off site will need to be retained and will be appended to the site validation report.

10.3.3. Phase 3: Supplementary Contamination Assessment within AEC05

Phases 1 and 2 will need to be undertaken and completed prior to the start of phase 3 works.

A supplementary contamination assessment will be undertaken within AEC05, beneath the former hardstand footprints following the demolition of existing structures. Pending the results of the supplementary assessment, further remediation areas may be identified and remediated under an unexpected finds protocol or may be outlined within an additional addendum letter prior to starting phase 4.

10.3.4. Phase 4: Remediation of Asbestos Contamination

Phases 1-3 will need to be undertaken and completed prior to the start of phase 4 works.

Following the supplementary contamination assessment of AEC05, the remediation areas for known asbestos contamination identified within AEC01 and AEC02 (and potentially AEC05) will need to be marked out by the Environmental Consultant in conjunction with the Remediation Contractor.

10.3.4.1. AEC01 – Friable Asbestos Impacted Fill Materials

Fill soils in vicinity of structures present on-site are impacted with friable asbestos and require remediation. The fill materials should be excavated using an excavator, or similar, to the depth of impact (0.5 m bgs).

SE understand that the asbestos contamination is likely to be limited to fill clayey sand materials overlying fill CLAY materials.

The soil materials will be excavated and disposed off-site to a licensed waste receiving facility in line with the NSW EPA Waste Classification Guidelines 2014. A SafeWork NSW Licensed Asbestos Assessor will need to provide a visual clearance certificate of the excavation footprint.

Validation samples will need to be collected from the base of the excavation footprint and analysed for quantitative asbestos analysis (0.001%) to confirm the removal of asbestos containing materials. If asbestos is observed or detected within the samples submitted, additional scraping of the ground surface and additional validation samples will need to be collected until no asbestos remains across the remediation area.

Following removal of impacted materials, validation sampling (per **Section 11**) is to be undertaken.

10.3.4.2. AEC02 – Non-Friable Asbestos Impacted Fill Materials

Fill soils in vicinity of structures present on-site are impacted with non-friable asbestos and require remediation. The fill materials should be excavated using an excavator, or similar, to the depth of impact (0.5 m bgs).

SE understand that the asbestos contamination is likely to be limited to fill clayey sand materials overlying fill CLAY materials.

The soil materials will be treated on site on site via a method of spreading out the soil materials to a thickness of approximately 100 mm on a ‘treatment pad’. The soil materials will then be raked, and any fragments of presumed asbestos picked by a suitably appropriate asbestos removalist. The footprint of the excavation will need to be visually assessed to ensure no fragments of non-friable asbestos are present. An occupational hygienist will need to provide a visual clearance certificate of the excavation footprint.

Validation samples will need to be collected from the base of the excavation footprint and analysed for quantitative asbestos analysis (0.001%) to confirm the removal of asbestos containing materials. If asbestos is observed or detected within the samples submitted, additional scraping of the ground surface and additional validation samples will need to be collected until no asbestos remains across the remediation area.

The soil materials will then be stockpiled in 30 m^3 volumes and re-assessed against the adopted site assessment criteria. A visual inspection of the stockpiles and validation samples submitted for quantitative asbestos analysis (0.001%) will need to be collected from the treated soil material stockpiles. If the materials meet the adopted site assessment criteria, the soil materials will be retained onsite. The soil materials will be buried beneath proposed roadways or within open spaces planned for the site. Treated asbestos soil materials are not to be buried beneath a residential lot.

In the event that soil materials exceed the adopted site assessment criteria, a waste classification based on NSW EPA Waste Classification Guidelines 2014 must be prepared for disposal offsite to a licensed waste receiving facility.

Following removal/treatment of impacted materials, validation sampling (per **Section 11**) is to be undertaken.

10.3.4.3. Remediation Contingencies

10.3.4.3.1. AEC01, AEC02 – Validation Results Above Site Adopted Criteria

Should validation samples indicate further contamination, additional remediation will be required. The additional vertical and lateral extents will be determined by the environmental consultant in attendance. Generally, a further 0.2-0.3 m of depth to be excavated vertically and 0.2-0.3 m of additional lateral excavation is considered reasonable prior to additional validation sampling. Following further removal of material, additional validation samples will be taken. This will be continued until validation samples meet the validation criteria.

10.3.4.3.2. AEC05 – Supplementary Assessment Results Above Site Adopted Criteria

Should results from the supplementary contamination assessment indicate the need for further assessment or remediation, the environmental consultant would decide if treatment under the unexpected finds protocol is sufficient or if there was a need to develop an addendum letter to report on site specific methodology to remediate the newly identified AEC. The decision will be based on the extent of impact, access constraints, and any other observations.

10.3.5. Phase 5: Unexpected Finds Protocol

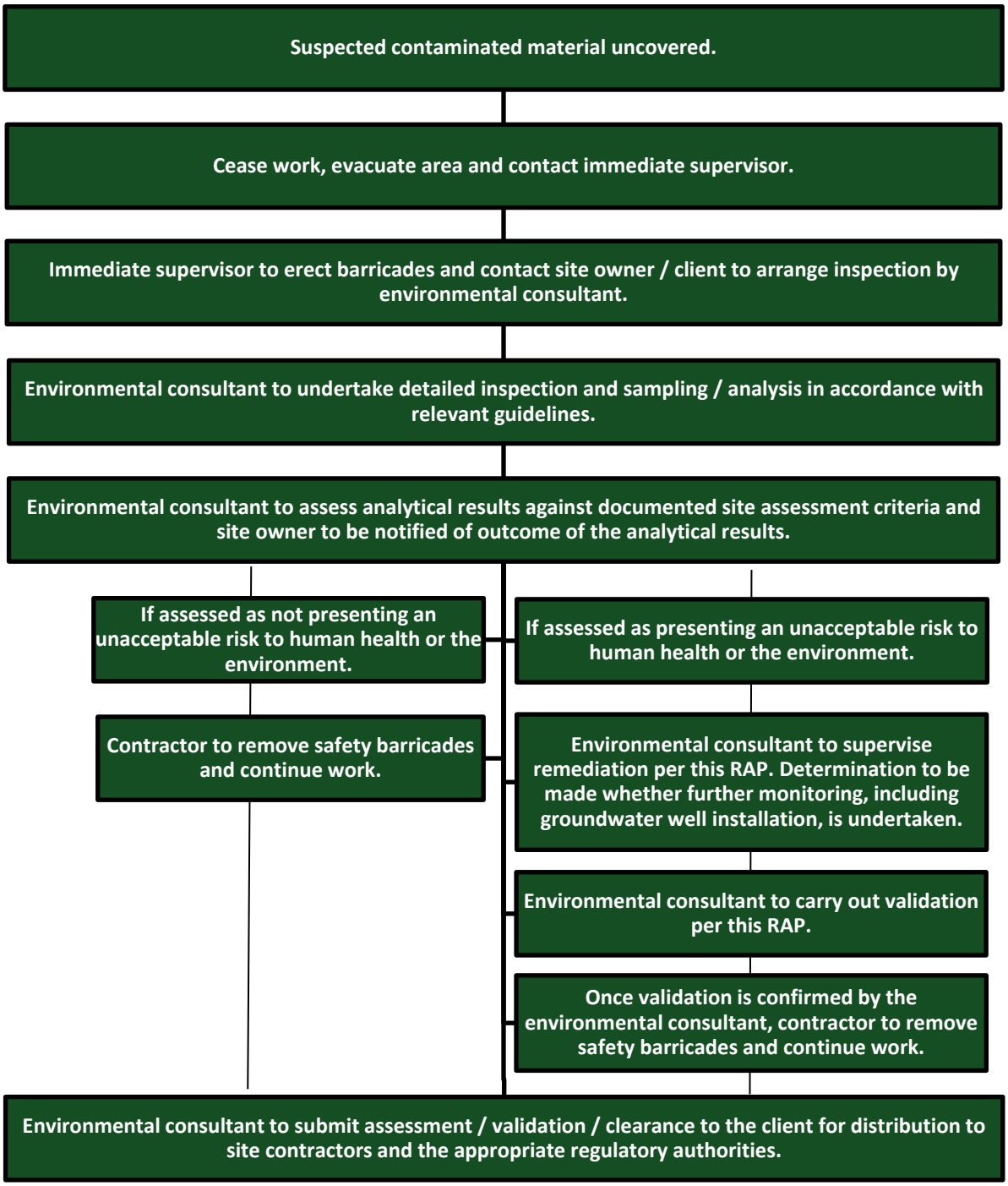
Due to the large size of the site and the proposed low-density residential redevelopment works, SE understand that a large bulk earthworks program will be implemented at the site, which may uncover any currently unknown contamination. This risk will be addressed by following an unexpected finds protocol.

Prior to bulk earthworks starting at the site, all workers are to be advised of the potential presently unknown contamination which they may come across. Presently unknown contamination may include:

- Other underground storage tanks that are previously not identified;
- Buried containers and drums;
- Phase separated hydrocarbons;
- Powders and other suspicious buried material;
- Potentially hazardous materials;
- ACM impacted fill materials;
- Buried ACM conduits;
- Waste burial pits; and
- Evidence of contamination including significant staining, odours and discolouration.

In the event that any material suspected of containing potentially hazardous substances is found during remediation works, the following Unexpected Finds Protocol is to be followed:

Unexpected Finds Protocol



10.3.6. Roles and Responsibilities

The main parties involved in carrying out the remediation works at the site are the Project Manager, Remediation Contractor and the Environmental Consultant. The roles and responsibilities of all parties involved is specified in Section 10.5 of the AG RAP (2022). A table of role and responsibilities of all parties has been outlined below in **Table 10.3.1.**

Table 10.3.1 Roles and Responsibilities for the Remediation Works

Roles	Responsibility
Property Owner or Site Developer	• Overall responsibility of site and key liaison for council. Appoints site contractors, including all other members of the Remediation Works Team.
Project Manager	• Overall site manager and day to day decision maker. Key communicator between site owner / developer • Ensures relevant control plans are developed and implemented.
Remediation Contractor	• Site Preparation including establishment of management plan requirements, importation of suitable landscaping material (if required) waste classification and disposal, as well as ensuring the remediation is conducted in accordance with this plan. • Ensure consultant is up to date with work schedules and is engaged to complete key components of the work (i.e. waste classification assessments, etc) • Implementation of measures required to mitigate any adverse effects resulting from the remediation • Ensure all spoil removed from site is classified by the environmental consultant and is diposed of at a suitable facility • Tracking of waste between the site and deposition facility, including collection of all waste documentation to be provided to the environmental consultant. • Reporting any environmental issues, complaints or unexpected finds to the project manager and environmental consultant
Environmental Consultant	• Development of the remediation objectives and strategy • Support all other members of the Remediation Works Team in understanding the requirements of the RAP and the potential risk posed should measures not be implemented • Monitoring of key remediation components, collection of all environmental samples, and provide guidance to ensure the remediation is understood, and effective • Complete site validation tasks and detail the works in a validation report concluding on site suitability
Local Government Authority	• Responsible for granting all consents and ensuring the recommendations of environmental reports are implemented

10.4. Remedial Works

Remedial works will be guided and monitored by the environmental consultant. The environmental consultant will assist the remediation contractor in setting out the inferred lateral extent of the identified AEC. The environmental consultant will monitor remedial works and provide guidance to the remedial contractor on:

- When to pause remedial works in an AEC, to allow validation works to be undertaken; and
- Where to extend remedial works in an AEC beyond the inferred extent (if observations or analytical results indicate a need for 'chasing out' additional contamination).

The following remediation works outlined in **Table 10.4.1**, is based on data available at the time of preparing this RAP.

The validation strategy for each identified AEC is outlined in **Section 11**.

10.4.1. Overview of Remediation Methodologies

The following method presents a guide for a qualified environmental consultant and specialised civil works and/or remediation contractor engaged to undertake the remediation works. The following sections do not provide sufficient detail to be used as specification for civil works or water treatment works undertaking.

All remediation works should be performed under the on-site guidance of a contaminated land consultant with sufficient experience in soil remediation activities.

Table 10.4.1 Proposed Remedial Works

AEC	Contamination Risk	Proposed Remedial Strategy
AEC01	Friable ACM in soil	Excavation vertically to the base of impacted fill and laterally to the AEC edge or site boundary (whichever occurs first). Disposal offsite to a licensed waste receiving facility as per NSW EPA Waste Classification Guidelines. The remediation contractor will retain transport and disposal records for all wastes removed off site.
AEC02	Non-friable ACM in or on soil	Fill soils will be excavated, spread out to a maximum thickness of 100mm on a suitably prepared pad (e.g. concrete slab, or a cleared area onsite with a suitable barrier layer between underlying soils and the spread soils) and subjected to raking (where practical) to a depth of 100mm below the surface, using a rake with teeth spaced ≤7mm apart and >100mm long, and fragments of bonded ACM handpicked. At least two passes of raking and picking shall be undertaken, with a 90° direction change between each pass, and using a grid pattern. SE notes that remediation of non-friable asbestos contaminated soils for re-use may not be suitable due to the high clay content observed within the fill materials. All reasonable attempts will be made to remediate the soils; however, if deemed unfeasible by the supervising environmental consultant with consideration to adequacy of remediation methodology and timing, consultation with the client will be made to discuss the requirement for off-site disposal. OR Excavation vertically to base of fill and laterally to the edge of fill or to the site boundary (whichever occurs first). Disposal off-site to a licensed waste receiving facility as per NSW EPA Waste Classification Guidelines. The remediation contractor will retain transport and disposal records for all wastes removed off site.
AEC05	Soil beneath Building Footprints	Requires supplementary Assessment. Potential contaminants may include: Metals, PAHs, TRH, BTEX, OCPs, Asbestos (0.001%)

10.4.2. Backfilling

Should remedial excavations require backfilling, then backfill soils will be limited to:

- Virgin excavated natural material (VENM);
- Excavated natural material (ENM); or
- Other material subject to a resource recovery exemption and the placement of that material is within the lawful constraints of the resource recovery exemption (and does not present an unacceptable exposure risk to human health or the environment, within the context of the proposed land use setting).

11. REMEDIATION AND VALIDATION DATA QUALITY OBJECTIVES

Appendix B of NEPM ASC 2013 provides guidance on the development of data quality objectives (DQO) using a seven-step process. In line with AG (2022), the following DQO for this project are set out in **Sections 11.1** to **11.7** of this report.

11.1. Step 1: State the problem

The first step involves summarising the contamination problem that will require new data and identifying the resources available to resolve the problem.

The objective of this project is to assess whether the remedial goal has been achieved, and whether the site presents an unacceptable human health exposure risk, for the proposed land use setting.

This project is being undertaken because:

- The site is the subject of redevelopment works comprising subdivision for residual land use; and
- Historically identified areas of environmental concern on the site, have the potential to present an unacceptable human health risk in the context of the proposed land use setting.

The project team identified for this project includes Sydney Environmental Group Pty Ltd, the client and the planning consent authority.

The regulatory authorities identified for this investigation include NSW EPA and the Local Council.

11.2. Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this investigation include:

- Is the sampling adequate to determine the risk of contamination at the site, including any potential offsite migration?
- If the data does not provide enough information, what data gaps require closure to enable the suitability of the site to be determined, or selection and design of an appropriate remedial strategy.

11.3. Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 11.2** for this investigation, will include:

- Data obtained in previous contamination assessments and the proposed development plans;
- Understanding of the current site use and historic activities that have occurred;
- Geological and hydrogeological data relevant to the area, including physiochemical parameters for calculating ecological criteria;
- Site observations for the presence of visual/olfactory contamination indicators;
- Contaminant concentrations in soil at the site indicating the distribution of contaminants; and
- Further input to the decision will be sample collection and handling, field and laboratory QAQC and confirmation that data quality indicators (DQIs) were achieved.
- Survey dimensions of remediated areas and stockpiled quantities;
- Documentation tracking excavation of contaminated materials from cradle-to-grave (e.g. stockpile movements, trucking records, waste disposal records); and
- Waste classification assessment.

Assessment criteria are provided in **Section 6**.

11.4. Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the site as defined by its boundaries.

The temporal boundaries of the project include:

- The results will be valid on the day samples are collected and will remain valid if no changes to site use occur, and contamination (if present) does not migrate on to site from off-site sources;
- The project timeframes by SE for this project, and subsequent remediation contractor works program;
- Unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- Access availability of the site (to be defined by the site owner/representative); and
- Availability of SE field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC) and may be altered based on the data collected during the supplementary contamination assessment.

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the previously identified areas of environmental concern (AEC) and may be altered based on the data collected during the supplementary contamination assessment.

The scale of the decisions required will be based on the entire site.

Constraints which may affect the carrying out of this investigation may include access limitations, presence of above and below ground infrastructure, and hazards creating health and safety risks.

11.5. Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

11.5.1. Rinsate Blanks

One rinsate blank will be collected and scheduled for analysis, for each day of sampling undertaken, if non-disposable sampling equipment was used on that day. The rinsate blank will be analysed for the analytes the sample/s collected that day are being scheduled for analysis for (with the exception of asbestos).

For the purpose of waste classification assessment, collection / analysis of rinsate blank samples will not be required.

11.5.2. Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, for each day of sampling undertaken, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH C_6-C_{10}).

For the purpose of waste classification assessment, collection / analysis of trip spike/blank samples will not be required.

11.5.3. Intra-Laboratory and Inter-Laboratory Duplicates

Intra-laboratory and inter-laboratory field duplicates will be collected at a rate of one per twenty (5%) site samples collected. The duplicates collected will be analysed for the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relevant percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate will be calculated.

11.5.4. Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

11.5.5. If/Then Decision Rules

SE has adopted the following 'if/then' decision rules for this investigation:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this investigation; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this investigation (refer **Section 11.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then SE will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this investigation (refer **Section 11.2**), SE will undertake an assessment of the exceedance in the context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

11.6. Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

SE will mitigate the risk of decision error by:

- Calculation of the 95% upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern (excluding asbestos);
- Assignment of fieldwork tasks to suitably experienced SE consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories; and
- Assignment of data interpretation tasks to suitably experienced SE consulting staff, and outsourcing to technical experts where required.

SE will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Table 11.6.1 Performance and Acceptance Criteria Summary

Completeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Critical locations sampled	Refer **Section 11.4**	Critical samples analysed according to DQO	Refer **Section 11.7.8**
Critical samples collected	Refer **Section 11.4**	Analytes analysed according to DQO	Refer **Section 11.7.8**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 11.7.8**
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis
Sample Holding Times	Laboratory holding times provided by laboratory	Sample extraction and holding times complied with	Refer **Section 11.7.8**
Comparability			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer **Section 11.7.8**
Climatic conditions	Samples stored in 500ml zip-lock bags	Same LORs at primary laboratory	Refer **Section 11.7.8**
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in 500ml zip-lock bags	Same laboratory for primary sample analysis	All primary samples to Eurofins | Environmental Testing
Analytical measurement units consistent	All measurement units the same between same analytes	Same analytical measurement units	Refer **Section 11.7.8**
Representativeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to SAQP	Refer **Section 11.4**	Samples analysed according to SAQP	Refer **Section 11.7.8**
Media identified in SAQP sampled	Refer **Section 11.4**	Nil	Nil
Precision			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field duplicate / triplicate RPD (Metals & PAH only)	Minimum 5% duplicates and triplicates No limit for analytical results <10 times LOR 50% for analytical results 10-20 times LOR 30% for analytical results >20 times LOR	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%	Nil	Nil
Accuracy (bias)			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Rinsate blanks	Analyte concentration <LOR. None collected for asbestos.		No exceedances of acceptance criteria
Field trip spikes (BTEX only)	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of acceptance criteria
Field trip blanks (BTEX only)	Analyte concentration <LOR None collected for asbestos.	Surrogate spike recovery	No exceedances of acceptance criteria

11.7. Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

11.7.1. Remediation Monitoring Records

A daily record is to be maintained by the remediation contractor and supervising environmental consultant detailing daily remedial activities, estimated treatment quantities, and all bulk soil movements.

11.7.2. Validation Sampling

Validation should focus on collecting clear evidence to assess whether the key objectives have been met. Validation sampling programs should identify and delineate the lateral and vertical extent of contamination (if any) and arrive at a scientifically defensible and statistically valid data set which characterises the chemical concentrations and human health risk present at the site.

An appropriately experienced environmental consultant should be present onsite at all stages of the remediation works, to assess the extent of remediation required to render the site suitable for the proposed development. Site observations and field screening equipment can be used to assist in decision-making in relation to:

- The location and extent of any excavations to trace contamination or whether to remove additional soil;
- Create a more focused sample collection (number and location) and laboratory analysis; and
- The need to consider (or implement) any specific health and safety measures.

A judgemental validation sampling pattern will be carried out, with one soil sample collected from the floor (per 25m^2) and one soil sample collected from each wall (per 5 linear meters) of the remedial excavation footprints.

The validation sampling arrangements for this project are presented in **Table 11.7.1.**

Table 11.7.1 Validation Methodology

AEC ID	Contamination Risk	Validation Methodology
AEC01	**Friable ACM in Fill Soils**	1 x 500 mL soil sample per 5 linear metres of excavation wall, with a minimum of 1 per wall and one 250 mL soil sample per 25 m^2 of excavation footprint. Photographic record of excavation footprint.
AEC01	**Non-friable ACM in or on Fill Soils**	Visual inspection of at least one pass of treated material, using a rake with teeth spaced ≤7mm apart and >100mm long. 1 x 10L sample per 30 m^3 of treated material, screened for fragments of ACM >7mm and a subsequent 500 mL sample for quantitative asbestos analysis. Visual inspection of excavation footprint to confirm removal of fill. Following removal: 1 x 500 mL soil sample per 10 linear metres of excavation wall, with a minimum of 1 per wall and one 500 mL soil sample per 50 m^2 of excavation footprint Photographic record of treated soils. Photographic record of excavation. SE notes that all reasonable attempts will be made to remediate the soils; however, if deemed unfeasible by the supervising environmental consultant with consideration to adequacy of remediation methodology and timing, consultation with the client will be made to discuss the requirement for off-site disposal.
AEC01 **AEC02**	**Airborne Asbestos Fibres**	Airborne asbestos monitoring is to be undertaken by a suitably qualified occupational hygienist or SafeWork NSW licensed asbestos assessor for the duration of asbestos removal and treatment works. Copies of results are to be included in the site validation report.

AEC05	**Direct Contact Risks (*If Identified)***	1 x 250 mL soil sample per 5 linear metres of excavation wall, with a minimum of 1 per wall and one 250 mL soil sample per 25 m^2 of excavation footprint. Photographic record of treated soils. Photographic record of excavation footprint.
-	**Imported Fill (VENM/ENM)**	Formal review of the waste classification report to be undertaken by the environmental consultant engaged followed by visual inspection on receipt of material to site OR 1 soil sample per 500 tonnes of imported material (minimum 3 samples) submitted for analysis of Asbestos (Bulk ID), Metals (8), BTEX, TRH, PAH, OCP and PCB.

The quantity and movement of all waste materials excavated and removed offsite with be tracked by the remedial contractor. All waste disposal dockets issued by the suitably licensed waste receiving facility will be retained by the remedial contractor for reconciliation against the material tracking records, and for inclusion in the validation report. This will demonstrate that the waste was appropriately disposed to licensed facilities.

If visual or olfactory observations indicated a potential for soil contamination to be present, then collection of additional validation samples will be considered.

11.7.3. Validation Sampling Methodology

Grab soil samples will be collected at each required sampling point directly from the base and walls of the excavation. Depending on the depth of the excavation footprint, an excavator may be required to obtain samples. In these instances, samples will be collected from soils in the centre of the excavator bucket, to avoid cross contamination from the excavator bucket.

Sampling will be guided by a combination of visual evidence (e.g. visible ACM, staining, etc), olfactory evidence (hydrocarbon odours) and field analytical instrumentation (e.g. portable PID soil headspace screening) where applicable.

Observations of the materials encountered during sampling will be recorded on the relevant field observation log with photographic record.

11.7.4. Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the AEC, the number of samples collected and the depth/interval the sample was collected from, e.g. a sample collected from AEC01 from the excavation footprint base, would be identified as AEC01-Base.

Project samples will be stored in laboratory prepared glass jars or zip-lock bags (if collected for asbestos).

Soil samples in glass jars will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- SE project identification number
- Each sample identifier
- Date each sample was collected
- Sample type (e.g. soil or water)
- Container type/s for each sample collected
- Preservation method used for each sample (e.g. ice)
- Analytical requirements for each sample and turnaround times
- Date and time of dispatch and receipt of samples (including signatures)

11.7.5. Headspace Screening

Where the contaminants of potential concern include volatiles, project soil samples will be subjected to field screening for ionisable volatile organic compounds (VOC), using a photo-ionisation detector (PID). The results of field screening will be recorded on a field sampling point log and presented in test-pit logs.

11.7.6. Decontamination

In the unlikely event that non-disposable sampling equipment is used, that equipment will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

11.7.7. Laboratory Selection

The analytical laboratories used for this project will be NATA accredited for the analysis undertaken.

11.7.8. Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled;
- Headspace screening results (where available); and
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on the site history, SE has adopted the laboratory analytical schedule for the supplementary contamination assessment and the validation sampling. Project specific information is presented in **Table 11.7.2.**

Table 11.7.2 Laboratory Analytical Schedule (Validation Sampling)

AEC ID	Area of Environmental Concern	Analytical Schedule	Sample Quantity
AEC01	Friable Asbestos Impacted Fill Soils	Quantitative Asbestos (0.001%)	Per **Section 11.7.2**
AEC02	Non-Friable Asbestos Impacted Fill Soils	Quantitative Asbestos (0.001%)	Per **Section 11.7.2**
AEC05	Soil Materials Beneath Building Footprints	TBC Following receipt of the supplementary assessment	Per **Section 11.7.2**
Imported Fill – VENM	Imported soils (if required)	In absence of a VENM validation report, each sample will be subjected to TRH, BTEX, PAH, 8 metals, OCP and asbestos.	Per **Section 11.7.2**
Imported Fill – ENM	Imported soils (if required)	In absence of an ENM validation report, each sample will be subjected to TRH, BTEX, PAH, 8 metals, EC, pH, foreign materials and asbestos.	Per **Section 11.7.2**

11.7.9. Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented below in **Table 11.7.3** and **Table 11.7.4**.

Table 11.7.3 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (Eurofins - Soil).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos	No limit	AS4964:2004	Absence / presence
Asbestos	No limit	Inhouse Method	0.001% w/w
BTEX and TPH C_6-C_{10}	14 days	NEPM Schedule B3	0.1-20
Metals	6 months	USEPA 6010, 6020	0.1-5
TPH >C_{10}-C_{40}	14 days	NEPM Schedule B3	20-100
OCP/OPP	14 days	USEPA 8081	0.2
PAH	14 days	USEPA 8270	0.1-0.5
VOC	14 days	USEPA 8260	0.1-0.5

Table 11.7.4 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (ALS - Soil).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos	No limit	PLM/Disp. Stain.	Absence / presence
Asbestos	No limit	WA-DER	0.001% w/w
BTEX and TPH C_6-C_{10}	14 days	USEPA 8260	0.2-0.5
Metals	6 months	USEPA 200.8/3050/6010B	0.1-3
TPH >C_{10}-C_{40}	14 days	USEPA 8270	20-100
OCP/OPP	14 days	USEPA 8270	0.1-0.2/0.2-1
PAH	14 days	USEPA 8270	0.1
VOC	14 days	USEPA 8260	0.2-0.5

12. REPORTING

12.1. Site Validation Report

At the completion of remediation works, a site validation report will be prepared with reference to the relevant sections of NSW EPA 2020, 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'.

The site validation report must include:

- Document control;
- An executive summary;
- The scope of reporting work undertaken;
- Site identification details;
- A summary of site history;
- A summary of site condition and the surrounding environment;
- A summary of geology and hydrogeology;
- Conceptual site model;
- Validation criteria;
- Information on the remediation works undertaken;
- The results of field and laboratory work;
- An assessment of field and laboratory quality assurance / quality control data;
- Waste management (waste classification reports, tipping dockets, and review of import fill (if applicable);
- A discussion on site validation;
- Information on ongoing site monitoring requirements (if any); and
- Conclusions and recommendations.

The site validation report will be completed within 4 weeks following the remediation and validation of the site and will be provided to the site auditor for review and approval.

13. SITE MANAGEMENT PLAN

The following site management plan will apply during undertaking of the remediation tasks.

13.1. Soil and Stormwater Management

13.1.1. Site Access/Egress

Vehicle access and egress to the site will be stabilised to prevent tracking of sediment onto roads and footpaths. Soil, mud and other similar materials will be removed from the roadway adjacent the access/egress point by sweeping, shovelling or a means other than washing, on a daily basis, or as required.

Trucks will be loaded adjacent to the remediation excavation (where practical). Spills of excavated soil will be scraped / swept up and combined with the soil being disposed offsite.

Soil and sediment will be broomed or washed off vehicle/plant tyres and tracks, prior to vehicles/plant leaving the remediation works zone. This soil and sediment will be scraped / swept up and managed onsite or disposed of, depending on its contamination status.

A site-specific sediment and erosion control plan will be prepared and maintained by the remediation contractor, to suit staging of the remediation works. Erosion and sediment control measures will be maintained in a functional condition. Sediment laden stormwater runoff will be controlled using measures outlined in Landcom 2004, '*Managing Urban Stormwater - Soils and Construction*' (the Blue Book).

13.1.2. Stockpiles

Stockpiles of soil or other materials:

- Will not be placed on footpaths or nature strips, unless approved by Council;
- Will be placed away from gutters, stormwater pits and other drainage lines;
- Will be stored in a secure area and be covered if remaining on site for more than 24 hours; and
- Will generally be constructed as low elongated mounds on level surfaces.

13.1.3. Excavation Pump Out

Should excavations require pumping out, water will be analysed for total suspended solids, pH, metals and petroleum hydrocarbons. Should analytical results be less than relevant marine ecosystem groundwater investigation levels in ANZ (2018), excavation water may be discharged to stormwater. Further assessment would be required should these levels be exceeded.

SE note that the principal contractor may have additional obligations (i.e. permitting) to fulfill prior to discharge. SE recommend consultation with the relevant authority (local council) prior to any discharge occurring.

Should analytical results exceed ANZ (2018) criteria, other options for disposal will be considered, including:

- Discharge to sewer (with prior approval from Sydney Water with a Trade Waste Agreement); and
- Removal and offsite disposal by a liquid waste contractor.

13.1.4. Rehabilitation and Landscaping

Stabilisation of exposed areas on the site, where required, will be undertaken in a progressive manner, as stages of remediation works are completed. Stabilisation will be maintained until such time as site redevelopment works commence.

As site redevelopment works are expected to be undertaken in conjunction with remediation works, revegetation of the site is considered unlikely to be required.

13.2. Waste Management

Removal of materials from site for recycling and/or disposal, will be undertaken with reference to the relevant provisions of the *Protection of the Environment Operations Act* (1997) and NSW EPA *Waste Classification Guidelines* (2014).

If waste classification is required for site material, the following is required (as a minimum):

- Waste classification documentation;
- Material source and description;
- Sampling density, pattern, COPCs;
- Result summary, including appropriate table with comparison to acceptance criteria; and
- Waste classification.

If offsite disposal is required for site material, the following is required (as a minimum):

- Source location;
- Estimated volume (based on excavation size;
- Actual volume of disposal;
- Waste classification;
- Transporter;
- Final destination, POEO license;
- Reconciliation of waste dockets with actual disposal volume; and
- Reconciliation of actual disposal volume and the estimated volume of disposal (based on excavation size.

The remediation contractor will maintain detailed records of materials removed from the site, including date/time of removal, quantities of materials, transport company details and vehicle registration details.

The remediation contractor will retain records verifying lawful disposal of the materials, including date / time the waste left site, approximate volume per load, the classified of the waste contained in each individual load, transport vehicle registration details, weighbridge / tipping dockets with receipt dates / times and tipped waste classification from the waste receiving facility.

Material placed onsite (stockpiles or moved to other location) must be tracked so that the source of material can be identified should unexpected finds be encountered.

13.3. Asbestos Management

For non-friable asbestos removal works, a SafeWork NSW Class A or B licensed asbestos removalist contractor must be engaged to undertake the works. Works should be supervised by a suitably qualified and experienced occupational hygienist.

For friable asbestos removal works, a SafeWork NSW Class A licensed asbestos removalist contractor must be engaged to undertake the works. Works must be supervised by a SafeWork NSW licensed asbestos assessor.

SE note that based on the current conditions at the site, at the time of this RAP, only non-friable asbestos is present at the site.

13.4. Regulatory Notification

A notification of intent to remove asbestos containing materials must be submitted to the regulator (SafeWork NSW) at least 5 days prior to commencing asbestos removal works.

An Asbestos Removal Control Plan is to be prepared by the asbestos removalist contractor engaged for the works.

13.5. Airborne Asbestos Monitoring

For non-friable asbestos removal works, airborne asbestos monitoring is to be undertaken by a suitably experienced occupational hygienist.

For friable asbestos removal works, airborne asbestos monitoring must be undertaken by a SafeWork NSW licensed asbestos assessor.

Airborne fibre monitoring will be implemented during all remedial works involving friable asbestos at the site, and will be carried out in accordance with SafeWork NSW (2019) *Code of Practice – How to Safely Remove Asbestos*. SE recommend that airborne fibre monitoring be implemented during works involving non-friable asbestos within the site, this however is not explicitly required but is highly recommended by SafeWork NSW.

Portable battery-operated air monitors are to be placed within static positions approximately 1.5m above the ground surrounding the work/removal area. The air sample analysis shall be carried out by a NATA-accredited laboratory. The results of asbestos air monitoring should be provided to the Site Project Management Representative the day following the removal or handling works. Project management will display results of air monitoring on the site's safety notice board for a period of 24hr.

The following actions are to be undertaken based on the results of daily air monitoring.

Table 13.1 Airborne Asbestos Fibre Concentration Action Levels

Action Level (airborne asbestos fibres/ml)	Action
< 0.01 fibres/ml	Continue with control measures
≥ 0.01 fibres/ml **< 0.02 fibres/ml**	Review control measures, Investigate the cause, Implement new controls to prevent further release.
≥ 0.02 fibres/mL	Stop removal works, Notify the relevant regulator that work has ceased, Investigate the cause, Extend the isolation area and implement controls to minimise further exposure, Do not recommence work until fibre levels are at or below 0.01 fibres/ml.

13.6. Clearance Inspection and Certificates

Following the successful removal of asbestos impacted soils, the occupational hygienist or licensed asbestos assessor (as must be the case for any friable asbestos removal works) will undertake a visual inspection of the works area and provide an asbestos materials clearance report detailing that the asbestos has been successfully removed. Further in the case of friable asbestos, validation samples will be taken and analysed for quantitative asbestos per NEPM/WA DoH and will form part of the clearance report.

Clearance reports are to be included in the site validation report.

13.7. Groundwater Management

Should dewatering of the site be required, development consent may be required from the planning consent authority. Dewatering may also require approvals from the NSW Department of Planning and Infrastructure, and the NSW Department of Primary Industry – Water.

Further, should unexpected significant contamination be encountered during remediation that may affect groundwater (e.g. the presence of unknown underground storage tanks), additional groundwater assessment will be required.

13.8. Noise Control

Noise levels from the site during the project will not exceed the limits indicated in AS2436-1981.

No 'offensive noise' as defined under the Protection of the Environment Operations Act 1997 will be created during remediation works/activities.

Plant and equipment will be fitted with noise attenuation devices (e.g. mufflers on exhausts). Consideration will be given to use of reversing alarms other than the standard pulsed tonal alarms.

Vehicle access roads will be designed in such a way to minimise the need for plant and vehicles to reverse (e.g. provision of a turning circle adjacent to the remediation works zone).

13.9. Dust Control

Dust may be generated during remediation works and associated tasks. To mitigate risk of dust emissions migrating beyond the site boundary, consideration will be given to implementing the following procedures:

- Erection of dust screens around the perimeter of the site (e.g. fencing with shade cloth attached);
- Securely covering all loads entering or exiting the site;
- Use of water sprays across the site to suppress dust;
- Covering stockpiles of contaminated soil remaining on site for more than 24 hours;
- Keeping excavation surfaces moist;
- Wetting down of placed fill material during spreading;
- Sweeping of hardstand surfaces;
- Minimising soil disturbance works during windy days; and
- Retaining stabilised site access/egress points for vehicles.

13.10. Odour Control

Generation of significant odours during the remediation works is considered to be unlikely.

If odours are generated, odours will be monitored at the site boundary. Should unacceptable odours be detected at the site boundary, consideration will be given to implementing the following procedures:

- Use of appropriate covering techniques such as plastic sheeting to cover excavation faces or stockpiles;
- Use of fine mist sprays (which may incorporate deodorizing agents);
- Use of hydrocarbon mitigating agents on impacted areas/materials; and
- Adequate maintenance of equipment and machinery to minimise exhaust emissions.

A record of unacceptable odours and corrective/preventative action taken, will be maintained by the remediation contractor.

13.11. Traffic Management

Haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site will be selected by the remediation contractor and will meet the following objectives:

- Compliance with all traffic road rules;
- Minimisation of noise, vibration and odour to adjacent premises; and
- Utilisation of state roads and minimisation of use of local roads.

The remediation contractor will ensure that site vehicles:

- Conduct deliveries of soil, materials, equipment or machinery during the hours of remediation work identified in **Section 13.17**;
- Securely cover all loads to prevent dust or odour emissions during transportation;
- Exit the site in a forward direction; and
- Do not track soil, mud or sediment onto the road.

13.12. Vibration Management

Vibration emissions during remediation works will be controlled to mitigate risk of potential damage to assets on adjacent properties, and to mitigate unreasonable loss of amenity to nearby residents.

13.13. Fill Importation

Material proposed to be imported to site as engineered fill, will be limited to materials certified as:

- Virgin Excavated Natural Material (VENM); or
- Excavated Natural Material (ENM).

VENM certification will be undertaken with reference to NSW EPA (2022). ENM certification will be undertaken with reference to NSW EPA Excavated Natural Material Exemption (2014).

All waste classification reports for proposed fill to be imported to the site are to be formally reviewed by the environmental consultant prior to importation to the site.

The remediation contractor will maintain detailed records of all fill imported to the site, including details of the supplier, the source of the fill, the quantities of the fill, vehicle registration numbers and the dates/times the fill was received on site.

The remediation contractor will inspect every load of material imported to site, to check the material is consistent with the material described in the VENM/ENM certification and each load is free of visual anthropogenic materials, staining or odours. The remediation contractor will maintain a documented record of each inspection.

13.14. Work Health and Safety

13.14.1. Safe Work Method Statement

Each contractor and sub-contractor undertaking remediation works, or working within a remediation works zone, will prepare a project specific safe work method statement (SWMS), which will include, but not be limited to:

- The tasks to be undertaken;
- Hazards identified for each of the tasks to be undertaken;
- An assessment of risk for each hazard, considering likelihood and consequence; and
- Control measures to eliminate or mitigate risks associated with each identified hazard.

13.14.2. Personal Protective Equipment

The following minimum personal protective equipment (PPE) should be worn by all persons working in or visiting the remediation works zone:

- Long sleeves and long pants;
- High visibility vests (or clothing);
- Safety boots;

- Hard hats;
- Gloves; and
- Eye protection (e.g. safety glasses).

Additional PPE may be required in accordance with task specific control measures in SWMS (refer **Section 13.14.1**) for asbestos handling and removal works.

The following minimum personal protective equipment (PPE) are be worn by any persons entering a non-friable asbestos impacted remediation works zone:

- Disposable coveralls;
- Minimum P2 respirator;
- Disposable boot covers; and
- Disposable gloves.

Should friable asbestos be identified during the works, the following minimum PPE are to be worn by any persons entering a friable asbestos impacted remediation works zone:

- Disposable coveralls;
- Minimum P3 half-face respirator (Higher protection may be required during works. Refer to the licensed asbestos assessor on-site for further details);
- Disposable boot covers; and
- Disposable gloves.

Additionally, a 3 stage (minimum) decontamination unit must be present at the egress point to the friable asbestos works area and used by all personnel entering and exiting the area.

13.14.3. Decontamination of Personnel, Plant and Equipment

Personnel undertaking remediation tasks, or entering the remediation works zone, will be required to decontaminate upon exiting the remediation works zone. Decontamination of plant and equipment used to remediate will also need to be decontaminated upon exiting the remediation work zones. Decontamination procedures will include:

- Removal of all disposable PPE;
- Cleaning down of protective footwear (including removal of soil from the soles);
- Washing of hands and exposed dermal areas; and
- Decontamination of plant and equipment (as applicable).

13.15. Site Signage

A sign will be posted on the boundary of the site, adjacent to the site access point, which will include 24-hour contact details of the remediation contractor and appropriate notification of asbestos contamination/remediation works (in progress).

13.16. Site Security

Site security will be maintained throughout the duration of the remediation works, with appropriate boundary fencing and gate locks. Other security measures may be implemented, if the need arises.

13.17. Site Hours of Operation

Remediation works will be undertaken on Monday to Friday between the hours of 7:00am to 5:00pm, and Saturday between the hours of 8:00am and 1:00pm.

Remediation works will not be undertaken outside the hours stated above, or on Sundays or public holidays.

13.18. Community Relations and Complaints

Owners, occupants and tenants of properties adjoining the site and across the road from the site, will be provided with notification of remediation works, at least two days prior to those works commencing.

Personnel undertaking remediation works on the site, will direct all third-party communications and/or complaints to the Project Manager. The Project Manager will arrange for the communication/complaint to be assessed, a response prepared, corrective/preventative actions implemented (if necessary).

A register will be maintained on site for the recording of communications / complaints from third parties, including but not limited to, local residents and local businesses.

13.19. Emergency Preparedness

An emergency assembly point will be established at the site egress point. This point will be communicated to all site workers and visitors, during relevant site induction processes.

In the event of an emergency, site workers and visitors will assemble here and await further instructions from the site supervisor, project manager or emergency services.

Spill control kits and fire extinguishers will be located on site, as and where required.

Contact details to be used in the event of an emergency, are presented in **Section 13.20**.

13.20. Register of Contacts

A register of contacts for the project is presented in **Table 13.20.1** below.

Table 13.20.1 Register of Contacts

Project Role	Person	Organisation	Contact
Emergency Services	-	Fire / Police / Ambulance	000
Site Owner	Nibraas Ahmad	Mirvac Pty Ltd	0406 006 792
Project Manager	Shane Gray	Beveridge Williams	0419 331 779
Planning Consent Authority	-	City of Canterbury-Bankstown	9707 9000
WHS Regulatory Authority	-	SafeWork NSW	131 050
Environmental Regulatory Authority	-	NSW EPA	131 500
Remediation Contractor	TBC	TBC	TBC
Environmental Consultant	Steven Wallace	Sydney Environmental Group	0434 215 998

13.21. Interim Site Management Plan

Prior to the implementation of the remedial action plan, the following site management activities will be enforced to reduce the contamination risk to human health and the environment:

- Site Isolation:
  - Site access and egress will be limited to nil (if possible) to prevent the tracking of contaminants outside of the site boundaries.
  - Appropriate boundary fencing with locked gates will be installed (if not already present), regularly maintained and remained locked when site is not in use.
  - Signage will be posted on the boundary of the site, adjacent to the site access point, which will include ‘keep out, asbestos contamination’ (or similar).

- Safe Work Method Statement:
  - Each contractor and sub-contractor gaining access to the site, will prepare a project specific safe work method statement (SWMS), which will include, but not be limited to:
    - The tasks to be undertaken;
    - Hazards identified for each of the tasks to be undertaken;
    - An assessment of risk for each hazard, considering likelihood and consequence; and
    - Control measures to eliminate or mitigate risks associated with each identified hazard.
- Personal Protective Equipment:
  - The following minimum personal protective equipment (PPE) should be worn by all persons working in or visiting the remediation works zone:
    - Hard hat;
    - Long sleeves and long pants;
    - High visibility vest (clothing);
    - Safety boots;
    - Gloves;
    - Eye protection (safety glasses); and
    - Respiratory protection (Only within asbestos impacted remediation areas).
- Decontamination of Personnel equipment:
  - Cleaning down of protective footwear (including removal of soil from the soles); and
  - Washing of hands.

14. CONCLUSIONS

Based on the information presented in the historical contamination assessment reports, SE concludes that the remedial goal can be achieved, and the site made suitable for the proposed land use setting, subject to:

- Implementation of the strategies, methodologies and measures set out in this remedial action plan;
- Should newly identified unacceptable land contamination risks be identified during the supplementary assessment and/or remediation works, a revision to this RAP may be required. The revision should be prepared by a suitably experienced environmental consultant;
- Prior to any removal of soils from site for offsite disposal during remedial works, a waste classification for those soils should be prepared by a suitably experienced environmental consultant;
- Future remedial works should be monitored and validated by a suitably experienced environmental consultant; and
- Following the completion of the remediation and validation work, the environmental consultant needs to prepare a site remediation and validation report that documents both the remediation and validation work as required by the EPA (2020) reporting guidelines.

This report must be read in conjunction with the limitations set out in **Section 15**.

15. STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Sydney Environmental Group Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, SE reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to SE's engagement. The report must not be used for any purpose other than the purpose specified at the time SE was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual SE consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, SE reserves the right to review and amend this report.

16. REFERENCES

Coffey (Coffey 2011), 'Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus', dated 25 August 2011, Ref: GEOTLCOV24163AG-AB;

Noel Arnolds and Associates (NAA 2011), 'Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW', dated October 2011, Ref: SJ0085:95458;

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JBS&G (JBS&G 2018), 'Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;

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Alliance Geotechnical (AG 2022), 'Remedial Action Plan, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-2-1; and

Sydney Environmental Group (2024), 'Supplementary Detailed Site Investigation, Western Sydney University – Milperra Campus, Milperra NSW', dated 22 February 2024, Ref: 2300-DSI-01-220224.v1f.

ANZG 2018, '*Australian and New Zealand Guidelines for Fresh and Marine Water Quality*', 2018;

Landcom 2004, '*Managing Urban Stormwater - Soils and Construction'* (the Blue Book).

National Environment Protection Council (NEPC), '*Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013'*;

National Environment Protection Council (NEPC), '*Schedule B(2) Guideline on Site Characterisation, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013'*;

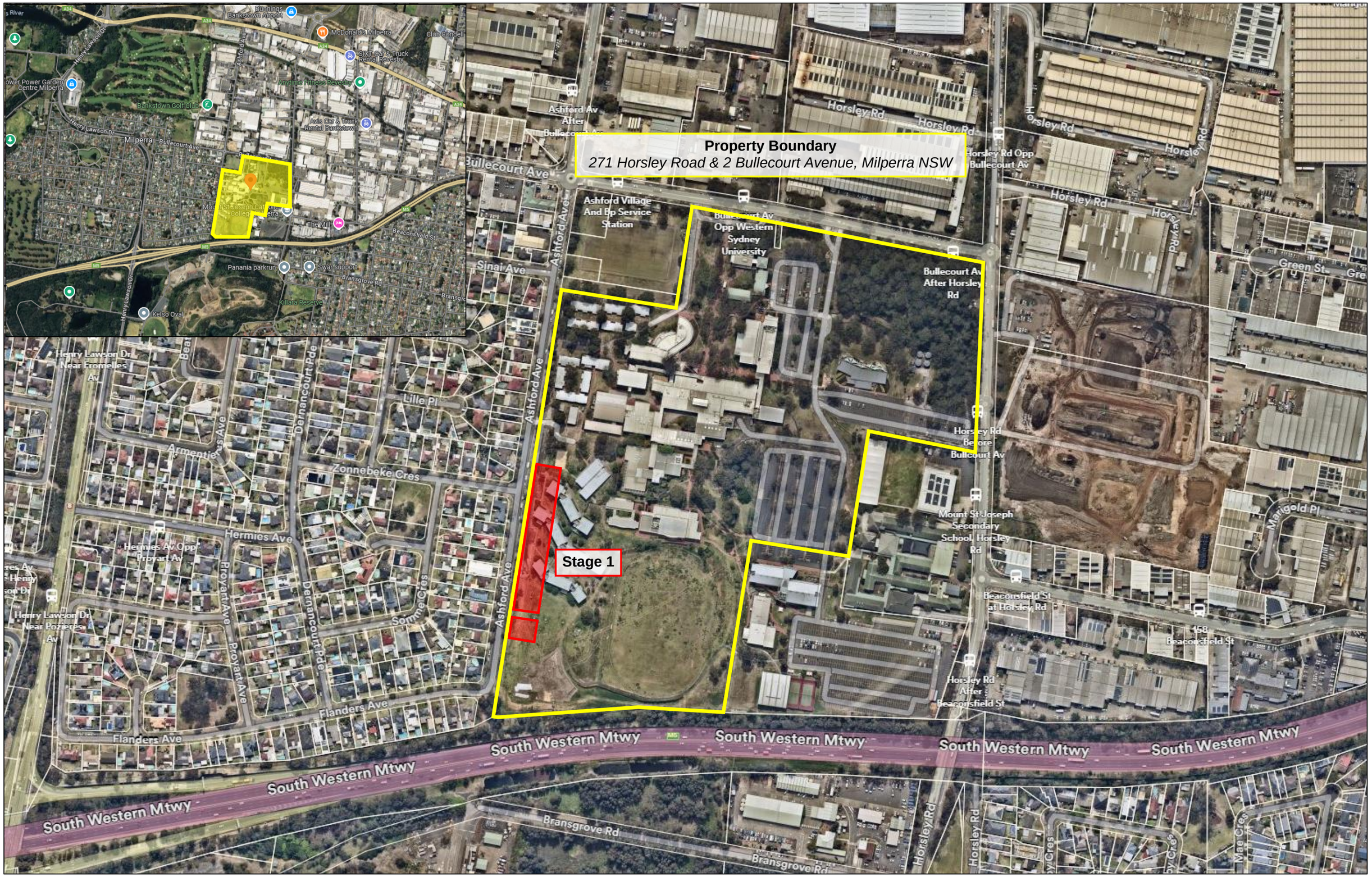
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NSW EPA 2017, '*Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition)*';

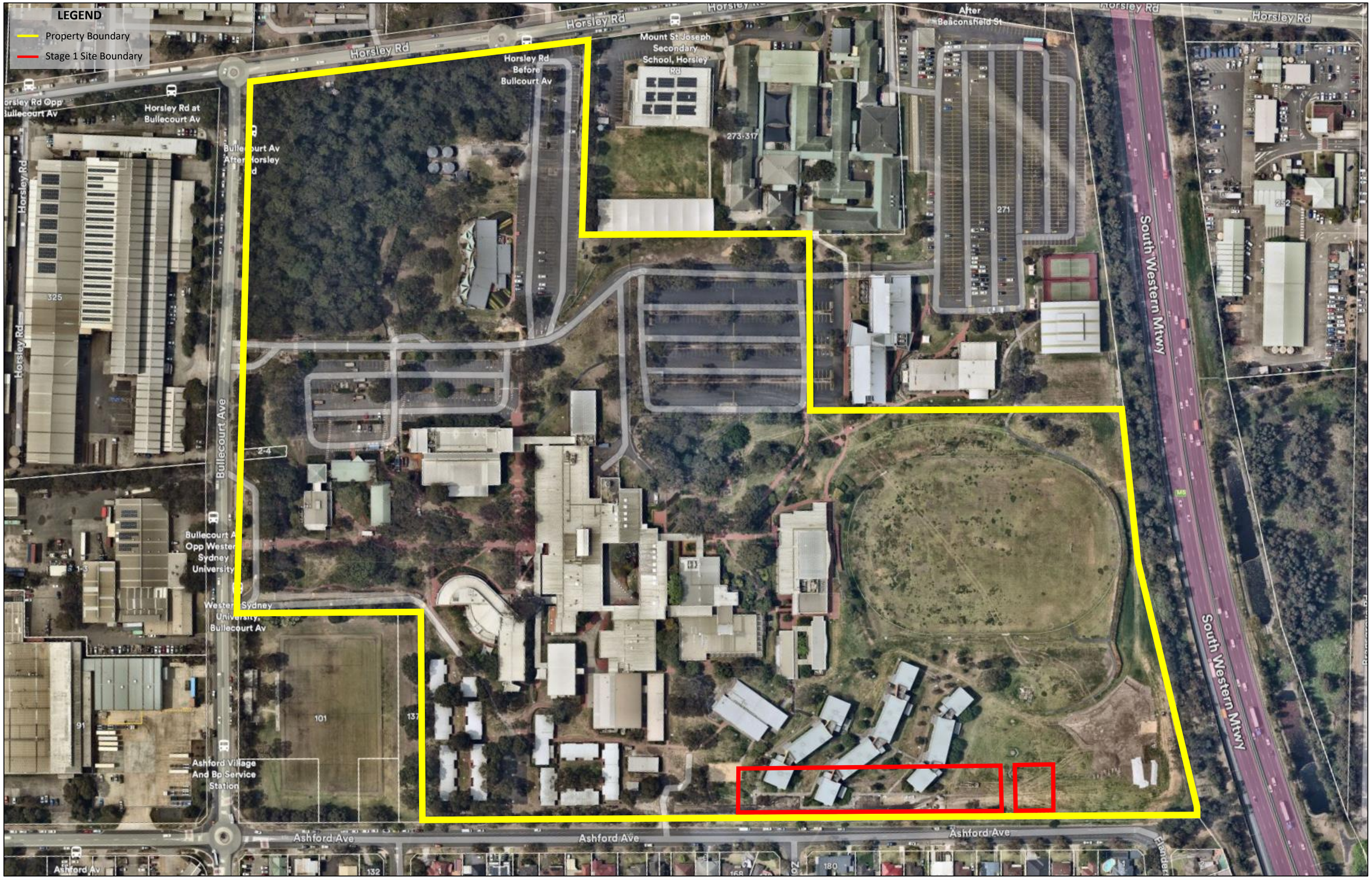
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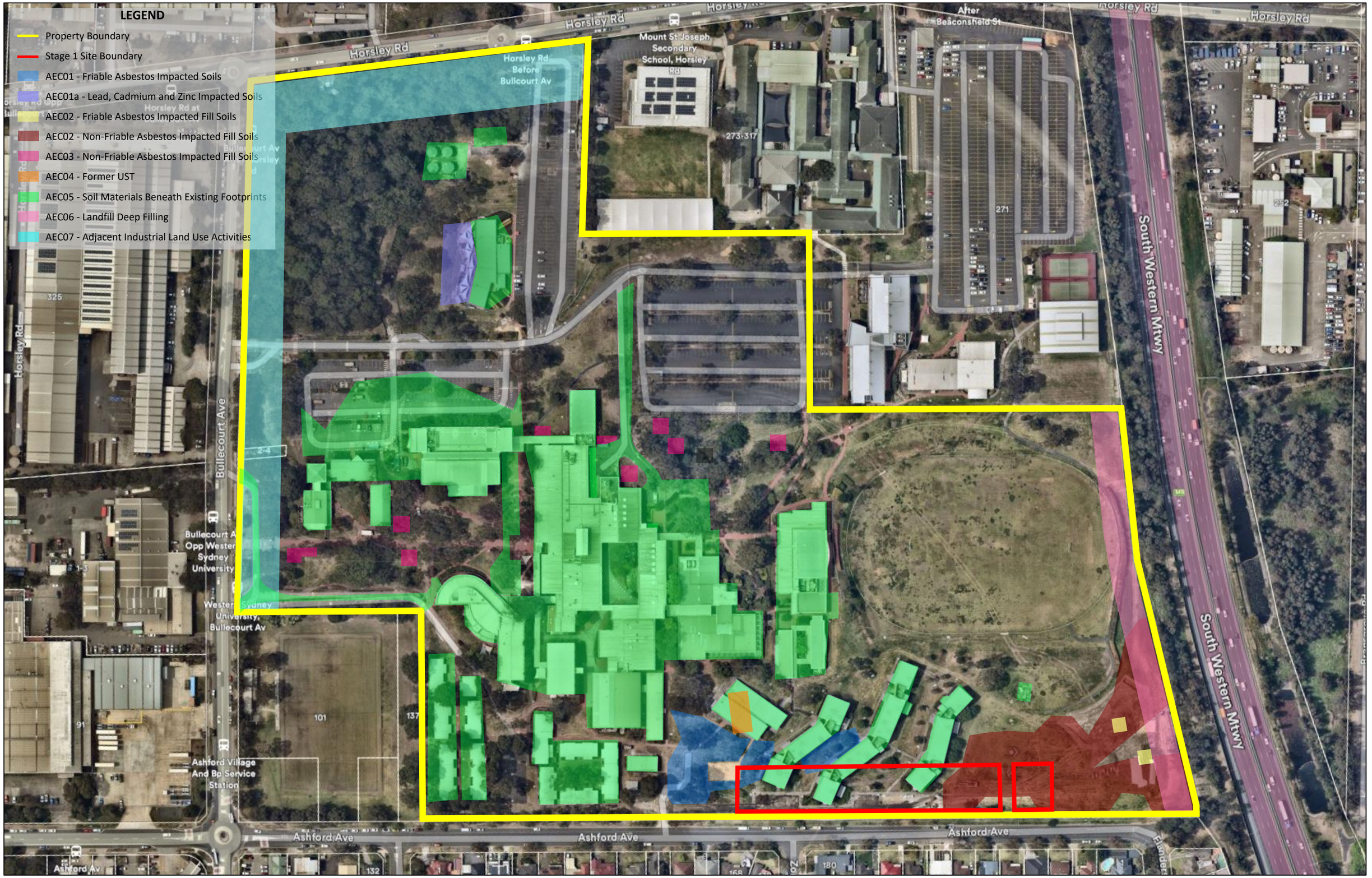
FIGURES



Sydney Environmental Group	Scale:	150 m	Site Locality	
	Client Name:	Mirvac Pty Ltd	N	Figure Number: 1
	Project Name:	Remedial Action Plan		Figure Date: 30 September 2024
	Project Location:	Stage 1, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW		Report Number: 2300-RAP-01-300924.v1f



Sydney Environmental Group	Scale: 100 m	Site Layout	
	Client Name: Mirvac Pty Ltd	Figure Number:	2
	Project Name: Remedial Action Plan	Figure Date:	30 September 2024
	Project Location: Stage 1, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW	Report Number:	2300-RAP-01-300924.v1f



Scale:	100 m	Site Layout & Areas of Environmental Concern	
Client Name:	Mirvac Pty Ltd	Figure Number:	3
Project Name:	Remedial Action Plan	Figure Date:	30 September 2024
Project Location:	Stage 1, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW	Report Number:	2300-RAP-01-300924.v1f

Sydney Environmental Group



Scale:	25 m	Stage 1 – Areas of Environmental Concern		
Client Name:	Mirvac Pty Ltd		Figure Number:	4
Project Name:	Remedial Action Plan		Figure Date:	30 September 2024
Project Location:	Stage 1, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW		Report Number:	2300-RAP-01-300924.v1f

Sydney Environmental Group



Scale:	25 m	Stage 1 – Areas of Environmental Concern		
Client Name:	Mirvac Pty Ltd		Figure Number:	4
Project Name:	Remedial Action Plan		Figure Date:	30 September 2024
Project Location:	Stage 1, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW		Report Number:	2300-RAP-01-300924.v1f

Sydney Environmental Group

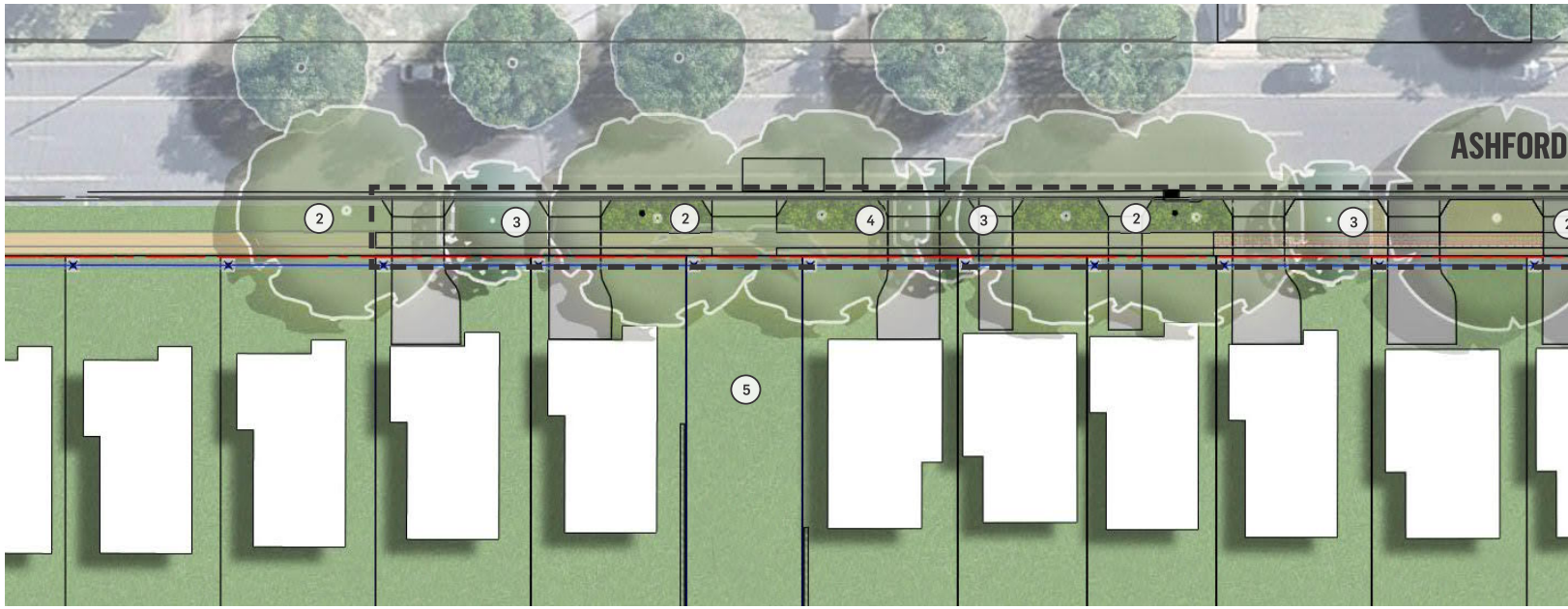
APPENDIX O: LANDSCAPE PLAN

LANDSCAPE CONCEPT DESIGN
STAGE 1



1.1 LANDSCAPE CONCEPT

STAGE 1 STREETSCAPE

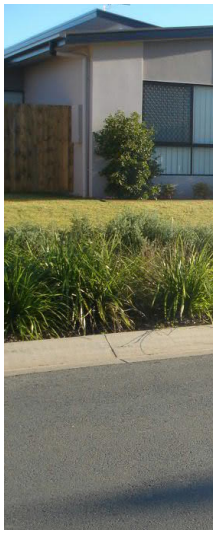


Legend

- Stage 1 Earthworks, Refer Civil, Key Plan
- (1) Proposed Footpath upgrade
- (2) Proposed Large Tree species
- (3) Proposed Medium Tree species
- (4) 1800mm wide verge planting with native species
- (5) Future Through Site Link
- (6) Existing Trees to be removed



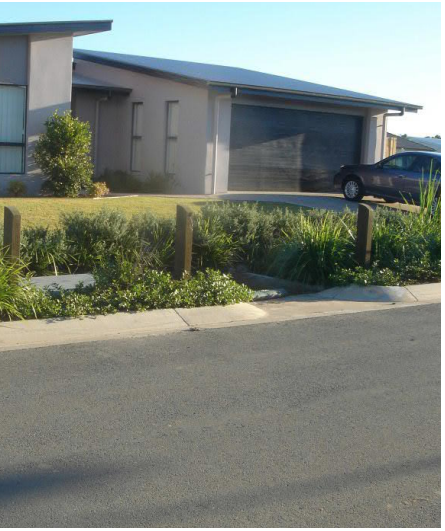






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SCALE 1:400 0 5 10 15 20



Key Plan



1.2 STREETSCAPE CHARACTER - LOCAL STREETS (ASHFORD AVENUE INTERFACE)

1.3 PLANT SCHDEULE

Plant Schedule - Stage 1 - TREES

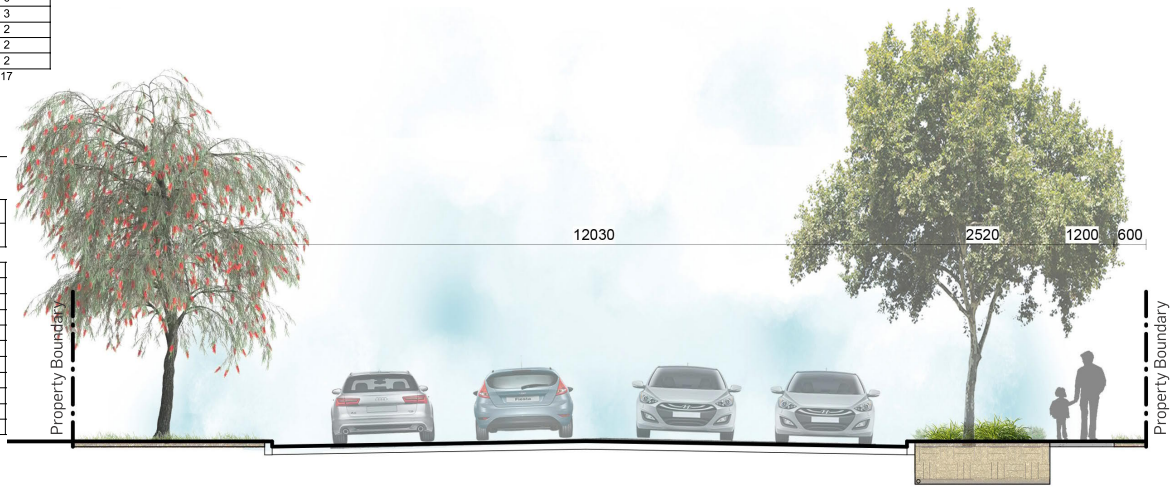
Plant_Code	Plant_Botanic Name	Plant_Common Name	Plant_Container Size	Tree_Ø_Tree Canopy	STAGE 1 Qty
ANG flo	Angophora floribunda	Rough-barked Apple	200 Litre	16000	2
CAL vim	Callistemon viminalis	Weeping Bottlebrush	200 Litre	8000	6
COR gum	Corymbia gummifera	Red Bloodwood	200 Litre	16000	3
EUC bot	Eucalyptus botryoides	Bangalay	200 Litre	16000	2
EUC cre	Eucalyptus creba	Narrow-leaved ironbark	200 Litre	16000	2
EUC mol	Eucalyptus moluccana	The Grey Box	200 Litre	16000	2
Grand total: 17					17

Plant Schedule - Stage 1 - SHRUBS & GROUNDCOVERS

Plant_Code	Plant_Botanic Name	Plant_Common Name	Plant_Container Size_Ø	Plant_Supply Spread_Ø	STAGE 1 Qty
COR sta	Correa alba 'Star Showers'	Star Showers	140	200	243
MYO yar	Myoporum parvifolium 'Yareena'	Creeping Myoporum	140	240	213
VIO hed	Viola Hederacea	Native Violet	140	240	250
CHR api	Chrysocephalum apiculatum	Yellow Buttons	200	200	24
CHR sil	Chrysocephalum apiculatum 'Silver and Gold'	Yellow Buttons	200	200	25
COR alb	Correa alba	White Correa	200	300	25
DIA for	Dianellalongifolia 'Forte'	Blue Flax Lily	140	200	208
LOM sea	Lomandraconfertifolia 'Seascape'	Basket grass	200	800	220
LOM tan	Lomandra longifolia 'Tanika'	Basket grass	140	800	233
POA lab	Poa labillardieri	Common Tussock Grass	140	800	24
THE AUS	Themada australis	Kangeroo Grass	140	600	23
Grand total: 1488					1488

1.4 SECTION

The interface with Ashford Avenue uses Principles of these streets include rainwater and WSUD kerbs drainage, safe lines of sight, a feeling of local character such as reference to the university, local Cumberland Plain Woodland.





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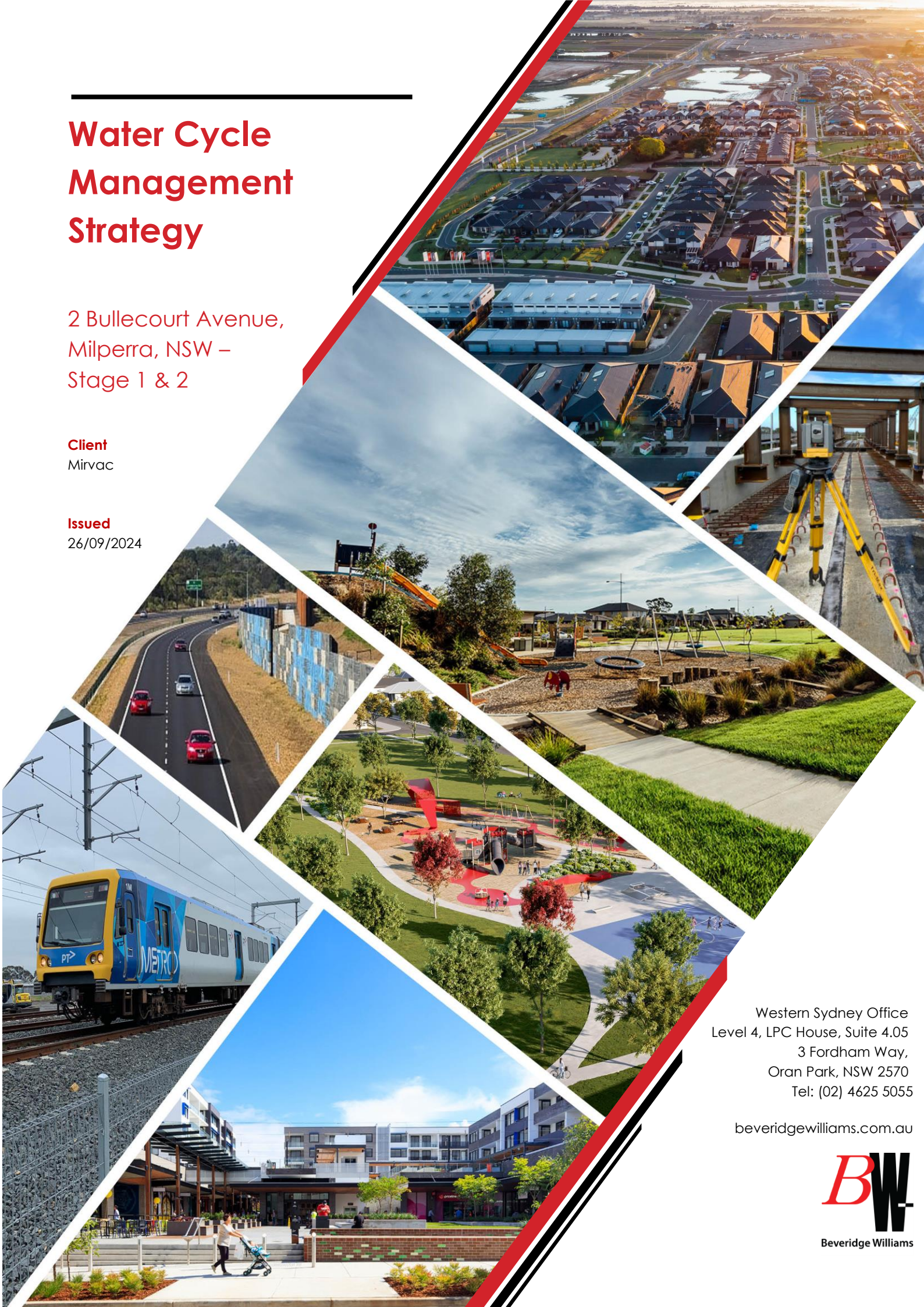
APPENDIX P: WATER CYCLE MANAGEMENT PLAN

Water Cycle Management Strategy

2 Bullecourt Avenue, Milperra, NSW – Stage 1 & 2

Client
Mirvac

Issued
26/09/2024



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Project Number:	2301879

Surveying
Asset Recording
Civil Engineering
Infrastructure Engineering
Traffic & Transport Engineering
Environmental Consulting
Water Resource Engineering
Strata Certification (NSW)
Town Planning
Urban Design
Landscape Architecture
Project Management

Revision Table

REV	DESCRIPTION	DATE	AUTHORISED
A	Issued for DA Support	**25/09/2024**	**SG**

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1. INTRODUCTION

Beveridge Williams has been engaged by Mirvac, to prepare a water cycle management study addressing the Stage 1 & 2 development and corresponding demolition work of the Milperra campus of Western Sydney University, located at 2 and 2A Bullecourt Avenue, Milperra - Lot 2 of DP1291984.

This following document which is separate to this report is to be read in conjunction with the following:

- **Flood and Risk Impact Assessment**, WSU Campus Milperra, Planning Proposal, J. Wyndham Prince, Rev C May 2023

The purpose of this study is to ensure that the Stage 1 & 2 construction and demolition work is carried out in accordance with best practice floodplain and stormwater management guidelines, as well as flood and stormwater planning controls outlined in Canterbury Bankstown Development Control Plan (DCP, 2023). Specifically, this study aims to:

- ensure that floodplain and stormwater management is integrated into the development in an efficient and sustainable way
- determine whether on-site detention requirements are required for the southern portion of the site containing Stage 1 and 2
- protect receiving water quality from adverse effects of development through the implementation of Water Sensitive Urban Design (WSUD) for Stage 1 and 2

1.1. Project Background

The precinct is located within Canterbury-Bankstown Council (CBC) Local Government Area (LGA). Stages 1 and 2 are situated in the South West portion of the site along Ashford Avenue and consists of 16 and 11 lots respectively, with no new road reserve contained in the stage boundary. The proposed Stage 1 and 2 layout is presented in Figure 1 as well as on the staging plan which can be found in Appendix A. Further detail on the development context of Stage 1 and 2 is summarised in the Statement of Environmental Effects which will be lodged with the Stage 1 and Stage 2 DA.

1.2. Objectives

The objectives of this report comprises of:

- Undertaking stormwater concept design to ensure the adequacy of the pit and pipe system in safely managing runoff from Stages 1 and 2 to the discharge point in a controlled manner. Ensuring that these pit and pipe networks as well as surface runoff have optimal connectivity to the proposed temporary basin.
- Conducting a comprehensive water quantity assessment for the Stage 1 and 2 site. This includes proving that an OSD basin is not required via hydrology modelling of pre-developed and post-developed peak flows.
- Employing MUSIC modelling to determine the appropriate sizing and design of the treatment train for the Stage 1 site. This is crucial for achieving the approved water quality treatment targets.
- Designing and evaluating Compensatory Floodplain Storage solutions for the Stage 1 and 2 area impacted by Georges River regional flooding.

1.3. Study Area

The site has until recently been used as the Milperra Campus of Western Sydney University (WSU). The existing campus is spread out, consisting of a range of buildings used for learning, student housing and office administration. In addition, the Campus also possesses ancillary impervious surfaces used for parking, footpaths, as well as pervious areas of open space and vegetation.

The existing site (Lot 2 of DP1291984) consists of approximately 19.6 ha of university land (refer **Figure 1**). The site currently has access via Horsley Road in the east, Ashford Avenue in the west, and Bullecourt Avenue in the

north. The South-Western Motorway (M5) runs east-west along the southern boundary of the site. The roadway is separated by a noise attenuation fence and a vegetated batter and swale approximately 15m wide. No access is available via the southern boundary. Under the development proposal, the road network will connect to the existing roads in the east, west and north. Stage 1 consists of 16 lots with a total area of 0.603 ha and Stage 2 consists of 11 lots with an area of 0.407 ha as well as road reserve with an area of 0.06ha, with both stages fronting Ashford Ave. It is proposed that the entire residential area (1.01 ha) is collected in a common drainage pipe system and piped to a temporary raingarden. The existing Ashford Ave road reserve is existing and drains to the existing pipe system in Ashford Ave. As this verge and the existing drainage system in Ashford Ave is existing, it is not required to and therefore has not been modelled as part of the Stage 1 and 2 Drainage Assessment.

The topography within the site area is characterised by predominantly sloping terrain from the high point in the northeast corner of the site. The westerly grade creates a ridgeline that diverts flows in two directions south/southwest and northwest. Slopes of approximately 3% - 8% fall towards Ashford Avenue in the west and M5 in the south and Bullecourt in the northwest.

The southern part of the site discharges to an existing vegetated swale within the M5 via multiple headwalls or overland. The swale runs parallel to the southern boundary which conveys flows to the existing culverts (4 x 1500mm dia. RCP) under the freeway and ultimately into the downstream watercourse on the southern side of the M5.

The process prior to the completion of the Stage 1 and 2 works is to have the majority of the site area (the Southern portion) to be demolished.



Figure 1: Site Plan (NTS)

1.4. Relevant Stormwater DCP Controls

The Stormwater objectives and controls listed in the Canterbury Bankstown Development Control Plan will be addressed for the Stage 1 and 2 design as follows:

O1: To control Stormwater runoff and minimise discharge impacts on adjoining properties and into natural drainage systems before, during and after construction

During demolition works and following the completion of Stage 1 and 2, the runoff conveyed from the Southern portion of the site will not affect natural drainage systems. The temporary sediment basin and Bioretention basin designed for Stage 1 and 2 and the Southern catchment will ensure that runoff during construction work and post-development will not increase peak flows or pollute natural drainage systems.

O2: To prevent flood damage to the built and natural environment, inundation of dwellings and stormwater damage to properties

Stormwater assets such as pits and pipes will be appropriately placed, sized, and graded to ensure that it will convey runoff respective to the design storm being catered to. Furthermore, the road and lot layout of Stage 1 and 2 has been designed to convey runoff and prevent inundation and damage to dwellings.

O3: To ensure the design of buildings and structures does not create any unreasonable risks to life and assets

Stormwater assets have been designed to meet safety requirements such as ensuring that freeboard and runoff velocity requirements have been met. Appropriate grades and berms will be adopted for basin designs to ensure safety for maintenance vehicles and staff.

O4: To ensure that proposed development does not adversely affect the operational capacity of the downstream stormwater system

Analysis using DRAINS has been conducted to ensure the post development flow will not be greater than the corresponding predevelopment flow for the Southern portion of the site containing Stage 1 and 2. As the post development flow is not greater than the predevelopment flow, an OSD basin will not be required to reduce peak flow to the predevelopment level.

O5: To ensure an integrated water cycle management approach through water-sensitive urban design principles and does not adversely impact public recreation opportunities within the RE1 Public Recreation zoned land

The temporary basin proposed for the Southern portion of the site containing Stage 1 and 2 is located in accordance with the rezoning documents, proposed zoning and recently adopted site specific DCP.

C1: The following devices must be provided in accordance with Council's specifications and subject to Council approval:

a) **Bio Basin in Southern Open Space (Basin 1), with an area of approximately 650 sqm**
b) **Bio Basin in Drainage Basin (Basin 2), with an area of approximately 210 sqm**
c) **Bio Basins in Northern Open Space (Basin 3), with an area of approximately 350 sqm**

All three ultimate Bio Basins stated above will be detailed in the overall Water Cycle Management Strategy report submitted following the submission of this WCMS report for Stage 1 and 2 works.

C2: All proposed dwellings must comply with Section 3.1 Development Engineering Standards of the Canterbury Bankstown Development Control Plan 2023

All stormwater runoff from future residential dwellings will be designed in accordance with Section 3.1 of the Canterbury Bankstown Development Control Plan. This will be completed under a separate DA.

C3: Drainage systems should be sized to consider increases in rainfall intensity, frequency and duration under future climate change

The design storm was determined from data obtained from the ARR using the 'Interim Climate Change Factor' which reflects the increase in rainfall intensity, frequency, and duration under future climate change. The final drainage design during the Subdivision Works Certification phase will design and detail all pipe sizes. This final design will include the 'Interim Climate Change Factor'.

C4: A local Stormwater Management Plan is to be provided with the first Development Application for proposing subdivision/construction of residential accommodation of the site

The local Stormwater Management plan is provided by the submission of this Water Cycle Management Strategy report.

2. GENERAL WATER CYCLE MANAGEMENT STRATEGY

2.1. Stage 1 & 2 Scenario

Best practice stormwater and floodplain management principles have been applied to this development to ensure that floodplain and stormwater management is integrated into the development in an efficient and sustainable way. This report investigates the implementation of water cycle management strategy for the development of Stage 1 and 2 as well as the associated demolition works.

Stage 1 and 2 are situated in the South West corner of the precinct (as depicted in **Figure 3**) with an area of 0.603 ha and 0.467 respectively. Stage 1 consists of 16 lots and Stage 2 consists of 11 lots with a small section of road reserve in between lots. A proposed temporary sediment basin is to be situated south east of Stage 1 & 2 and installed under the demolition DA1512/2023. Initially it will continue to be used as a temporary sediment basin for the Stage 1 and 2 construction works, however, once the site is stabilised and 80% of the houses are built it will be converted to a temporary bioretention (raingarden) basin to address water quality from the stage 1 and 2 development. As a result of the demolition occurring first, the existing impervious area of the site will be significantly reduced, resulting in less runoff from the site even with the Stage 1 and 2 residential development. As such, the basin is not required to have an OSD component and will only consist of the sediment basin and bioretention components.

Stormwater quantity for Stage 1 and 2 is managed using 2kL rainwater tanks on each lot, which reduces potable water requirements of future homes. Wastewater on site will be managed by future connection to the Sydney Water sewerage system. Wastewater recycling is not proposed for this development. Stormwater quantity management is explored in **Section 3**.

Stormwater drainage will be designed in accordance with Council's stormwater design manual and the major (1% AEP) – minor (10% AEP) approach recommended in Australian Rainfall and Runoff 2019 (ARR 2019). Major overflow routes will be designed to convey stormwater exceeding the capacity of the pipe network (minor storm) safely to the temporary basin for the 1% AEP event to ensure the that the temporary basin can cater for all storms up to the 1%AEP. Additional consideration will be given to extreme events in the design of major overland flow routes through the subdivision. The Stage 1 and 2 concept stormwater layout is presented on the Concept Civil Engineering Plans that can be found in **Appendix B**.

A water quality treatment train has been incorporated into the proposed subdivision consisting of 2 kL rainwater tanks on each lot and a bioretention basin. Due to a lack of stormwater quality pollution removal targets from CBC, pollutant removal targets of 90% GP, 85% TSS, 65% TP, and 45% TN have been adopted from the "Flood and Risk Impact Assessment Report" prepared by J. Wyndham Prince which in turn was based on from the adjacent Liverpool City Council WSUD Technical Guidelines. Water quality modelling to determine the WSUD requirements are provided in **Section 4**.

The design of the proposed stormwater assets for the Stage 1 and 2 development is presented on the Concept Civil Engineering Plans in Appendix B. The design is based on the proposed zonings identified in the Planning Proposal Report as well as the "Flood and Risk Impact Assessment Report" prepared by J. Wyndham Prince. The proposed temporary bioretention filter has been integrated into the temporary sediment basin to minimise the amount of temporary works as much as possible.

A detailed flood assessment including 2-dimensional hydraulic modelling has been conducted by J. Wyndham Prince in the Flood and Risk Impact Assessment Report to determine the 1%AEP flood level. The report concluded that the ultimate development does not create unacceptable flood impacts external to the site, and no loss in floodplain storage occurs due to the proposed development for Stage 1 and 2. The proposed finished surface level modelling has been designed to minimise how much filling is below the Regional Flood Level of RL 5.55 and therefore limit the amount of required compensatory floodplain storage for the 1% AEP event. The assessment of floodplain management is presented in **Section 5**.

3. WATER QUANTITY MANAGEMENT

3.1. Hydrologic modelling methodology and parameters

The hydrologic modelling to determine peak flow rates discharging from the site has been conducted using the RAFTS Storage Routing model in DRAINS software package, an industry standard model for hydrological modelling. The procedures and model inputs for this assessment are consistent with the Australian Rainfall and Runoff Guidelines and the CBC DCP.

Adopted Parameters for the hydrologic modelling have been summarised in **Table 1**. The DRAINS model and results are provided in **Appendix D**.

Table 1: Hydrological Parameters and Considerations

DESIGN PARAMETER	REQUIREMENT/ASSUMPTION	COMMENT
Software Package	DRAINS Version 2021.02 – 4 Aug 2021	
Rainfall Estimation Procedures	ARR 2019	
Rainfall Runoff Model	RAFTS Storage Routing model (as applied in DRAINS)	
IFD Data	ARR 2016 Design Rainfalls	Bureau of Meteorology
Losses	Impervious Area IL = 0 mm Impervious Area CL = 0 mm/h Pervious Area IL = 29 mm Pervious Area CL = 0.8 mm/h	ARR Book 5, Section 3.5.3.1.2 ARR Datahub ARR Datahub Value x 0.4
Temporal Patterns	10 Rainfall Patterns from the East Coast South region	ARR Datahub
Mannings	Pre-Development = 0.03 Stage 1 & 2 = 0.02 Post-Development (grassed) = 0.035	

Both the pre-development and post-development models have adopted the same Pervious Area IL as both pervious areas are of the urbanised condition with similar levels of compaction.

RAFTS is a storage routing runoff model that is commonly used for the determination of hydrographs, peak flow rates and to inform the size and outlet requirements of detention basins. RAFTS is one of the recommended models under ARR2019 and is suitable for modelling a range of catchment sizes and configurations. For this report, RAFTS was selected for the catchment hydrology in preference to the DRAINS IL/CL model as it give more reliable hydrological estimates on medium to large catchment sizes, such as the lumped catchments used for this assessment.

3.2. Hydrological modelling inputs

3.2.1. Pre-Development Scenario

The southern section of the site comprises two catchments, Ex1A and Ex1B, delineated in **Figure 2** below. These catchments discharge to DSP1 through the swale before reaching the existing culverts under the M5. The imperviousness of the pre-development catchment has been assessed based on current conditions i.e. existing buildings and hardstand areas being in place. Details of the pre-development catchment are tabulated in **table 2**.

3.2.2. Post-Development Ultimate Scenario

Stage 1 and 2 encompasses the development of 27 lots situated along the current Ashford Avenue in the southwestern region of the site. This stage's progression follows the complete demolition of all existing structures and pavement on the premises, as stipulated in DA1512/2023. Post-demolition, the site will undergo spray grassing and stabilization until further residential development occurs in subsequent stages. This interim measure will lead to a decrease in imperviousness and peak flows, as the site transitions to a more pervious state.

In the post-development modelling, the boundaries of catchments (refer to **Figure 3**) and the flow directions generally remain consistent. A small section of Ex1A will be transformed into the Stage 1 and 2 residential lots. An imperviousness of 85% was adopted as a conservative approach. The proposed demolition will remove hard surfaces from the remaining Ex1A and the majority of Ex1B. Consequently, the total imperviousness of the DSP1 catchments (southern portion of the site) will decrease from 41.3% to 15.34%. This reduction indicates an anticipation of lower peak flow rates in the subsequent drainage modelling. Details of the post-development catchment are tabulated in **table 3**.

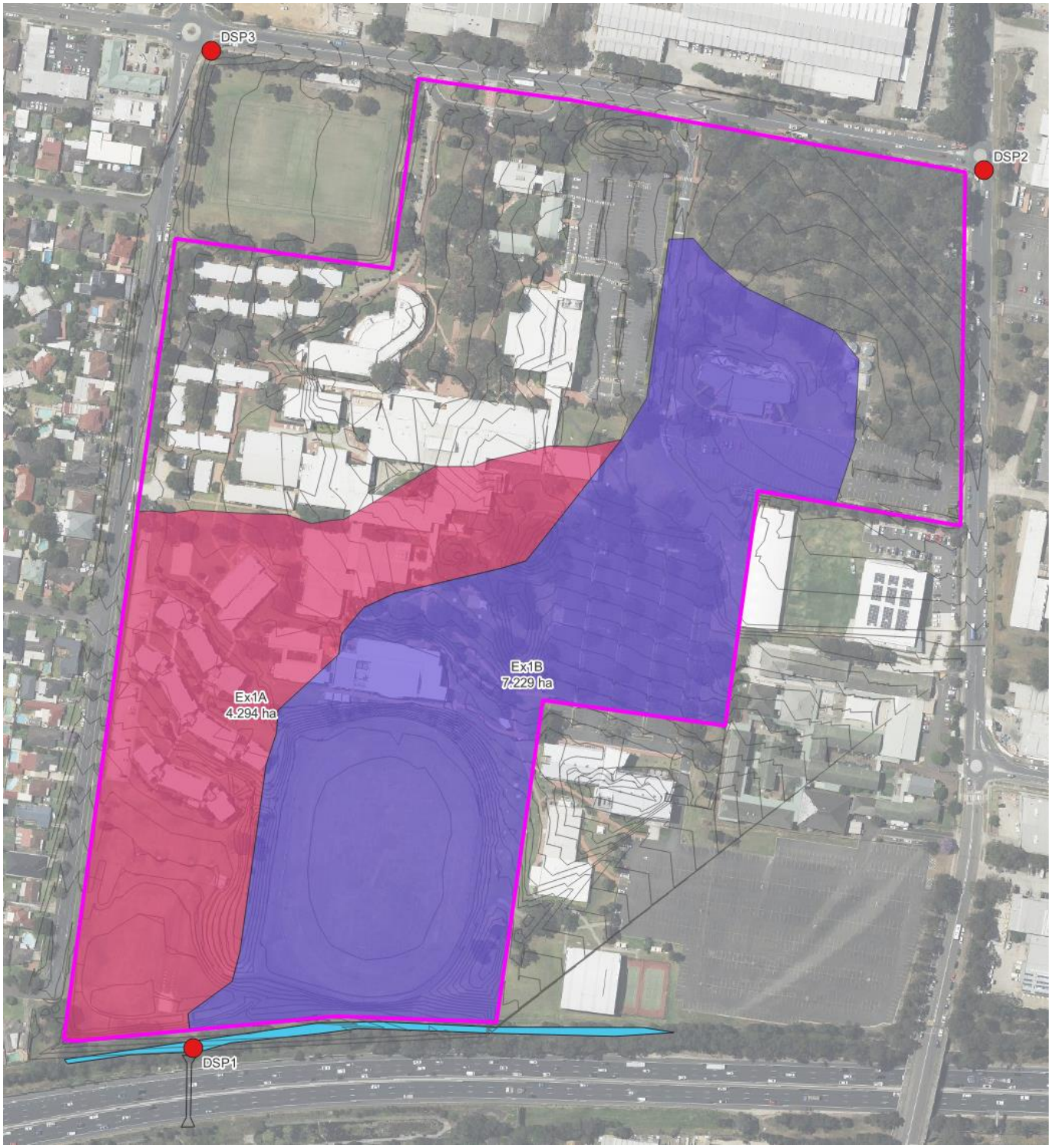


Figure 2: Pre-Development Catchment Plan

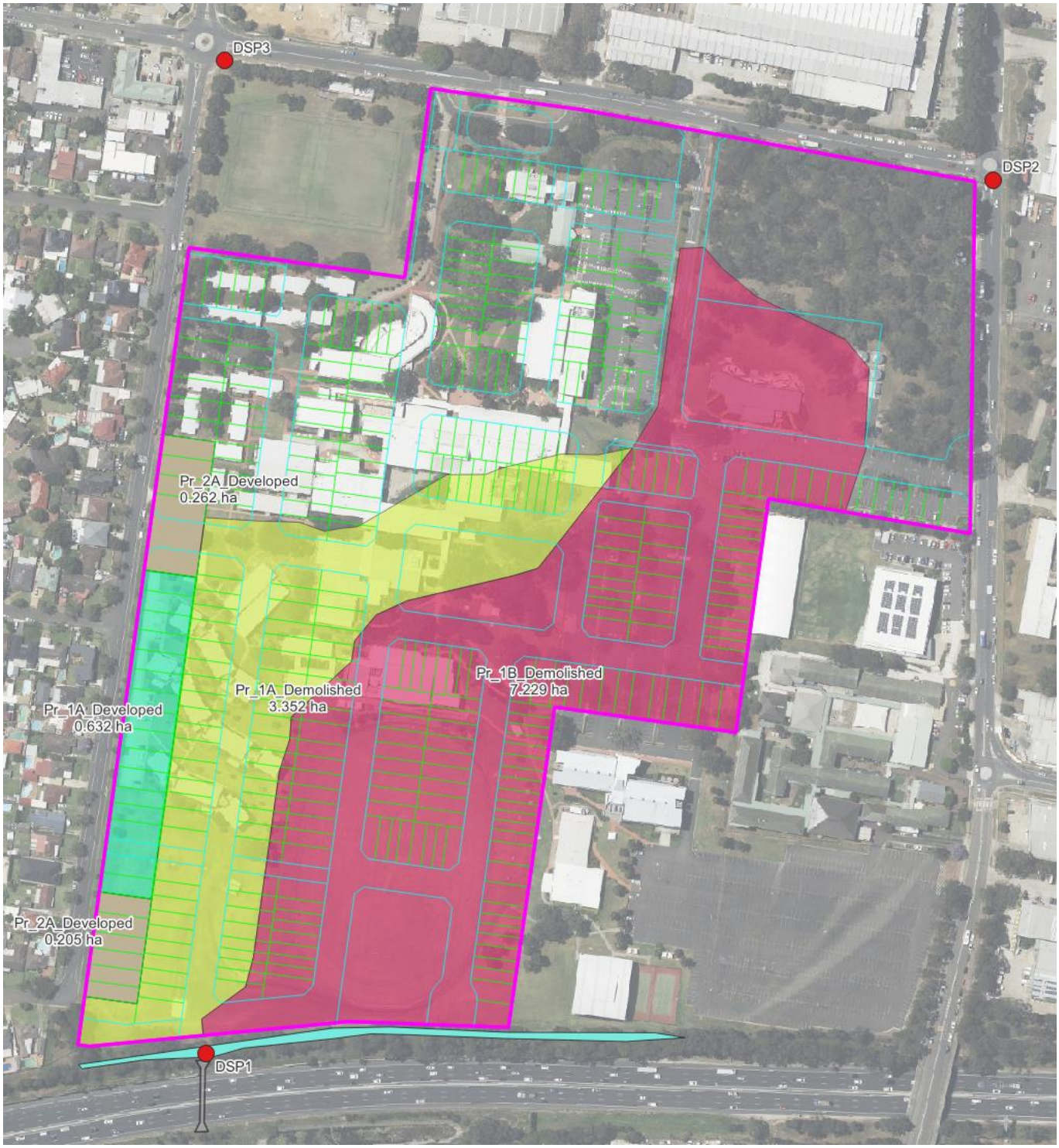


Figure 3: Post-Development catchment Plan

Table 2: Existing Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUSNESS (%)
DSP1	**Ex1A**	4.294	47
	Ex1B	7.229	37.9
	Total Area	11.523	41.3

Table 3: Proposed Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUSNESS (%)
DSP1	**Pr_1A_Developed**	0.632*	85
	Pr_2A_Developed	0.467	86
	Pr_1A_Demolished	3.352	0
	Pr_1B_Demolished	7.229	11.8
	Total Area	11.68	15.34

*Pr_1A_Developed has accounted for the future public reserve (0.029 ha in between lots 1014 and 1015). The area for stage 1 is 0.603 ha. Please refer to Appendix B for lot configuration of Stage 1

3.3. Hydrological modelling Results

3.3.1. Pre-Development Scenario

The existing model was simulated for all nominated design events - a range of storm durations. The critical storm was selected as maximum duration with the temporal pattern just above the median selected from each set of 10 temporal patterns as recommended in the ARR2019 guidelines. Existing critical storm peak flow rates are summarised in **Table 4**. Peak flow rates of 2.49 m^3/s and 3.87 m^3/s were calculated for the 10% and 1% AEP events respectively.

3.3.2. Post-Development Scenario

With the total imperviousness of the DSP1 catchments reduced from 41.3% to 15.34%, and considering the unchanged catchment boundary and flow direction, the peak flow rates have reduced in the hydrological modelling results. Specifically, the peak flow rates have decreased from 2.491 m^3/s and 3.87 m^3s to 1.32 m^3/s and 2.22 m^3/s, in the 10% and 1% AEP respectively. This comparison is detailed in **Table 4**. As a consequence of the demolition activities, including the transformation of 27 residential lots along with the remaining pervious site, the resultant peak flows are anticipated to be lower than those observed under existing conditions. Consequently, an OSD is deemed unnecessary for the Stage 1 and 2 development.

Table 4: Pre Development versus Post Development Peak Flow Rates Comparison

DISCHARGE POINT	10% AEP(m3/s)	1% AEP(m3/s)
Existing DSP1 (Ex1A+ Ex1B)	2.49	3.87
Proposed DSP1(Pr_1A&2A_Developed + Pr_1A_Demolished+ Pr_1B_Demolished)	1.32	2.22
Change (Post minus Pre)	-1.17	-1.65

4. WATER QUALITY MANAGEMENT

4.1. Ultimate Scenario

4.1.1. Water Quality Management Strategy

A stormwater quality treatment train has been assessed utilising the MUSIC software package. Assets within the treatment train have been selected and sized to meet the targets specified in the "Flood and Risk Impact Assessment Report" prepared by J. Wyndham Prince which in turn was based on from the adjacent Liverpool City Council WSUD Technical Guidelines. Targets are as per the below:

- 85% reduction in the post-development mean annual load of Total Suspended Solids (TSS)
- 45% reduction in the post-development mean annual load of Total Nitrogen (TN)
- 65% reduction in the post-development mean annual load of Total Phosphorous (TP)
- 90% reduction in the post-development mean annual load of Gross Pollutants (GP)

The proposed treatment train consists of lot scale rainwater tanks (2 kL RWTs), followed by a temporary bioretention basin.

4.1.2. Model Configuration

Rainfall input into the model was using MUSIC-link file for Liverpool City Council (Clay). The Liverpool City Council MUSIC-link file was implemented due to the proximity to Canterbury Bankstown Council. A conservative estimation of Clay soil has been assumed in the modelling in lieu of the Georges River sandy loam option.

Source node, and RWT inputs into the model have been adopted from Water NSW's Using MUSIC in Sydney's Drinking Water Catchment (2019) or left as recommended model defaults. Design parameters for the temporary bioretention basin have been adopted following the recommendations of Bioretention Technical Design Guidelines (Water by Design, 2014) and Advancing the Design of Stormwater Biofiltration (FAWB, 2008).

The proposed per lot assumptions for Stage 1 and 2 have adopted a total percentage impervious of 85% and are determined as per the following assumptions:

- Roof Area = 300m^2
- Roof Area contributing to Rainwater Tank (RWT) = 75% of the Roof Area
- Roof Area that overflows to drainage system (ex RWT) = 25% of the Roof Area
- Yard area = Lot Area – Roof area
- Effective Impervious of Roof = 100%
- Effective Impervious of Yard = 21 - 26%
- Effective Impervious of Road Reserves = 95%

Inputs into the model are as follows:

- Catchment properties adopted in the model are summarised in **Table 5**.
- Soil parameters in the model are summarised in **Table 6**.
- Pollutant generation parameters are summarised in **Table 7**.
- RWT input parameters are summarised in **Table 8**.
- Bioretention input parameters are summarised in **Table 9**.

Table 5: MUSIC Catchment Properties

								Node Inputs			
Catchment	**Total Catchment Area (ha)**	**Lot Area (ha)**	**No. of Lots**	**Avg Lot Size (m2)**	**Road Reserve Area (ha)**	**Active Open Space (ha)**	**Passive Open Space/RG (ha)**	**Commercial (ha)**	**Roof to RWT (ha)**	**Roof ex RWT (ha)**	**Yard (ha)**	**Effective % Impervious**
Stage 1	0.603	0.603	16	377	0	0	0	0	0.36	0.12	0.123	85.00
Stage 2	0.467	0.407	11	370	0.06	0	0	0	0.25	0.08	0.077	86.28

Table 6: MUSIC Soil Properties

PARAMETER	VALUE
Rainfall Threshold (mm)	0.3
Soil Storage Capacity (mm)	187
Initial Storage (%)	30
Field Capacity (mm)	127
Infiltration Capacity Coefficient A	135
Infiltration Capacity Coefficient B	4
Initial Depth (mm)	10
Daily Recharge Rate (%)	10
Daily Baseflow Rate (%)	10
Daily Deep Seepage Rate (%)	0

Table 7: MUSIC Pollutant Generation Parameters

PARAMETER	ROOF	RESIDENTIAL	SEALED ROAD
TSS Baseflow Mean (Log mg/L)	1.1	1.2	1.2
TSS Baseflow Std Dev (Log mg/L)	0.17	0.17	0.17
TSS Stormflow Mean (Log mg/L)	1.3	2.15	2.43
TSS Stormflow Std Dev (Log mg/L)	0.32	0.32	0.32
TP Baseflow Mean (Log mg/L)	-0.82	-0.85	-0.85
TP Baseflow Std Dev (Log mg/L)	0.19	0.19	0.19
TP Stormflow Mean (Log mg/L)	-0.89	-0.6	-0.3
TP Stormflow Std Dev (Log mg/L)	0.25	0.25	0.25
TN Baseflow Mean (Log mg/L)	0.32	0.11	0.11
TN Baseflow Std Dev (Log mg/L)	0.12	0.12	0.12
TN Stormflow Mean (Log mg/L)	0.3	0.3	0.34
TN Stormflow Std Dev (Log mg/L)	0.19	0.19	0.19

Table 8: Rainwater Tank Parameters

CATCHMENT	NUMBER OF TANKS	VOLUME (L)	TOTAL DAILY DEMAND* (kL/d)	OUTLET PIPE DIAMETER (m)
Stage 1	16	2000 per tank	7.52	0.1 per tank
Stage 2	11	2000 per tank	5.17	0.1 per tank

*Total Daily Demand is based on 0.47kL/d per household lot

Table 9: Bioretention Parameters

PARAMETER	TEMP BASIN
Low Flow Bypass (m^3/s)	0
High Flow Bypass (m^3/s)	100
Extended Detention Depth (m)	0.30
Surface Area (m^2)	675
Filter Area (m^2)	68
Saturated Hydraulic Conductivity (mm/h)	200
Filter Depth (m)	0.40
TN Content of Filter Media (mg/kg)	600
Orthophosphate Content of Filter Media (mg/kg)	30
Base Lined?	No
Unlined Filter Media Perimeter (m)	0.01
Exfiltration Rate (mm/hr)	0
Vegetation Properties	Effective Nutrient Removal Plants
Overflow Weir Width (m)	3.4
Underdrain Present?	Yes
Submerged Zone Present?	No

4.2. Stage 1 & 2

4.2.1. Input and Results

Model setup of Stage 1 and 2 development is presented in **Figure 4** below and results are presented in **Table 10** below. Three catchments comprising of: Roof to RWT, Roof ex RWT and Yard have been utilised for the MUSIC modelling of treatment performance in Stages 1 and 2.

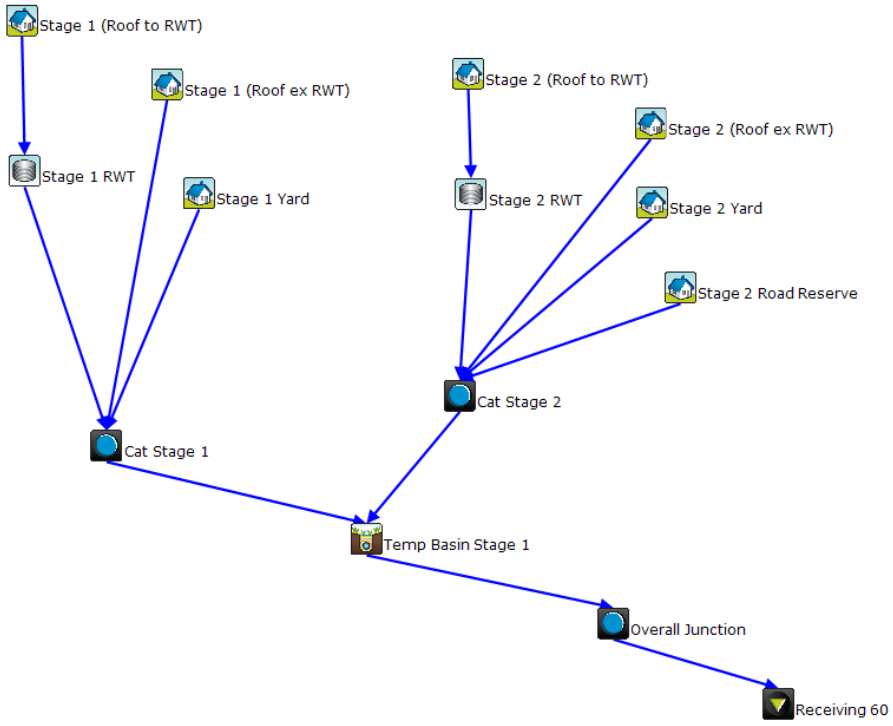


Figure 4: MUSIC treatment Train for Stage 1 and 2

Table 10: Stage 1 & 2 Treatment Train Effectiveness

PARAMETER	SOURCES (kg/yr)	RESIDUAL (kg/yr)	DIFFERENCE (kg/yr)	REDUCTION (%)	WCC TARGET (%)	COMPLIANT?
TSS	288.8	26.87	261.93	90.7	85	Yes
TP	1.203	0.1909	1.01	84.12	65	Yes
TN	16.03	4.079	11.95	74.55	45	Yes
GP	200.1	0	200.1	100	90	Yes

4.2.2. Soil and water management during construction

During construction, water quality is a major concern. As a result, sediment, and erosion controls such as sediment fencing, and straw bales must be used as minimum control and located entirely on the downstream side of the subject property.

The Stage 1 and 2 concept civil engineering plans show the location of the sediment fencing and a 1.8m high barrier fencing around the site. In addition, it is proposed that each pit in the Ashford Avenue will contain a kerb inlet sediment trap while sand filled hessian socks will be located in the kerb to help filter our sediment from stormwater being conveyed by the gutter. The common drainage surface inlet pits will also contain a geofabric filter. The existing sediment basin installed for the demolition will be maintained and be used during the Stage 1 and 2 works. Dirty water will be diverted via a 'V' Drain or mound and directed into the temporary sediment basin. This should be

flocculated after every rain event and once clean, the water should be pumped on to the large grassed area immediately east to evaporate or eventually drain into the M5 corridor.

It is reinforced that Sediment and Erosion Control will need to be implemented and maintained throughout the construction phase of the project. It is an evolving plan that needs to vary as site conditions dictate. It is noted that any site amendments should be done in conjunction with Council.

The sediment basin was sized according to the principles of Volume 1 of the Managing Urban Stormwater – Soils and Construction, otherwise referred to as the Bluebook. The total volume of this sediment basin was calculated to be 228 m^3 using a spreadsheet that can be referred to in **Appendix F**.

5. FLOODPLAIN MANAGEMENT

5.1. Compensatory Storage

Noting that the JWP report identified that there are no adverse flood level impacts external to the site in the 1% AEP event, a further compensatory storage assessment of the site under both existing and developed conditions for Stage 1 and 2 was prepared to ensure that adequate compensatory flood storage was provided.

The compensatory storage assessment was undertaken in 12D and is documented in **Appendix C** – Plan of Compensatory Storage assessment. The 12D modelling assessed all surface levels and volume between RL 3.00 (lowest part of the site under existing conditions) and the 1%AEP flood level of RL 5.55 for both the pre-development and post-development conditions. A summary of the compensatory storage volumes is tabulated below in **Table 11**.

Table 11: Compensatory Storage Comparison

SCENARIO	VOLUME
Pre-development Flood Storage	6400m^3
Post-development Stage 1 & 2 Flood Storage	6872m^3 (Temp Sediment Basin for demolition)
Balance	472 m^3

In summary, the temporary sediment basin being constructed as part of the demolition DA and as modified to include the temporary raingarden at the completion of Stage 1 and 2 will provide approximate 472m^3 of excess compensatory flood storage.

While this is temporary and will be modified as part of the overall masterplan development, this demonstrates that Stage 1 and 2 will not be required to provide any additional drainage.

6. CONCLUSIONS AND RECOMMENDATIONS

The water cycle management strategy outlined in this report has been prepared in support of the Stage 1 and 2 development which involves the creation of 27 residential lots along Ashford Avenue as well as the demolition of the existing buildings of the site.

This report provides the following conclusions and recommendations:

Stage 1 & 2

- The existing temporary sediment basin being used during the demolition of the structures and impervious surfaces on site as part of DA1512/2023 is to be utilised for temporary sediment control during the development of Stage 1 and 2. All 'dirty' water is to be directed to the basin.
- The Stage 1 and 2 development contains significantly less impervious surfaces than what the WSU campus had under existing conditions prior to the demolition of the buildings. This results in less peak flows than under existing conditions meaning that the Stage 1 and 2 development does not require any OSD control. A DRAINS model was prepared to demonstrate the reduction in peak flows.
- A MUSIC model was prepared to determine whether any WSUD measures are required for the Stage 1 and 2 development. The MUSIC model assessed stormwater from each of the lots only as the existing footpath in Ashford Road is existing and falls to the existing drainage system. It has been assumed that 75% of the roof water from each lot drains to a 2kL rainwater tank for reuse while the remaining 25% overflows to the common drainage system and flows downstream to a temporary raingarden containing a 68m^2 media area. The modelling found that this treatment train meets Council's water quality objectives to improve the stormwater runoff from the 27 lots in Stage 1 and 2.
- Stage 1 and 2 does not complete any filling within any portion of the site that has an existing ground level less than RL5.55 (Regional 1%AEP Flood Level). As a result, no portion of the flood plain is being filled and therefore no compensatory storage is required under Stage 1 and 2.

The proposed Water Cycle Management Strategy meets the following objectives:

- There are no detrimental offsite impacts as a result from the proposed development,
- There is no increase in flood levels, and flow rates as a result of this development,
- Compensatory Storage has been provided,
- OSD is not required and treatment design requirements have been met for Stage 1 and 2 as per CBC council requirements.

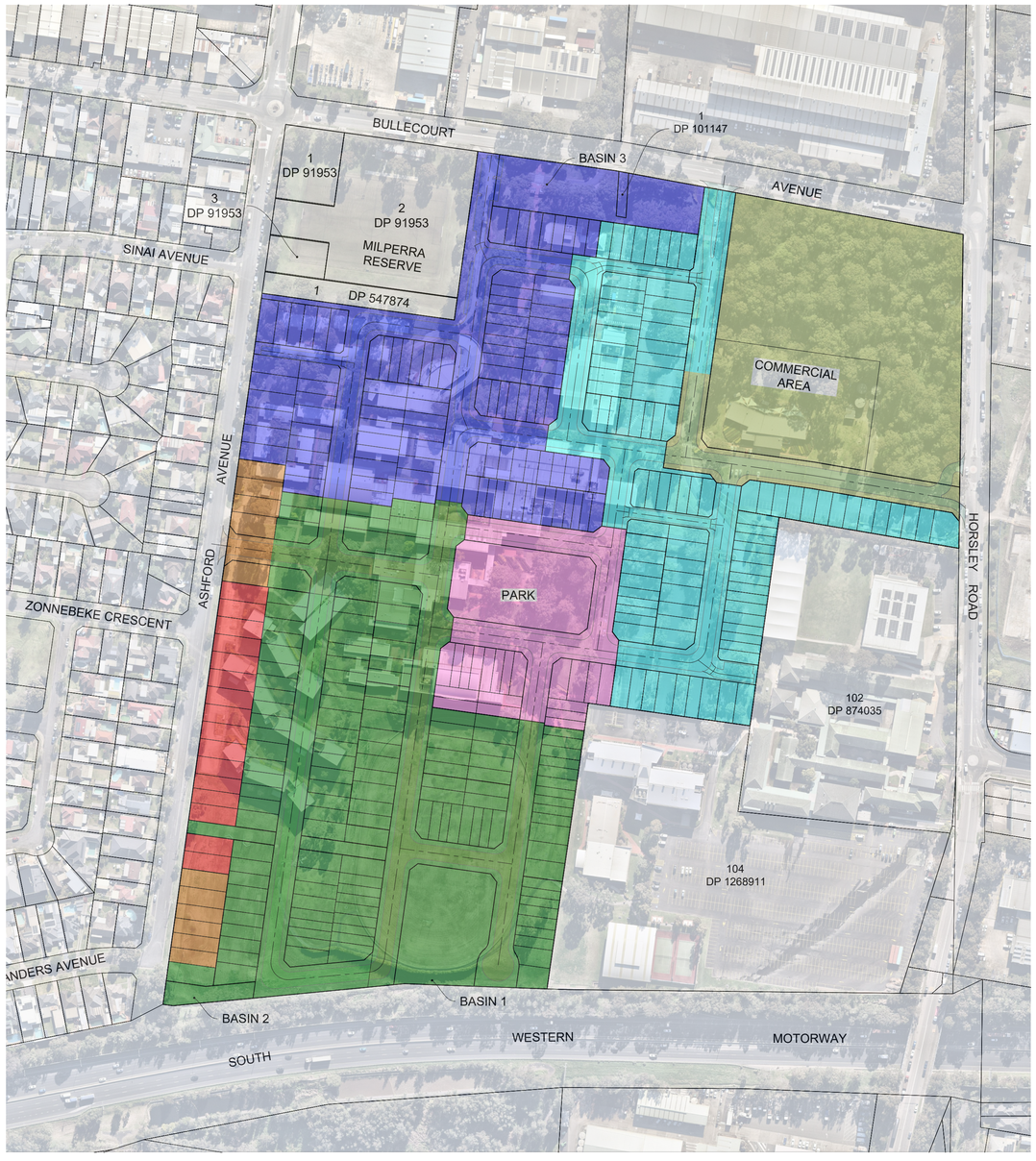
In summary, the proposed development achieves all stormwater objectives in Council's DCP and all impacts (temporary or permanent) can be mitigated as part of the detailed design process.

Prepared by

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Frank Guo
Senior Water Resources Engineer
GuoF@bevwill.com.au

APPENDIX A: OVERALL STAGING PLAN



Stage No.	No. of Superlots Lots	No. of Residential Lots	No. of Public/Drainage Reserve Lots	Stage Area (m²)
Stage 1	0	16	0	6030
Stage 2	0	11	0	4690
Stage 3	10	135	2	61674
Stage 4	2	19	1	15108
Stage 5	9	96	0	35176
Stage 6	9	105	1	40385
Commercial	1	0	0	33340

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E	STAGE 4 & 5 BOUNDARY MODIFIED	13.06.24	S.G.	S.G.
D	LAYOUT MODIFIED	23.05.24	S.G.	S.G.
C	STAGE 1 BOUNDARIES	31.01.24	S.G.	S.G.
B	STAGE 1 LIMITS UPDATED	22.01.24	S.G.	S.G.
A	ISSUED FOR INFORMATION	15.12.23	D.H.	S.G.

REV	DESCRIPTION	DATE	DRN.	APP.
G	REVISED STAGING ADDITION OF COMMERCIAL AREA	29.08.24	AA	S.G.
F	REVISED STAGING ADDITION OF STAGE 6	09.08.24	AA	S.G.

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Designed S. GRAY
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Drawn D. HALL
Approved N/A
Date N/A
DA Number N/A

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2 BULLECOURT AVE, MILPERRA
CANTERBURY-BANKSTOWN COUNCIL

Drawing Title: STAGING PLAN

Sheet 01 of 01
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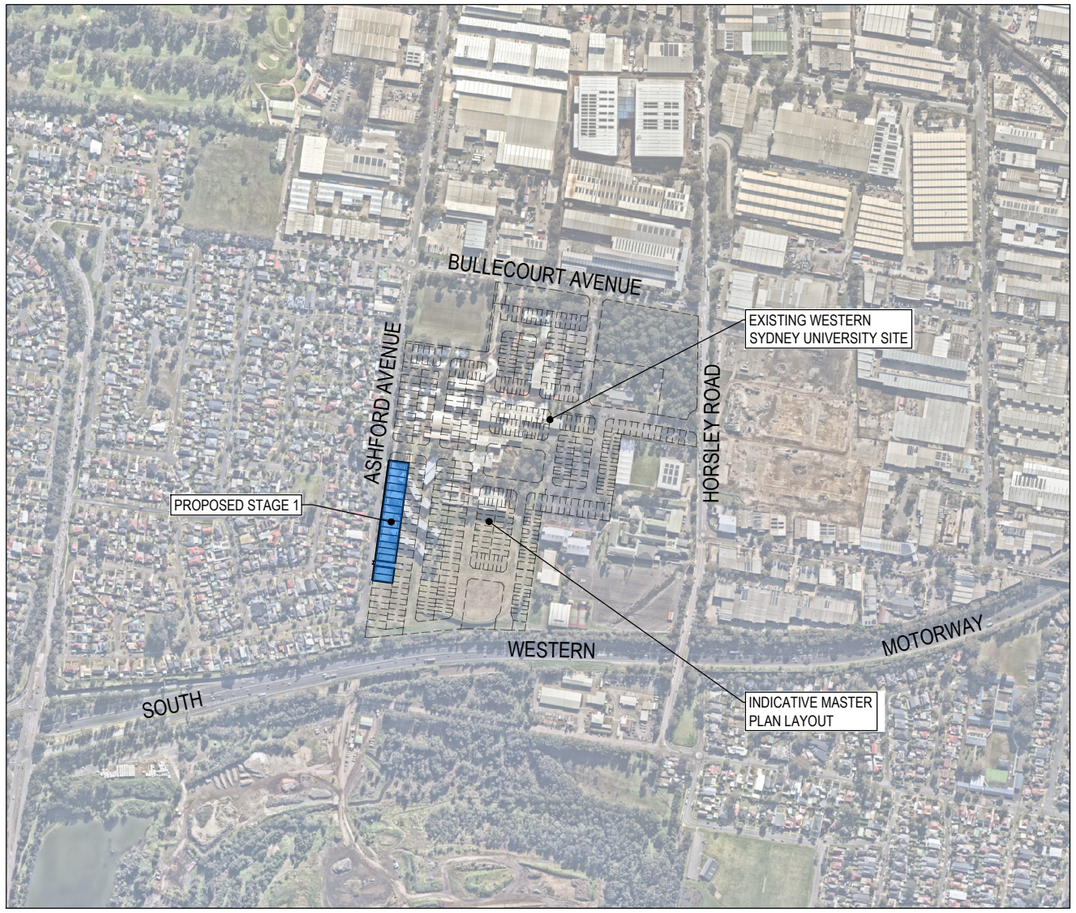
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2301879	302	010	G

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APPENDIX B: 2301879-303-DA_REV C & 2301879-307-DA_REV A

WSU MILPERRA

CONCEPT CIVIL ENGINEERING PLANS TO SUPPORT THE STAGE 1 SUBDIVISION
LOT 2 IN DP1291984 - 2 BULLECOURT AVENUE, MILPERRA
CANTERBURY-BANKSTOWN COUNCIL
MIRVAC HOMES (NSW) PTY LTD



SITE PLAN

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DRAWING INDEX

Sheet No.	DRAWING No.	TITLE	REVISION
1	2301879 - 303 - 001	COVER SHEET	C
2	2301879 - 303 - 002	DEMOLITION PLAN	C
3	2301879 - 303 - 011	LAYOUT PLAN	C
4	2301879 - 303 - 012	BULK EARTHWORKS AND LOT BENCHING PLAN	C
5	2301879 - 303 - 101	ASHFORD AVENUE BACK OF KERB - LONGITUDINAL SECTION - & TYPICAL CROSS SECTION	C
6	2301879 - 303 - 201	LOT CROSS SECTIONS - SHEET 1 OF 5	C
7	2301879 - 303 - 202	LOT CROSS SECTIONS - SHEET 2 OF 5	C
8	2301879 - 303 - 203	LOT CROSS SECTIONS - SHEET 3 OF 5	C
9	2301879 - 303 - 204	LOT CROSS SECTIONS - SHEET 4 OF 5	C
10	2301879 - 303 - 205	LOT CROSS SECTIONS - SHEET 5 OF 5	C
11	2301879 - 303 - 301	DETENTION BASIN LAYOUT PLAN	C
12	2301879 - 303 - 401	SOIL AND WATER MANAGEMENT PLAN - OVERALL PLAN	C
13	2301879 - 303 - 402	SOIL AND WATER MANAGEMENT PLAN - STAGE 1 PLAN	C
14	2301879 - 303 - 403	SOIL AND WATER MANAGEMENT PLAN - DETAILS & NOTES	C

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A	ISSUED TO CLIENT FOR REVIEW	06.03.24	JB	SG

REV	DESCRIPTION	DATE	DRN.	APP.

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Designed S. FERGUSON
Date 08.03.2024
Drawn J. BIRD
Approved S. GRAY
Date 08.03.2024
DA Number -

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STAGE 1 SUBDIVISION

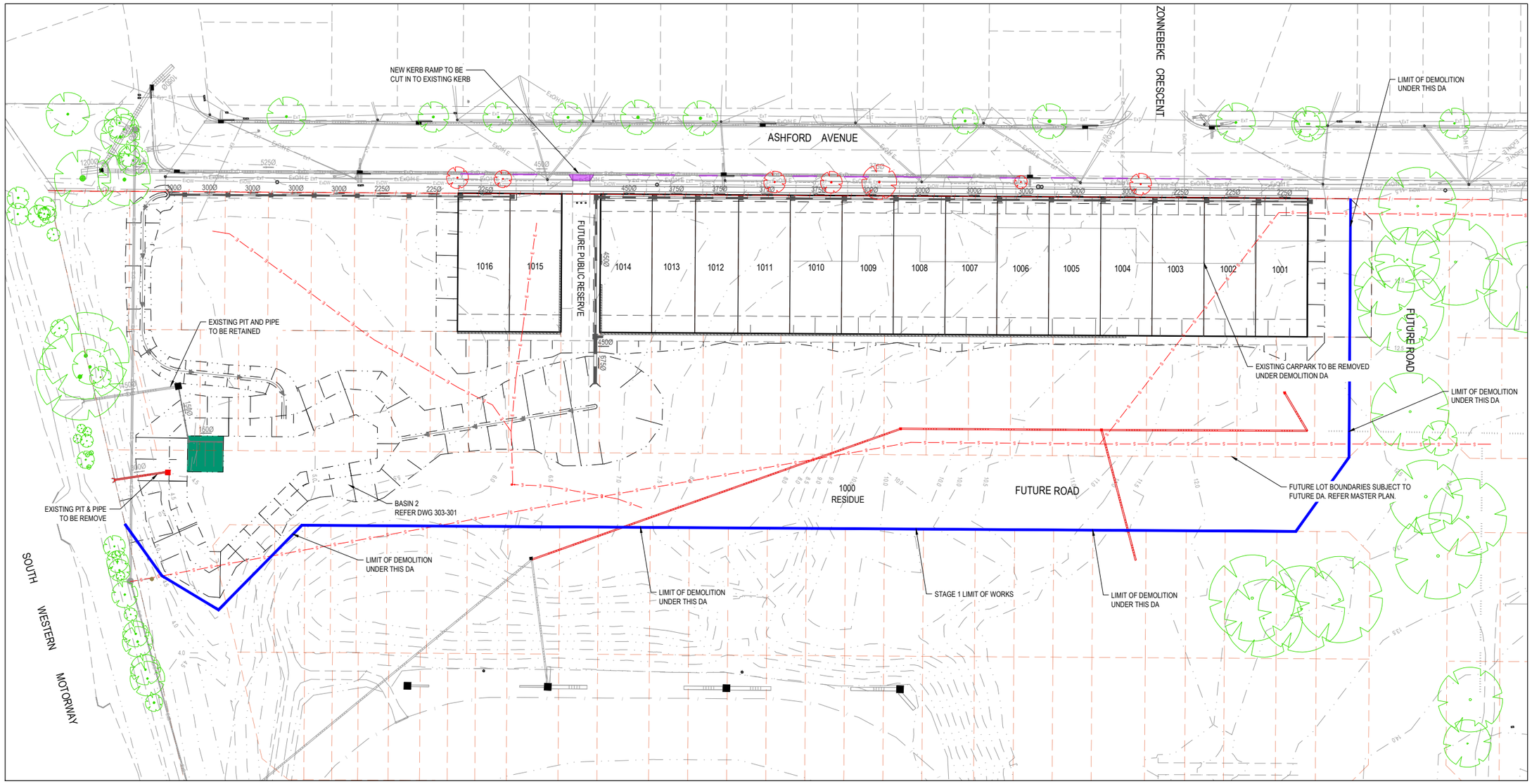
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Sheet 01 of 14

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LEGEND - DEMOLITION PLAN PLAN

- EXISTING TREE TO BE RETAINED UNLESS IMPACTED BY UNDERGROUND ELECTRICAL WORKS
- EXISTING TREE TO BE RETAINED
- EXISTING STORMWATER PIT/PIPE TO BE REMOVED
- EXISTING ELECTRICITY TO BE REMOVED
- EXISTING SEWER TO BE REMOVED
- EXISTING FENCE TO BE REMOVED

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Date	08.03.2024
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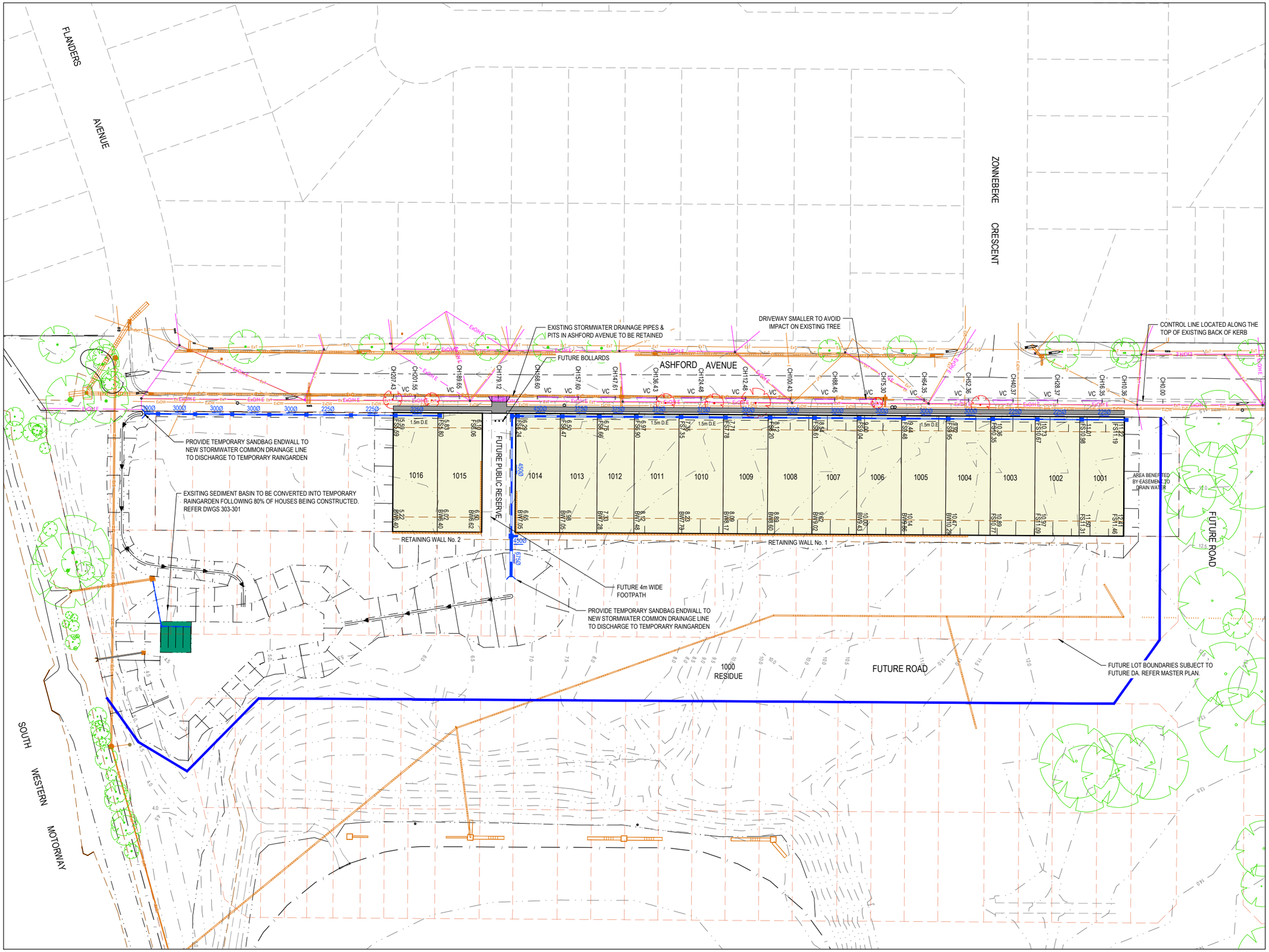
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Drawing Title	DEMOLITION PLAN

Sheet 02 of 14

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Project Number	Reference	Drawing No	Revision
2301879	303	002	C

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LEGEND - LAYOUT PLAN

- STORMWATER DRAIN, PIT & PROPERTY INLET
- SWALE DRAIN
- SEWER & MAINTENANCE STRUCTURES
- HOUSE DRAIN
- SERVICE CONDUITS
- TACTILE PAVERS (INDICATIVE ONLY)
- ELECTRICITY (UNDERGROUND)
- ELECTRICITY (OVERHEAD)
- OPTIC FIBRE
- TELECOMMUNICATIONS
- GAS
- WATER
- RECYCLED WATER
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING RECYCLED WATER
- EXISTING STORMWATER DRAIN
- EXISTING SEWER
- EXISTING HOUSE DRAIN
- EXISTING SWALE DRAIN
- 141.34 EXISTING SURFACE LEVEL
- FS140.35 FINISHED BUILDING LINE LEVEL
- FR157.40 FINISHED RIDGE LINE LEVEL
- TW159.30 TOP OF RETAINING WALL
- BW159.30 BOTTOM OF RETAINING WALL
- RIDGE LINE
- RETAINING WALL
- ZERO LOT LINES
- PAVEMENT TREATMENT
- STRUCTURAL FILL > 200mm DEEP
- EX. STRUCTURAL FILL > 200mm DEEP
- DIRECTION OF FALL
- OVERLAND FLOW
- ALLOTMENT TO BE GRADED EVENLY IN DIRECTION OF FALL TO LEVELS INDICATED
- CONCRETE EDGE STRIP WITH SUBSOIL DRAIN, "NO ROAD" SIGN & BARRIER
- LIMIT OF WORKS
- EXISTING TREE TO BE RETAINED UNLESS IMPACTED BY UNDERGROUND ELECTRICAL WORKS
- EXISTING TREE TO BE RETAINED
- PERMANENT SURVEY MARK
- TEMPORARY BENCH MARK
- PROPOSED DRIVEWAY
- TREE PROTECTION ZONE (TPZ)
- VC — NEW LAYBACK TO BE CUT IN TO EXISTING KERB FOR FUTURE DRIVEWAY. ALL NEW DRIVEWAYS TO BE 4m WIDE WITH EXCEPTION TO LOTS 1006, 1012 & 1013. LOTS 1006, 1012 & 1013 DRIVEWAYS TO BE 3m WIDE.
- RAINGARDEN

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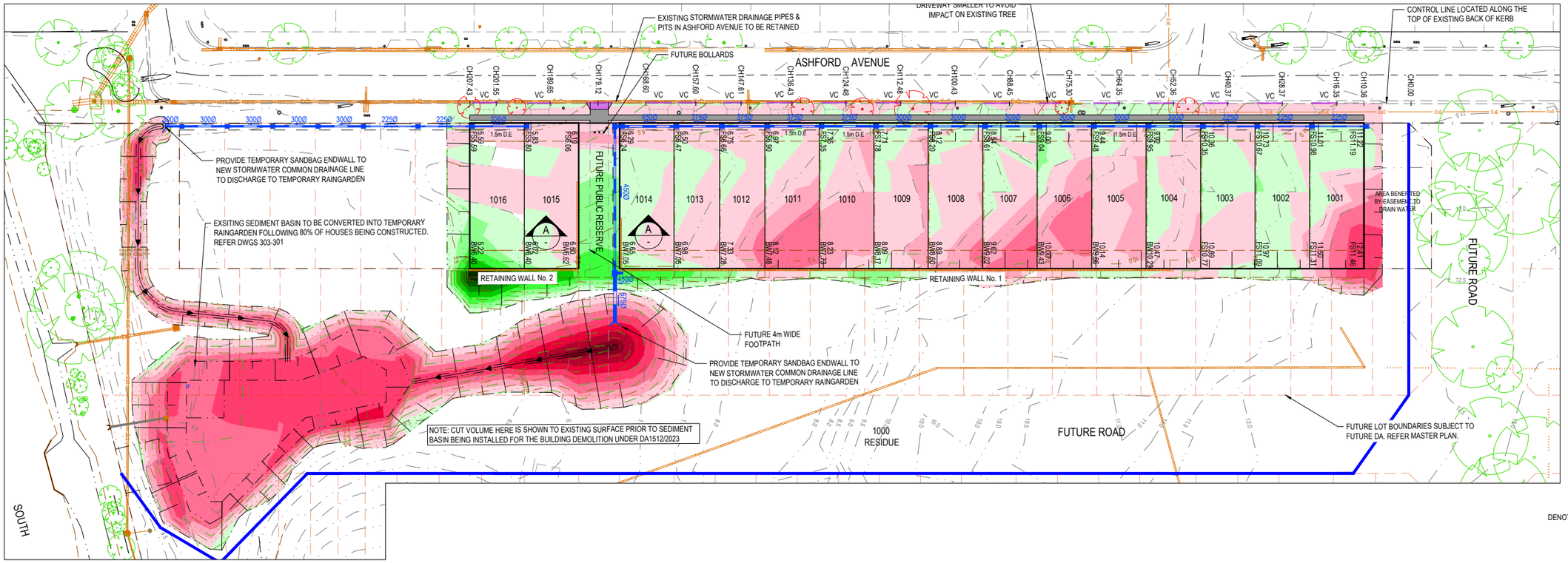
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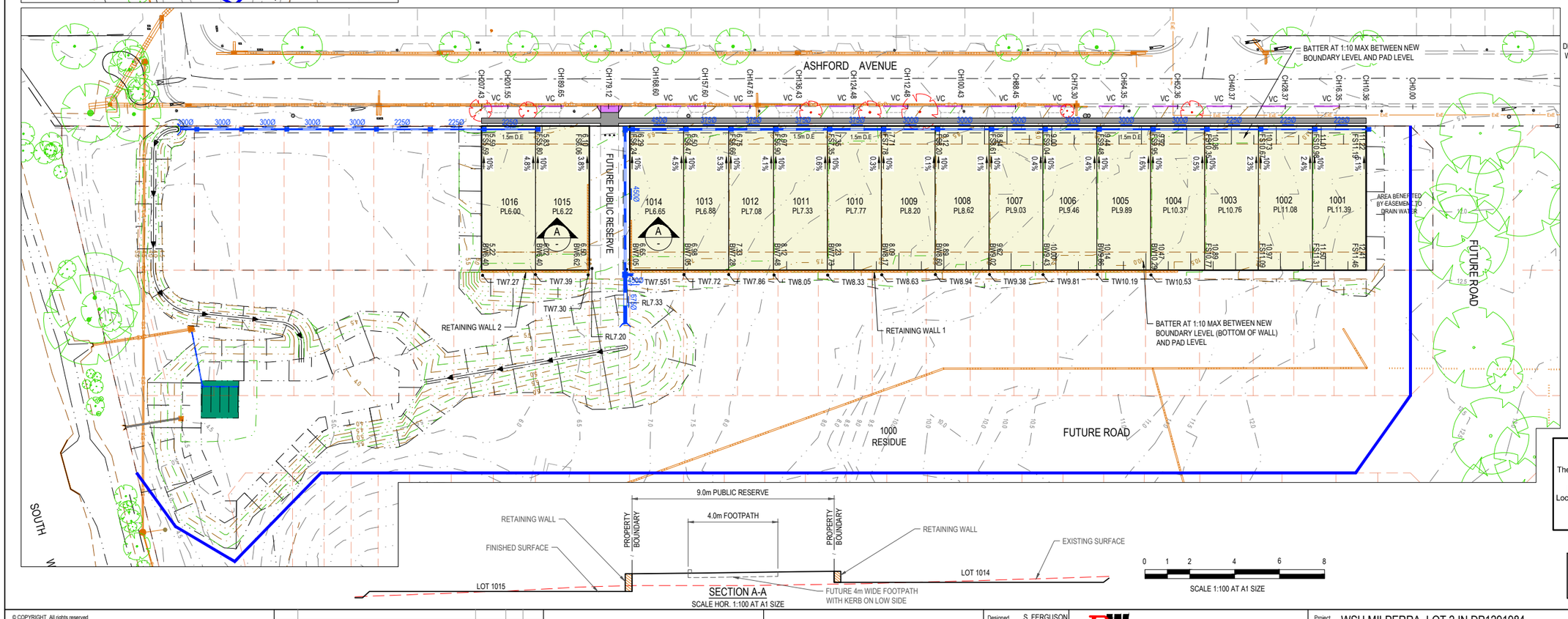
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SECTION A-A
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SCALE 1:100 AT A1 SIZE

CUT AND FILL LEGEND

DEPTH RANGE (m)		COLOUR
>1.8m CUT		
-1.8	-1.5	
-1.5	-1.2	
-1.2	-0.9	
-0.9	-0.6	
-0.6	-0.3	
-0.3	0.0	
0.0	0.3	
0.3	0.6	
0.6	0.9	
0.9	1.2	
1.2	1.5	
1.5	1.8	
1.8	2.1	
2.1	2.4	
2.4	2.7	
>2.7m FILL		

CUT

FILL

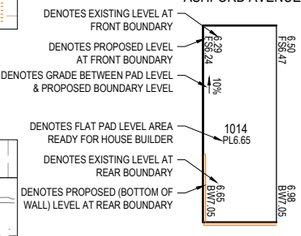
APPROXIMATE EARTHWORKS VOLUMES:

CUT - 3,756m³
FILL - 640m³

BALANCE - 3,116m³ OF CUT

* THIS ESTIMATE IS BASED ON SURFACE TO SURFACE MODELLING ONLY AND IS SUBJECT TO FINAL DESIGNS

ASHFORD AVENUE



LOT LEVEL LEGEND

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Date	08.03.2024
Drawn	J. BIRD
Approved	S. GRAY
Date	08.03.2024
DA Number	-

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STAGE 1 SUBDIVISION

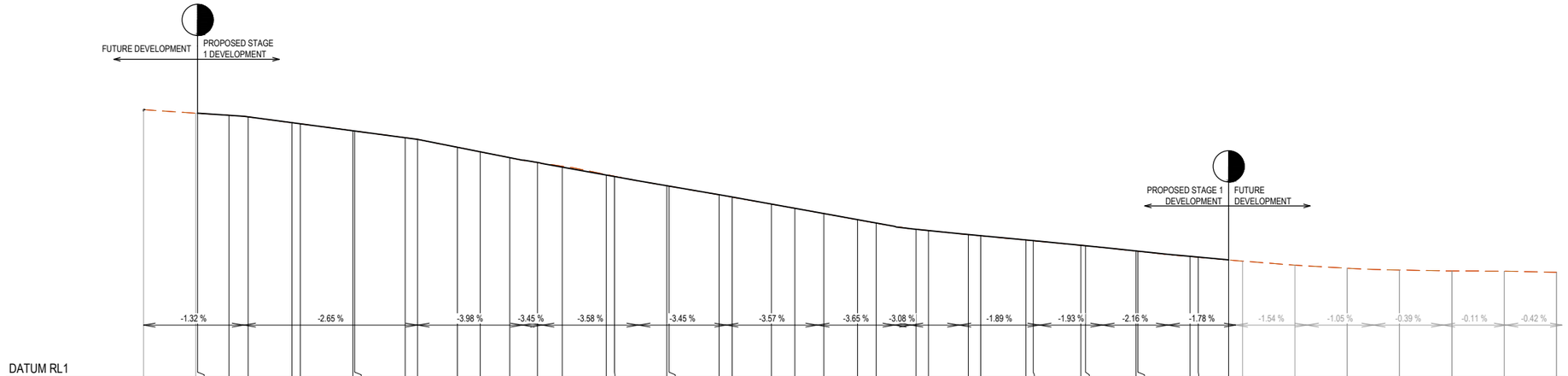
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Sheet 04 of 14
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DESIGN LINE



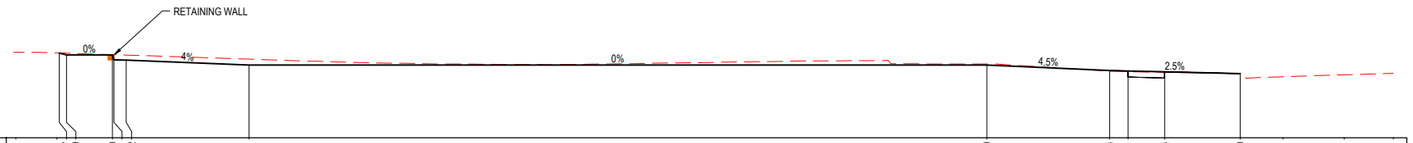
DATUM RL1

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LEGEND

EXISTING SURFACE

DESIGN SURFACE



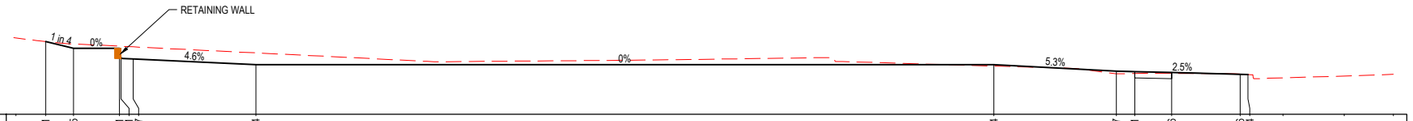
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LEGEND

EXISTING SURFACE

DESIGN SURFACE



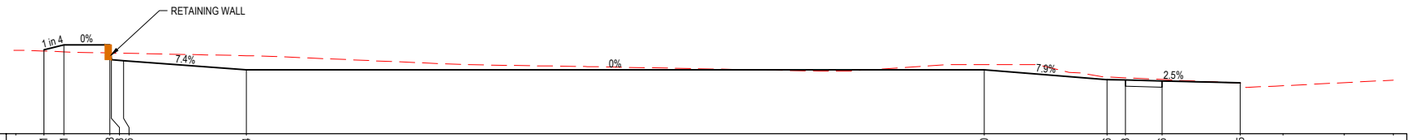
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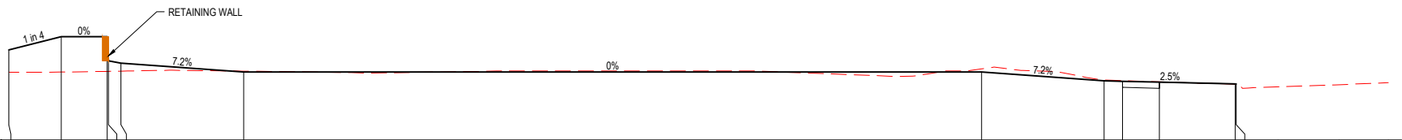
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LEGEND

EXISTING SURFACE

DESIGN SURFACE



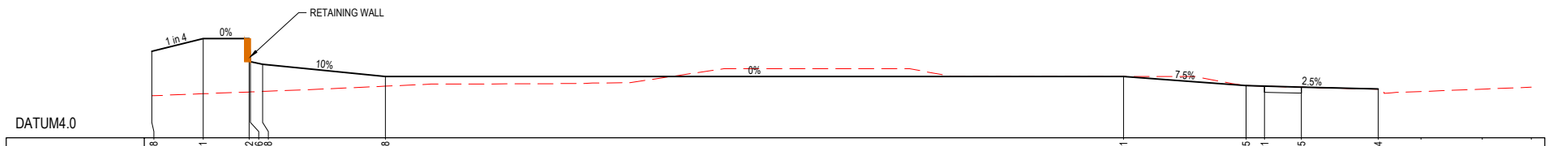
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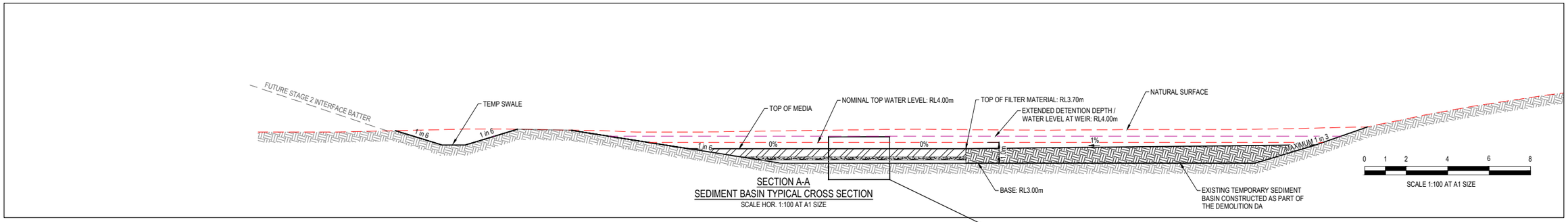
EXISTING SURFACE

DESIGN SURFACE

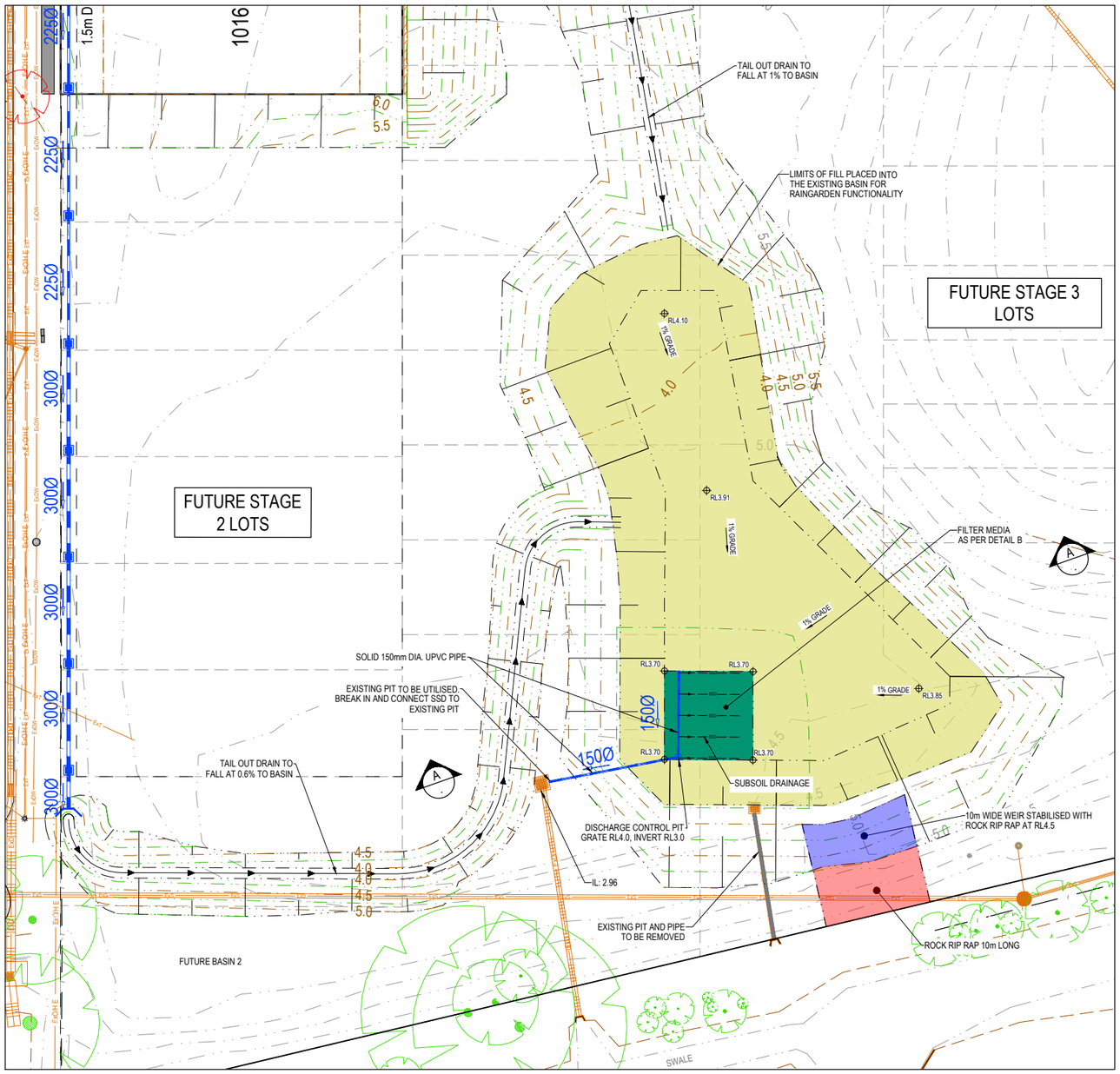


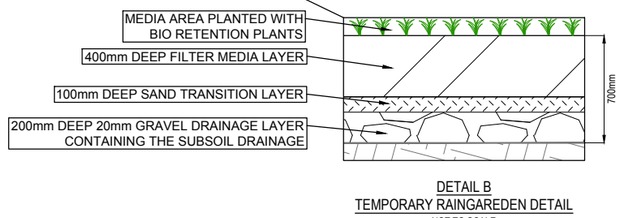
DATUM4.0

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SECTION A-A
SEDIMENT BASIN TYPICAL CROSS SECTION
SCALE HOR. 1:100 AT A1 SIZE





DETAIL B
TEMPORARY RAINGAREDEN DETAIL
NOT TO SCALE

WARNING
BEWARE OF UNDERGROUND SERVICES
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REV	DESCRIPTION	DATE	DRN.	APP.
C	DRAWINGS REVISED	13.09.24	R.G	S.G
B	TEMPORARY BASIN & DRAINAGE AMENDED	23.05.24	S.F.	S.G.
A	ISSUED TO CLIENT FOR REVIEW	08.03.24	JB	SG

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0 2.5 5 10 15 20
SCALE 1:250 AT A1 SIZE

Designed	S. FERGUSON
Date	08.03.2024
Drawn	J. BIRD
Approved	S. GRAY
Date	08.03.2024
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way Oran Park NSW 2570
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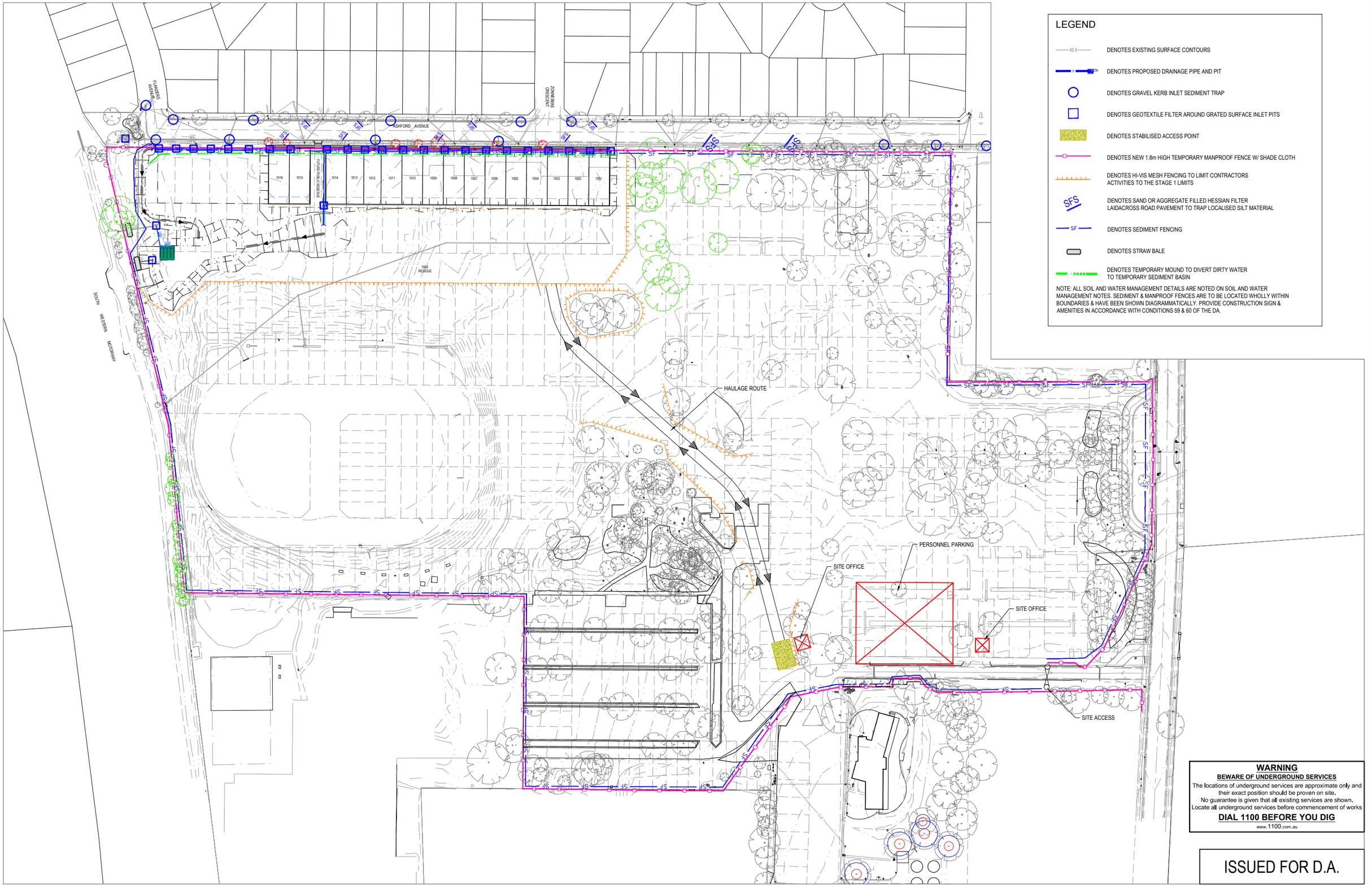
Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 1 SUBDIVISION

Drawing Title: DETENTION BASIN LAYOUT PLAN

Sheet 11 of 14
Scale 1:250 @ A1

Project Number	Reference	Drawing No	Revision
2301879	303	301	C

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LEGEND

- 45.5 — DENOTES EXISTING SURFACE CONTOURS
- DENOTES PROPOSED DRAINAGE PIPE AND PIT
- DENOTES GRAVEL KERB INLET SEDIMENT TRAP
- DENOTES GEOTEXTILE FILTER AROUND GRATED SURFACE INLET PITS
- DENOTES STABILISED ACCESS POINT
- DENOTES NEW 1.8m HIGH TEMPORARY MANPROOF FENCE W/ SHADE CLOTH
- DENOTES HI-VIS MESH FENCING TO LIMIT CONTRACTORS ACTIVITIES TO THE STAGE 1 LIMITS
- SFS — DENOTES SAND OR AGGREGATE FILLED HESSIAN FILTER LAIDACROSS ROAD PAVEMENT TO TRAP LOCALISED SILT MATERIAL
- SF — DENOTES SEDIMENT FENCING
- DENOTES STRAW BALE
- DENOTES TEMPORARY MOUND TO DIVERT DIRTY WATER TO TEMPORARY SEDIMENT BASIN

NOTE: ALL SOIL AND WATER MANAGEMENT DETAILS ARE NOTED ON SOIL AND WATER MANAGEMENT NOTES. SEDIMENT & MANPROOF FENCES ARE TO BE LOCATED WHOLLY WITHIN BOUNDARIES & HAVE BEEN SHOWN DIAGRAMMATICALLY. PROVIDE CONSTRUCTION SIGN & AMENITIES IN ACCORDANCE WITH CONDITIONS 59 & 60 OF THE DA.

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REV	DESCRIPTION	DATE	DRN.	APP.

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0 10 20 40 60 80
SCALE 1:1000 AT A1 SIZE

Designed	S. FERGUSON
Date	08.03.2024
Drawn	J. BIRD
Approved	S. GRAY
Date	08.03.2024
DA Number	-

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Development & Infrastructure Consultants
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Oran Park NSW 2570
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Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 1 SUBDIVISION

Drawing Title: SOIL AND WATER MANAGEMENT PLAN
OVERALL PLAN

Sheet 12 of 14
Scale 1:1000 @ A1

Project Number	Reference	Drawing No	Revision
2301879	303	401	C

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1. Erosion Hazard and Sediment Basins

Site Name: WSU Milperra

Site Location: 2 Bullecourt Ave, Milperra

Precinct/Stage: Stage 1 & 2 Subdivision

Other Details:

Site area	Sub-catchment or Name of Structure: Temp. Basin 1						Notes
Total catchment area (ha)	2.841						
Disturbed catchment area (ha)	2.841						

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D if known)	F						From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	33						Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	33						
% clay (fraction finer than 0.002 mm)	33						
Dispersion percentage	10.0						E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	4.95						See Section 6.3.3(e). Auto-calculated
Soil Texture Group	F						Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5						See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25
Design rainfall depth (percentile)	75						
x-day, y-percentile rainfall event (mm)	19.4						
Rainfall R-factor (if known)	2600						Only need to enter one or the other here
IFD 2-year, 6-hour storm (if known)	8.3						

RUSLE Factors

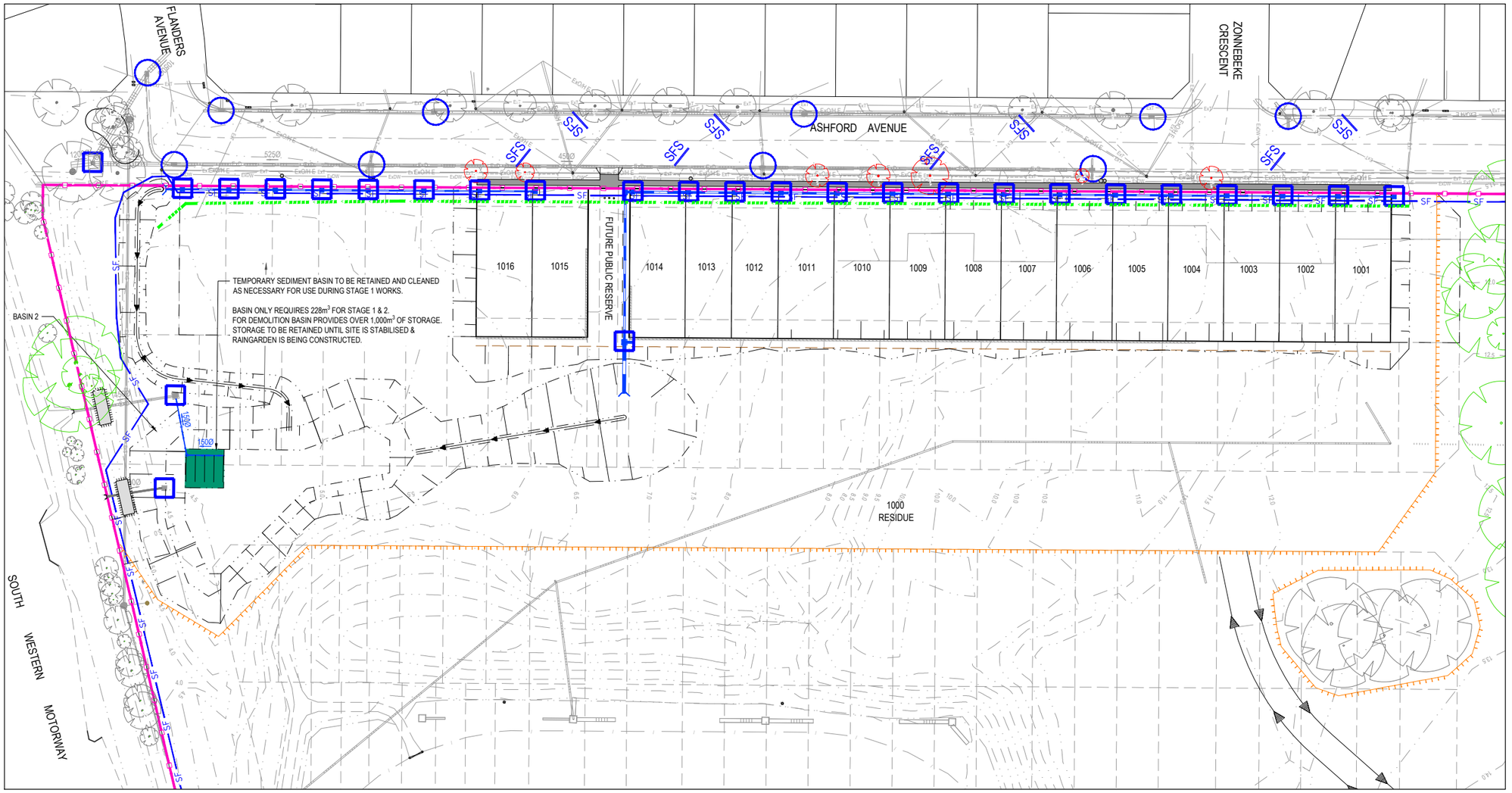
Rainfall erosivity (R-factor)	2600						Auto-filled from above
Soil erodibility (K-factor)	0.038						
Slope length (m)	200						
Slope gradient (%)	2.4						RUSLE LS factor calculated for a high rill/interrill ratio
Length/gradient (LS -factor)	0.74						
Erosion control practice (P-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (C-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2	2	2	2	2	2	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.35						See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	96						
Soil Loss Class	1						See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	73						Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	95						See Sections 6.3.4(b) for calculations
Sediment basin settling (water) volume (m^3)	193						See Sections 6.3.4(b) for calculations
Sediment basin total volume (m^3)	229						



LEGEND

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SEDIMENT BASIN

1. THE CONTRACTOR IS TO ENSURE STORMWATER RUNOFF IS DIRECTED TO THE SEDIMENT BASIN WITH PLACEMENT OF TEMPORARY DIVERSION MOUNDS OR THE FORMATION OF OVERLAND FLOW PATHS.
2. DIVERSION MOUNDS & FLOW PATHS ARE TO BE ADJUSTED AS FILLING LAYERS PROGRESS & SURFACE LEVELS RISE.
3 SEDIMENT IS TO BE REMOVED SUCH THAT NOT LESS THAN 70% OF THE DESIGN CAPACITY IS AVAILABLE AT ALL TIMES MARKERS WITH DEPTH INDICATORS ARE TO BE PLACED IN EACH BASIN TO INDICATE WHEN SEDIMENT ACCUMULATION EXCEEDS 30% OF STORAGE REQUIREMENTS.
4.BASINS ARE TO BE FLOCCULATED WITH GYPSUM WHEN SUSPENDED SOLID CONCENTRATION EXCEEDS 50 *milligrams per litre*. SPREADING RATE TO BE DETERMINED AFTER TESTING AND ANALYSIS OF THE INITIAL STORM EVENT. FIRST APPLICATION IS TO BE *30 kilograms GYPSUM PER 100 cum.* OF STORED WATER & THEREAFTER AS DETERMINED BY TESTING. PUMP OUT TO GOLF COURSE DAM WITHIN 72 hrs OF TREATMENT. REFER LANDCOM SOIL & CONSTRUCTION - "MANAGING URBAN STORMWATER" MANUAL - APPENDIX E
6. UPON ADEQUATE SITE REVEGETATION & COUNCIL APPROVAL SEDIMENT BASIN IS TO BE DECOMMISSIONED & CONVERTED INTO RAINGARDENS PER DESIGN.

CONSTRUCTION SEQUENCE

FOLLOWING INSTALLATION OF THE SEDIMENT BASIN AND EROSION CONTROLS AND REMEDIATION OF THE AREA:
1.ALL TOPSOIL CONTAINING VEGETATION TO BE STRIPPED FROM EXISTING SURFACE & STOCKPILED FOR RESPREADING FOLLOWING COMPLETION OF EARTHWORKS. (APPROX. 75mm THICK)
2. STRIPPED SURFACE TO BE INSPECTED & CERTIFIED READY FOR FILL PLACEMENT BY GEOTECHNICAL ENGINEER.
3. COMPLETE INITIAL EARTHWORKS IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S REPORT
4. IMPORTED FILL TO BE CERTIFIED AS V.E.N.M. & FREE OF SLAG, HAZARDOUS, CONTAMINATED, TOXIC, PUTRESCIBLE OR RADIO-ACTIVE MATTER & INDUSTRIAL WASTE & BUILDING DEBRIS. THE ORIGIN OF FILL PROPOSED TO BE IMPORTED & THE ABOVE CERTIFICATION TO BE REVIEWED & APPROVED BY COUNCIL PRIOR TO ANY IMPORTED FILL ARRIVING ON SITE.
5. ALL FILL IS TO BE PLACED & COMPACTED IN ACCORDANCE WITH COUNCIL'S CONSTRUCTION SPECIFICATION.
6. ALL FILL TO BE PLACED UNDER LEVEL 1 GEOTECHNICAL SUPERVISION.
7. COPIES OF ALL FILL COMPACTION TESTS TO BE PROVIDED TO PRINCIPLE.
8. COMPLETE ALL ROAD, DRAINAGE, RETAINING WALL & SERVICES WORKS
9. 300mm WIDE, 150mm THICK TOPSOIL TO BE PLACED BEHIND KERBS & TURFED WITH KIKUYU TURF
10. FINAL TOPSOIL/ TURF & PATHWAYS WITHIN ASHFORD AVENUE VERGES TO BE BONDED WITH COUNCIL & COMPLETED BY BUILDERS FOLLOWING HOUSE CONSTRUCTION

WARNING

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A	ISSUED TO CLIENT FOR REVIEW	06.03.24	JB	SG

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SCALE 1:500 AT A1 SIZE

Designed	S. FERGUSON
Date	08.03.2024
Drawn	J. BIRD
Approved	S. GRAY
Date	08.03.2024
DA Number	-

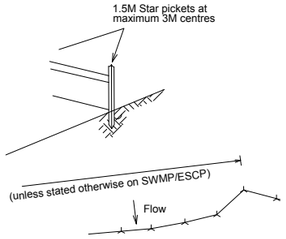
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ph: 02 46255055
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Project Details	WSU MILPERRA, LOT 2 IN DP1291984 2 BULLECOURT AVE, MILPERRA STAGE 1 SUBDIVISION
Drawing Title	SOIL AND WATER MANAGEMENT PLAN STAGE 1 PLAN

Sheet 13 of 14
Scale 1:500 @ A1

Project Number	Reference	Drawing No	Revision
2301879	303	402	C

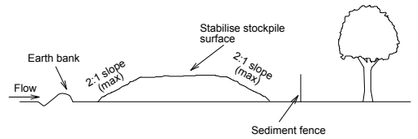
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Star pickets at maximum 3M spacings

1. Construct sediment fence as close as possible to parallel to the contours of the site
2. Drive 1.5 metre long star pickets into ground, 3 metres apart.
3. Dig a 150MM deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched
5. Fix self supporting geotextile to upslope side of posts with wire ties or as recommended by geotextile manufacturer
6. Join sections of fabric at a support post with a 150mm overlap

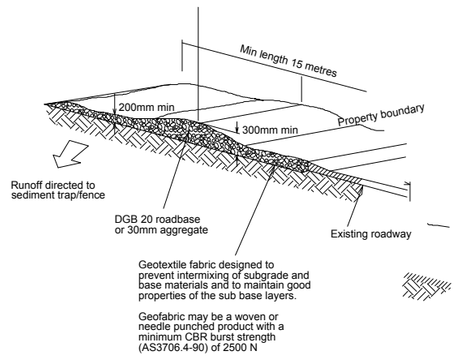
SEDIMENT FENCE



Construction Notes

1. Locate stockpile at least 5 metres from existing vegetation, concentrated water flows, roads and hazard areas.
2. Construct on the contour as a low, flat elongated mound.
3. All stockpiles shall be less than 2 metres in height
4. Rehabilitate in accordance with the SWMP/ESCP.
5. Construct earth bank (Standard Drawing 5-2) on the upslope side to divert run off around the stockpile and a sediment fence (standard Drawing 6-7) 1 to 2 metres downslope of stockpile.
6. Seeded areas to be watered twice weekly until established. Substantial growth required within 14 days or bitumen straw mulch to be placed.
7. Dust to be controlled by watering

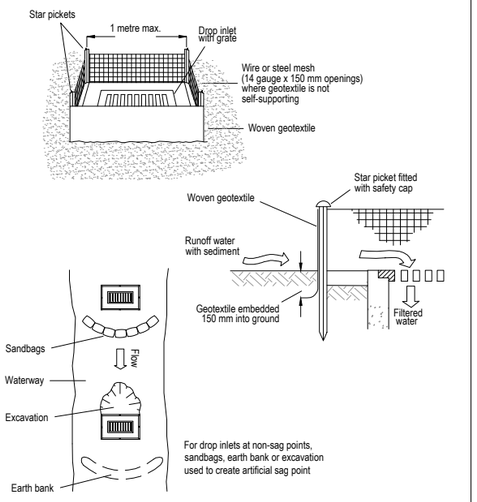
STOCKPILES



Construction Notes

1. Strip topsoil and level site.
2. Compact subgrade
3. Cover area with needle punch geotextile.
4. Construct 200mm thick pad over geotextile using roadbase or 30mm aggregate. Minimum length 15 metres or to building alignment width 3 metres
5. Construct hump immediately within boundary to divert water to a sediment fence or other sediment trap.

STABILISED SITE ACCESS

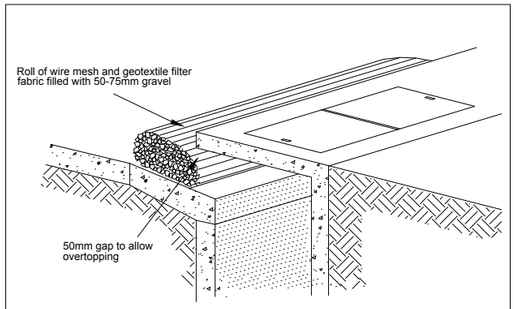


GEOTEXTILE INLET FILTER (SD 6-12)

NTS

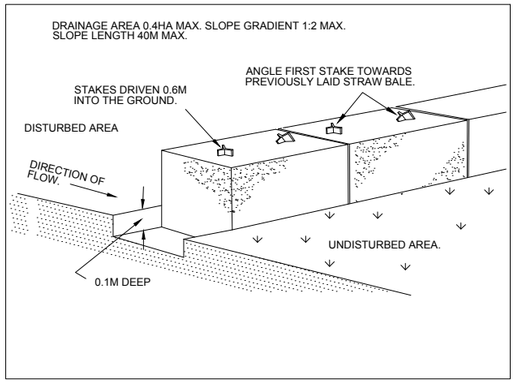
Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.



Portable Gravel Kerb Inlet

Sediment Trap



SEDIMENT & EROSION CONTROL

SE1. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO DISTURBANCE OF THE WORK AREA & TO BE CARRIED OUT IN ACCORDANCE WITH LANDCOM'S "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION" VOLUME 1.

SE2. THE CONTRACTOR SHALL REGULARLY MAINTAIN ALL SEDIMENT AND EROSION CONTROL DEVICES AND REMOVE ACCUMULATED SILT FROM SUCH DEVICES BEFORE MORE THAN 60% OF THEIR CAPACITY IS LOST. ALL THE SILT REMOVED SHALL BE DISPOSED OF AS DIRECTED BY THE SUPERINTENDENT. NO SILT IS TO BE PLACED OUTSIDE THE LIMIT OF WORKS. THE PERIOD FOR MAINTAINING THESE DEVICES SHALL BE AT LEAST UNTIL ALL DISTURBED AREAS ARE REVEGETATED AND LONGER AS MAY BE DIRECTED BY THE SUPERINTENDENT OR COUNCIL.

SE3. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING CONSTRUCTION CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS.

SE4. WHEN ANY DEVICES ARE TO BE HANDED OVER TO COUNCIL, THEY SHALL BE IN A CLEAN & STABLE CONDITION.

SE5. THE CONTRACTOR SHALL MAINTAIN ALL REVEGETATED AREAS INCLUDING WATERING UNTIL FINAL COMPLETION OF WORKS.

SE6. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL UNTIL FINAL COMPLETION OF WORKS.

SE7. THE CONTRACTOR'S RESPONSIBILITY IS TO ENSURE ALL NECESSARY MEASURES SO AS TO PROTECT ALL DISTURBED AREAS AS PER NOTE SE1. ALL ADDITIONAL COSTS ARE TO BE REFLECTED IN TENDER PRICE EVEN IF SUCH MEASURES ARE NOT INDICATED ON THE SEDIMENT AND EROSION CONTROL PLAN.

SE8. THE CONTRACTOR MUST COMMENCE REHABILITATION WITHIN 5 DAYS OF ANY SITE REGRADING & BATTER FORMATION.

SE9. A 0.3m WIDE STRIP OF TURF TO BE PLACED BEHIND THE EXISTING KERB IN ASHFORD AVENUE.

SE10. PROVIDE TURF AROUND ALL SURFACE INLET PITS IN ADDITION TO THE GEOTEXTILE INLET FILTER.

SE11. STOCKPILES TO BE STABILISED WITHIN 14 DAYS OF COMPLETING THE STOCKPILE.

NOTES

ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE LANDCOM'S MANUAL "MANAGING URBAN STORMWATER" 4TH EDITION AUGUST 2004.

WORKS SHALL BE UNDERTAKEN AS OUTLINED ON PLANS EROSION AND SEDIMENT CONTROL MEASURES AFFECTED BY WORKS ARE TO BE RE-ESTABLISHED PRIOR TO THE COMPLETION OF EACH DAY'S WORK.

THE CONTRACTOR IS TO STABILISE ALL STOCKPILES AND DISTURBED AREAS AS SOON AS THEY ARE FORMED TO FINAL LEVELS. STABILISATION TO BE BY HYDROSEEDING / SPRAY GRASS, OR AS DIRECTED BY COUNCIL ENGINEER.

SEED MIXTURE FOR FOOTWAYS AND OTHER AREAS UNDER THE CONTROL OF COUNCIL ARE TO BE IN ACCORDANCE WITH COUNCIL'S SPECIFICATION. FOR OTHER AREAS, THE LIST OF PLANT SPECIES FOR TEMPORARY COVER IS:-

JAPANESE MILLET AND OATS(RYECORN) AT 25kg/ha EACH - SPRING/SUMMER
JAPANESE MILLET AT 10kg/ha AND OATS(RYECORN) AT 30kg/ha - AUTUMN/WINTER

ALL SEEDED AREAS ARE TO BE WATERED TWICE WEEKLY.

WHERE SURFACE SLOPES ARE MORE THAN 4H:1V BATTER THEY SHALL BE TURFED.

DUST CONTROL MEASURES SHALL BE IMPLEMENTED CONTINUOUSLY DURING CONSTRUCTION WORKS. SUCH MEASURES ARE TO BE TO THE SATISFACTION OF THE SUPERINTENDENT AND COUNCIL.

TOPSOIL SHALL BE RESPREAD ON CONSTRUCTION AREAS AND STABILISED AS SOON AS POSSIBLE WITHIN 60 DAYS OF DISTURBANCE. ALL DISTURBED AREAS ARE TO BE LEFT WITH A SCARIFIED SURFACE AT ALL TIMES TO ENCOURAGE WATER INFILTRATION AND ASSIST WITH KEYING OF TOPSOIL.

FOLLOWING COMPLETION OF WORKS AND STABILISATION OF ALL DISTURBED SURFACES, ALL MATERIALS AND CONTROL MEASURES ARE TO BE REMOVED FROM SITE AND TEMPORARY BASINS FILLED, COMPACTED AND STABILISED.

ALL SITE ACCESS TO BE ACHIEVED FROM DESIGNATED SITE ACCESS. SITE ACCESS TO BE PROTECTED BY THE INSTALLATION OF AN APPROVED SHAKER RAMP. SHAKER RAMP TO BE REGULARLY MAINTAINED TO ENSURE EFFECTIVENESS.

UPON COMPLETION OF FINAL EARTHWORKS OR AFTER WRITTEN DIRECTION OF COUNCIL, IMMEDIATE SILT CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.

ALL DISTURBED OVER ALL STORMWATER, POWER, TELEPHONE, GAS AND SEWER LINES NOT WITHIN STREETS IS TO BE SPRAY GRASSED AS SOON AS POSSIBLE BUT NO LATER THAN WITHIN 14 DAYS AFTER BACKFILL.

NO MORE THAN 150m OF TRENCH IS TO BE OPEN AT ANY ONE TIME. ALL TEMPORARY EARTH BERMS, DIVERSION AND SEDIMENT BASIN EMBANKMENTS ARE TO BE TRACK ROLLED, SEEDED OR MULCHED OR SPRAYED WITH BITUMEN AS SOON AS THEY HAVE BEEN FORMED.

ALL FILLS ARE TO BE LEFT WITH A WINDROW AT LEAST 20cm HIGH AT THE TOP OF THE SLOPE AT THE END OF EACH DAY'S EARTHWORKS AMD ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO "SEAL" THE EARTHWORKS.

STABILISATION OF ALL CUT AND FILL SLOPES SHALL BE COMMENCED WITHIN 14 DAYS OF COMPLETION OF FORMATION.

THE CONTRACTOR SHALL MAINTAIN AND PRODUCE ON REQUEST A LOGBOOK ON SITE DETAILING THE FOLLOWING:-

- RECORDS OF ALL RAINFALL
- DAILY CONDITION OF ALL EROSION AND SEDIMENT CONTROL MEASURES
- ANY APPLICATION OF FLOCCULATION AGENTS TO BASINS
- VOLUMES OF WATER DISCHARGED FROM BASINS
- METHOD OF DISPOSAL OF WATER FROM BASINS
- ANY ADDITIONAL REMEDIAL WORKS REQUIRED.

THE ORIGINAL LOGBOOK SHALL BE ISSUED TO THE PROJECT MANAGER ON COMPLETION OF THE WORKS. SEDIMENT CONTROL MEASURES TO BE MONITORED ONCE A WEEK AND AFTER EVERY STORM EVENT.

STOCKPILES TO BE MAX 2 METRE HIGH WITH SEDIMENT FENCING TO LOW SIDE LOCATED CLEAR OF WATERCOURSES

ALL STORMWATER PITS TO BE BLOCKED DURING CONSTRUCTION UNTIL SITE STABILISED.

DURING CONSTRUCTION WORKS ANY WORK AND STORAGE AREAS WHERE SPILLAGE MAY OCCUR MUST BE BUNDED. THE SIZE OF THE AREA TO BE BUNDED AND HEIGHT OF THE BUND WALLS MUST BE CALCULATED AS BEING EQUAL TO 110% OF THE TOTAL VOLUME STORED OR EQUAL TO THE LARGEST STORAGE CONTAINER, WHICH EVER IS GREATER. ALL PIPE WORK EXTENDING FROM THE BUNDED AREA MUST BE DIRECTED OVER THE BUND WALL AND HOSE COUPLINGS MUST BE PLACED SUCH THAT LEAKS AND SPILLAGE'S ARE CONTAINED. THE AREAS MUST BE GRADED TO A PIT/SUMP TO FACILITATE EMPTYING.

ANY IMPORTED FILL USED MUST BE VALIDATED & SUITABLE & FREE OF SALINE & CONTAMINATION

WARNING
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REV	DESCRIPTION	DATE	DRN.	APP.
C	DRAWINGS REVISED	13.09.24	R.G	S.G
B	SCALE AMENDED	23.05.24	S.F.	S.G.
A	ISSUED TO CLIENT FOR REVIEW	08.03.24	JB	SG

mirvac

Designed	S. FERGUSON
Date	08.03.2024
Drawn	J. BIRD
Approved	S. GRAY
Date	08.03.2024
DA Number	-

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Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 1 SUBDIVISION

Drawing Title: SOIL AND WATER MANAGEMENT PLAN
DETAILS & NOTES

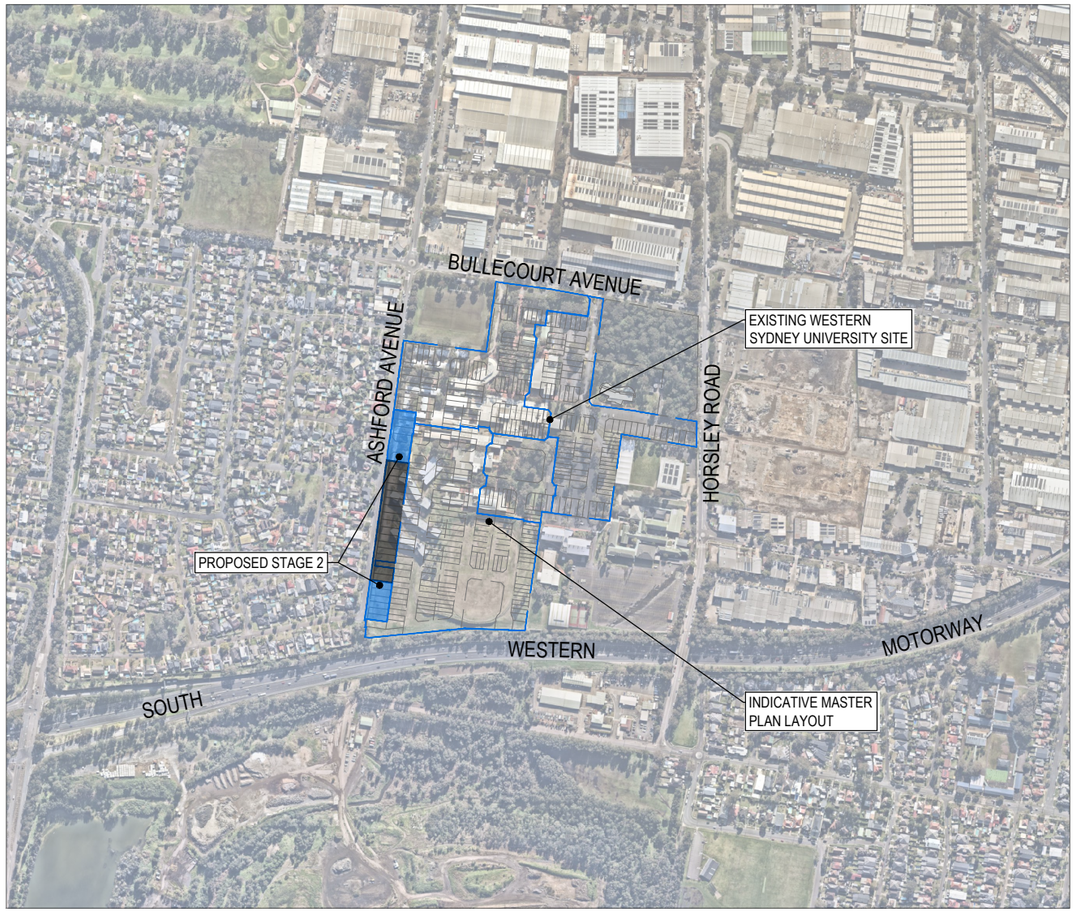
Sheet 14 of 14
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Project Number	Reference	Drawing No	Revision
2301879	303	403	C

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WSU MILPERRA

CONCEPT CIVIL ENGINEERING PLANS TO SUPPORT THE STAGE 2 SUBDIVISION OF PROPOSED LOT 1000 (UNREG.)(TO BE CREATED UNDER STAGE 1) LOT 2 IN DP1291984 - 2 BULLECOURT AVENUE, MILPERRA CANTERBURY-BANKSTOWN COUNCIL MIRVAC HOMES (NSW) PTY LTD



SITE PLAN

NOT TO SCALE

DRAWING INDEX

SHEET No	DRAWING No.	TITLE	REVISION
1	2301879-307-001	COVER SHEET	A
2	2301879-307-002	DETAILS & TYPICAL CROSS SECTION	A
3	2301879-307-005	DEMOLITION PLAN	A
4	2301879-307-010	LAYOUT PLAN	A
5	2301879-307-011	LOT BENCHING PLAN	A
6	2301879-307-012	BULT EARTHWORKS	A
7	2301879-307-100	ROAD 1 LONGITUDINAL SECTION	A
8	2301879-307-101	ASHFORD AVENUE BACK OF KERB LONGITUDINAL SECTIONS (NORTH AND SOUTH OF ROAD 1)	A
9	2301879-307-200	ROAD 1 CROSS SECTIONS	A
10	2301879-307-201	ASHFORD AVENUE (NORTH OF ROAD 1) LOT CROSS SECTIONS	A
11	2301879-307-202	ASHFORD AVENUE (SOUTH OF ROAD 1) LOT CROSS SECTIONS (SHEET 1 OF 2)	A
12	2301879-307-203	ASHFORD AVENUE (SOUTH OF ROAD 1) LOT CROSS SECTIONS (SHEET 2 OF 2)	A
13	2301879-307-400	SOIL AND WATER MANAGEMENT PLAN OVERALL PLAN	A
14	2301879-307-401	SOIL AND WATER MANAGEMENT PLAN STAGE 2 PLAN	A
15	2301879-307-402	SOIL AND WATER MANAGEMENT PLAN DETAILS AND NOTES	A
16	2301879-307-800	TURNING MOVEMENTS CAR (SHEET 1 OF 2)	A
17	2301879-307-801	TURNING MOVEMENTS SERVICE VEHICLE (SHEET 2 OF 2)	A

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A	ISSUED FOR INFORMATION	17.09.24	B.R	S.F

REV	DESCRIPTION	DATE	DRN.	APP.

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Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
DA Number	-

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Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

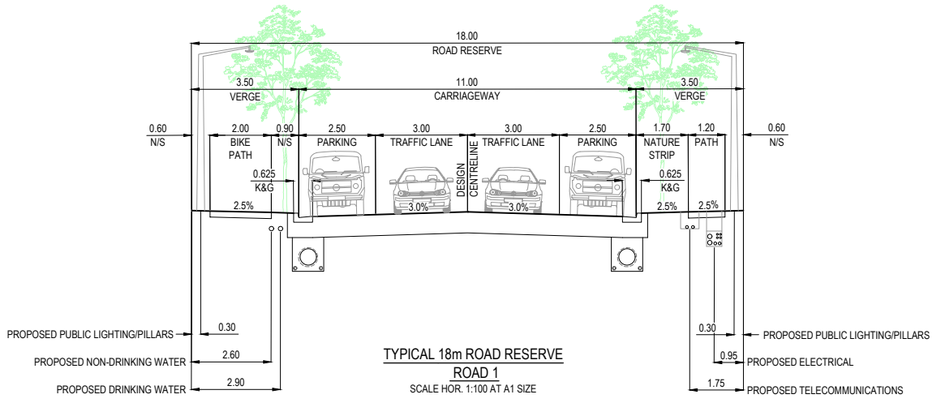
Drawing Title: COVER SHEET

Sheet 01 of 17

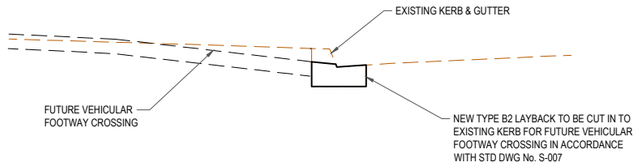
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Project Number	Reference	Drawing No	Revision
2301879	307	001	A

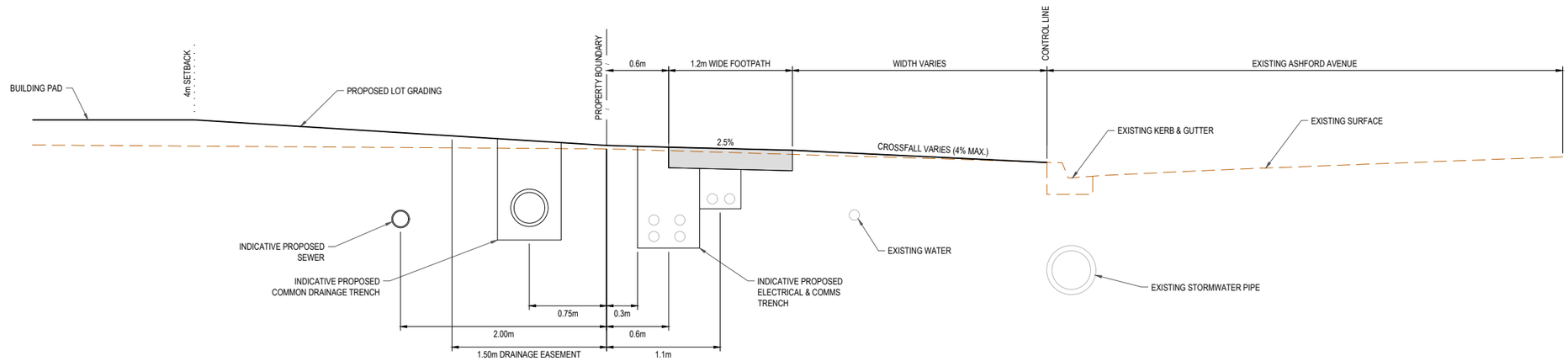
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TYPICAL 18m ROAD RESERVE
ROAD 1
SCALE HOR. 1:100 AT A1 SIZE



LAYBACK FOR VEHICULAR CROSSING TYPICAL SECTION
SCALE HOR. 1:40 AT A1 SIZE



ASHFORD AVENUE TYPICAL CROSS SECTION
SCALE HOR. 1:40 AT A1 SIZE

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Date	17.09.24
Drawn	B.RAU
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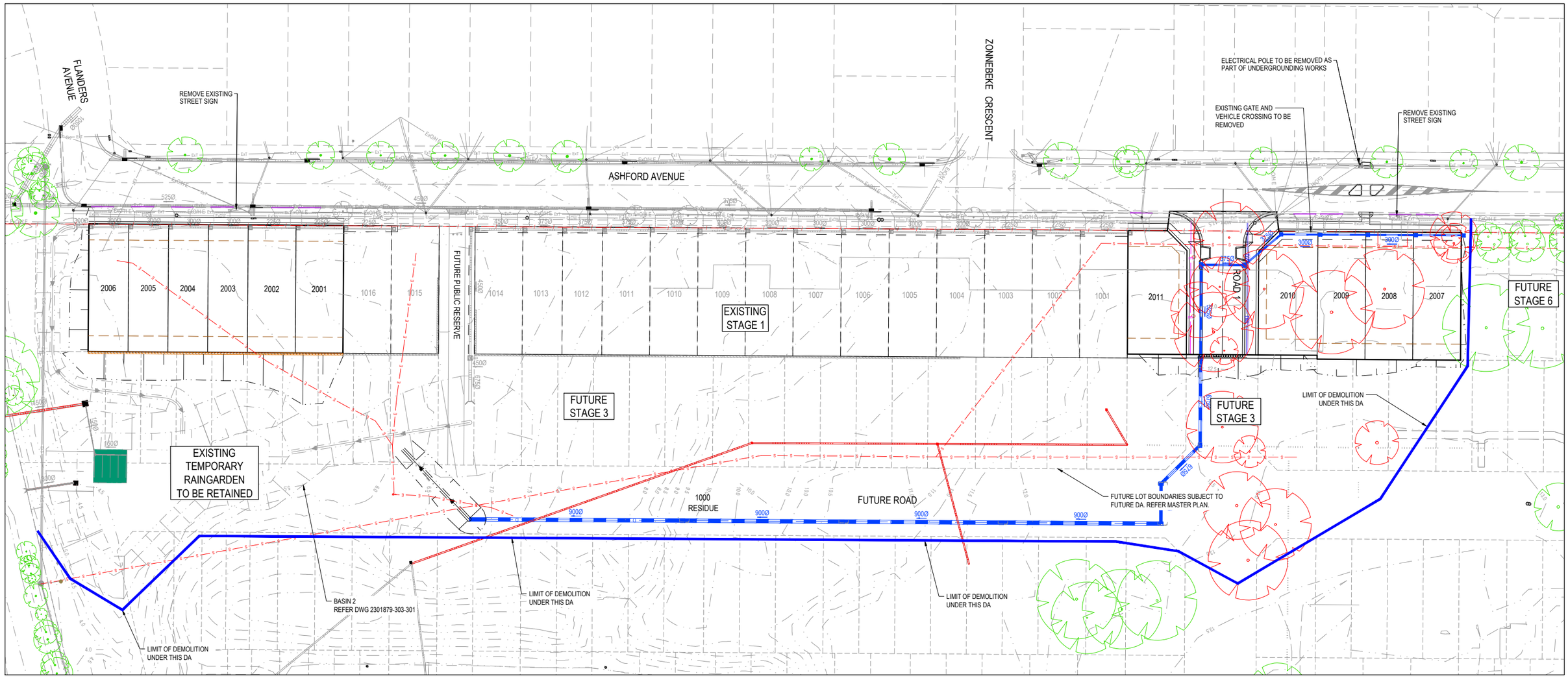
Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

Drawing Title: DETAILS & TYPICAL CROSS SECTION

Sheet 02 of 17
Scale: AS SHOWN

Project Number	Reference	Drawing No	Revision
2301879	307	002	A

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LEGEND - DEMOLITION PLAN PLAN

- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO BE RETAINED
- EXISTING STORMWATER PIT/PIPE TO BE REMOVED
- EXISTING ELECTRICITY TO BE REMOVED
- EXISTING SEWER TO BE REMOVED
- EXISTING FENCE TO BE REMOVED

WARNING

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0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
DA Number	-

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Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

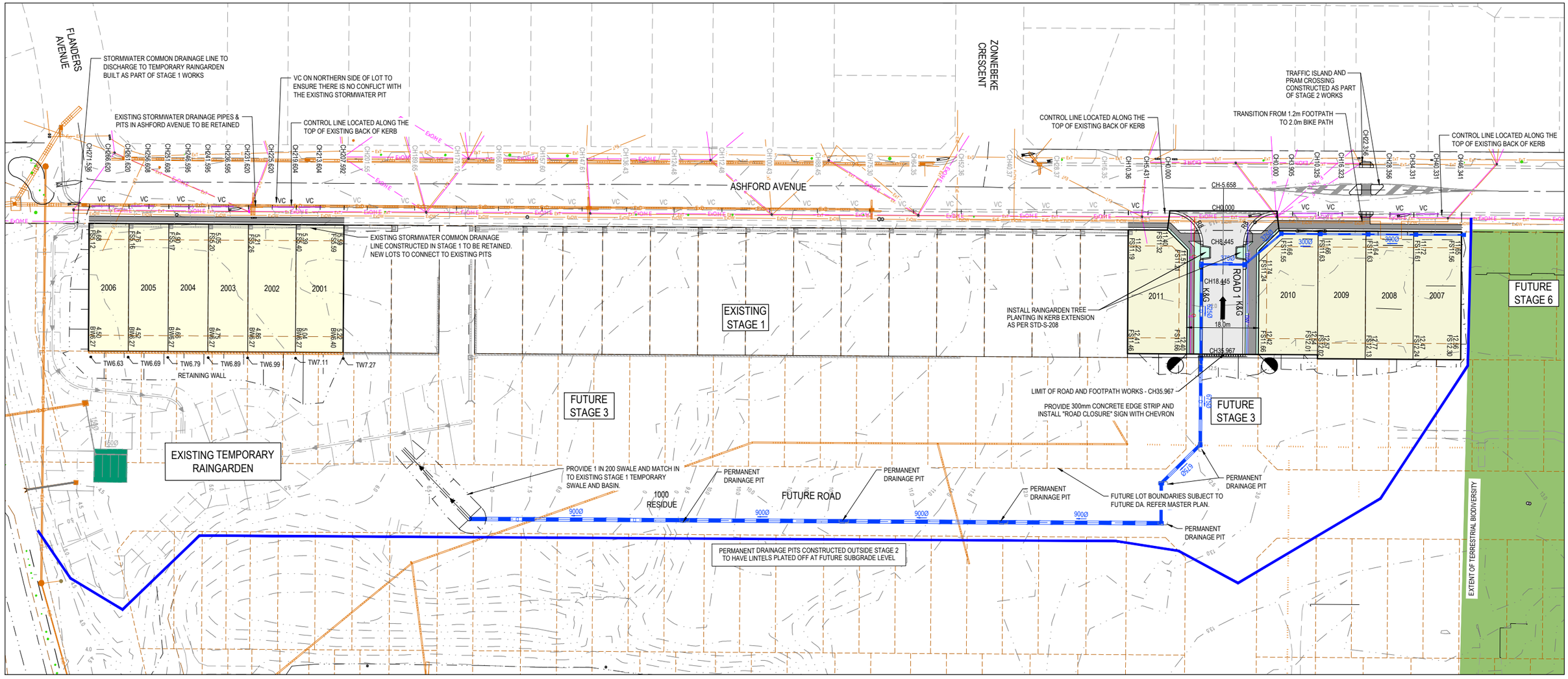
Drawing Title: DEMOLITION PLAN

Sheet 03 of 17

Scale 1:500 @ A1

Project Number	Reference	Drawing No	Revision
2301879	307	003	A

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LEGEND - LAYOUT PLAN

- STORMWATER DRAIN, PIT & PROPERTY INLET
- SWALE DRAIN
- SEWER & MAINTENANCE STRUCTURES
- HOUSE DRAIN
- SERVICE CONDUITS
- TACTILE PAVERS (INDICATIVE ONLY)
- ELECTRICITY (UNDERGROUND)
- ELECTRICITY (OVERHEAD)
- OPTIC FIBRE
- TELECOMMUNICATIONS
- GAS
- WATER
- RECYCLED WATER
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING RECYCLED WATER
- EXISTING STORMWATER DRAIN
- EXISTING SEWER
- EXISTING HOUSE DRAIN
- EXISTING SWALE DRAIN
- 141.34 EXISTING SURFACE LEVEL
- FS140.35 FINISHED BUILDING LINE LEVEL
- FR157.40 FINISHED RIDGE LINE LEVEL
- TW159.30 TOP OF RETAINING WALL
- BW159.30 BOTTOM OF RETAINING WALL
- RIDGE LINE
- RETAINING WALL
- ZERO LOT LINES
- PAVEMENT TREATMENT
- STRUCTURAL FILL > 200mm DEEP
- EX. STRUCTURAL FILL > 200mm DEEP
- DIRECTION OF FALL
- OVERLAND FLOW
- ALLOTMENT TO BE GRADED EVENLY IN DIRECTION OF FALL TO LEVELS INDICATED
- CONCRETE EDGE STRIP WITH SUBSOIL DRAIN, "NO ROAD" SIGN & BARRIER
- LIMIT OF WORKS
- PERMANENT SURVEY MARK
- TEMPORARY BENCH MARK
- TREE PROTECTION ZONE (TPZ)
- VC — NEW LAYBACK TO BE CUT IN TO EXISTING KERB FOR FUTURE DRIVEWAY. ALL NEW DRIVEWAYS TO BE 4m WIDE
- AREA OF TERRESTRIAL BIODIVERSITY
- RAINGARDEN

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SCALE 1:500 AT A1 SIZE

Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
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Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

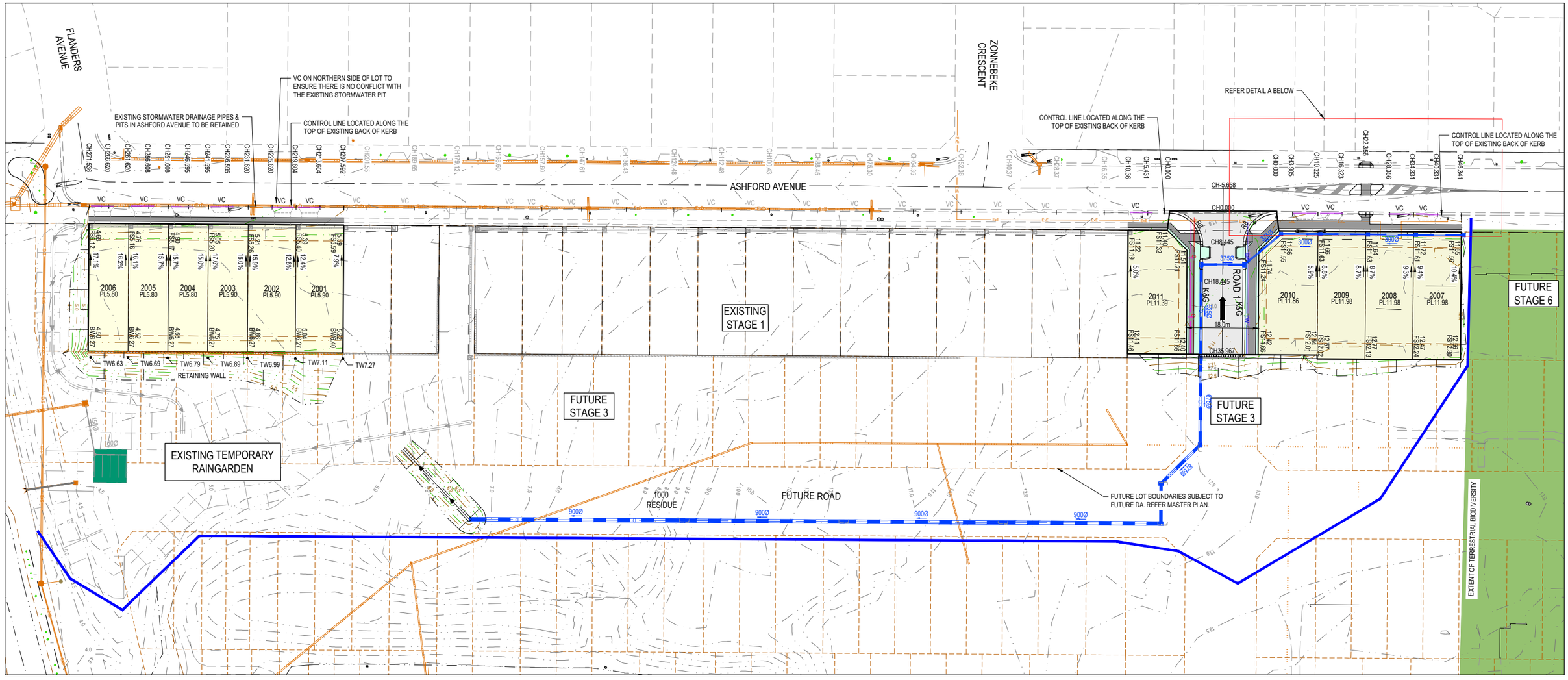
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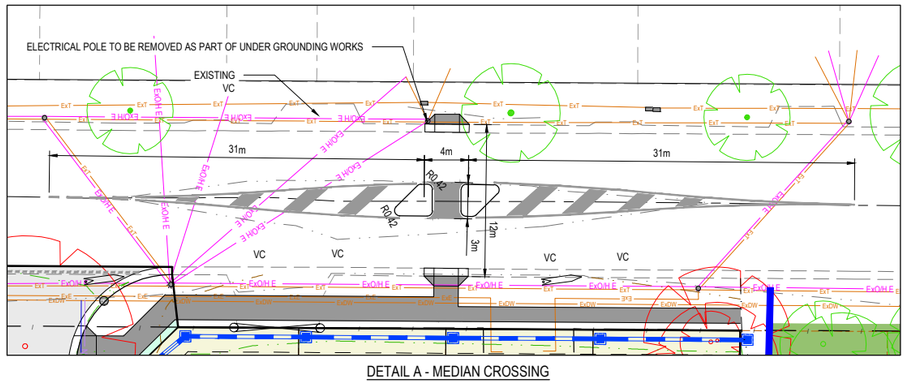
Sheet 04 of 17

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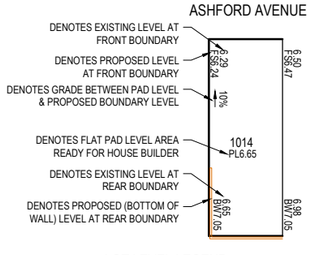
Project Number	Reference	Drawing No	Revision
2301879	307	010	A

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DETAIL A - MEDIAN CROSSING
SCALE 1:250 AT A1 SIZE



LOT LEVEL LEGEND

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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
DA Number	-

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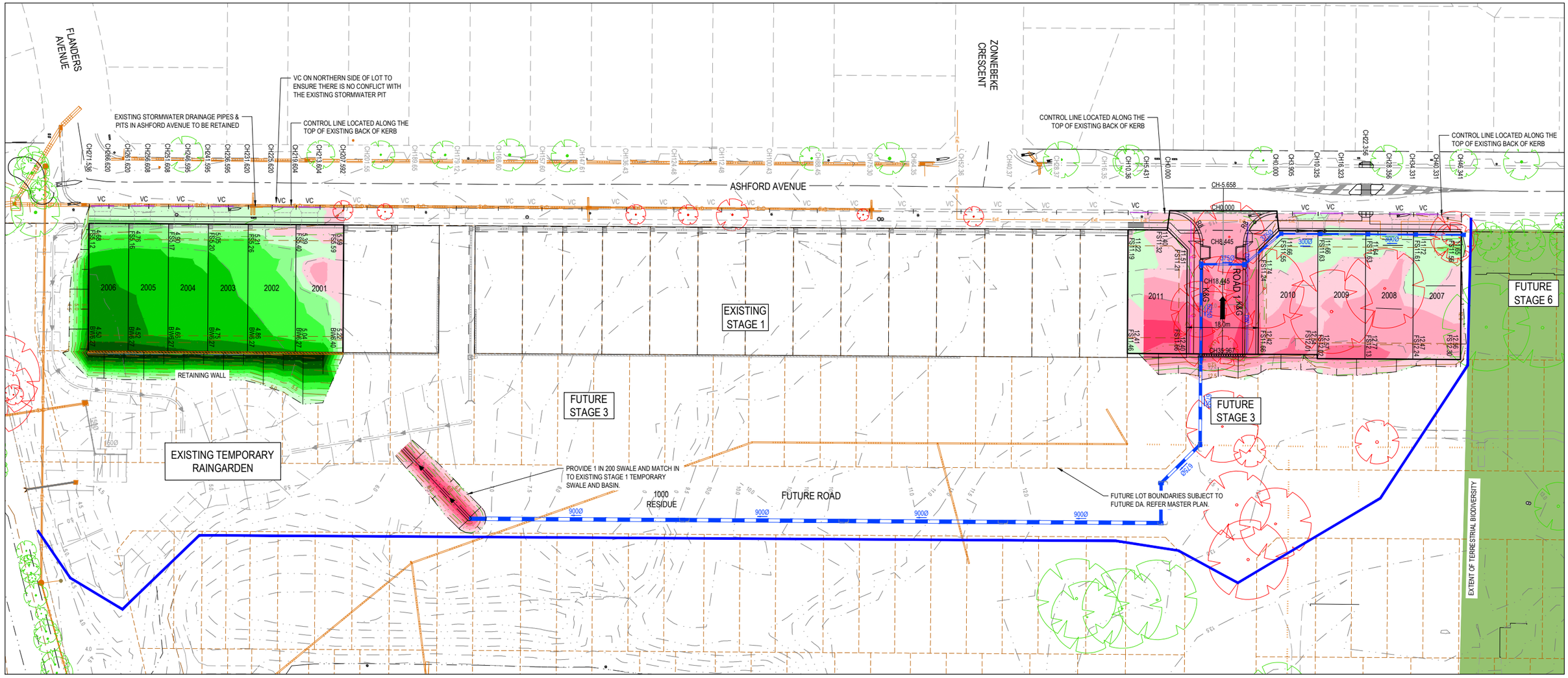
Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

Drawing Title: LOT BENCHING PLAN

Sheet 05 of 17
Scale 1:500 @ A1

Project Number	Reference	Drawing No	Revision
2301879	307	011	A

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CUT AND FILL LEGEND			
DEPTH RANGE (m)		COLOUR	
>1.8m CUT			CUT
-1.8	-1.5		
-1.5	-1.2		
-1.2	-0.9		
-0.9	-0.6		
-0.6	-0.3		
-0.3	0.0		
0.0	0.3		FILL
0.3	0.6		
0.6	0.9		
0.9	1.2		
1.2	1.5		
1.5	1.8		
1.8	2.1		
2.1	2.4		
2.4	2.7		
>2.7m FILL			

APPROXIMATE EARTHWORKS VOLUMES:

CUT - 1,201m³
FILL - 2337m³

BALANCE - 1,170m³ OF FILL

* THIS ESTIMATE IS BASED ON SURFACE TO SURFACE MODELLING ONLY AND IS SUBJECT TO FINAL DESIGNS

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0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
DA Number	-

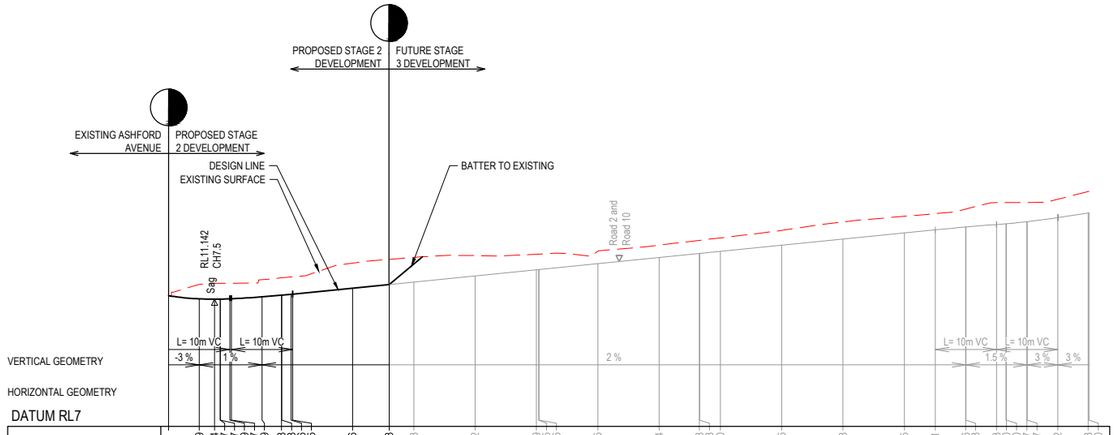
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Tuggerah NSW 2259
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Project Details	WSU MILPERRA, LOT 2 IN DP1291984 2 BULLECOURT AVE, MILPERRA STAGE 2 SUBDIVISION
Drawing Title	BULT EARTHWORKS

Sheet	06 of 17		
Scale	1:500 @ A1		
Project Number	Reference	Drawing No	Revision
2301879	307	012	A

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LEGEND
EXISTING SURFACE
DESIGN LINE

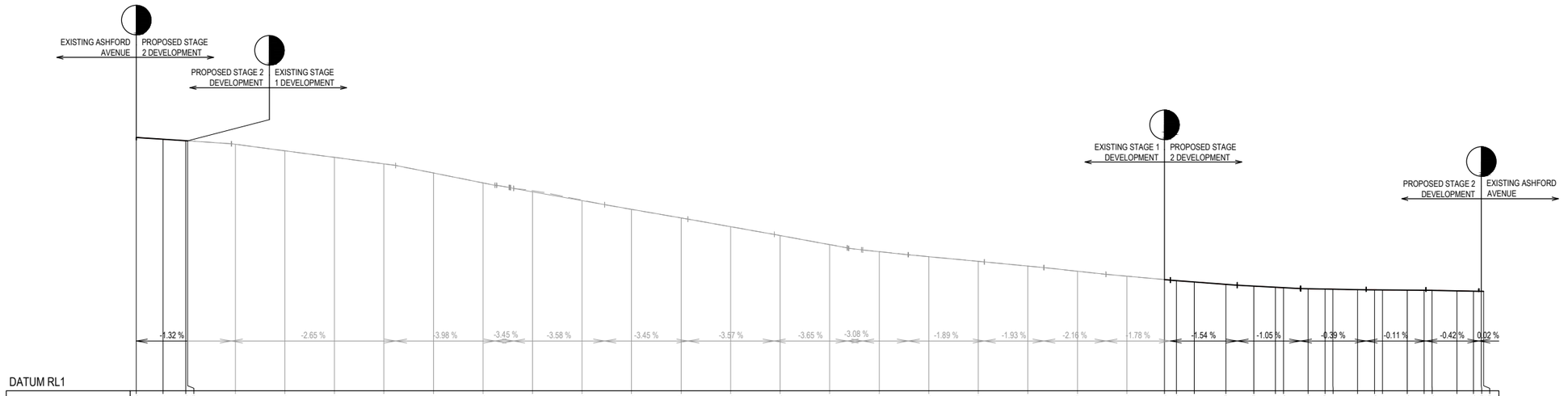


VERTICAL GEOMETRY

HORIZONTAL GEOMETRY

DATUM RL7

| | | |


EXISTING ASHFORD AVENUE
PROPOSED STAGE 2 DEVELOPMENT
PROPOSED STAGE 2 DEVELOPMENT
EXISTING STAGE 1 DEVELOPMENT
EXISTING STAGE 1 DEVELOPMENT
PROPOSED STAGE 2 DEVELOPMENT
PROPOSED STAGE 2 DEVELOPMENT
EXISTING ASHFORD AVENUE
-1.32 %
-2.65 %
3.98 %
-3.45 %
-3.58 %
-3.45 %
-3.57 %
-3.65 %
-3.08 %
-1.89 %
-1.93 %
-2.16 %
1.78 %
-1.54 %
-1.05 %
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-0.11 %
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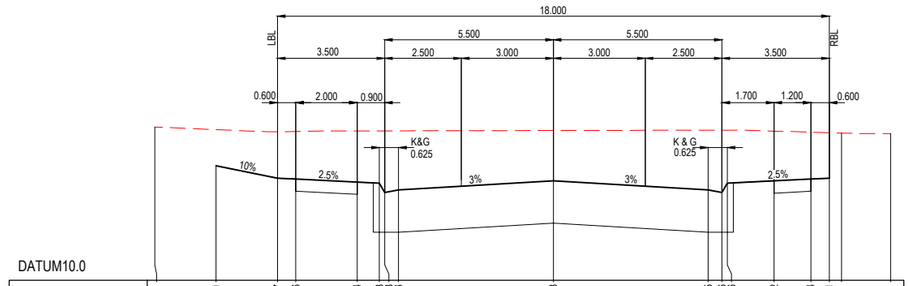
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LEGEND

EXISTING SURFACE

DESIGN SURFACE



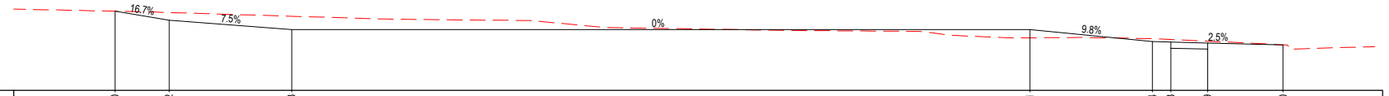
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LEGEND

EXISTING SURFACE

DESIGN SURFACE



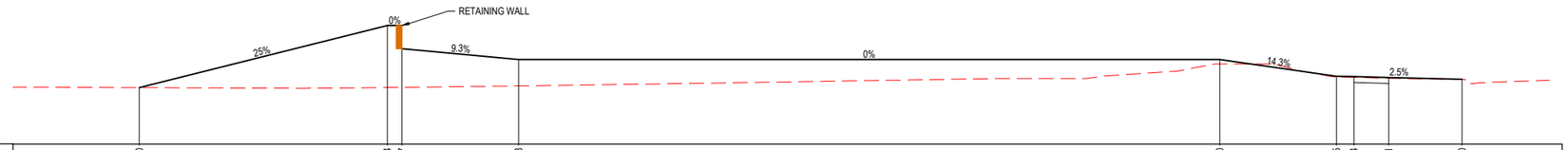
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| | | |

LEGEND

EXISTING SURFACE

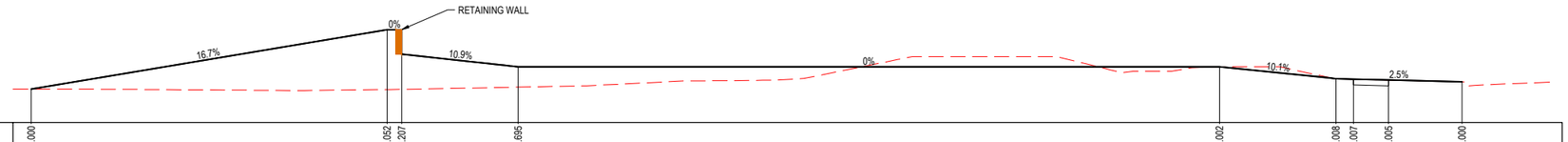
DESIGN SURFACE



DATUM3.0

CUT - / FILL +	0.000	2.124	1.327	0.908	0.150	0.025	0.024	0.021	0.000		
DESIGN SURFACE	4.937	7.064	6.272	5.900	5.900	5.326	5.311	5.281	5.219		
EXISTING SURFACE	4.937	4.940	4.946	4.992	5.750	5.302	5.288	5.260	5.219		
OFFSET	-45.407	-36.886	-36.386	-32.385	-8.312	-4.312	-3.712	-2.512	0.000		

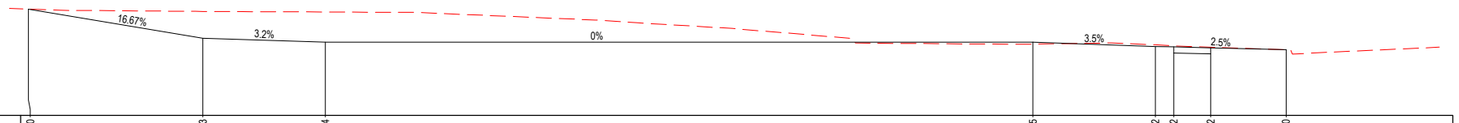
CH 225.620 - LOT 2002



DATUM4.0

CUT - / FILL +	0.000	2.052	1.207	0.695	0.002	0.008	0.007	0.005	0.000		
DESIGN SURFACE	5.138	7.174	6.336	5.900	5.900	5.496	5.481	5.451	5.387		
EXISTING SURFACE	5.138	5.122	5.129	5.205	5.898	5.487	5.474	5.446	5.387		
OFFSET	-49.112	-36.898	-36.398	-32.398	-8.325	-4.325	-3.725	-2.525	0.000		

CH 213.604 - LOT 2001



DATUM9.0

CUT - / FILL +	0.000	-0.873	-0.984	0.065	-0.052	-0.032	-0.022	0.000
DESIGN SURFACE	12.437	11.520	11.390	11.390	11.250	11.235	11.205	11.144
EXISTING SURFACE	12.437	12.393	12.374	11.325	11.302	11.267	11.227	11.144
OFFSET	-40.838	-35.335	-31.337	-8.262	-4.262	-3.662	-2.462	0.000

CH 5.431 - LOT 2011

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SCALE 1:100 AT A1 SIZE

Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
DA Number	-

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Tuggerah NSW 2259
ph: 02 43512233
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

Drawing Title: ASHFORD AVENUE (SOUTH OF ROAD 1)
LOT CROSS SECTIONS
(SHEET 1 OF 2)

Sheet 11 of 17

Scale 1:100 @ A1

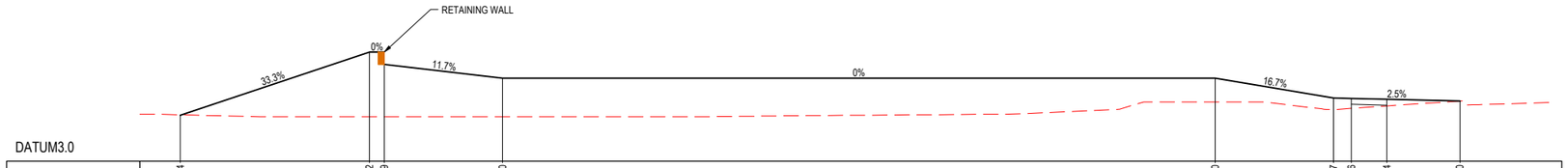
Project Number	Reference	Drawing No	Revision
2301879	307	202	A

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LEGEND

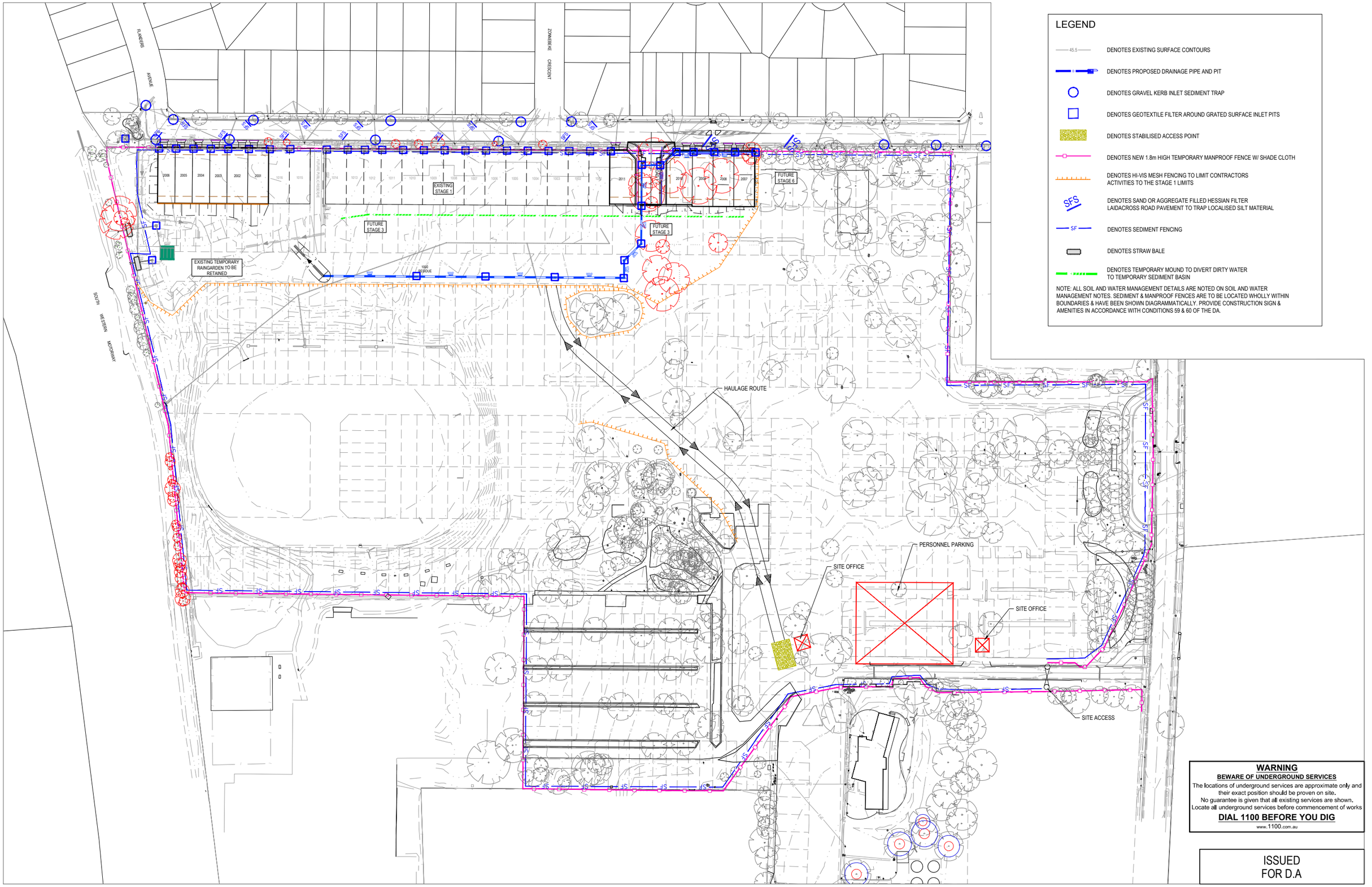
EXISTING SURFACE

DESIGN SURFACE



DATUM3.0

| | | |



WARNING
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0 10 20 40 60 80
SCALE 1:1000 AT A1 SIZE

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Drawn	B.RAU
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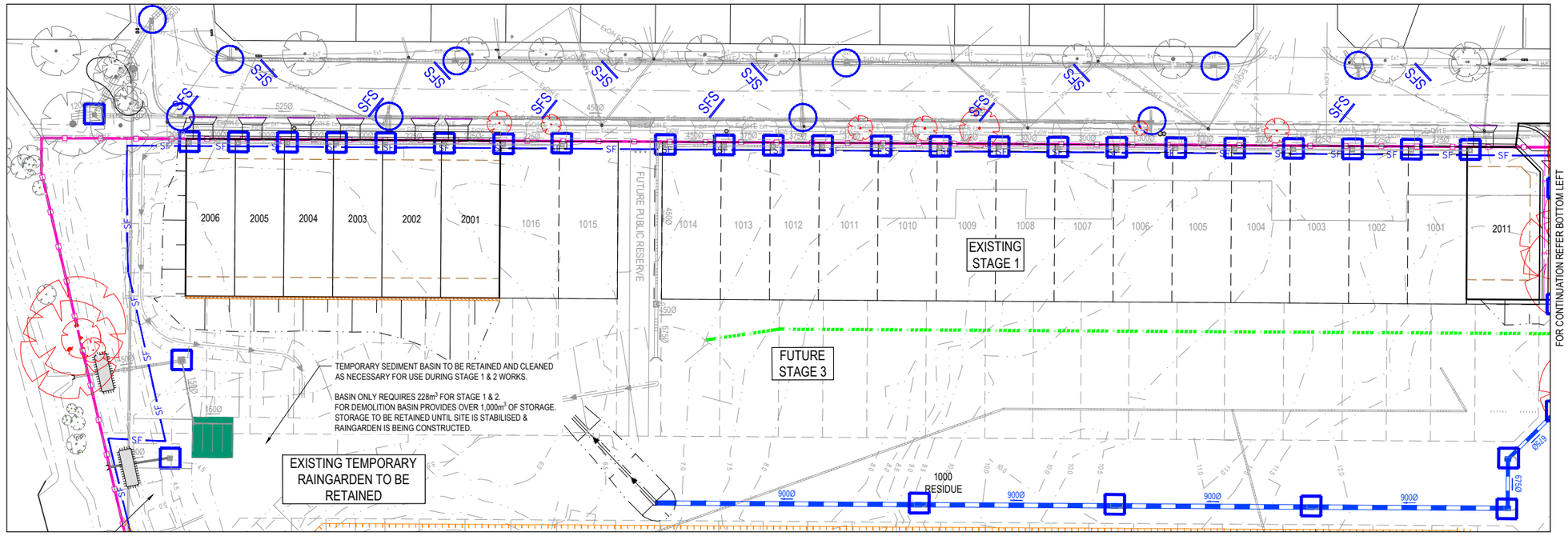
Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

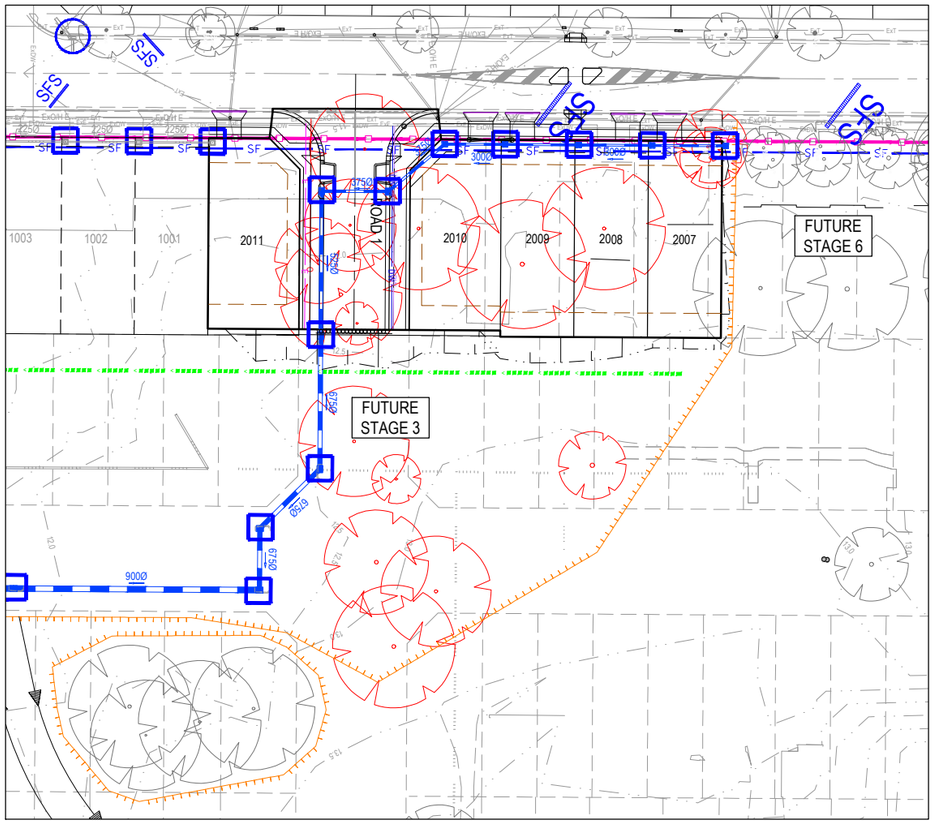
Drawing Title: SOIL AND WATER MANAGEMENT PLAN
OVERALL PLAN

Sheet 13 of 17
Scale 1:1000 @ A1

Project Number	Reference	Drawing No	Revision
2301879	307	400	A

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LEGEND

- DENOTES EXISTING SURFACE CONTOURS
- DENOTES PROPOSED DRAINAGE PIPE AND PIT
- DENOTES GRAVEL KERB INLET SEDIMENT TRAP
- DENOTES GEOTEXTILE FILTER AROUND GRATED SURFACE INLET PITS
- DENOTES STABILISED ACCESS POINT
- DENOTES NEW 1.8m HIGH TEMPORARY MANPROOF FENCE W/ SHADE CLOTH
- DENOTES HI-VIS MESH FENCING TO LIMIT CONTRACTORS ACTIVITIES TO THE STAGE 1 LIMITS
- SFS — DENOTES SAND OR AGGREGATE FILLED HESSIAN FILTER LAIDACROSS ROAD PAVEMENT TO TRAP LOCALISED SILT MATERIAL
- SF — DENOTES SEDIMENT FENCING
- DENOTES STRAW BALE
- DENOTES TEMPORARY MOUND TO DIVERT DIRTY WATER TO TEMPORARY SEDIMENT BASIN

NOTE: ALL SOIL AND WATER MANAGEMENT DETAILS ARE NOTED ON SOIL AND WATER MANAGEMENT NOTES. SEDIMENT & MANPROOF FENCES ARE TO BE LOCATED WHOLLY WITHIN BOUNDARIES & HAVE BEEN SHOWN DIAGRAMMATICALLY. PROVIDE CONSTRUCTION SIGN & AMENITIES IN ACCORDANCE WITH CONDITIONS 59 & 60 OF THE DA.

SEDIMENT BASIN

1. THE CONTRACTOR IS TO ENSURE STORMWATER RUNOFF IS DIRECTED TO THE SEDIMENT BASIN
WITH PLACEMENT OF TEMPORARY DIVERSION MOUNDS OR THE FORMATION OF OVERLAND FLOW PATHS.
2. DIVERSION MOUNDS & FLOW PATHS ARE TO BE ADJUSTED AS FILLING LAYERS PROGRESS & SURFACE LEVELS RISE.
3 SEDIMENT IS TO BE REMOVED SUCH THAT NOT LESS THAN 70% OF THE DESIGN CAPACITY IS AVAILABLE AT ALL TIMES MARKERS WITH
DEPTH INDICATORS ARE TO BE PLACED IN EACH BASIN TO INDICATE WHEN SEDIMENT ACCUMULATION EXCEEDS 30% OF STORAGE REQUIREMENTS.
4.BASINS ARE TO BE FLOCCULATED WITH GYPSUM WHEN SUSPENDED SOLID CONCENTRATION EXCEEDS 50 *milligrams per litre*. SPREADING RATE TO BE DETERMINED AFTER TESTING AND ANALYSIS OF THE INITIAL STORM EVENT. FIRST APPLICATION IS TO BE *30 kilograms GYPSUM PER 100 cum.* OF STORED WATER & THEREAFTER AS DETERMINED BY TESTING. PUMP OUT TO GOLF COURSE DAM WITHIN 72 hrs OF TREATMENT. REFER LANDCOM SOIL & CONSTRUCTION - "MANAGING URBAN STORMWATER" MANUAL - APPENDIX E
6. UPON ADEQUATE SITE REVEGETATION & COUNCIL APPROVAL SEDIMENT BASIN IS TO BE DECOMMISSIONED & CONVERTED
INTO RAINGARDENS PER DESIGN.

CONSTRUCTION SEQUENCE

FOLLOWING REMEDIATION OF THE AREA:
1.ALL TOPSOIL CONTAINING VEGETATION TO BE STRIPPED FROM EXISTING SURFACE & STOCKPILED FOR RESPREADING
FOLLOWING COMPLETION OF EARTHWORKS. (APPROX. 75mm THICK)
2. STRIPPED SURFACE TO BE INSPECTED & CERTIFIED READY FOR FILL PLACEMENT BY GEOTECHNICAL ENGINEER.
3. COMPLETE INITIAL EARTHWORKS IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S REPORT
4. IMPORTED FILL TO BE CERTIFIED AS V.E.N.M. & FREE OF SLAG, HAZARDOUS, CONTAMINATED, TOXIC, PUTRESCIBLE OR
RADIO-ACTIVE MATTER & INDUSTRIAL WASTE & BUILDING DEBRIS. THE ORIGIN OF FILL PROPOSED TO BE IMPORTED & THE ABOVE
CERTIFICATION TO BE REVIEWED & APPROVED BY COUNCIL PRIOR TO ANY IMPORTED FILL ARRIVING ON SITE.
5. ALL FILL IS TO BE PLACED & COMPACTED IN ACCORDANCE WITH COUNCIL'S CONSTRUCTION SPECIFICATION.
6. ALL FILL TO BE PLACED UNDER LEVEL 1 GEOTECHNICAL SUPERVISION.
7. COPIES OF ALL FILL COMPACTION TESTS TO BE PROVIDED TO PRINCIPLE.
8. COMPLETE ALL ROAD, DRAINAGE, RETAINING WALL & SERVICES WORKS
9. 300mm WIDE, 150mm THICK TOPSOIL TO BE PLACED BEHIND KERBS & TURFED WITH KIKUYU TURF
10. FINAL TOPSOIL/ TURF & PATHWAYS WITHIN ASHFORD AVENUE VERGES TO BE BONDED WITH COUNCIL & COMPLETED BY BUILDERS FOLLOWING
HOUSE CONSTRUCTION

1. Erosion Hazard and Sediment Basins

Site Name: WSU Milperra

Site Location: 2 Bullecourt Ave, Milperra

Precinct/Stage: Stage 1 & 2 Subdivision

Other Details:

Site area	Sub-catchment or Name of Structure						Notes
Total catchment area (ha)	2.841						
Disturbed catchment area (ha)	2.841						

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	F						From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	33						Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	33						
% clay (fraction finer than 0.002 mm)	33						
Dispersion percentage	10.0						E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	4.95						See Section 6.3.3(e). Auto-calculated
Soil Texture Group	F						Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5						See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	75						
x-day, y-percentile rainfall event (mm)	19.4						
Rainfall R-factor (if known)	2600						Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	8.3						

RUSLE Factors

Rainfall erosivity (*R*-factor)	2600						Auto-filled from above
Soil erodibility (*K*-factor)	0.038						RUSLE LS factor calculated for a high rill/interrill ratio.
Slope length (m)	200						
Slope gradient (%)	2.4						
Length/gradient (*LS*-factor)	0.74						
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2	2	2	2	2	2	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.35						See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	96						
Soil Loss Class	1						See Table 4.2, page 4-13
Soil loss (m³/ha/yr)	73						Conversion to cubic metres
Sediment basin storage (soil) volume (m³)	35						See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m³)	193						See Sections 6.3.4(i) for calculations
Sediment basin total volume (m³)	228						

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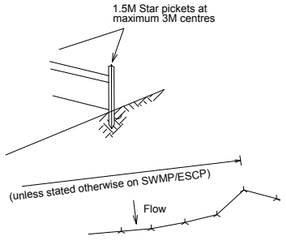
Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

Drawing Title: SOIL AND WATER MANAGEMENT PLAN
STAGE 2 PLAN

Sheet 14 of 17
Scale 1:500 @ A1

Project Number	Reference	Drawing No	Revision
2301879	307	401	A

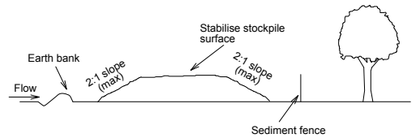
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Star pickets at maximum 3M spacings

1. Construct sediment fence as close as possible to parallel to the contours of the site
2. Drive 1.5 metre long star pickets into ground, 3 metres apart.
3. Dig a 150MM deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched
5. Fix self supporting geotextile to upslope side of posts with wire ties or as recommended by geotextile manufacturer
6. Join sections of fabric at a support post with a 150mm overlap

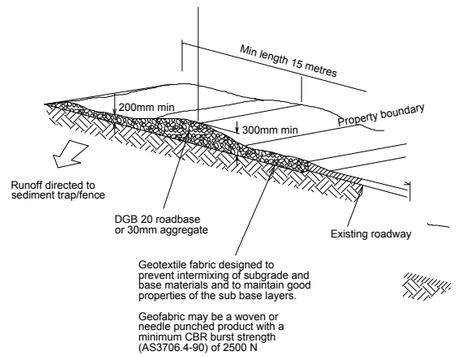
SEDIMENT FENCE



Construction Notes

1. Locate stockpile at least 5 metres from existing vegetation, concentrated water flows, roads and hazard areas.
2. Construct on the contour as a low, flat elongated mound.
3. All stockpiles shall be less than 2 metres in height
4. Rehabilitate in accordance with the SWMP/ESCP.
5. Construct earth bank (Standard Drawing 5-2) on the upslope side to divert run off around the stockpile and a sediment fence (standard Drawing 6-7) 1 to 2 metres downslope of stockpile.
6. Seeded areas to be watered twice weekly until established. Substantial growth required within 14 days or bitumen straw mulch to be placed.
7. Dust to be controlled by watering

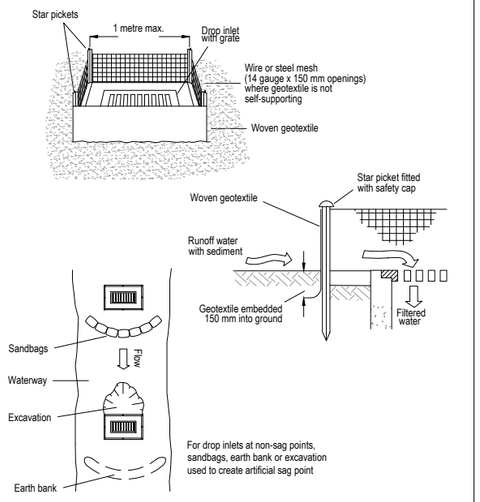
STOCKPILES



Construction Notes

1. Strip topsoil and level site.
2. Compact subgrade
3. Cover area with needle punch geotextile.
4. Construct 200mm thick pad over geotextile using roadbase or 30mm aggregate. Minimum length 15 metres or to building alignment width 3 metres
5. Construct hump immediately within boundary to divert water to a sediment fence or other sediment trap.

STABILISED SITE ACCESS

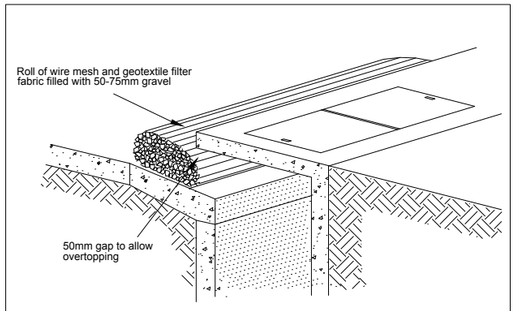


GEOTEXTILE INLET FILTER (SD 6-12)

NTS

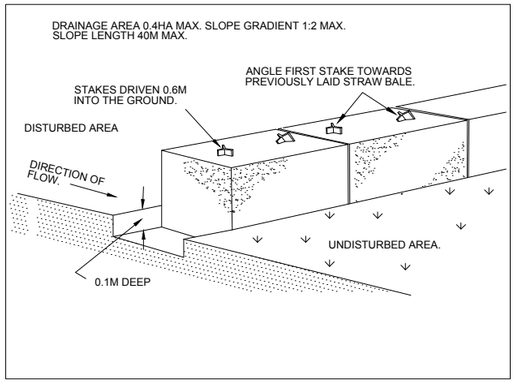
Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.



Portable Gravel Kerb Inlet

Sediment Trap



SEDIMENT & EROSION CONTROL

SE1. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO DISTURBANCE OF THE WORK AREA & TO BE CARRIED OUT IN ACCORDANCE WITH LANDCOM'S "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION" VOLUME 1.

SE2. THE CONTRACTOR SHALL REGULARLY MAINTAIN ALL SEDIMENT AND EROSION CONTROL DEVICES AND REMOVE ACCUMULATED SILT FROM SUCH DEVICES BEFORE MORE THAN 60% OF THEIR CAPACITY IS LOST. ALL THE SILT REMOVED SHALL BE DISPOSED OF AS DIRECTED BY THE SUPERINTENDENT. NO SILT IS TO BE PLACED OUTSIDE THE LIMIT OF WORKS. THE PERIOD FOR MAINTAINING THESE DEVICES SHALL BE AT LEAST UNTIL ALL DISTURBED AREAS ARE REVEGETATED AND LONGER AS MAY BE DIRECTED BY THE SUPERINTENDENT OR COUNCIL.

SE3. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING CONSTRUCTION CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS.

SE4. WHEN ANY DEVICES ARE TO BE HANDED OVER TO COUNCIL, THEY SHALL BE IN A CLEAN & STABLE CONDITION.

SE5. THE CONTRACTOR SHALL MAINTAIN ALL REVEGETATED AREAS INCLUDING WATERING UNTIL FINAL COMPLETION OF WORKS.

SE6. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL UNTIL FINAL COMPLETION OF WORKS.

SE7. THE CONTRACTOR'S RESPONSIBILITY IS TO ENSURE ALL NECESSARY MEASURES SO AS TO PROTECT ALL DISTURBED AREAS AS PER NOTE SE1. ALL ADDITIONAL COSTS ARE TO BE REFLECTED IN TENDER PRICE EVEN IF SUCH MEASURES ARE NOT INDICATED ON THE SEDIMENT AND EROSION CONTROL PLAN.

SE8. THE CONTRACTOR MUST COMMENCE REHABILITATION WITHIN 5 DAYS OF ANY SITE REGRADING & BATTER FORMATION.

SE9. A 0.3m WIDE STRIP OF TURF TO BE PLACED BEHIND THE EXISTING KERB IN ASHFORD AVENUE.

SE10. PROVIDE TURF AROUND ALL SURFACE INLET PITS IN ADDITION TO THE GEOTEXTILE INLET FILTER.

SE11. STOCKPILES TO BE STABILISED WITHIN 14 DAYS OF COMPLETING THE STOCKPILE.

NOTES

ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE LANDCOM'S MANUAL "MANAGING URBAN STORMWATER" 4TH EDITION AUGUST 2004.

WORKS SHALL BE UNDERTAKEN AS OUTLINED ON PLANS EROSION AND SEDIMENT CONTROL MEASURES AFFECTED BY WORKS ARE TO BE RE-ESTABLISHED PRIOR TO THE COMPLETION OF EACH DAY'S WORK.

THE CONTRACTOR IS TO STABILISE ALL STOCKPILES AND DISTURBED AREAS AS SOON AS THEY ARE FORMED TO FINAL LEVELS. STABILISATION TO BE BY HYDROSEEDING / SPRAY GRASS, OR AS DIRECTED BY COUNCIL ENGINEER.

SEED MIXTURE FOR FOOTWAYS AND OTHER AREAS UNDER THE CONTROL OF COUNCIL ARE TO BE IN ACCORDANCE WITH COUNCIL'S SPECIFICATION. FOR OTHER AREAS, THE LIST OF PLANT SPECIES FOR TEMPORARY COVER IS:-

JAPANESE MILLET AND OATS(RYECORN) AT 25kg/ha EACH - SPRING/SUMMER
JAPANESE MILLET AT 10kg/ha AND OATS(RYECORN) AT 30kg/ha - AUTUMN/WINTER

ALL SEEDED AREAS ARE TO BE WATERED TWICE WEEKLY.

WHERE SURFACE SLOPES ARE MORE THAN 4H:1V BATTER THEY SHALL BE TURFED.

DUST CONTROL MEASURES SHALL BE IMPLEMENTED CONTINUOUSLY DURING CONSTRUCTION WORKS. SUCH MEASURES ARE TO BE TO THE SATISFACTION OF THE SUPERINTENDENT AND COUNCIL.

TOPSOIL SHALL BE RESPREAD ON CONSTRUCTION AREAS AND STABILISED AS SOON AS POSSIBLE WITHIN 60 DAYS OF DISTURBANCE. ALL DISTURBED AREAS ARE TO BE LEFT WITH A SCARIFIED SURFACE AT ALL TIMES TO ENCOURAGE WATER INFILTRATION AND ASSIST WITH KEYING OF TOPSOIL.

FOLLOWING COMPLETION OF WORKS AND STABILISATION OF ALL DISTURBED SURFACES, ALL MATERIALS AND CONTROL MEASURES ARE TO BE REMOVED FROM SITE AND TEMPORARY BASINS FILLED, COMPACTED AND STABILISED.

ALL SITE ACCESS TO BE ACHIEVED FROM DESIGNATED SITE ACCESS. SITE ACCESS TO BE PROTECTED BY THE INSTALLATION OF AN APPROVED SHAKER RAMP. SHAKER RAMP TO BE REGULARLY MAINTAINED TO ENSURE EFFECTIVENESS.

UPON COMPLETION OF FINAL EARTHWORKS OR AFTER WRITTEN DIRECTION OF COUNCIL, IMMEDIATE SILT CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.

ALL DISTURBED OVER ALL STORMWATER, POWER, TELEPHONE, GAS AND SEWER LINES NOT WITHIN STREETS IS TO BE SPRAY GRASSED AS SOON AS POSSIBLE BUT NO LATER THAN WITHIN 14 DAYS AFTER BACKFILL.

NO MORE THAN 150m OF TRENCH IS TO BE OPEN AT ANY ONE TIME. ALL TEMPORARY EARTH BERMS, DIVERSION AND SEDIMENT BASIN EMBANKMENTS ARE TO BE TRACK ROLLED, SEEDED OR MULCHED OR SPRAYED WITH BITUMEN AS SOON AS THEY HAVE BEEN FORMED.

ALL FILLS ARE TO BE LEFT WITH A WINDROW AT LEAST 20cm HIGH AT THE TOP OF THE SLOPE AT THE END OF EACH DAY'S EARTHWORKS AMD ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO "SEAL" THE EARTHWORKS.

STABILISATION OF ALL CUT AND FILL SLOPES SHALL BE COMMENCED WITHIN 14 DAYS OF COMPLETION OF FORMATION.

THE CONTRACTOR SHALL MAINTAIN AND PRODUCE ON REQUEST A LOGBOOK ON SITE DETAILING THE FOLLOWING:-

- RECORDS OF ALL RAINFALL
- DAILY CONDITION OF ALL EROSION AND SEDIMENT CONTROL MEASURES
- ANY APPLICATION OF FLOCCULATION AGENTS TO BASINS
- VOLUMES OF WATER DISCHARGED FROM BASINS
- METHOD OF DISPOSAL OF WATER FROM BASINS
- ANY ADDITIONAL REMEDIAL WORKS REQUIRED.

THE ORIGINAL LOGBOOK SHALL BE ISSUED TO THE PROJECT MANAGER ON COMPLETION OF THE WORKS. SEDIMENT CONTROL MEASURES TO BE MONITORED ONCE A WEEK AND AFTER EVERY STORM EVENT.

STOCKPILES TO BE MAX 2 METRE HIGH WITH SEDIMENT FENCING TO LOW SIDE LOCATED CLEAR OF WATERCOURSES

ALL STORMWATER PITS TO BE BLOCKED DURING CONSTRUCTION UNTIL SITE STABILISED.

DURING CONSTRUCTION WORKS ANY WORK AND STORAGE AREAS WHERE SPILLAGE MAY OCCUR MUST BE BUNDED. THE SIZE OF THE AREA TO BE BUNDED AND HEIGHT OF THE BUND WALLS MUST BE CALCULATED AS BEING EQUAL TO 110% OF THE TOTAL VOLUME STORED OR EQUAL TO THE LARGEST STORAGE CONTAINER, WHICH EVER IS GREATER. ALL PIPE WORK EXTENDING FROM THE BUNDED AREA MUST BE DIRECTED OVER THE BUND WALL AND HOSE COUPLINGS MUST BE PLACED SUCH THAT LEAKS AND SPILLAGE'S ARE CONTAINED. THE AREAS MUST BE GRADED TO A PIT/SUMP TO FACILITATE EMPTYING.

ANY IMPORTED FILL USED MUST BE VALIDATED & SUITABLE & FREE OF SALINE & CONTAMINATION

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BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works
DIAL 1100 BEFORE YOU DIG
www.1100.com.au

ISSUED FOR D.A

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A	ISSUED FOR INFORMATION	17.09.24	B.R	S.F

REV	DESCRIPTION	DATE	DRN.	APP.

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Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
DA Number	-

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Tuggerah Business Park Unit 4, 5 Colony Cl
Tuggerah NSW 2259
ph: 02 43512233
www.beveridgewilliams.com.au

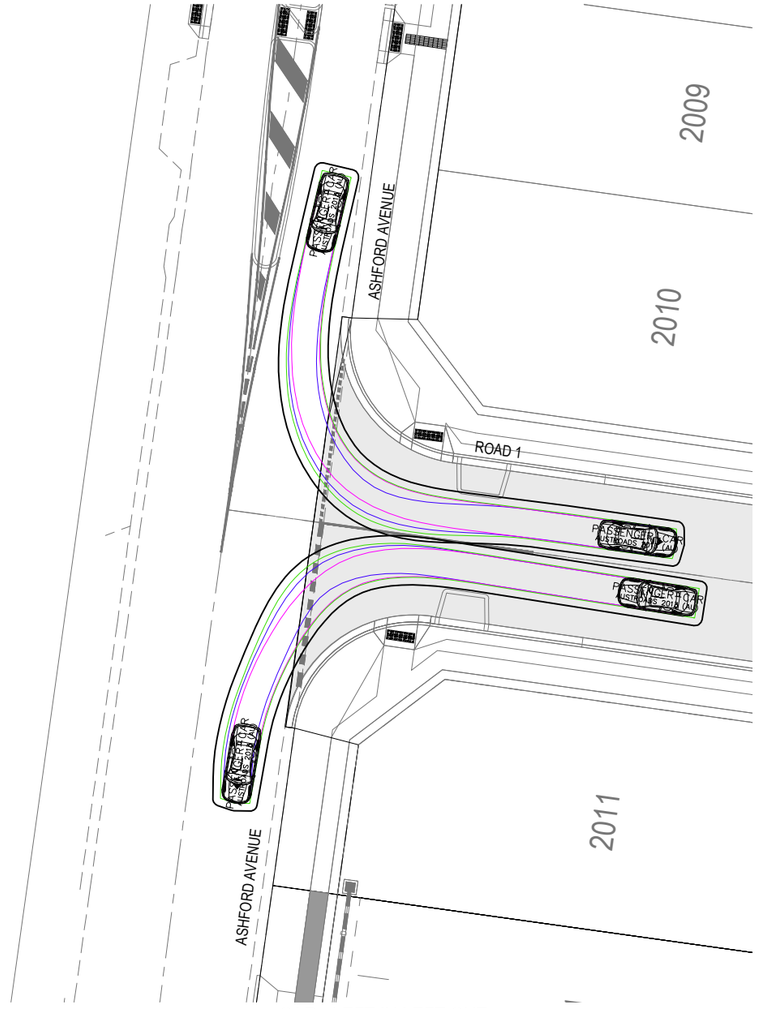
Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

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DETAILS AND NOTES

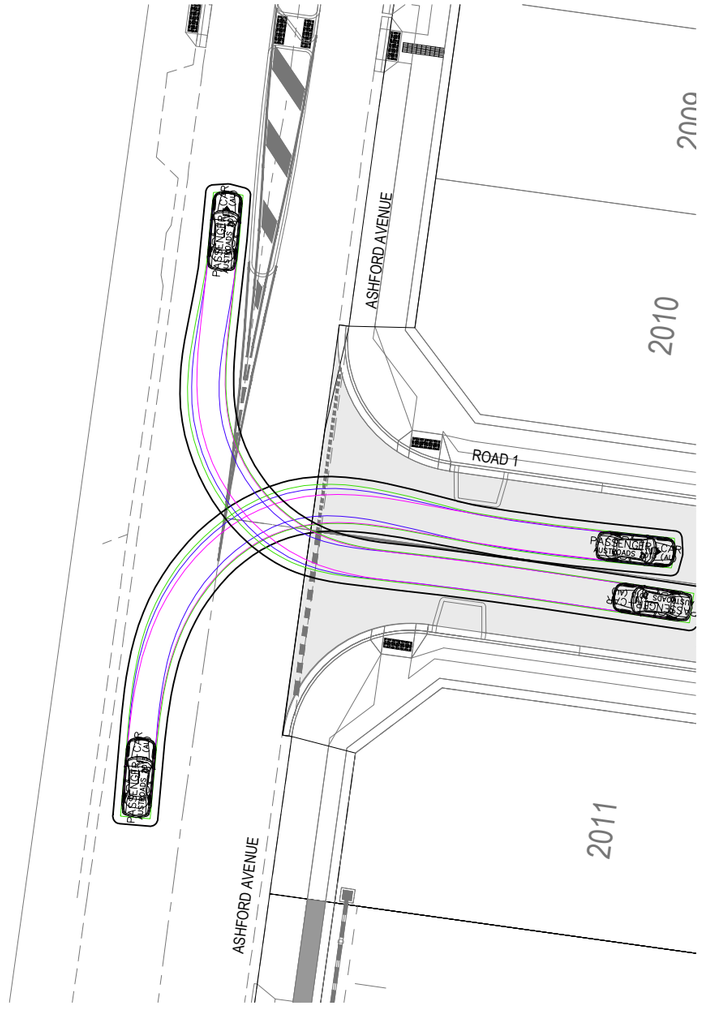
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Project Number	Reference	Drawing No	Revision
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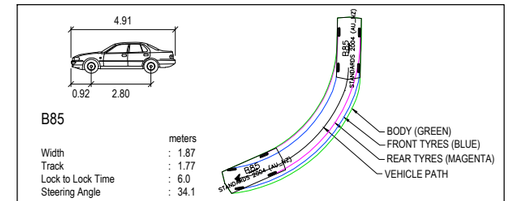
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CAR - LEFT IN/LEFT OUT



CAR - RIGHT IN/RIGHT OUT



DESIGN VEHICLE - B85 CAR

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FOR D.A

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0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
DA Number	-

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ph: 02 43512233
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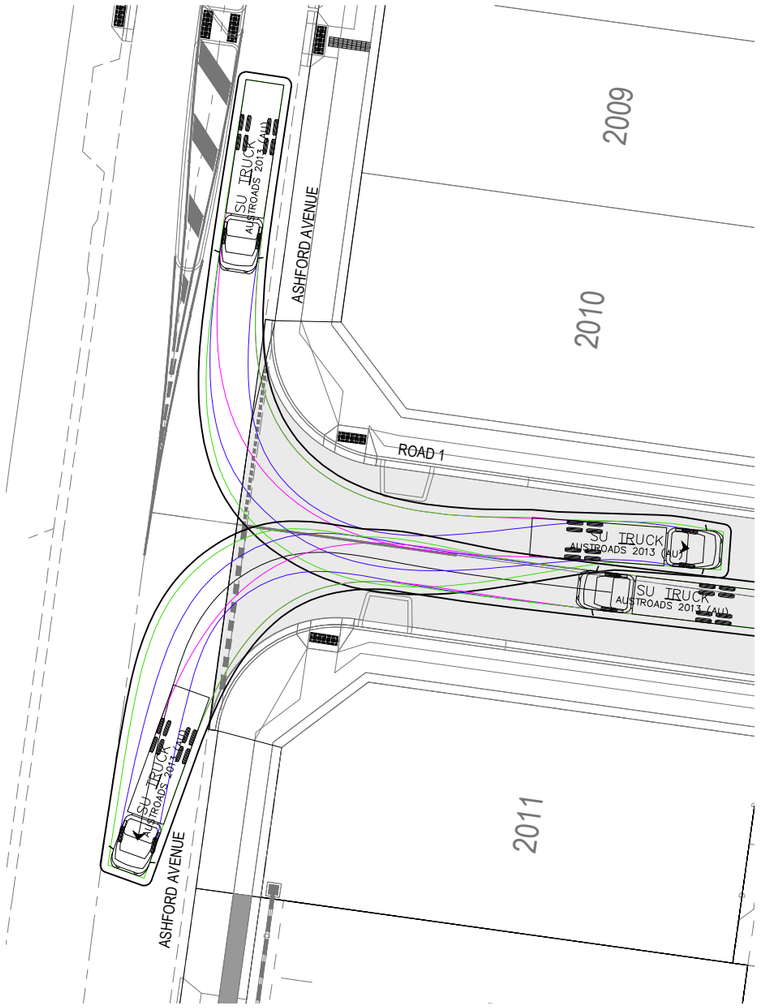
Project Details: WSU MILPERRA, LOT 2 IN DP1291984
2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

Drawing Title: TURNING MOVEMENTS
CAR
(SHEET 1 OF 2)

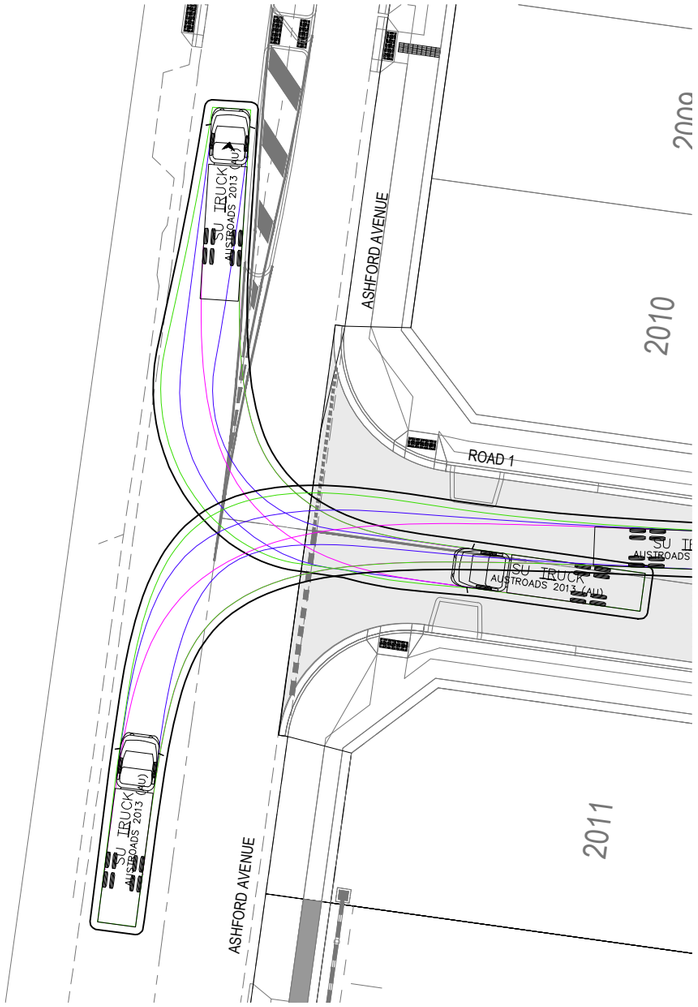
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Project Number	Reference	Drawing No	Revision
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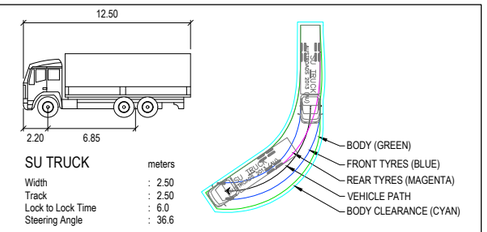
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TRUCK - LEFT IN/LEFT OUT



TRUCK - RIGHT IN/RIGHT OUT



SU TRUCK meters

Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	36.6

DESIGN VEHICLE - 12.5 m SERVICE VEHICLE

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REV	DESCRIPTION	DATE	DRN.	APP.

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0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	B.RAU
Date	17.09.24
Drawn	B.RAU
Approved	S.GRAY
Date	17.09.24
DA Number	-

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2 BULLECOURT AVE, MILPERRA
STAGE 2 SUBDIVISION

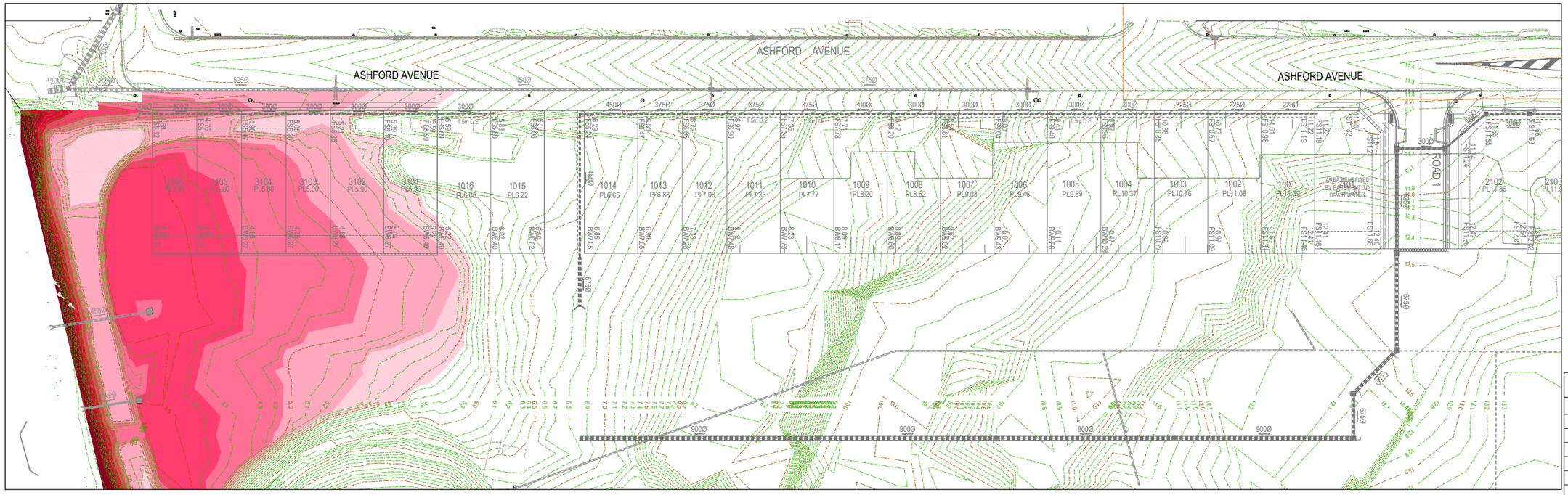
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SERVICE VEHICLE
(SHEET 2 OF 2)

Sheet 17 of 17
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
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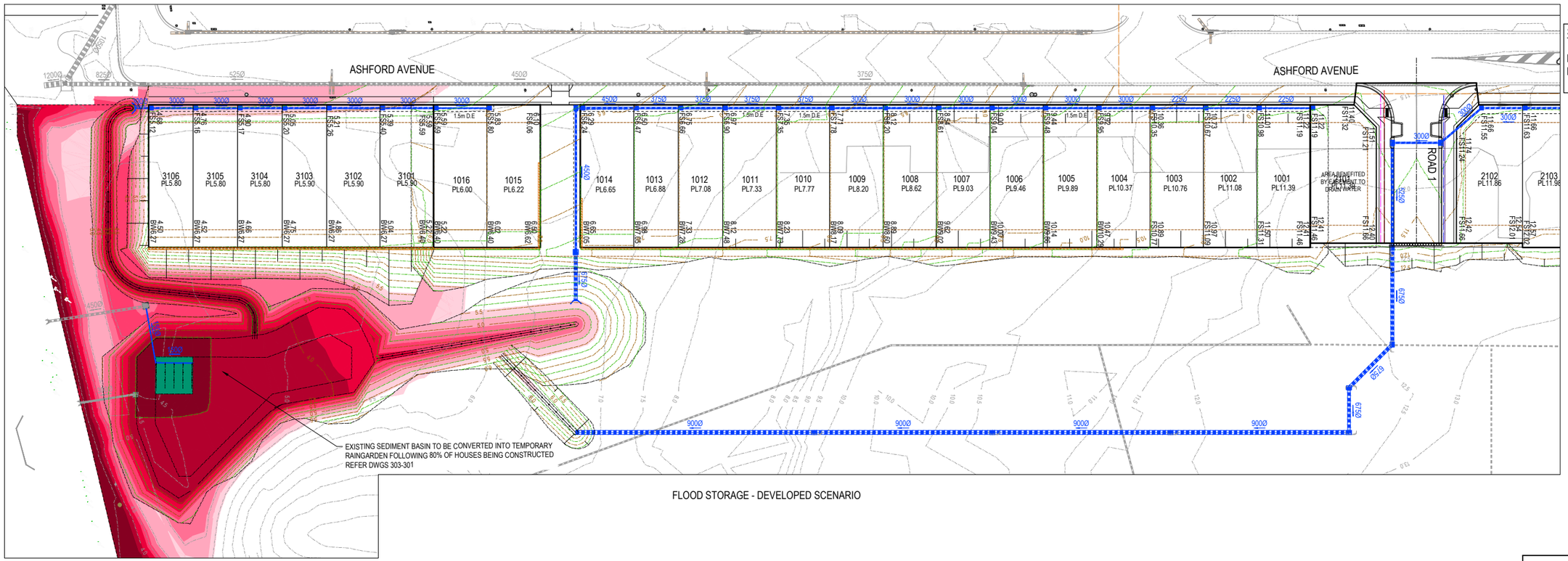
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APPENDIX C: COMPENSATORY STORAGE PLANS – STAGE 1 & 2



FLOOD STORAGE - EXISTING SCENARIO

STORAGE LEGEND		
DEPTH RANGE (m)		COLOUR
>1.8m STORAGE		
1.8	1.5	
1.5	1.2	
1.2	0.9	
0.9	0.6	
0.6	0.3	
0.3	0.0	



FLOOD STORAGE - DEVELOPED SCENARIO

STORAGE VOLUMES:	
EXISTING SCENARIO :	6400 m^3
DEVELOPED SCENARIO :	6855 m^3

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B	ISSUED FOR INFORMATION	19.09.24	R.G	S.G
A	ISSUED FOR INFORMATION	23.05.24	S.F.	S.G

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	S. FERGUSON
Date	20.05.2024
Drawn	C.YAP
Approved	S. GRAY
Date	20.05.2024
PS Number	-

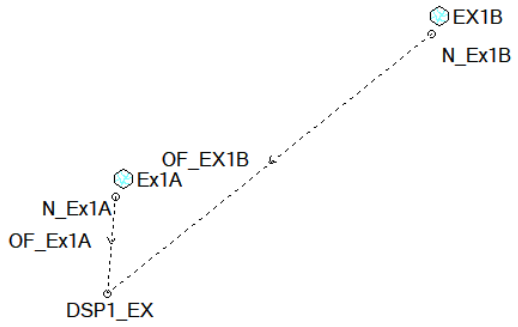
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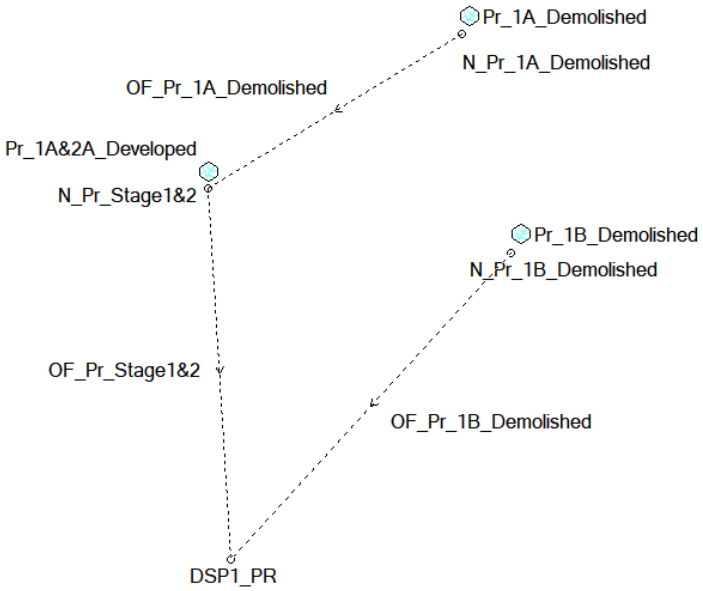
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Drawing Title	COMPENSATORY STORAGE PLAN

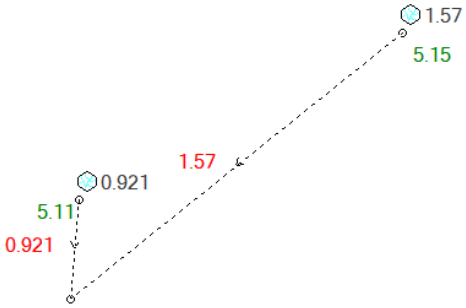
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Scale			
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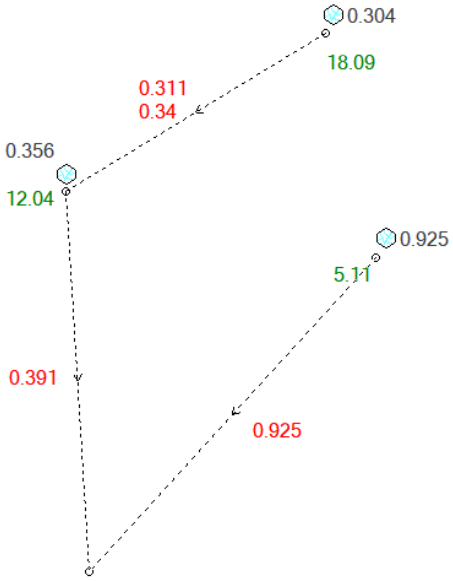
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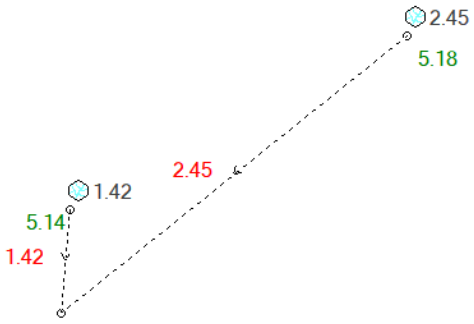
APPENDIX D: OSD DRAINS IL CL MODEL SETUP & DATA – STAGE 1 & 2

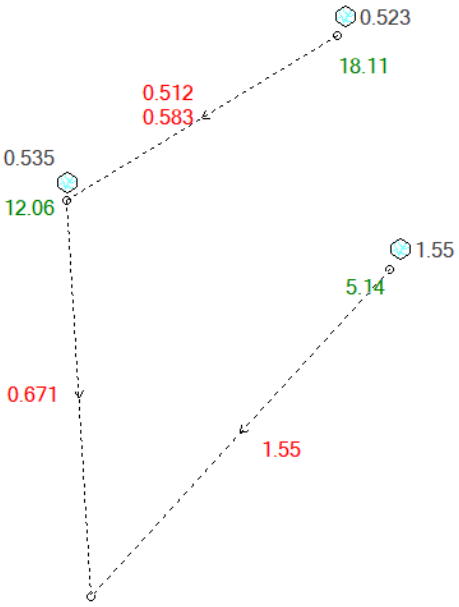









2.45
5.18
1.42
2.45
5.14
1.42


0.523
18.11
0.512
0.583
0.535
12.06
1.55
5.14
0.671
1.55

APPENDIX E: MUSIC LINK FOR LIVERPOOL

LIVERPOOL CITY COUNCIL

music*link*

MUSIC-*link* Report

Project Details		Company Details	
Project:		**Company:**	
Report Export Date:	2/09/2024	**Contact:**	
Catchment Name:	Receiving 60	**Address:**	
Catchment Area:	1.01ha	**Phone:**	
Impervious Area*:	85.0871287128713%	**Email:**	
Rainfall Station:	67035 LIVERPOOL(WHITLAM		
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/67 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	856.622mm		
Evapotranspiration:	1171.074mm		
MUSICX Version:	1.30.0.13025 (5.30.0.13025)		
MUSIC-link data Version:	5.0		
Study Area:	Liverpool City Council		
Scenario:	Liverpool Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node:	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	27.567%	Rainwater Tank Nodes	2	Urban_Roof Nodes	4
TSS	90.788%	Bioretention Nodes	1	Urban_Residential Nodes	2
TP	84.044%				
TN	74.44%				
GP	100%				

Comments

NOTE: A successful self-validation check of your model does not constitute an approved model by Liverpool City Council
MUSIC-*link* now in MUSICX by eWater – leading software for modelling stormwater solutions

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bioretention	Temp Basin Stage 1	Exfiltration Rate	0	None	0 mm/h
Bioretention	Temp Basin Stage 1	High Flow Bypass	0	None	100 m³/s
Bioretention	Temp Basin Stage 1	Orthophosphate Content of Filter Media	0	55	30
Bioretention	Temp Basin Stage 1	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	Temp Basin Stage 1	TN Content of Filter Media	1	800	600
Rainwater	Stage 1 RWT	% Reuse Demand Met	None	None	40.46 %
Rainwater	Stage 2 RWT	% Reuse Demand Met	None	None	40.579 %
Receiving	Receiving 60	Flow Reduction	None	None	27.567 %
Receiving	Receiving 60	GP Reduction	90	None	100 %
Receiving	Receiving 60	TN Reduction	45	None	74.44 %
Receiving	Receiving 60	TP Reduction	65	None	84.044 %
Receiving	Receiving 60	TSS Reduction	85	None	90.788 %
Urban_Residential	Stage 1 Yard	Impervious Area	None	None	0.033 ha
Urban_Residential	Stage 1 Yard	Pervious Area	None	None	0.09 ha
Urban_Residential	Stage 1 Yard	Total Area	None	None	0.123 ha
Urban_Residential	Stage 2 Yard	Impervious Area	None	None	0.016 ha
Urban_Residential	Stage 2 Yard	Pervious Area	None	None	0.061 ha
Urban_Residential	Stage 2 Yard	Total Area	None	None	0.077 ha
Urban_Roof	Stage 1 (Roof ex RWT)	Impervious Area	None	None	0.12 ha
Urban_Roof	Stage 1 (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Stage 1 (Roof ex RWT)	Total Area	None	None	0.12 ha
Urban_Roof	Stage 1 (Roof to RWT)	Impervious Area	None	None	0.36 ha
Urban_Roof	Stage 1 (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Stage 1 (Roof to RWT)	Total Area	None	None	0.36 ha
Urban_Roof	Stage 2 (Roof ex RWT)	Impervious Area	None	None	0.08 ha
Urban_Roof	Stage 2 (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Stage 2 (Roof ex RWT)	Total Area	None	None	0.08 ha
Urban_Roof	Stage 2 (Roof to RWT)	Impervious Area	None	None	0.25 ha
Urban_Roof	Stage 2 (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Stage 2 (Roof to RWT)	Total Area	None	None	0.25 ha

Only certain parameters are reported when they pass validation

NOTE: A successful self-validation check of your model does not constitute an approved model by Liverpool City Council
MUSIC-*link* now in MUSICX by eWater – leading software for modelling stormwater solutions

APPENDIX F: BLUEBOOK DESIGN SPREADSHEET TO SIZE TEMP SEDIMENT

1. Erosion Hazard and Sediment Basins

Site Name: **WSU Milperra**

Site Location: **2 Bullecourt Ave, Milperra**

Precinct/Stage: **Stage 1 & 2 Subdivision**

Other Details:

Site area	Sub-catchment or Name of Structure						Notes
	Temp Basin						
Total catchment area (ha)	2.841						
Disturbed catchment area (ha)	2.841						

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	F						From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	33						Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	33						
% clay (fraction finer than 0.002 mm)	33						
Dispersion percentage	10.0						E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	4.95						See Section 6.3.3(e). Auto-calculated
Soil Texture Group	F						Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5						See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	75						
x-day, y-percentile rainfall event (mm)	19.4						
Rainfall R-factor (if known)	2600						Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	8.3						

RUSLE Factors

Rainfall erosivity (*R* -factor)	2600						Auto-filled from above
Soil erodibility (*K* -factor)	0.038						RUSLE LS factor calculated for a high rill/interrill ratio.
Slope length (m)	200						
Slope gradient (%)	2.4						
Length/gradient (*LS* -factor)	0.74						
Erosion control practice (*P* -factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C* -factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2	2	2	2	2	2	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.35						See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	96						
Soil Loss Class	1						See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	73						Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	35						See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	193						See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	228						

NB for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).

APPENDIX Q: CONCEPT CIVIL ENGINEERING PLANS FOR DA

APPENDIX R: SURVEY PLAN

MGA
SCIMS



1A THESE NOTES AND LEGEND (IF SHOWN) FORM PART OF THE PLAN AND SURVEY AND MUST REMAIN WITH THE PLAN IN ANY REPRODUCTION IN WHOLE OR PART.
1B THE CAD FILE USES METRES AS ITS BASE UNIT AND IS IN A "GROUND" COORDINATE SYSTEM. IF THE SURVEY IS STATED AS MGA, ANY POINT IN THE FILE WILL BE AN APPROXIMATE MGA COORDINATE.
1C SOME SYMBOLS REPRESENTING PHYSICAL STRUCTURES SUCH AS POWER POLES AND PITS ARE DIAGRAMMATIC ONLY AND DO NOT NECESSARILY REPRESENT THE ACTUAL SIZE AND EXTENT OF THESE FEATURES.
1D THE SURVEY INFORMATION SHOWN HERE WAS PREPARED FOR A SPECIFIC PURPOSE FOR THE CLIENT SHOWN. THIS INFORMATION IS NOT INTENDED TO BE USED FOR ANY OTHER PURPOSE OR BY ANYONE NOT AUTHORISED BY THIS CLIENT.
2A BOUNDARY DIMENSIONS AND AREAS HAVE BEEN DETERMINED BY CURRENT CADASTRAL SURVEY AND THE BOUNDARY AND EASEMENT LINES IN THE ELECTRONIC FILE HAVE BEEN INCLUDED USING THOSE SURVEYED DIMENSIONS. THE TITLE DIMENSIONS SHOWN ON THE HARD COPY PLAN TAKE PRECEDENCE OVER THE LINES IN THE ELECTRONIC FILE
3A THE TITLES TO THE SUBJECT LAND HAS BEEN REVIEWED AND THE POSITION OF ALL EASEMENTS AFFECTING THE LAND ARE SHOWN. THE TERMS OF ANY EASEMENT, RESTRICTION ON THE USE OF LAND OR COVENANT AFFECTING THE LAND HAVE NOT BEEN INVESTIGATED. LEASES AND OTHER NOTATIONS MAY ALSO EXIST WHICH AFFECT THE LAND.
4A UNDERGROUND SERVICES OTHER THAN THOSE SHOWN HAVE NOT BEEN INVESTIGATED. PRIOR TO DEMOLITION, EXCAVATION OR CONSTRUCTION WORK ON THE SITE, THE RELEVANT SERVICE AUTHORITY SHOULD BE CONTACTED TO ESTABLISH DETAILED LOCATION AND DEPTH.
5A THIS SURVEY IS LIMITED TO IMPROVEMENTS AND OTHER DETAIL WHICH WERE VISIBLE AND ACCESSIBLE AT THE TIME OF SURVEY. THE LOCATION OF DETAIL SUCH AS PRIVATE UNDERGROUND SERVICE LINES AND BUILDING FOUNDATIONS WITHIN THE SITE IS UNKNOWN.
5B THE COORDINATES WITHIN THIS DRAWING RELATE TO THE DATUM SHOWN IN THE TITLE BLOCK. REFER TO A REGISTERED LAND SURVEYOR FOR FURTHER CLARIFICATION. CAUTION SHOULD BE TAKEN WHEN IMPORTING INFORMATION OBTAINED FROM OTHER SUB-CONSULTANTS OR SOURCES TO ENSURE THAT THE DATA IS ON A MATCHING COORDINATE SYSTEM.
5C CONTOURS SHOWN HEREON DEPICT THE GENERAL TOPOGRAPHY ONLY. EXCEPT AT SPOT LEVELS SHOWN, THEY DO NOT NECESSARILY REPRESENT THE EXACT LEVEL AT ANY PARTICULAR POINT.
5D ANY GUTTER, RIDGE, ROOF AND WINDOW DETAILS AND LEVELS SHOWN HAVE BEEN OBTAINED VIA INDIRECT SURVEY METHODS WHERE VISIBLE FROM GROUND LEVEL AND ARE SHOWN ON THIS PLAN IN THEIR APPROXIMATE LOCATION FOR THE PURPOSE OF GENERAL SITE ANALYSIS ONLY.
5E ANY TREE CANOPIES, TRUNK DIAMETERS AND HEIGHTS SHOWN ARE APPROXIMATE ONLY AND SHOULD BE VERIFIED BY FURTHER SURVEY WORKS IF CRITICAL TO DESIGN OR SITE ANALYSIS.
5F SMALL TREES, SHRUBS, GARDEN FEATURES, PATHWAYS AND OTHER MINOR DETAIL MAY NOT BE SHOWN ON THIS PLAN, FOR THE PURPOSES OF THIS SURVEY.

(ZB2) RIGHT OF CARRIAGE WAY VARIABLE WIDTH (DP1236474) (TO BE RELEASED)
(ZC) EASEMENT FOR SERVICES VARIABLE WIDTH (WHOLE OF LOT) (DP1268911) (TO BE RELEASED PRIOR TO THIS SUBDIVISION)
(ZEE2) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES (DP1144378).
(ZEE3) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 2 & 3.3 WIDE (DP1236474) (TO BE RELEASED)

LEGEND

SERVICES
UNDERGROUND POWER — E —
OVERHEAD POWER — OE —
COMMUNICATIONS — C —
SEWER — S —
WATER — W —
RECYCLED WATER — RW —
GAS — G —
DRAINAGE

TOPOGRAPHIC
BANK
TREE 8/0.4/15
DENOTES SPREAD/DIAMETER/HEIGHT
BENCHMARK
CONTOUR 90.5

SYMBOLS
ELECTRICAL PILLAR
LIGHT POLE
POWER POLE
COMMS JUNCTION PIT
MANHOLE
INSPECTION OPENING
MAINTENANCE SHAFT
HYDRANT
STOP VALVE
RECYCLED WATER HYDRANT
RECYCLED WATER STOP VALVE
TAP
WATER METER
GAS VALVE
SAG PIT
GRATED PIT
PIT/LINTEL
SYMBOLS REPRESENTING PHYSICAL STRUCTURES
SUCH AS POWER POLES AND PITS ARE DIAGRAMMATIC ONLY AND DO NOT NECESSARILY REPRESENT THE ACTUAL SIZE AND EXTENT OF THESE FEATURES.

VER	BY	AMENDMENTS	DATE
A	BC	ORIGINAL ISSUE	04-09-2024

- THE POSITION OF SERVICES SHOWN ON THIS DRAWING ARE INDICATIVE ONLY AND HAVE BEEN PLOTTED FROM PLANS AND DRAWINGS SUPPLIED BY RELEVANT AUTHORITIES.
- SERVICE AUTHORITY PITS, MANHOLES, POLES, MARKER POSTS, ETC., WHERE SIGHTED AT TIME OF SURVEY, HAVE BEEN LOCATED. THE SURVEY DOES NOT INCLUDE INVESTIGATION OR LOCATION OF UNDERGROUND INFRASTRUCTURE.
- SERVICES INFORMATION SHOWN ON THIS DRAWING HAS BEEN OBTAINED THROUGH A DIAL BEFORE YOU DIG SEARCH AND IS VALID FOR THE PERIOD OF TIME FROM THE DATE OF ISSUE NOMINATED BY THE AUTHORITY.
- PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON OR ADJACENT TO THE SITE IT IS THE RESPONSIBILITY OF THE DEVELOPER AND CONTRACTORS TO APPLY FOR AND OBTAIN UP TO DATE PLANS THROUGH A NEW DIAL BEFORE YOU DIG SEARCH AND TO CONTACT
ALL THE RELEVANT AUTHORITIES TO ESTABLISH AND CONFIRM THE DETAILED LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES.

www.dialbeforeyoudig.com.au DIAL 1100 BEFORE YOU DIG

CLIENT: mirvac

Beveridge Williams
Development and Infrastructure Consultants
Western Sydney (02) 4625 5055 www.beveridgewilliams.com.au

DETAILS:
PLAN OF DETAIL SURVEY OVER PROPOSED STAGE 1
2 BULLECOURT AVENUE, MILPERRA

ORIGINAL
SCALE 1:1500 SHEET SIZE
A1
CAD REFERENCE: 2301879(1)-DET
0 30 60 90
SCALE ON ORIGINAL DRAWING AT 1:1500

SURVEYOR:	BC
DRAWN:	YC
CHECKED:	BC
SURVEY DATE:	N/A
VERTICAL DATUM:	AHD
HORIZONTAL DATUM:	MGA 2020

PROJECT No.
2301879
DRAWING REF.
2301879(1)-DET
VERSION A
SHEET 1 OF 3

MGA
SCIMS

LEGEND

SERVICES

UNDERGROUND POWER	E
OVERHEAD POWER	OE
COMMUNICATIONS	C
SEWER	S
WATER	W
RECYCLED WATER	RW
GAS	G
DRAINAGE	

TOPOGRAPHIC

BANK

TREE 8/0.4/15

DENOTES SPREAD/DIAMETER/HEIGHT

BENCHMARK

CONTOUR 90.5

SYMBOLS

ELECTRICAL PILLAR
LIGHT POLE
POWER POLE
COMMS JUNCTION PIT
MANHOLE
INSPECTION OPENING
MAINTENANCE SHAFT
HYDRANT
STOP VALVE
RECYCLED WATER HYDRANT
RECYCLED WATER STOP VALVE
TAP
WATER METER
GAS VALVE
SAG PIT
GRATED PIT
PIT/LINTEL

SYMBOLS REPRESENTING PHYSICAL STRUCTURES
SUCH AS POWER POLES AND PITS ARE DIAGRAMMATIC ONLY AND DO NOT NECESSARILY REPRESENT THE ACTUAL SIZE AND EXTENT OF THESE FEATURES.

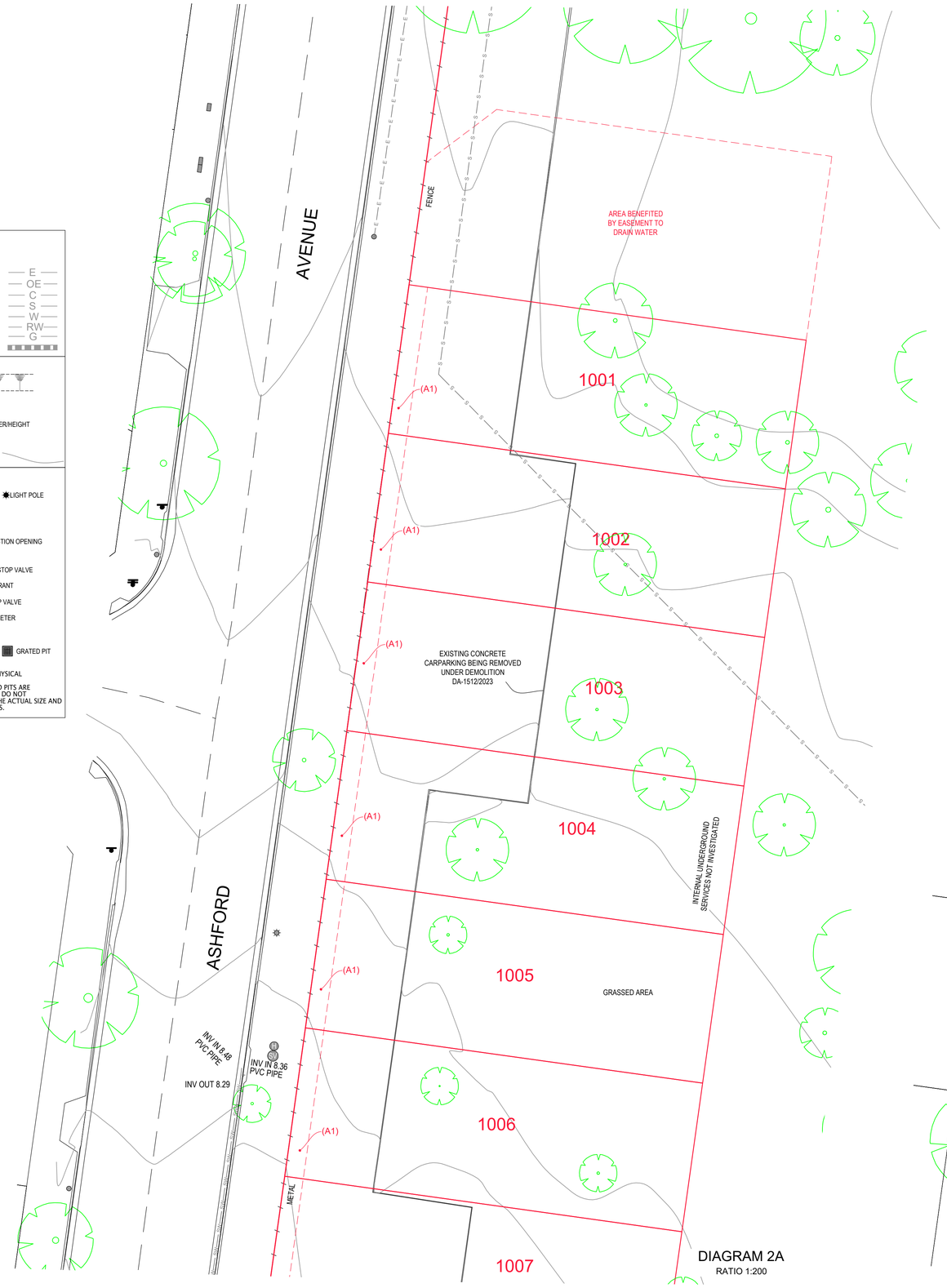
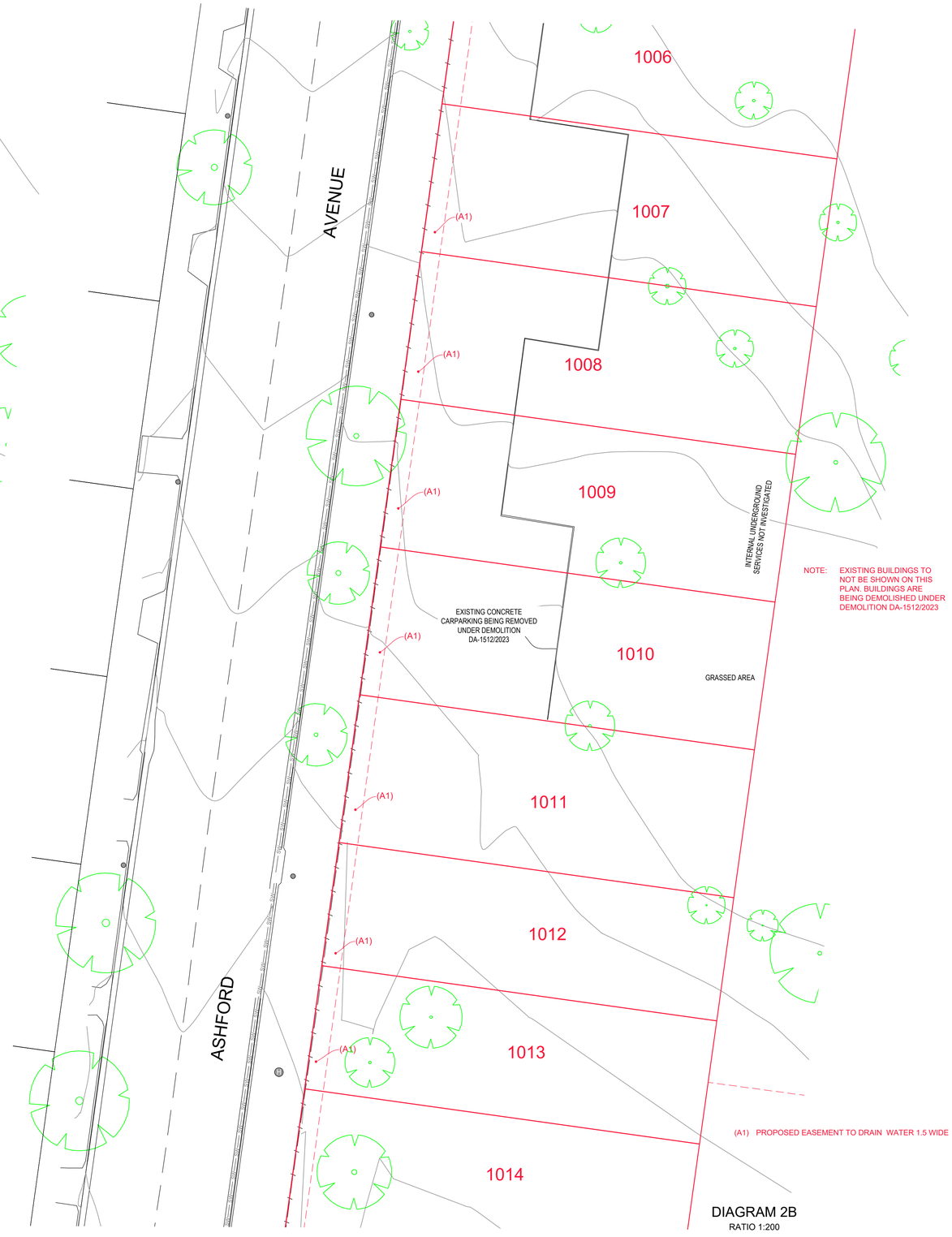


DIAGRAM 2A
RATIO 1:200



NOTE: EXISTING BUILDINGS TO NOT BE SHOWN ON THIS PLAN. BUILDINGS ARE BEING DEMOLISHED UNDER DEMOLITION DA-1512/2023

(A1) PROPOSED EASEMENT TO DRAIN WATER 1.5 WIDE

DIAGRAM 2B
RATIO 1:200

VER	BY	AMENDMENTS	DATE
A	BC	ORIGINAL ISSUE	04-09-2024

- THE POSITION OF SERVICES SHOWN ON THIS DRAWING ARE INDICATIVE ONLY AND HAVE BEEN PLOTTED FROM PLANS AND DRAWINGS SUPPLIED BY RELEVANT AUTHORITIES.
- SERVICE AUTHORITY PITS, MANHOLES, POLES, MARKER POSTS, ETC., WHERE SIGHTED AT TIME OF SURVEY, HAVE BEEN LOCATED. THE SURVEY DOES NOT INCLUDE INVESTIGATION OR LOCATION OF UNDERGROUND INFRASTRUCTURE.
- SERVICES INFORMATION SHOWN ON THIS DRAWING HAS BEEN OBTAINED THROUGH A DIAL BEFORE YOU DIG SEARCH AND IS VALID FOR THE PERIOD OF TIME FROM THE DATE OF ISSUE NOMINATED BY THE AUTHORITY.
- PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON OR ADJACENT TO THE SITE IT IS THE RESPONSIBILITY OF THE DEVELOPER AND CONTRACTORS TO APPLY FOR AND OBTAIN UP TO DATE PLANS THROUGH A NEW DIAL BEFORE YOU DIG SEARCH AND TO CONTACT
ALL THE RELEVANT AUTHORITIES TO ESTABLISH AND CONFIRM THE DETAILED LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES.

www.dialbeforeyoudig.com.au DIAL 1100 BEFORE YOU DIG

CLIENT: mirvac

Beveridge Williams
Development and Infrastructure Consultants
Western Sydney (02) 4625 5055 www.beveridgewilliams.com.au

DETAILS:

PLAN OF DETAIL SURVEY OVER PROPOSED STAGE 1
2 BULLECOURT AVENUE, MILPERRA

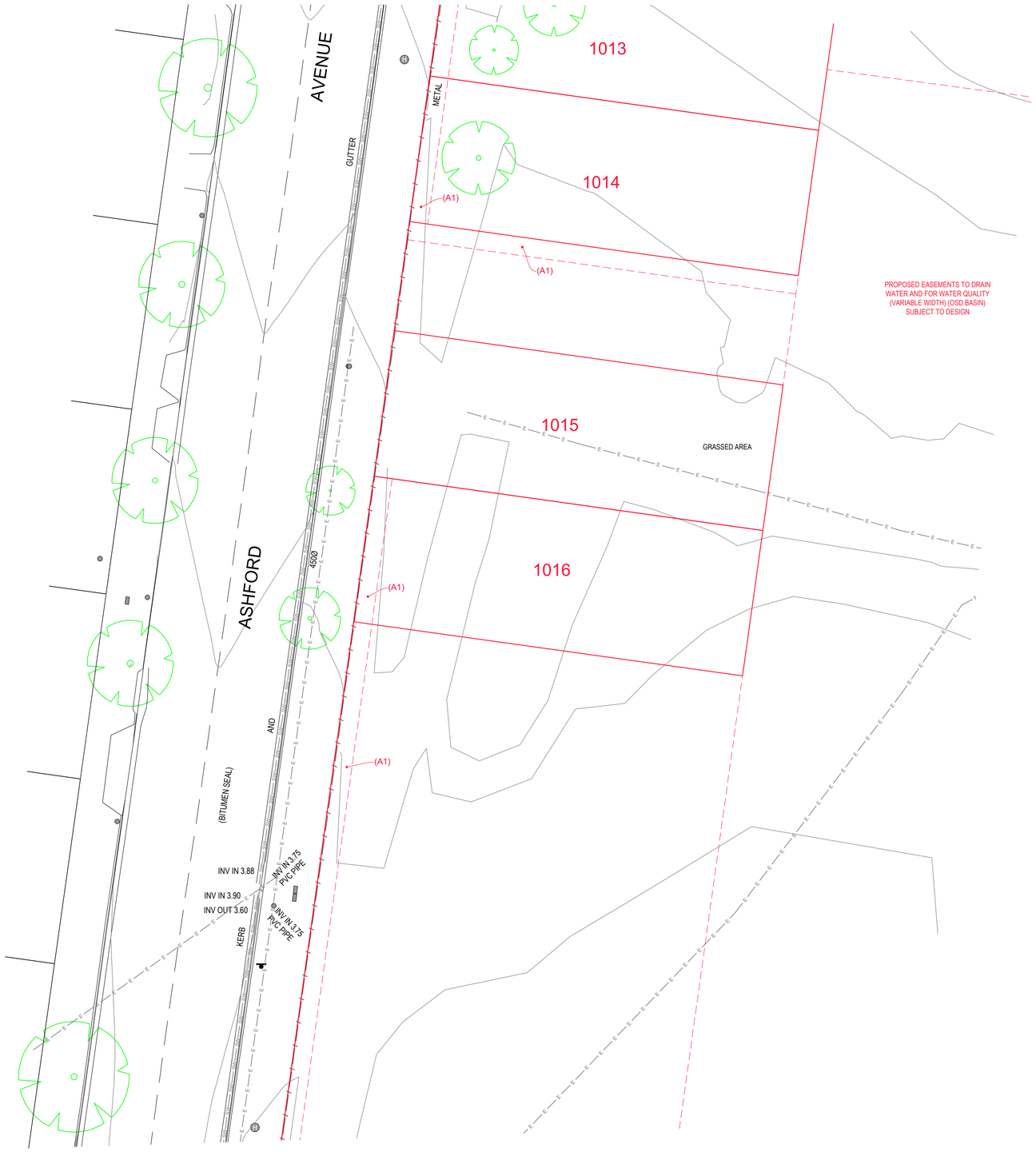
ORIGINAL
SCALE 1:200 SHEET SIZE A1

CAD REFERENCE: 2301879(1)-DET

0 4 8 12
SCALE ON ORIGINAL DRAWING AT 1:200

SURVEYOR:	BC
DRAWN:	YC
CHECKED:	BC
SURVEY DATE:	N/A
VERTICAL DATUM:	AHD
HORIZONTAL DATUM:	MGA 2020

PROJECT No. 2301879
DRAWING REF. 2301879(1)-DET
VERSION A
SHEET 2 OF 3



MGA
SCIMS

LEGEND

SERVICES

UNDERGROUND POWER	E
OVERHEAD POWER	OE
COMMUNICATIONS	C
SEWER	S
WATER	W
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(A1) PROPOSED EASEMENT TO DRAIN WATER 1.5 WIDE

VER	BY	AMENDMENTS	DATE
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DETAILS:

PLAN OF DETAIL SURVEY OVER PROPOSED STAGE 1
2 BULLECOURT AVENUE, MILPERRA

ORIGINAL
SCALE 1:200 SHEET SIZE A1

CAD REFERENCE: 2301879(1)-DET

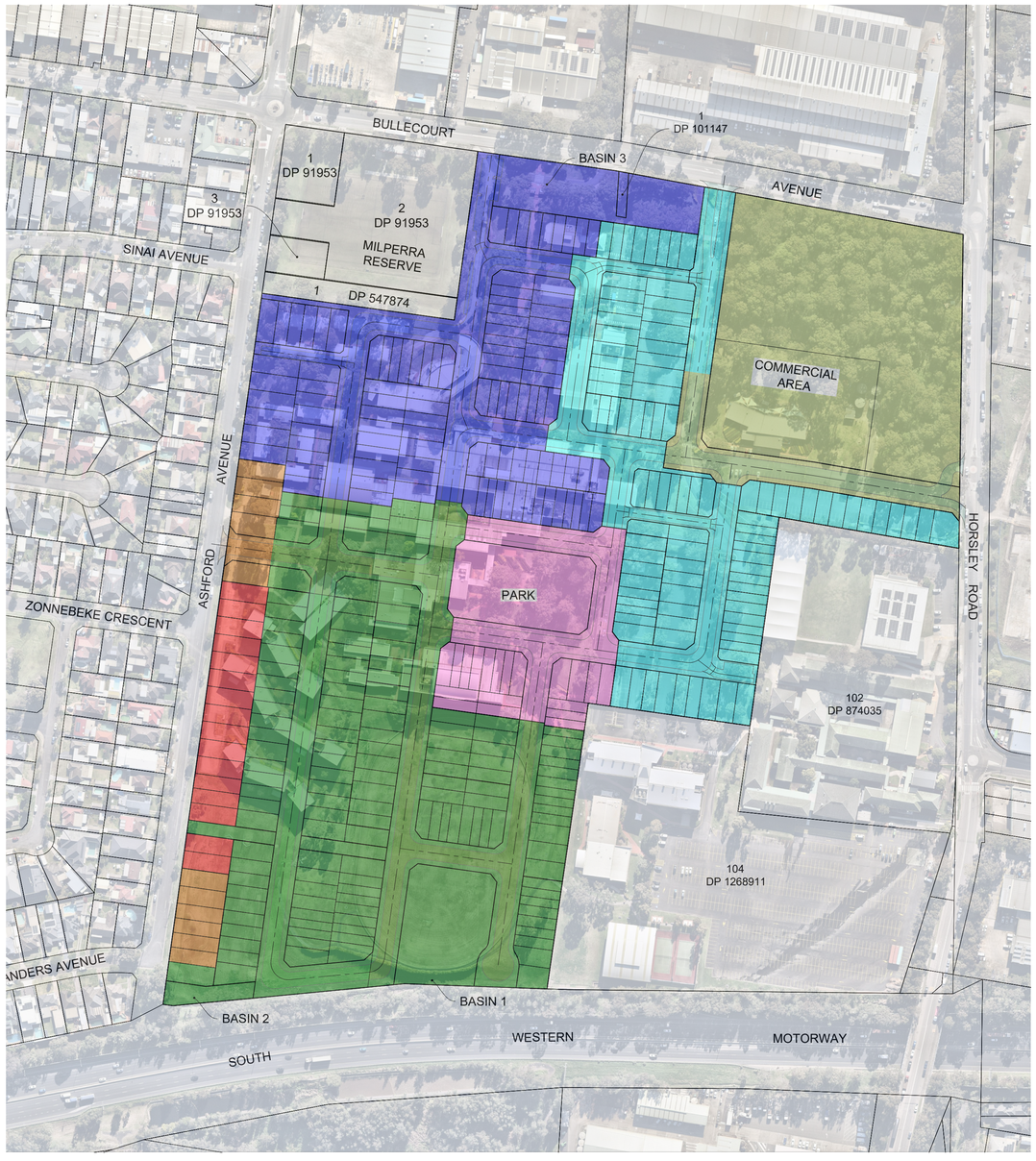
0 4 8 12
SCALE ON ORIGINAL DRAWING AT 1:200

SURVEYOR:	BC
DRAWN:	YC
CHECKED:	BC
SURVEY DATE:	N/A
VERTICAL DATUM:	AHD
HORIZONTAL DATUM:	MGA 2020

PROJECT No. 2301879
DRAWING REF. 2301879(1)-DET
VERSION A
SHEET 3 OF 3

APPENDIX S: PROPOSED PLAN OF SUBDIVISION

APPENDIX T: MASTERPLAN - STAGING PLAN



Stage No.	No. of Superlots Lots	No. of Residential Lots	No. of Public/Drainage Reserve Lots	Stage Area (m²)
Stage 1	0	16	0	6030
Stage 2	0	11	0	4690
Stage 3	10	135	2	61674
Stage 4	2	19	1	15108
Stage 5	9	96	0	35176
Stage 6	9	105	1	40385
Commercial	1	0	0	33340

WARNING

BEWARE OF UNDERGROUND SERVICES

The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works

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REV	DESCRIPTION	DATE	DRN.	APP.
E	STAGE 4 & 5 BOUNDARY MODIFIED	13.06.24	S.G.	S.G.
D	LAYOUT MODIFIED	23.05.24	S.G.	S.G.
C	STAGE 1 BOUNDARIES	31.01.24	S.G.	S.G.
B	STAGE 1 LIMITS UPDATED	22.01.24	S.G.	S.G.
A	ISSUED FOR INFORMATION	15.12.23	D.H.	S.G.

REV	DESCRIPTION	DATE	DRN.	APP.
G	REVISED STAGING ADDITION OF COMMERCIAL AREA	29.08.24	AA	S.G.
F	REVISED STAGING ADDITION OF STAGE 6	09.08.24	AA	S.G.

mirvac

0 20 40 80 120 160
SCALE 1:2000 AT A1 SIZE

Designed S. GRAY
Date 15.01.2024
Drawn D. HALL
Approved N/A
Date N/A
DA Number N/A

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Project Details: WSU MILPERRA
2 BULLECOURT AVE, MILPERRA
CANTERBURY-BANKSTOWN COUNCIL

Drawing Title: STAGING PLAN

Sheet 01 of 01
Scale 1:2000 @ A1
N

Project Number	Reference	Drawing No	Revision
2301879	302	010	G

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