ENVIRONMENTAL CONSULTING SERVICES

DETAILED ENVIRONMENTAL SITE INVESTIGATION

Gladstone Street, 4 Terminal Place & 4A Terminal Place Merrylands NSW 2160

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Executive Summary

Environmental Consulting Services Pty Ltd (ECS) was engaged to undertake an environmental assessment of the property at Gladstone Street, 4 Terminal Place & 4A Terminal Place in Merrylands (the Site). ECS understands that it is proposed to redevelop the Site for residential purposes and that this development will incorporate 5 and 6 level basements.

The objective of the environmental investigation was to evaluate for contamination resulting from past Site activities and draw conclusion about the suitability of the Site for residential use. The scope of work undertaken to meet this objective included the review of selected background information including the Preliminary Site Investigation report, the preparation of a Site Sampling Plan and soil and groundwater sampling.

The Site appeared to have been part of a quarry (brick pit) prior to 1930. This quarry extended onto the Site across the north west boundary was backfilled between 1961 and 1965. There was also a creek across the Site (A'Becketts Creek) which was partly directed through a manmade culvert before 1943 and then completely piped (underground) by 1982.

Site developments appear to have included a flour mill on the southern boundary which was demolished prior to 2000. Based on the history of the Site, three potential sources of contamination were identified including uncontrolled backfilling, hazardous building materials and potential off-site impacts potentially from the quarry to the north west.

Soil and groundwater sampling was undertaken to characterise soil and groundwater. Based on the Site history and the identified areas of environmental concern, near surface soils were considered the primary indicator for significant impact based. Additionally, contaminants associated with quarry have the potential to leach contamination into subsurface groundwater.

The results of the soil analysis indicate concentrations of hydrocarbons below the site assessment criteria (SAC) for residential (with minimal opportunity for soil access) land use except for asbestos which was encountered at three locations. The proposed development requires the excavation of the soils across the total development areas (Development Site 1 and Development Site 2 as shown in Figure 5.1). This excavation activity will remove any potential asbestos impacted soil from these areas. The strip of land covering the culvert will not be excavated for the construction of a basement. Residual soil along this section of the Site has the potential to be impacted with asbestos.

Concentrations of chromium and zinc were detected in the groundwater at levels above the assessment criteria relevant to the protection of freshwater ecosystem. This impact is considered likely to be related to regional conditions including the former quarry to the north west of the Site.

Concentrations of some metals were also above drinking water criteria. However, it is not considered likely the groundwater will be extracted for consumption at this location. The heavy metal concentrations encountered are not considered a potential human health risk at this location or an environmental risk at the Site.

Based on the Site investigation and sampling conducted, ECS considered the Site would be suitable for the proposed residential redevelopment provided the following recommendations are followed:

- Preparation of a Remediation Action Plan (RAP) to document the required works associated with the excavation and removal of fill material potentially impacted by

asbestos. The RAP must also specify the required validation testing. The RAP should be prepared by an experienced contaminated land consultant in accordance with the NSW EPA (2020) Guidelines.

- Additional investigation should be undertaken along the culvert that crosses the Site to assess for asbestos. This can be included as a data gap assessment in the RAP. The results of this additional investigation may require the remediation of surface soils along this strip of land. The additional investigation scope can be included in the RAP; and
- All waste material should be classified in accordance with the NSW EPA Waste Classification Guidelines and disposed of to an appropriate and licenced facility.

It is recommended that a Remediation Action Plan (RAP) is prepared to document the required works associated with the further investigation. The RAP must also specify the required validation testing.

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1.0 INTRODUCTION

Environmental Consulting Services Pty Ltd (ECS) was engaged to undertake a Detailed Site Assessment (DSI) of the property known as Gladstone Street, 4 Terminal Place & 4A Terminal Place in Merrylands (the Site). The purpose of this assessment was to evaluate for contamination resulting from past Site activities and to draw conclusions regarding the suitability of the Site for future residential development.

ECS understands that it is proposed to redevelop the Site for residential purposes and that this development will incorporate multistorey residential tower buildings over basements that generally extend to 5 levels below ground although one area will extent to 6 levels down. Selected copies of development plans are provided in Appendix 1.

The investigation has been undertaken in accordance with:

- Guidelines for Consultants Reporting on Contaminated Sites (NSW EPA, 2020);
- State Environmental Planning Policy (Resilience and Hazards) 2021; and
- National Environment Protection Measure (NEPM) for the Assessment of the Site Contamination (NEPM 2013).

1.1 Scope of Work

The objective of the environmental investigation was to evaluate for contamination resulting from past Site activities and draw conclusion about the suitability of the Site for residential use. The scope of work undertaken to meet this objective included the following:

- The review of selected background information including the Preliminary Site Investigation report;
- The review of the potential contamination types and the conceptual Site model (CSM);
- The preparation of a Site Sampling Plan;
- A Site inspection and sampling; and
- The preparation of a site assessment report for submission to council.

2.0 SITE INFORMATION

2.1 Site Identification

The location of the Site is presented in Figure 2.1 – Site Location Plan with the Site identification details summarised in Table 2.1 – Site Identification.

Table 2.1 – Site Identification

Attribute	Detail
Site Address	Gladstone Street, 4 & 4A Terminal Place, Merrylands NSW 2160
Lot & Deposited Plan	Lot 1 DP 229589, Lot 2 DP 1217412 & Lot 1 DP 1173048
Current Land Use	Vacant land adjoining a development site
Proposed Land Use	High Density Residential
Local Government Authority	Cumberland City Council
Current Zoning	RE1 – Public Recreation R4 – High Density Residential B6 – Enterprise Corridor
Site Area (m^2)	Approximately 16300
Geographical Location (approximate centre)	Latitude: -33.83515 Longitude: 150.993505

Figure 2.1 – Site Location Plan

2.2 Site Location and Regional Setting

The Site is located within multiple zoning boundaries and is primarily between a high-density residential and an enterprise corridor precinct of Merrylands. Additionally, to the north of the Site is Holroyd Gardens Park, which is zoned as public recreation space, and there is a railway track along the south-eastern boundary.

The Site is made up of two lots (Lot 1 DP 229589 & Lot 2 DP 1217412) that are irregular in shape and have access to Pitt Street from the adjoining cul-de-sac, Gladstone Street.

The neighbouring land uses include residential and commercial developments. There are commercial facilities to the west of the Site on the northern side of Gladstone Street and a residential development under construction on the southern side of Gladstone Street. There is a residential development to the north of the Site across Neil Street and also to the east across the rail line. There are commercial facilities to the south of the Site.

The Site is outlined in red and surrounding properties shown on Figure 2.2 – Site Layout.

Figure 2.2 – Site Layout

2.3 Topography

The Site is generally flat and is at an elevation of approximately 20m AHD (Australian Height Datum). The topography appears to follow the natural topography of the surrounding area although it is noted that the land surface in this location has been modified. There is an embankment along Neil Street leading to a bridge across the rail line to the east of the Site and there is a significant excavation for the residential development to the west of the Site. Spoil from the adjoining excavation has been placed on the Site.

3.0 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

Regional geology of the area is shown on the Penrith Geological Map Sheet 1:100,000 (Sheet 9030 1st Edition 1991). The Site is located along the boundary of Ashfield Shale and Bringelly Shale of the Wianamatta Group.

Bringelly shale is described as shale, carbonaceous claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff. Ashfield shale is described as dark-grey to black claystone-siltstone and fine sandstone-siltstone laminite.

3.2 Acid Sulfate Soil (ASS) Risk Planning

The Cumberland Local Environment Plan (LEP) 2021 prepared by the Cumberland City Council includes Acid Sulfate Soil (ASS) risk maps which indicate a low likelihood of encountering ASS in the area. Additionally, The ASS risk maps prepared by the NSW Department of Planning, Industry and Environment do not extend over this area.

ECS indicates there is a low likelihood for ASS to be encountered at the Site.

3.3 Hydrogeology

The nearest surface water body to the Site is A'Becketts Creek located approximately 50m to the north of the Site which appears to continue underground towards the Site. A'Becketts Creek flows into Duck Creek, which connects to Duck River and ultimately discharges to the Parramatta River.

The MinView database provided by the NSW Government (2021) shows the nearest registered groundwater bores are located approximately 150m to the north-west at a service station site. There are also registered bores 720m to the west at another service station. There is a registered bore 600m south-east of the Site at football field/park land. The details of the registered bores are summarised in Table 3.1 – Groundwater bores.

Table 3.1 – Groundwater Bores

Groundwater bore	Year constructed	Purpose	Depth
GW105488	2003	Exploration	6.9m
GW105489	2003	Exploration	6.5m
GW105490	2003	Exploration	6.5m
GW105491	2003	Exploration	6.5m
GW107473	2005	Exploration	6.5m
GW107474	2005	Exploration	6.5m
GW112492	2010	Exploration	11.5m
GW112493	2010	Exploration	9m
GW112494	2010	Exploration	9m
GW105424	2001	Water Supply	25.6m

An extract from the Minview database showing registered groundwater bores is presented in Figure 3.1 – Groundwater Bores with the approximate location of the Site shown in red and groundwater bores shown in blue.

Figure 3.1 – Groundwater Bore Locations

The groundwater bores to the north-west and west are considered to be for monitoring purposes associated with underground petroleum storage systems. It is not considered likely that groundwater is extracted for irrigation purposes in either of these areas.

The groundwater bore to the south-east is located on park land, next to a football field and is listed as functioning for irrigation purposes.

4.0 PREVIOUS INVESTIGATIONS

4.1 Preliminary Site Investigation

ECS completed a Preliminary Site Investigation (PSI) of the Site and presented to findings in the report entitled *Preliminary Environmental Site Investigation, 4 Gladstone Street & 4A Terminal Place Merrylands NSW 2160* (22 October 2022).

The objective of the environmental investigation was to evaluate the potential for contamination resulting from past Site activities and draw conclusion about the suitability of the Site for residential use.

The scope of work undertaken to meet this objective included:

- The review of selected background information including historical aerial photographs and certificates of title;
- The identification of potential contamination types and the development of a conceptual Site model (CSM);
- A Site inspection; and
- The preparation of a site assessment report.

The PSI noted that the Site appeared to have been part of a quarry (brick pit) prior to 1930. The quarry extended onto the Site across the north west boundary was backfilled between 1961 and 1965. There was also a creek across the Site (A'Becketts Creek) which was partly directed through a manmade culvert before 1943 and then completely piped (underground) by 1982.

Site developments appear to have included a flour mill on the southern boundary which was demolished prior to 2000.

Early Site ownership was by The Farmers Fertilizers Corporation Limited. Their use of the land has not been established but NSW EPA records (below) indicate the land to the north of the Site was used for stockfeed manufacturing which potentially indicates the activities undertaken by The Farmers Fertilizers Corporation Limited.

The title records show that the southern section (Lot) of the Site was owned by Donald Archibald McLeod (Flour Miller) and references to flour milling extended from 1925 to 1998.

The Site uses are considered to have been for commercial/industrial activities including brickmaking and flour milling. In addition, ownership by The Farmers Fertilizers Corporation Limited may indicate the storage or manufacture of fertilizer between 1914 and 1951 although no associated structure were observed on the Site.

The PSI concluded that there is a potential for significant or widespread contamination to be present associated with the historical Site activities.
Based on the history three potential Areas of Environmental Concern (AEC) are considered to be associated with the Site.

These AEC include; fill and natural soils in contact with the fill, groundwater impacted by fill material and groundwater impacted by off-site sources.

The PSI recommended that a Detailed Site Investigation is conducted that includes:

- Evaluation of the fill material in the section of the quarry on the Site;

- Evaluation of the fill material along the covered creek alignment;
- Evaluation of fill material across the Site surface and any stockpiles of excavated material remaining after development activities on the neighbouring land;
- Evaluation of groundwater conditions in and adjacent to the quarry, along the northern boundary and across the Site in general.

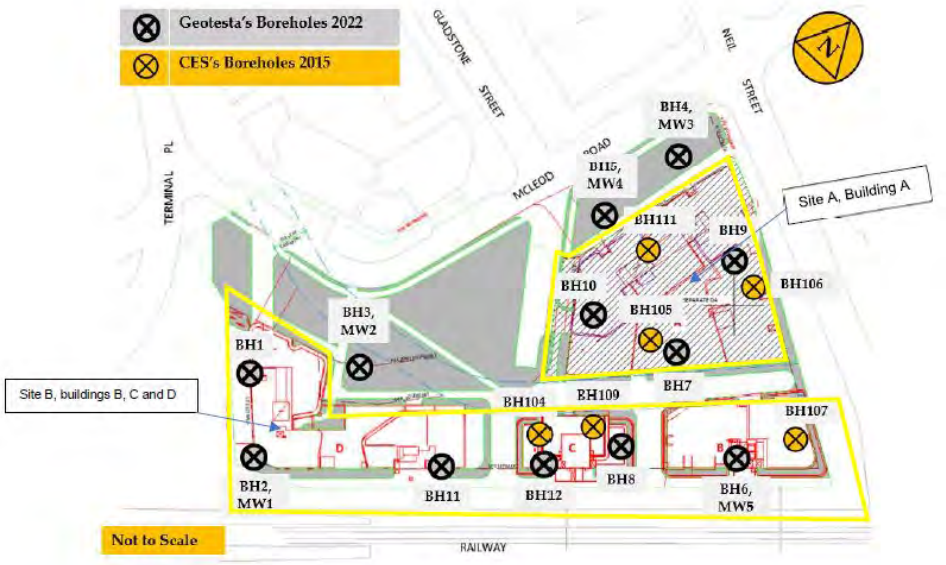
The findings of Detailed Site Investigation should be used to establish the suitability of the Site for the proposed development. Details of the development should be included in the Detailed Site Investigation.

4.2 Geotechnical Investigation

The Site has been the subject of a geotechnical investigation with the findings presented in the report entitled *Geotechnical Site Investigation Report* (Geotesta Pty Ltd 31 October 2022). This investigation included data from a previous geotechnical investigation (Consulting Earth Scientists Pty Ltd 2015) and also included

the drilling of twelve (12) boreholes (BH1 – BH12) to a maximum depth of 24.0m below ground level (bgl). A plan showing the borehole locations drilled by Geotesta and during the previous investigation is presented in Figure 4.1 – Geotechnical Investigation.

Figure 4.1 – Geotechnical Investigation



During the geotechnical investigation five (5) 50mm diameter PVC groundwater monitoring wells were installed in BH2 – BH6. These monitoring wells were constructed with between 12 and 21m well screens with between 3 and 5m solid casing. Sand packs were placed to between 1 and 3m above the well screen and then a bentonite plug over the sand to prevent surface water entering the well. The wells were developed 24h after the completion of the installation and the groundwater measurement were carried out at least 24h after the completion of the well development.

The subsurface conditions encountered during the geotechnical investigation generally consisted of fill over natural clay and shale bedrock. The thicknesses of fill encountered during the investigation are summarised in Table 4.1 – Thicknesses of Fill.

Table 4.1 – Thicknesses of Fill

Borehole Number	Depth of Fill	Description of Fill
BH1	0.2 m	Silty Clay, orange-brown
BH2 (MW1)	1.6 m	Gravelly Clay, dark grey-brown
BH3 (MW2)	1.0 m	Clay, dark grey-brown
BH4 (MW3)	12.6 m	Clay, grey, timber, rubber, tyre
BH5 (MW4)	11.8 m	Clay, dark grey and black, metal, rubber, concrete
BH6 (MW5)	0.15 m	Bitumen pavement
BH7	4.3 m	Silty Clay, brown some gravel
BH8	0	No fill recorded at this location
BH9	0.5 m	Silty Clay, grey-brown, trace sand and gravel
BH10	2.0 m	Silty Clay, grey and yellow-brown, trace gravel
BH11	0	No fill recorded at this location
BH12	0	No fill recorded at this location

Groundwater monitoring undertaken during the geotechnical investigation indicated water levels in monitoring wells MW1, MW3 and MW4 ranging between 12.9 and 14.6m AHD (Australian Height Datum). The levels in monitoring wells MW2 and MW5 were measured at between 4.2 and 6.2m AHD. The geotechnical investigation noted the significant variation in groundwater levels across the Site.

5.0 DATA QUALITY OBJECTIVES

The Data Quality Objective (DQO) process is a systematic, seven-step process that defines the criteria an investigation should satisfy including the type, quantity and quality of data required to support decisions relating to the investigation. DQOs for this investigation have been developed based on the seven-step approach in accordance with the NSW DEC Guidelines for the NSW Site Auditor Scheme (3rd Edition), 2017. The DQOs incorporate field quality control and laboratory analysis, methods and information on laboratory quality control data and validate the field and analytical data for this investigation. The DQOs are presented in detail in the following sections.

Step 1 - State the Problem

The purpose of the investigation is to evaluate for contamination resulting from past Site activities and to draw conclusions regarding the suitability of the Site for residential land use.

This investigation should be undertaken in general accordance with the NSW EPA Guidelines for Consultants Reporting on Contaminated Sites 2020. This requires a review of the findings of the PSI and an intrusive investigation to assess conditions at the identified Areas of Environmental Concern.

Step 2 - Identify the Decisions

The assessment for contamination is based on the known historic uses of the land and the results of sampling activities. The decisions associated with this assessment include:

- Does past land use indicate the presence of potential contamination that may preclude commercial land use of the Site?
- Is there evidence of actual contamination of soil or groundwater at the Site?
- Is the Site suitable for proposed residential use?

Step 3 - Identify Inputs to the Decision

The inputs required to make the identified decisions include:

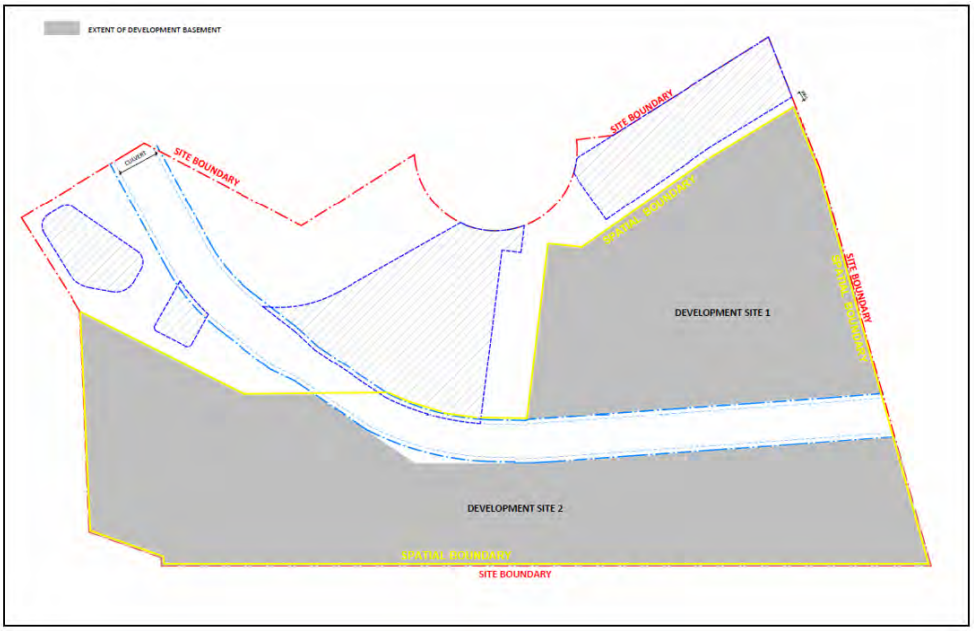
- Site walkover;
- Review of previous investigation results:
- Data regarding the regional and local conditions; and
- Historical records including aerial photographs, certificates of title and previous investigations.
- Laboratory results from soil and groundwater analysis.

Step 4 - Define the Study Boundary

The boundaries for this assessment have been identified as follows:

- Spatial boundaries – the Site area (Lot 1 DP 229589 & Lot 2 DP 1217412) but limited to the areas described as Development Site 1 and Development Site 2 shown on Figure 5.1 – Spatial Boundaries (ref. plans in Appendix 1) and also including the section of culvern between these two development sites. The area to the north of the two development sites is excluding from the Study Area and will be developed as open space and subject to a separate Development Application.
- Soil to the expected base of the proposed basements.

Figure 5.1 – Spatial Boundaries



Step 5 - Develop an Analytical Approach

The decision rule for this investigation are:

- If the Site history indicate the potential for Site contamination, then assessment for actual impacts from that activity must be undertaken.
- If the presence of potential sources of contamination are encountered such as uncontrolled contaminated fill material then remediation or management must be undertaken.

- Results of assessment activities undertaken to investigate for actual impacts need to consider the proposed Site use. If the results of sampling encounter concentrations of contaminants greater than nominated Site Assessment Criteria indicating a potential human health of environmental risk then remediation or management must be undertaken.

Step 6 - Specify Performance or Acceptance Criteria

The null hypothesis is that the material is contaminated and exceeds the adopted Site Assessment Criteria. The alternative hypothesis is that the material is not contaminated above the adopted Site Assessment Criteria.

The incorrect consideration of background information and analytical results has the potential to conclude that the Site is contaminated when it is not or alternatively, conclude the Site is not contaminated when it actually is. To provide more certainty to the conclusion regarding the contamination status of the Site, both the background information and the analytical results will be jointly evaluated.

The continuity and understanding of past Site activities provides the basis for the Site sampling plan. Where there is uncertainty or indications of the potential for contamination, sampling needs to be undertaken.

The sampling at the Site needs to address the findings of the background data review and needs to include sufficient sampling locations and depths, utilise appropriate field sampling methodologies, review suitable data quality indicators (DQIs) and quality assessment procedures and incorporate appropriate data evaluation procedures such as the use of 95 percent upper confidence limit (95% UCL) calculations.

Step 7 - Optimise the Design for Obtaining Data

The data sources for this assessment are historic records that have been maintained and that are readily available, soil, groundwater and soil vapour sample that are from targeted sampling locations established as the sampling plan.

The target, judgemental sampling plan prepared for this investigation, considered the Site history and the Site setting, the Site area, likely soil and groundwater media and potential depth of impact. A sampling plan was established to assess surface soil conditions, soil vapour potentail and groundwater quality with locations targeting areas of environmental concern, including fill material.

The density of sampling considered the NSW EPA Sampling Design Guidelines (2022) Table 2 and Schedule B2 of the ASC NEPM 2014 Guideline on Site Characterisation (2011). The sampling depth intervals set to assess surface soil. The sampling density is considered suitable for the investigation.

6.0 CONCEPTUAL SITE MODEL SUMMARY

The PSI developed the Conceptual Site Model (CSM) based on the findings of the desktop study including regional and local conditions and historical records. The history review indicated the Site has been associated and used for commercial/industrial purposes that are likely to result in significant contamination.

During this investigation, the following potential areas of environmental concern were identified. Each potential area of concern was analysed and determined if further investigation and management were required.

The CSM is the framework for identifying activities with the potential to contaminate the site and how potential receptors may be exposed to contamination (if present) either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

Potential Sources

Based on the results of the background data review the Areas of Environmental Concern (AEC) include the following potential sources of contamination and associated Contaminants of Potential Concern (CoPC) have been identified.

S1 – Uncontrolled backfilling.
The former quarry has been filled and also the creek has been piped and the land above filled. There is also the potential for general surface filling undertaken to level the Site. The Contaminants of Potential Concern include:

- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethylbenzene & Xylene (BTEX);
- Heavy metals;
- Polycyclic Aromatic Hydrocarbons (PAH);
- Organochlorine Pesticides (OCP); and
- Asbestos Containing Materials.

S2 – Hazardous building materials.
Hazardous building material may be present as a result demolition of the building on the Site. The Contaminants of Potential Concern include:

- Heavy metals; and
- Asbestos.

S3 – Off-site impacts
The neighbouring facilities including the stockfeed manufacturer, may have resulted in Site contamination. The Contaminants of Potential Concern include:

- TRH and BTEX;
- Heavy metals; and
- Nutrients (nitrates and phosphates)

Potential Receptors

Human health receptors
R1 – Construction and maintenance workers;
R2 – End users (residential); and
R3 – Adjacent users (residential and sensitive).

Environmental receptors
R4 – Water bodies (A'Becketts Creek);
R5 – Ecology (vegetation and biota); and
R6 – Groundwater (freshwater).

Potential Pathways

P1 – Ingestion and dermal contact;
P2 – Inhalation of dust;
P3 – Surface water run-off;
P4 – Leaching of contaminants and vertical migration into groundwater;
P5 – Lateral migration of groundwater providing base flow to water bodies; and
P6 – Direct contact with ecological receptors (including accidental and/or via irrigation).

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human, water or environmental receptors from potential contamination sources on or in the vicinity of the Site, via exposure pathways (complete pathways). The possible pathways between the above potential source (S1 and S2) and receptors (R1 to R6) are provided in Table 6.1 – Source Pathway Analysis.

Table 6.1 – Source Pathway Analysis

Source	Pathway	Receptor	Risk Evaluation
S1, S2 and S3	P1 – Ingestion and dermal contact	R1 – Workers	Possible during development works
		R2 – Occupants	Possible following development works
		R3 – Neighbours	Possible during development works
	P2 – Inhalation of dust and/or vapours	R1 – Workers	Possible during development works
		R2 – Occupants	Possible following development works
		R3 – Neighbours	Possible during development works
	P3 – Surface water run-off	R4 – Water bodies	Possible, a creek crosses the Site
		R6 – Groundwater	Possible there was a quarry on Site
	P4 – Leaching of contaminants	R4 – Water bodies	Possible, a creek crosses the Site
		R6 – Groundwater	Possible there is deep filling
	P5 – Migration of groundwater	R4 – Water bodies	Possible, a creek crosses the Site
		R6 – Groundwater	Possible there is deep filling
	P6 – Contact with ecological receptors	R5 – Ecology	Possible there is deep filling in groundwater

Notes: Risk ranking assessed as low and acceptable are shaded in green
Risk ranking assessed to be more than low shaded in yellow.

The potential areas of environmental concern (AEC) associated with the Site include:

- Fill and natural soils in contact with the fill;
- Groundwater impacted by fill material; and
- Groundwater impacted by off-site sources

7.0 SITE INVESTIGATION

To evaluate for the existing conditions at the Site an inspection was undertaken on 22 December 2022. During this inspection the conditions observed included:

- There were no permanent structures on the Site although there were site sheds providing amenities to the development work being conducted on the neighbouring land;
- There were no remining stockpiles clay soils along the south eastern side of the Site which were present at the time of the PSI and which were from excavation activities associated with the development work being conducted on the neighbouring land; and
- There were construction materials and equipment stored on the Site.

The general Site conditions at the time of the inspection are shown on Figure 7.1 – Site Appearance (west) and Figure 7.2 – Site Appearance (east).

Figure 7.1 – Site Appearance (west)

Figure 7.2 – Site Appearance (east)

Three potential areas of environmental concern (AEC) have been identified associated with historical Site usage. To evaluate for the presence of contamination at the Site, the following scope of work was undertaken:

- A walkover Site inspection;
- The excavation of 12 shallow test pits in a nominal grid pattern across the study area including in the vicinity of the former section of quarry and the culvert with the collection of surface soil samples from each test pit;

- The sampling of three groundwater monitoring wells installed during a geotechnical investigation (Geotesta Pty Ltd 31 October 2022); and
- The laboratory analysis of the soil and groundwater samples for contaminants of potential concern.

The rationale for environmental sampling locations was based on the probability that surface soils may be impacted from the use of chemicals on the Site or the placement of fill characterised as top-down impact. Groundwater samples were collected from two wells installed into the former quarry along the western boundary of Development Site 1 (ref. Figure 5.1) and a third well at the southern corner of the Site.

7.1 Site Walkover

The Site walkover was conducted on 22 December 2022. At this time the Site was predominantly vacant cleared land although building materials were being stored along the south eastern boundary. The building materials included steel for concrete reinforcement, Dincel formwork, aerated concrete blocks and concrete pipes.

The surface of the study area generally appeared to be disturbed natural clays but with some concrete waste (gravel) and some fragments of timber.

There was no distinctly visible evidence of the alignment of the culver that crosses the Site or the former quarry that encroaches onto the Site. Potential Asbestos Containing Material was not observed during the Site inspection or sampling activities.

There was no evidence of underground storage tanks (USTs) on the Site (and none were expected based on the former land uses).

7.2 Soil and Groundwater Assessment Method

The sampling plan prepared for this investigation considered the Site history and the Site setting. Targeted sampling locations were established to assess the potential AECs. The rational for sampling locations for soil and groundwater included:

- The placement of test pits along the western boundary of Development Site 1 where the former quarry potentially encroaches the Site;
- The placement of test pits over the culvert that contains A'Becketts Creek;
- The excavation of a test pit across the study area in a nominal grid pattern; and
- The collection of groundwater samples from monitoring wells installed during a geotechnical investigation.

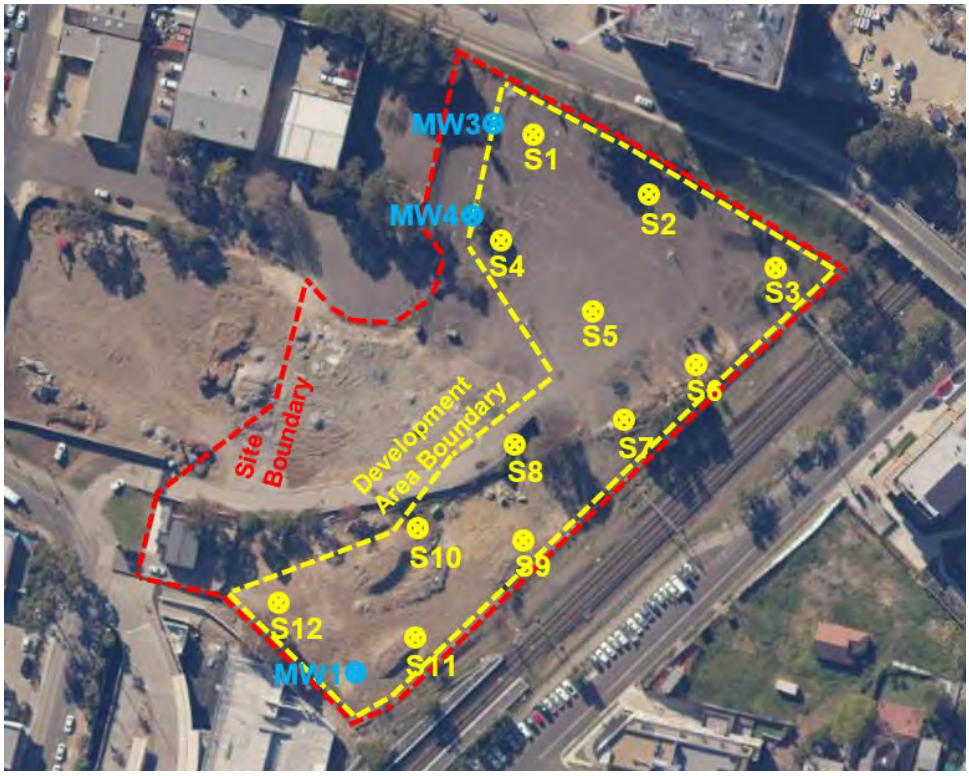
To characterise the surface and subsurface material across the Site, twelve test pits were excavated with soil samples collected from each test pit over the depth interval 0-0.5m. This sampling interval was established targeting the surface material which was expected to be fill material. Each sample location was recorded in the field on a sample schedule and on a chain of custody.

Test pits were numbered sequentially from S1 to S12. Samples were labelled with the test pit number. Three existing groundwater monitoring wells that had been previously assigned the well numbers MW1, MW3 and MW4 (installed in geotechnical boreholes numbered BH2, BH4 and BH5 respectively) were also samples.

The locations of the test pits and monitoring wells that were sampled are presented on Figure 7.3 – Soil and Groundwater Sample Location Plan. The locations labelled in blue represent

the boreholes where monitoring wells were established, the location labelled in yellow are the test pits.

Figure 7.3 – Soil and Groundwater Sample Location Plan



The subsurface conditions encountered at each location are summarised in Table 7.1 – Sample Schedule. Soil conditions across the Siter appeared to be relatively uniform which is considered to be the result of placement and subsequent removal of excavated materials associated with development activities.

The soil conditions encountered across the Site generally consisted of fill which comprised of clayey sand with traces of gravel. During this investigation, potential Asbestos Containing Material (ACM) was not observed on the Site surface.

Soil samples were collected directly from the test pits at the nominated sample depths. Care was taken whilst sampling to avoid cross contamination. Samples were collected by hand directly into laboratory prepared sample jars wearing a new pair of disposable gloves to collect each sample.

Table 7.1 – Sample Schedule

Location Number	Medium	Sample Number	Sample Depth (m bgl)	Description
S1	Soil	S1	0-0.5	Fill – Clay, brown, some sand and gravel
S2	Soil	S2	0-0.5	Fill – Clay, brown, some sand and gravel
S3	Soil	S3	0-0.5	Fill – Clay, brown, some sand and gravel
S4	Soil	S4	0-0.5	Fill – Clay, brown, some sand and gravel
S5	Soil	S5	0-0.5	Fill – Clay, brown, some sand and gravel
S6	Soil	S6	0-0.5	Fill – Clay, brown, some sand and gravel
S7	Soil	S7	0-0.5	Fill – Clay, brown, some sand and gravel
S8	Soil	S8	0-0.5	Fill – Clay, brown, some sand and gravel
S9	Soil	S9	0-0.5	Fill – Clay, brown, some sand and gravel
S10	Soil	S10	0-0.5	Fill – Clay, brown, some sand and gravel
S11	Soil	S11	0-0.5	Fill – Clay, brown, some sand and gravel
S12	Soil	S12	0-0.5	Fill – Clay, brown, some sand and gravel
MW1	Water	BH2	3.02	
MW3	Water	BH4	3.45	
MW4	Water	BH5	3.89	

Notes: Sample depths for water samples represent depth to groundwater.

The soil samples were analysed at a laboratory for COPC including heavy metals and petroleum hydrocarbons.

The monitoring wells were installed during the geotechnical investigation and were constructed using 50mm diameter PVC screens placed at the appropriate depth to intersect the water table. Well construction details are included in the geotechnical investigation report and are summarised in section 4.2 of this report.

Groundwater samples were collected on 22 December 2022 after purging approximately one well volume using a stainless-steel bailer (the wells were purged of standing water then left to recharge to allow sampling). The groundwater samples were analysed at a laboratory for common contaminants including heavy metals, petroleum hydrocarbons and also for VOC.

7.3 Quality Plan

The field quality assurance / quality control (QA/QC) procedures adopted during this assessment included: field decontamination protocols, collection of duplicates, sample labelling storage and handling methodologies.

Field decontamination involved rinsing of sampling equipment with potable water. All samples were labelled in the field with the sample location recorded. Soil and groundwater duplicate samples were also collected. The locations and labelling of duplicate samples are outlined in Table 7.2 – QA/QC Samples.

Table 7.2 – QA/QC Samples

Sample Type	Location	Duplicate Label
Soil	S1	D
Groundwater	BH2/MW1	D

The investigation minimised the potential loss of volatile contaminants through the use of prepared sample jars and vials that were filled as far as practical to minimise headspace. Samples were also chilled as soon as practical whilst on Site.

The analytical laboratory also conducted a QA/QC program. This program included; the analysis of one blank sample and one spiked sample with every batch of samples tested; the repeat analysis of approximately 10% of the samples. The results of this laboratory QA/QC program are included within the laboratory reports.

8.0 ASSESSMENT GUIDELINES

8.1 Soil Assessment Criteria

The NSW Environment Protection Authority (EPA) has issued a number of guidelines relevant to the concentration of contaminants in soil. These are used in conjunction with the National Environment Protection Council (NEPC) – National Environment Protection (Assessment of Site Contamination) Measure 2013.

The Site Assessment Criteria (SAC) that have been used to assess soils are based on the National Environment Protection Measure (NEPM) for the Assessment of Site Contamination (NEPM 2013). These criteria are not derived as acceptance criteria for contamination at a site, but as levels above which specific consideration of risk, based on the site use and potential exposure, is required. If a risk is determined present, then remediation and/or management must be undertaken.

The National Environmental Protection Measure (ASC NEPM 2013) provides Health Investigation Levels (HILs) that are concentration levels, which have been tiered (provided in sets based on risk) for various exposure settings pertaining to land uses. The site criteria within the NEPM are based on potential impact to human health and are intentionally conservative.

The HILs have been derived for four (4) generic land use settings. The HILs for the land use type considered in NEPM include:

- 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.
- HIL B – residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.
- HIL C – public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate.
- HIL D – commercial/industrial such as shops, offices, factories and industrial sites.

Health Screening Levels (HSLs) for various petroleum hydrocarbon compounds have also been developed. The HSLs also relate to the land use (consistent with the HILs) and are dependent on soil type and depth.

The Site has the potential to be redeveloped for residential purposes with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats. The suitable guidelines used for this proposed land use are residential guidelines (HIL B levels). Consistent with the HILs, HSLs for residential land use (HSL A/B) with clay soils have been adopted for the relevant SAC. These criteria are summarised on Table 8.1 – Site Assessment Criteria.

Table 8.1 – Soil Assessment Criteria

Contaminant	Site Assessment Criteria (mg/kg)
Heavy Metals	
Arsenic	500[1]
Cadmium	150[1]
Chromium (VI)	500[1]
Copper	30000[1]
Lead	1200[1]
Mercury	120[1]
Nickel	1200[1]
Zinc	60000[1]
Total Recoverable Hydrocarbons (TRH)	
Naphthalene	5[2]
TRH C6-C10 (F1)	50[2]
TRH C10-C16 (F2)	280[2]
Monocyclic Aromatic Hydrocarbons	
Benzene	0.7[2]
Toluene	480[2]
Ethylbenzene	NL[2]
Xylene (Total)	110[2]
Polycyclic Aromatic Hydrocarbons (PAH)	
Benzo(a)pyrene	4[3]
Total PAH	40[3]
Asbestos	
Bonded ACM	0.04%
Friable asbestos (& asbestos fines)	0.001%

Notes: NL – Not Limiting
1. HIL B levels sensitive land use.
2. Health screening levels HSL A/B for clayey soils over the depth interval 0-1m.
3. Carcinogenic PAHs based on the 8 carcinogenic PAHs.
4. Health screening levels for bonded ACM of residential land use.

The consideration of aesthetic assessment criteria and ecological assessment criteria are not considered relevant to the Site given that the Site will be predominantly paved following development. As such a complete exposure pathway to ecological receptors in the future won't exist.

8.2 Groundwater Assessment Criteria

The NSW EPA Guidelines for the Assessment and Management of Groundwater Contamination (NSW DEC 2007) describes the process to identify environmental values which must be considered in groundwater investigations at contaminated sites. Based on these guidelines, assessment of relevant environmental values requires that the consultant assess whether it is a major drinking water aquifer; assess the uses of the aquifer and identify if it is a suitable drinking water source.

ECS has identified that:

- The site is in an Unincorporated Area Groundwater Management Area (GMU). The fractured rock aquifer beneath the site is not considered to be part of the NSW Office of Water list of protected aquifers as an actual or potential drinking water supply (NSW DEC, 2007).
- The closest potential discharge point is considered to potentially be A'Becketts Creek which crosses the Site in a culvert.

The principal ecological receptor of groundwater is potentially A'Becketts Creek which is a freshwater, so environmental values for groundwater quality are for protection of freshwater ecosystems. In addition, protection of human health from hydrocarbon vapours is applicable to assessment of groundwater.

The Australian and New Zealand Guidelines for the Protection of Aquatic Organisms have trigger values for 95% Protection of Species in freshwater ecosystem and these are considered applicable to assess groundwater at the Site. In addition, the ASC NEPM (2013) has HSL for vapour intrusion of petroleum hydrocarbon contaminants in groundwater.

There are also establish drinking water guidelines that can be used to assess water quality (Australian Drinking Water Guidelines NHMRC 2011). Groundwater is not currently being extracted for domestic consumption, however, the criterial are considered relevant as a potential measure of water quality. These criteria are summarised on Table 8.2 – Groundwater Criteria.

Table 8.2 – Groundwater Assessment Criteria

Contaminant	**Site Assessment Criteria (µg/l)**		
	ANZG[1]	ASC NEPM[2]	Drinking[3]
Monocyclic Aromatic Hydrocarbons			
Benzene	950	5000	1
Toluene	--	NL	800
Ethylbenzene	--	NL	600
Xylene	200[4]/350[5]	NL	300
Polycyclic Aromatic Hydrocarbons (PAH)			
Naphthalene	16	NL	--
TRH F1	--	6000	--
TRH F2	--	NL	--
Heavy Metals			
Arsenic	13	--	10
Cadmium	0.2	--	2
Chromium (VI)	1	--	50
Copper	1.4	--	2000
Lead	3.4	--	10
Mercury	0.6	--	1
Nickel	11	--	2
Zinc	8	--	--
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene	--	--	0.01
Total PAH	--	--	--
Volatile Organic Chlorinated Compounds			
Tetrachloroethene (PCE)	--	--	50

Notes: NL – Not Limiting
1. Australian and New Zealand Guidelines for the Protection of freshwater organisms (2018).
2. ASC NEPM 2013 guidelines for vapour intrusion groundwater at 2m to 4m depth in sands.
3. Investigation levels are health values of the Australian Drinking Water Guidelines (NHMRC 2011).
4. P-xylene only. Criteria for total xylenes have not been provided
5. O-xylene only. Criteria for total xylenes have not been provided

9.0 INVESTIGATION RESULTS

9.1 Site Conditions

At the time of this investigation, the Site was vacant land although some building materials were beings stored along the southern boundary. The surface soil conditions encountered across the Site generally consisted of disturbed natural clay with sand and traces of gravel.

9.2 Soil Analytical Results

The results of analysis soil samples are summarised in Table 9.1 – Soil Analytical Results. The laboratory reports are included in Appendix 2.

The results of the soil analysis indicate levels of all contaminants except for asbestos below the site assessment criteria (SAC) for residential land use. Concentrations of asbestos were detected in three soil samples at levels above the SAC.

Table 9.1 – Soil Analytical Results

Sample Number	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	Site Assessment Criteria (mg/kg)
Metals													
Arsenic	9.3	7.6	4.7	7.7	14	11	6.6	7.2	20	15	52	17	500
Cadmium	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	150
Chromium (VI)	25	35	15	20	22	20	29	15	24	25	24	20	500
Copper	28	45	13	36	26	17	44	19	36	36	36	17	30000
Lead	43	63	13	62	61	13	68	18	58	45	49	16	1200
Mercury	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.1	< 0.1	0.2	0.1	< 0.1	< 0.1	120
Nickel	27	51	6.5	25	17	5	48	12	22	24	24	5	1200
Zinc	190	180	11	110	170	14	300	60	150	130	140	24	60000
Petroleum Hydrocarbons													
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	5
TRH F1	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	50
TRH F2	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	280
Benzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.7
Toluene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	480
Ethylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NL
Xylene (Total)	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	110
Polycyclic Aromatic Hydrocarbons													
Benzo(a)pyrene	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	4
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	40
Asbestos													
Bonded& Friable	ND	ND	ND	**0.0023**	ND	ND	**0.11**	ND	ND	**0.0012**	ND	ND	0.001%

Note: All concentrations mg/kg except asbestos

9.3 Groundwater Analytical Results

The results of analysis of groundwater samples are summarised in Table 9.2 – Groundwater Analytical Results. The laboratory reports are included in Appendix 2.

The results of the groundwater analysis indicate concentrations of hydrocarbons below the site assessment criteria (SAC) and levels of pesticides (OCPs and OPPs) and most volatile organic compounds below the laboratory level of reporting. Minor levels of toluene, ethylbenzene and xylene were detected in groundwater from wells in boreholes BH4 and BH5 which is in the former quarry.

Concentrations of heavy metals were detected in each groundwater sample with concentrations generally expected to represent background levels within a degraded industrial area. The elevated concentrations of metals are not expected to be contamination sourced from the Site but rather representative of regional conditions and significantly influenced by the backfilled quarry to the west of the Site. Concentrations of chromium and zinc were detected at levels above the SAC.

Table 9.2 – Groundwater Analytical Results

Sample Number	BH2	BH4	BH5	Site Assessment Criteria (µg/L)		
				ANZECC[1]	NEPM[2]	Drinking[3]
Monocyclic Aromatic Hydrocarbons						
Benzene	< 1	< 1	< 1	950	5000	1
Toluene	< 1	2	7	--	NL	800
Ethylbenzene	< 1	4	19	--	NL	600
Xylene	< 3	7	160	200/350	NL	300
Volatile Chlorinated Organics						
Tetrachloroethene	< 1	< 1	< 1	--	--	50
Total Recoverable Hydrocarbons (TRH)						
Naphthalene	< 10	< 10	< 10	16	NL	--
TRH F1	< 20	< 20	< 20	--	6000	--
TRH F2	< 50	< 50	50	--	NL	--
Heavy Metals						
Arsenic	< 1	1	3	13	--	10
Cadmium	< 0. 2	< 0. 2	< 0. 2	0.2	--	2
Chromium (VI)	< 1	**5**	**8**	1	--	50
Copper	< 1	< 1	< 1	1.4	--	2000
Lead	< 1	1	3	3.4	--	10
Mercury	< 0. 1	< 0. 1	< 0. 1	0.6	--	1
Nickel	3	3	7	11	--	2
Zinc	**9**	**44**	**31**	8	--	--
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	< 1	< 1	< 1	--	--	0.01
Total PAH	< 1	2	18	--	--	--
Organochlorine Pesticides						
All OCPs	< LOR	< LOR	< LOR			-
Organophosphate Pesticides-						
All OPPs	< LOR	< LOR	< LOR			

Note: All concentrations in ug/l
NL – Not limiting
LOR – Level of Reporting.

9.4 Data Quality Review

Data Quality Objectives

The purpose of establishing data quality objectives is to ensure the field investigations and analyses are undertaken in a way that enables the collection and reporting of reliable data on which to base the site assessment.

The data quality objectives (DQOs) for sampling techniques and laboratory analysis of collected samples defines the acceptable level of error required for this investigation. The data quality objectives will be assessed by reference to data quality indicators (DQI) as follows:

Data Representativeness

Data representativeness expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness was achieved by collecting samples at pre-determined locations across the Site and by taking an adequate number of samples to achieve the intended objectives. Consistent and repeatable sampling techniques and methods were utilised throughout the sampling, as described.

Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study. If there is insufficient valid data, as determined by the other data quality indicators, then additional data would be required to be collected.

Completeness also needs to consider the integrity of the samples collected delivered to the laboratory for analysis. The laboratory sample receipt notice summarises the sample integrity on receipt.

Data Comparability

Data comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency for analytical techniques and reporting methods. With respect to soil vapour sampling the same method and laboratory was used to allow for comparison of pre and post demolition samples.

Reporting of results was done in consistent units and nomenclatures, and comparability was achieved by ensuring that precision and accuracy objectives were met.

Precision

Precision measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples. The criteria used for the assessment of RPDs is based on guidelines given in AS4482.1 (1997) and laboratory criteria but has been set by ECS for this assessment. If duplicate results are not within the acceptable RPDs, investigation into the cause is initiated. If a cause cannot be determined the validity of the data is questioned.

The proposed acceptable range for Relative Percent Difference (RPD) for duplicate samples have been set as follows:

%RPD Range result >10 times PQL then maximum RPD 50%
result >5 times PQL then maximum RPD 75%
result >2 times PQL then maximum RPD 100%
result <2 times PQL then no limit.

RPD is calculated as the absolute value of the difference between the initial and repeat result divided by the average value expressed as a percentage. The overall success is based on assessment of the data set as a whole and not on individual acceptance or exceedance within the data set.

A summary of the duplicate soil and groundwater samples with the calculated RPDs is presented in the Table 9.3. These calculations are limited to contaminants that were detected, that is to say above the laboratory Level of Reporting (LOR). In total, twelve primary soil samples were collected with one duplicate and three primary groundwater samples were collected with one duplicate sample.

Table 9.3 – Relative Percent Differences

Sample Number	LOR	S1	D	RPD (%)	Comment
Arsenic	2	9.3	6.6	33	Meets criteria
Cadmium	0.4	< 0.4	< 0.4	-	Meets criteria
Chromium (VI)	5	25	19	27	Meets criteria
Copper	5	28	25	11	Meets criteria
Lead	5	43	35	20	Meets criteria
Mercury	0.1	< 0.1	< 0.1	-	Meets criteria
Nickel	5	27	23	16	Meets criteria
Zinc	5	190	97	62	Above criteria
All other CoPC below the LOR					
Sample Number	**LOR**	**BH2**	**D**	**RPD**	**Comment**
Nickel	1	3	3	0	Meets criteria
Zinc	5	9	9	0	Meets criteria
All other CoPC below the LOR					

In general, the analysis of duplicate samples showed correlation with consistent detections/non detections. Where RPDs were able to be calculated most results were below the acceptance criteria. Where the calculated RPDs were noted as 'above criteria' consideration of all results for duplicate pairs was undertaken. Acceptable results were required for most (70% or better) of the calculated RPDs or duplicate samples.

The analytical laboratory QA/QC program included the analysis of one blank sample and one spiked sample with every batch of samples tested, and the repeat analysi of approximately 10% of the samples. Laboratory Quality Assurance and Quality Control procedures are provided in the Final Certificate of Analysis.

- A copy of chain of custody (COC) forms are provided with the laboratory results. These forms detail the sample logs such as sample identification, matrix, depths, dates of sampling, container type, and analysis requests;
- A sample receipt notice (SRN) is issued upon delivery of samples, and Sample Integrity and Validated Time of Sample Receipt (VTSR) Holding Times are verified;
- Analytical methods are detailed in the Final Certificate of Analysis; and
- NATA accreditation is held for each method and sample matrix type reported, unless otherwise specified, NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, and modified USEPA / APHA documents.

Performance of intra-laboratory spikes and duplicates are specific to each report, details of which are provided in the Final Certificate of Analysis (FCA). Details referring to instrument detection limits, method detection limits (MDL), and estimated quantitative limits (EQL) are also provided in the FCA.

This soil and groundwater data is considered to meet the DQIs and thus be representative and usable for the purposes of the investigation.

10.0 DISCUSSION

At this time the Site was predominantly vacant cleared land although building materials were being stored along the south eastern boundary. The building materials included steel for concrete reinforcement, Dincel formwork, aerated concrete blocks and concrete pipes.

The surface of the study area generally appeared to be disturbed natural clays but with some concrete waste (gravel) and some fragments of timber.

There was no distinctly visible evidence of the alignment of the culver that crosses the Site or the former quarry that encroaches onto the Site. Potential Asbestos Containing Material was not observed during the Site inspection or sampling activities.

The PSI noted that the Site appeared to have been part of a quarry (brick pit) prior to 1930. The quarry extended onto the Site across the north west boundary was backfilled between 1961 and 1965. There was also a creek across the Site (A'Becketts Creek) which was partly directed through a manmade culvert before 1943 and then completely piped (underground) by 1982.

Site developments appear to have included a flour mill on the southern boundary which was demolished prior to 2000. The title records show that the southern section (Lot) of the Site was owned by Donald Archibald McLeod (Flour Miller) and references to flour milling extended from 1925 to 1998.

The Site uses are considered to have been for commercial/industrial activities including brickmaking and flour milling. Based on the history of the Site, three potential sources of contamination were identified:

- S1 – Uncontrolled backfilling. The former quarry has been filled and also the creek has been piped and the land above filled;
- S2 – Hazardous building materials. Hazardous building material may be present as a result demolition of the building on the Site; and
- S3 – Off-site impacts. The primary source of off-site impacts is considered to be the quarry to the north west.

Considering the potential sources of contamination, soil and groundwater sampling was undertaken to characterise soil and groundwater and assess for the presence of contamination at the Site. Based on the Site history and the identified areas of environmental concern, near surface soils were considered the primary indicator for significant impact based. Additionally, contaminants associated with quarry have the potential to leach contamination into subsurface groundwater.

To assess for the presence of contamination at the Site, the scope of work undertaken included the collection of soil samples from twelve locations and groundwater samples from

three locations across the Site including in the vicinity of the backfilled quarry. All soil and groundwater samples were submitted for laboratory analysis for contaminants of potential concern.

The results of the soil analysis indicate concentrations of hydrocarbons below the site assessment criteria (SAC) for residential (with minimal opportunity for soil access) land use except for asbestos which was encountered at three locations. The proposed development requires the excavation of the soils across the total development areas (Development Site 1 and Development Site 2 as shown in Figure 5.1). This excavation activity will remove any potential asbestos impacted soil from these areas. The strip of land covering the culvert will not be excavated for the construction of a basement. Residual soil along this section of the Site has the potential to be impacted with asbestos.

The low levels of petroleum hydrocarbon impacts were encountered in the groundwater samples collected from wells installed into the former quarry. These levels are not considered to represent a potential human health risk associated with the proposed development.

Concentrations of chromium and zinc were also detected in the groundwater at levels above the SAC relevant to the protection of freshwater ecosystem. This impact is considered likely to be related to regional conditions including the former quarry to the north west of the Site.

Concentrations of some metals were also above drinking water criteria. However, it is not considered likely the groundwater will be extracted for consumption at this location. The heavy metal concentrations encountered are not considered a potential human health risk at this location or an environmental risk at the Site.

11.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the Site investigation and sampling conducted, ECS considered the Site would be suitable for the proposed residential redevelopment provided the following recommendations are followed:

- Preparation of a Remediation Action Plan (RAP) to document the required works associated with the excavation and removal of fill material potentially impacted by asbestos. The RAP must also specify the required validation testing. The RAP should be prepared by an experienced contaminated land consultant in accordance with the NSW EPA (2020) Guidelines.
- Additional investigation should be undertaken along the culvert that crosses the Site to assess for asbestos. This can be included as a data gap assessment in the RAP. The results of this additional investigation may require the remediation of surface soils along this strip of land. The additional investigation scope can be included in the RAP; and
- All waste material should be classified in accordance with the NSW EPA Waste Classification Guidelines and disposed of to an appropriate and licenced facility.

It is recommended that a Remediation Action Plan (RAP) is prepared to document the required works associated with the further investigation. The RAP must also specify the required validation testing.

APPENDIX 1

ARCHITECTURAL DRAWING LIST

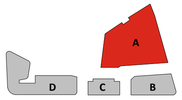
SHEET NUMBER	SHEET NAME	REV	REV DESCRIPTION	DATE
DA-00-GENERAL INFORMATION				
DA-A-00-0000	COVER SHEET & DRAWING LIST	A	D.A. SUBMISSION	11.11.22
DA-A-00-0004	DEVELOPMENT DATA SHEET	A	D.A. SUBMISSION	11.11.22
DA-A-00-1002	SITE PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-00-1003	SUBDIVISION PLAN & AREAS	A	D.A. SUBMISSION	11.11.22
DA-A-00-1004	DEEP SOIL DIAGRAM	A	D.A. SUBMISSION	11.11.22
DA-A-01-0300	SITE ANALYSIS PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-01-0400	PROPOSED SETBACKS AND CONSTRAINTS DIAGRAM	A	D.A. SUBMISSION	11.11.22
DA-10-GENERAL ARRANGEMENT PLANS				
DA-A-10-0090	BASEMENT 05 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0100	BASEMENT 04 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0200	BASEMENT 03 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0300	BASEMENT 02 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0400	BASEMENT 01 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0500	GROUND FLOOR PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0600	LEVEL 01 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0700	LEVEL 02-03 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0800	LEVEL 04-19 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-0900	LEVEL 20 PLAN	A	D.A. SUBMISSION	11.11.22
DA-A-10-1000	ROOF PLAN	A	D.A. SUBMISSION	11.11.22
DA-20-ELEVATIONS				
DA-A-20-0010	STREETSCAPE ELEVATIONS	A	D.A. SUBMISSION	11.11.22
DA-A-20-0100	NEIL ST NORTH EAST SITE ELEVATION	A	D.A. SUBMISSION	11.11.22
DA-A-20-0200	RAIL CORRIDOR SOUTH EAST SITE ELEVATION	A	D.A. SUBMISSION	11.11.22
DA-A-20-0300	SOUTH WEST & NORTH EAST ELEVATIONS	A	D.A. SUBMISSION	11.11.22
DA-A-20-0400	MCLEOD ROAD WEST ELEVATION	A	D.A. SUBMISSION	11.11.22
DA-30-SECTIONS				
DA-A-30-0100	SECTION 1	A	D.A. SUBMISSION	11.11.22
DA-A-30-0200	SECTION 2	A	D.A. SUBMISSION	11.11.22
DA-50-DETAILS PLANS				
DA-A-50-0200	ADAPTABLE APARTMENTS SHEET 1	A	D.A. SUBMISSION	11.11.22
DA-A-50-0211	ADAPTABLE APARTMENTS SHEET 2	A	D.A. SUBMISSION	11.11.22
DA-A-50-0212	ADAPTABLE APARTMENTS SHEET 3	A	D.A. SUBMISSION	11.11.22
DA-A-50-0213	ADAPTABLE APARTMENTS SHEET 4	A	D.A. SUBMISSION	11.11.22
DA-A-50-0214	ADAPTABLE APARTMENTS SHEET 5	A	D.A. SUBMISSION	11.11.22
DA-70-GENERAL INFORMATION				
DA-A-70-0100	EXTERNAL MATERIAL AND FINISHES BOARD	A	D.A. SUBMISSION	11.11.22
DA-91-SCHEDULES (AREA) / AREA PLANS				
DA-A-91-0200	COMMUNAL OPEN SPACE DIAGRAM	A	D.A. SUBMISSION	11.11.22
DA-A-91-0300	GFA DIAGRAMS	A	D.A. SUBMISSION	11.11.22
DA-93-SOLAR ACCESS COMPLIANCE				
DA-A-93-0100	SOLAR ACCESS DIAGRAMS SHEET 1	A	D.A. SUBMISSION	11.11.22
DA-A-93-0110	SOLAR ACCESS DIAGRAMS SHEET 2	A	D.A. SUBMISSION	11.11.22
DA-A-93-0120	SOLAR ACCESS DIAGRAMS SHEET 3	A	D.A. SUBMISSION	11.11.22
DA-A-93-0200	SHADOW DIAGRAM SHEET 1	A	D.A. SUBMISSION	11.11.22
DA-A-93-0210	SHADOW DIAGRAM SHEET 2	A	D.A. SUBMISSION	11.11.22
DA-A-93-1200	SUN EYE VIEWS_SITE 1 SHEET 1	A	D.A. SUBMISSION	11.11.22
DA-A-93-1210	SUN EYE VIEWS_SITE 1 SHEET 2	A	D.A. SUBMISSION	11.11.22
DA-94-CROSS VENTILATION COMPLIANCE				
DA-A-94-0100	CROSS VENTILATION DIAGRAMS SHEET 1	A	D.A. SUBMISSION	11.11.22
DA-95-COMPLIANCE DIAGRAMS				
DA-A-95-0100	LEP HEIGHT BLANKET DIAGRAMS	A	D.A. SUBMISSION	11.11.22
DA-A-95-0200	LEP HEIGHT BLANKET PLAN	A	D.A. SUBMISSION	11.11.22

Grand total: 43

DEVELOPMENT APPLICATION SUBMISSION

GLADSTONE STREET, MERRYLANDS LOT 2 DP1217412

Key Plan



A1

Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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trading as PTW Architects

NSW Nominated Architects
S Parsons Architect No.6098
D Jones Architect No.4778

PTW

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Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-00-GENERAL INFORMATION
COVER SHEET & DRAWING LIST

Drawing Number DA-A-00-0000 **Revision** A

25/11/2022 5:34:34 PM

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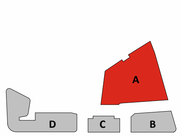
Autodesk Docs://ALand Pitt Street Merrylands/PA030522_AlandPittStMerrylands_BA_AR_SK.rvt

Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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PTW

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Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-00-GENERAL INFORMATION
SITE PLAN

Drawing Number DA-A-00-1002 **Revision** A

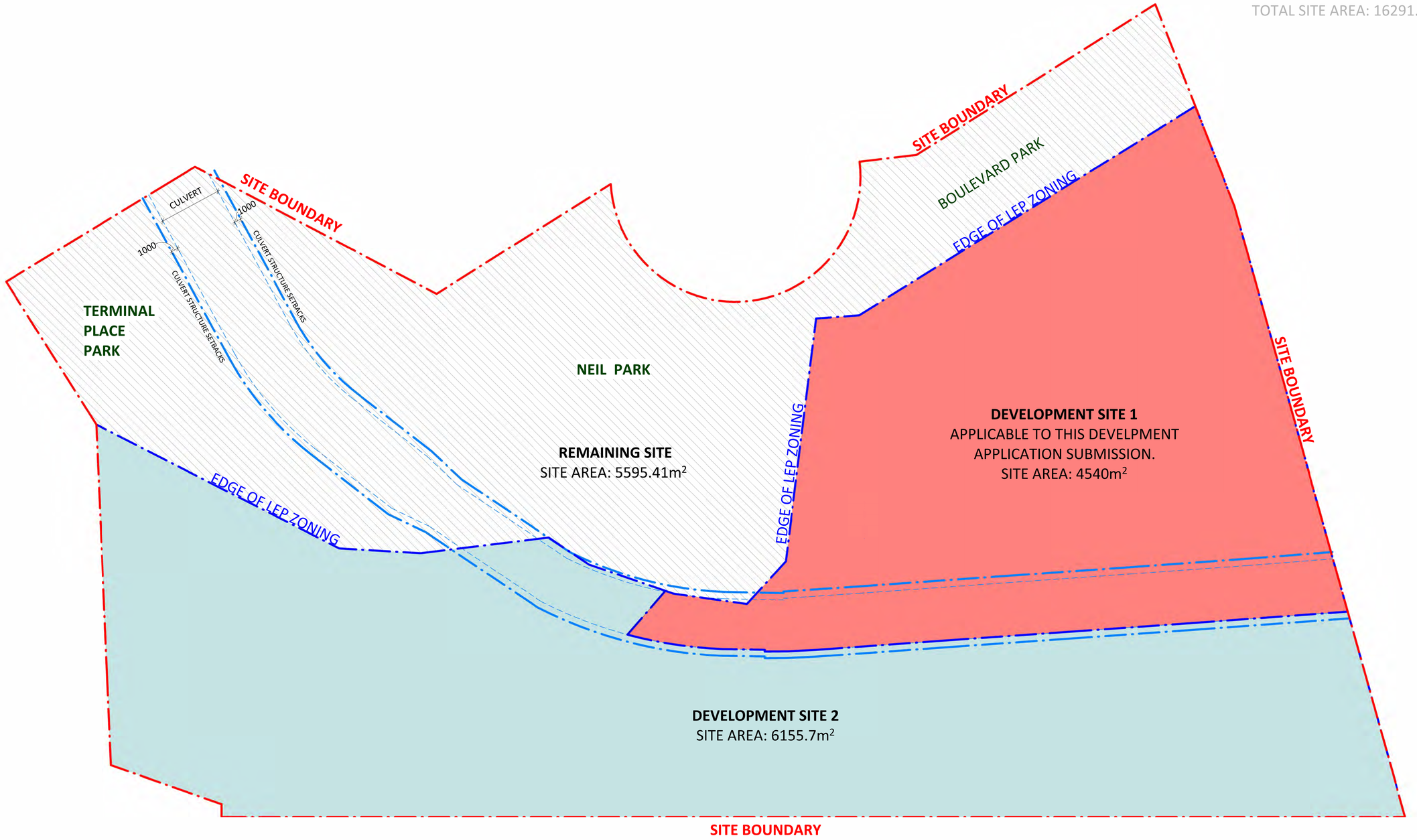
24/11/2022 6:10:59 PM

SITE 1: 4540.00m²

SITE 2: 6155.70m²

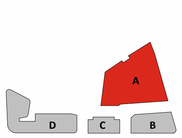
REMAINING SITE: 5595.41m²

TOTAL SITE AREA: 16291.11m²



1 SUBDIVISION
1 : 300

Key Plan



A1

Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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D Jones Architect No.4778

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1 : 300 @ A1

Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-00-GENERAL INFORMATION
SUBDIVISION PLAN & AREAS

Drawing Number DA-A-00-1003 **Revision** A

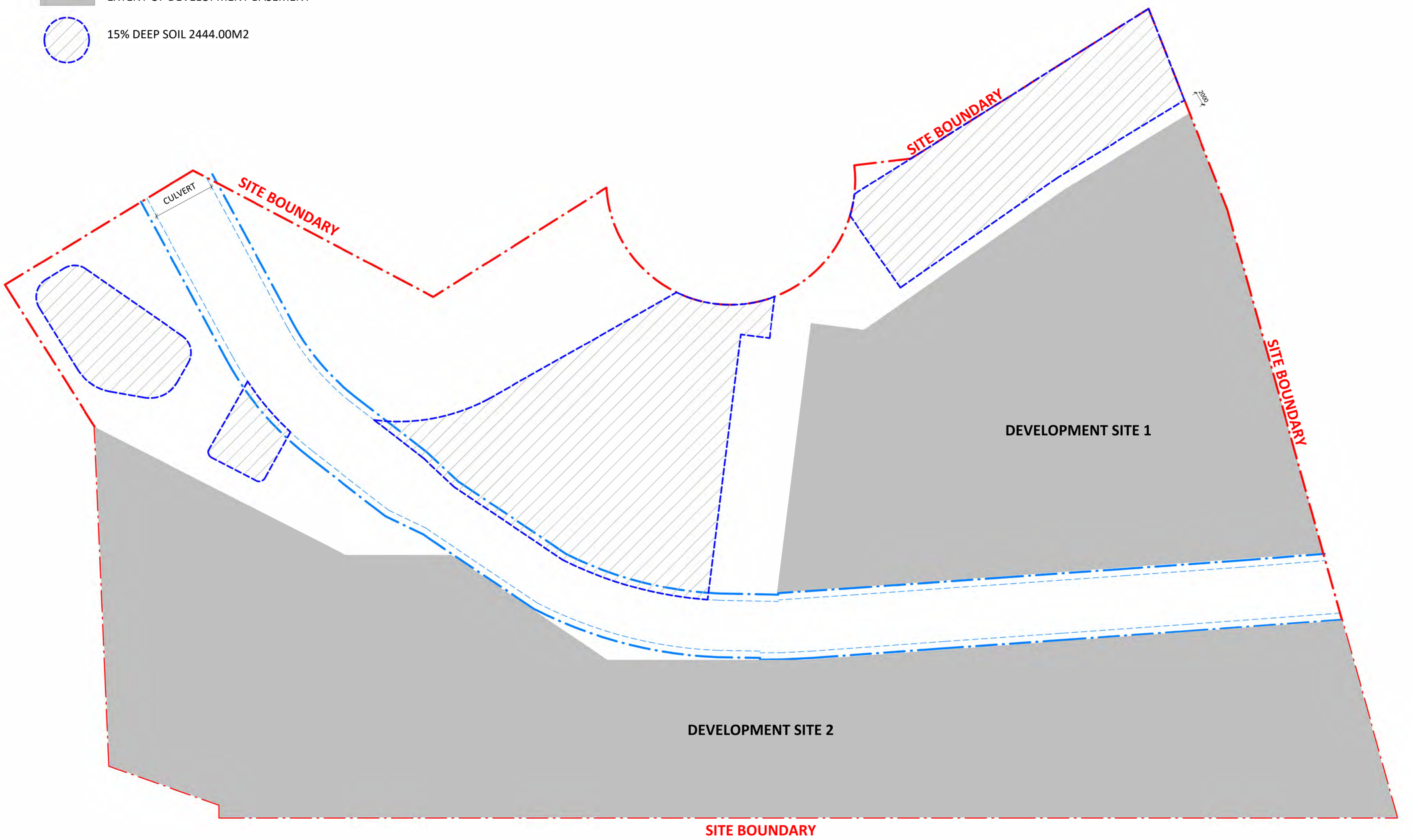
24/11/2022 6:11:28 PM

Autodesk Docs://ALand Pitt Street Merrylands/PA030522_AlandPittStMerrylands_BA_AR_SK.rvt

TOTAL SITE AREA: 16291.11M^2

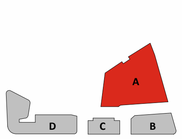
EXTENT OF DEVELOPMENT BASEMENT

15% DEEP SOIL 2444.00M2



1 DEEP SOIL DIAGRAM
1 : 300

Key Plan



A1

Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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D Jones Architect No.4778

0 1 2 5 8m
1 : 300 @ A1

Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

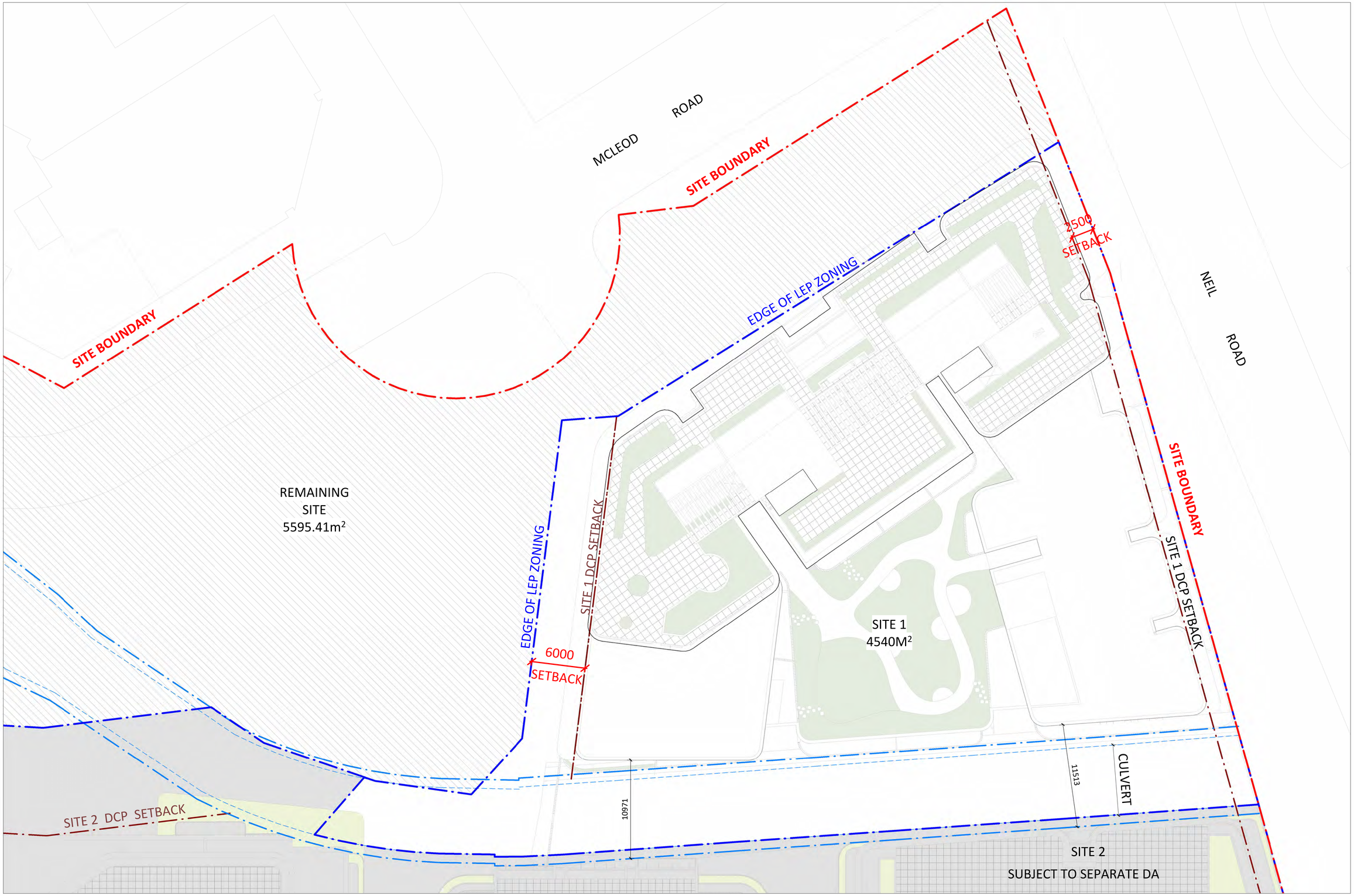
Status
DEVELOPMENT APPLICATION

Title
DA-00-GENERAL INFORMATION
DEEP SOIL DIAGRAM

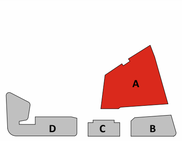
Drawing Number DA-A-00-1004 **Revision** A

24/11/2022 6:11:58 PM

Autodesk Docs://ALand Pitt Street Merrylands/PA030522_AlandPittStMerrylands_BA_AR_SK.rvt



Key Plan



A1

Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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D Jones Architect No.4778

PTW

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Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-00-GENERAL INFORMATION
PROPOSED SETBACKS AND CONSTRAINTS DIAGRAM

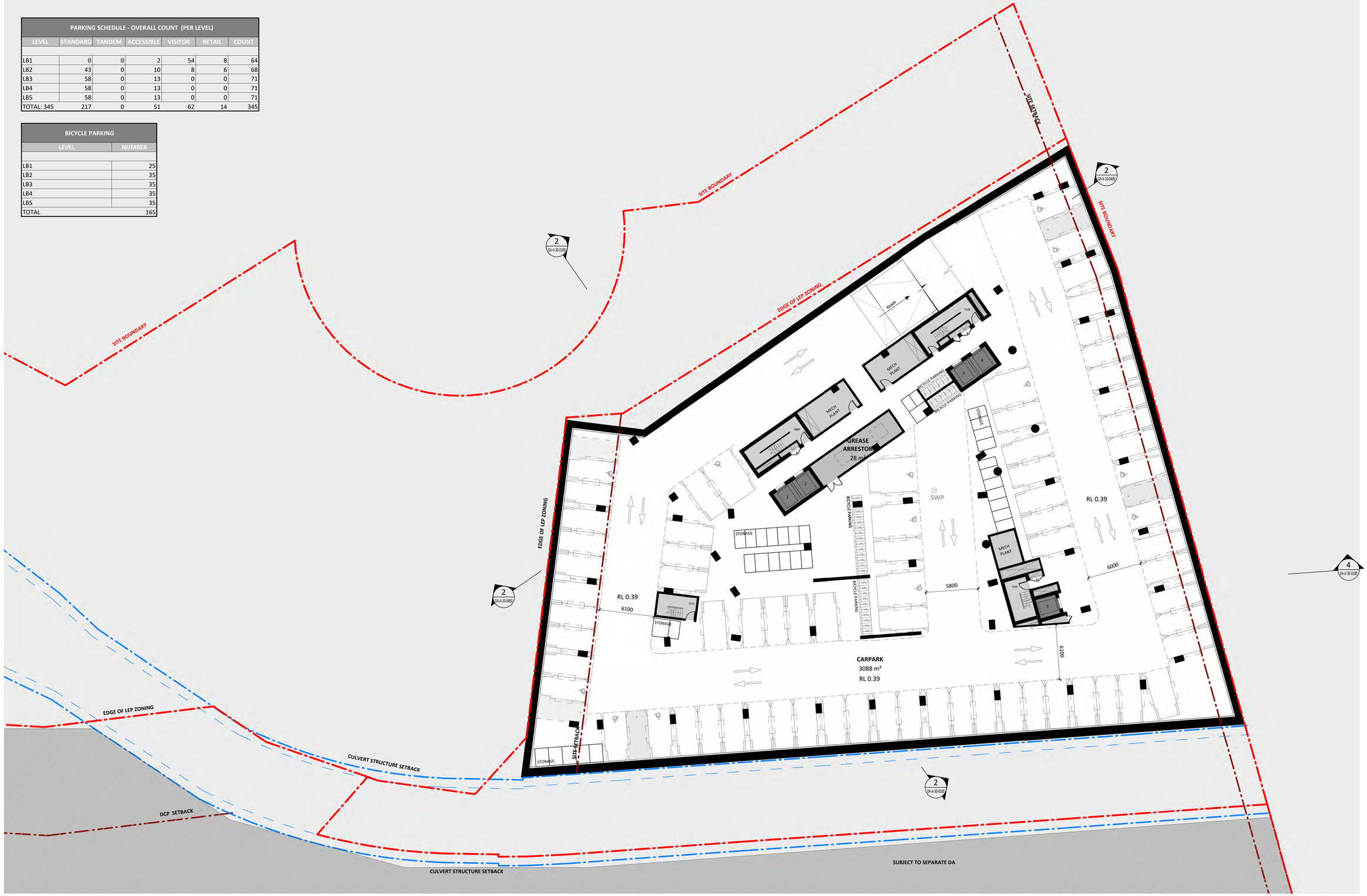
Drawing Number DA-A-01-0400 **Revision** A

28/11/2022 1:20:15 PM

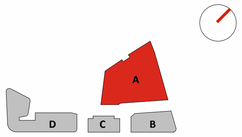
Autodesk Docs://ALand Pitt Street Merrylands/PA030522_AlandPittStMerrylands_BA_AR_SK.rvt

PARKING SCHEDULE - OVERALL COUNT (PER LEVEL)						
LEVEL	STANDARD	TANDEM	ACCESSIBLE	VISITOR	RETAIL	COUNT
LB1	0	0	2	54	8	64
LB2	43	0	10	8	6	68
LB3	58	0	13	0	0	71
LB4	58	0	13	0	0	71
LB5	58	0	13	0	0	71
TOTAL: 345	217	0	51	62	14	345

BICYCLE PARKING	
LEVEL	NUMBER
LB1	25
LB2	35
LB3	35
LB4	35
LB5	35
TOTAL	165



Key Plan



A1

Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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D Jones Architect No.4778

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Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 05 PLAN

Drawing Number DA-A-10-0090 **Revision** A

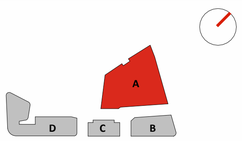
24/11/2022 6:17:57 PM

Autodesk Docs://ALand Pitt Street Merrylands/PA030522_AlandPittStMerrylands_BA_AR_SK.rvt

PARKING SCHEDULE - OVERALL COUNT (PER LEVEL)						
LEVEL	STANDARD	TANDEM	ACCESSIBLE	VISITOR	RETAIL	COUNT
LB1	0	0	2	54	8	64
LB2	43	0	10	8	6	68
LB3	58	0	13	0	0	71
LB4	58	0	13	0	0	71
LB5	58	0	13	0	0	71
TOTAL: 345	217	0	51	62	14	345

BICYCLE PARKING	
LEVEL	NUMBER
LB1	25
LB2	35
LB3	35
LB4	35
LB5	35
TOTAL	165

Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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NSW Nominated Architects
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D Jones Architect No.4778

PTW

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Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 04 PLAN

Drawing Number DA-A-10-0100 **Revision** A

24/11/2022 6:18:33 PM

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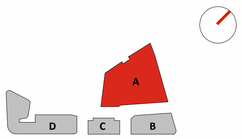
PARKING SCHEDULE - OVERALL COUNT (PER LEVEL)						
LEVEL	STANDARD	TANDEM	ACCESSIBLE	VISITOR	RETAIL	COUNT
LB1	0	0	2	54	8	64
LB2	43	0	10	8	6	68
LB3	58	0	13	0	0	71
LB4	58	0	13	0	0	71
LB5	58	0	13	0	0	71
TOTAL: 345	217	0	51	62	14	345

BICYCLE PARKING	
LEVEL	NUMBER
LB1	25
LB2	35
LB3	35
LB4	35
LB5	35
TOTAL	165

Key Plan



A1

Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 03 PLAN

Drawing Number DA-A-10-0200 **Revision** A

24/11/2022 6:19:06 PM

PARKING SCHEDULE - OVERALL COUNT (PER LEVEL)						
LEVEL	STANDARD	TANDEM	ACCESSIBLE	VISITOR	RETAIL	COUNT
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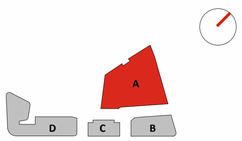
LB2	43	0	10	8	6	68
LB3	58	0	13	0	0	71
LB4	58	0	13	0	0	71
LB5	58	0	13	0	0	71
TOTAL: 345	217	0	51	62	14	345

BICYCLE PARKING	
LEVEL	NUMBER
LB1	25
LB2	35
LB3	35
LB4	35
LB5	35
TOTAL	165

Key Plan



A1

Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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D Jones Architect No.4778

PTW

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Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 02 PLAN

Drawing Number DA-A-10-0300 **Revision** A

24/11/2022 6:19:43 PM

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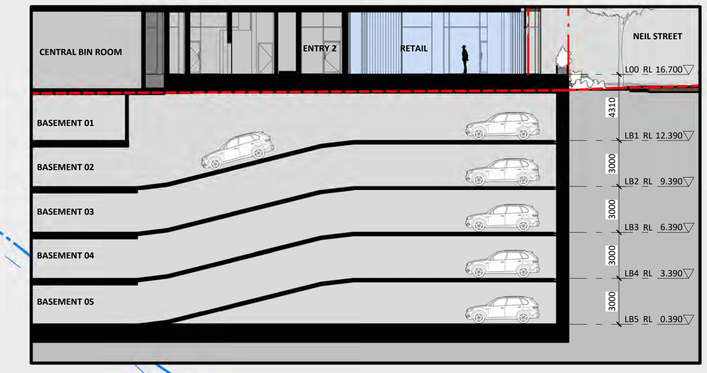
PARKING SCHEDULE - OVERALL COUNT (PER LEVEL)						
LEVEL	STANDARD	TANDEM	ACCESSIBLE	VISITOR	RETAIL	COUNT
LB1	0	0	2	54	8	64
LB2	43	0	10	8	6	68
LB3	58	0	13	0	0	71
LB4	58	0	13	0	0	71
LB5	58	0	13	0	0	71
TOTAL: 345	217	0	51	62	14	345

BICYCLE PARKING	
LEVEL	NUMBER
LB1	25
LB2	35
LB3	35
LB4	35
LB5	35
TOTAL	165



2 SECTION 1
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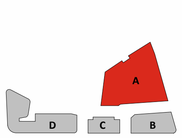
Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			11.11.22

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PTW

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Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 01 PLAN

Drawing Number DA-A-10-0400 **Revision** A

24/11/2022 6:20:29 PM

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Key Plan	Rv	Amendment	By	Ck	Date
A D C B	A	D.A. SUBMISSION			11.11.22

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NSW Nominated Architects
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D Jones Architect No.4778

PTW

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As indicated @ A1

Project PA030522
MERRYLANDS (A)88 DEVELOPMENT PTY LTD
SITE 1

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
GROUND FLOOR PLAN

Drawing Number DA-A-10-0500 **Revision** A

24/11/2022 6:21:22 PM

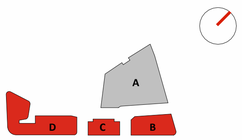
ARCHITECTURAL DRAWING LIST				
SHEET NUMBER	SHEET NAME	REV	REV DESCRIPTION	DATE
DA-00-GENERAL INFORMATION				
DA-B-00-0000	COVER SHEET & DRAWING LIST	A	D.A. SUBMISSION	09.12.22
DA-B-00-0002	DEVELOPMENT DATA SHEET	A	D.A. SUBMISSION	09.12.22
DA-B-00-1002	SITE PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-00-1003	SUBDIVISION PLAN & AREA	A	D.A. SUBMISSION	09.12.22
DA-B-00-1004	DEEP SOIL DIAGRAM	A	D.A. SUBMISSION	09.12.22
DA-B-01-0300	SITE ANALYSIS PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-01-0400	PROPOSED SETBACKS AND CONSTRAINTS DIAGRAM	A	D.A. SUBMISSION	09.12.22
DA-B-02-0600	DEMOLITION PLAN	A	D.A. SUBMISSION	09.12.22
DA-10-GENERAL ARRANGEMENT PLANS				
DA-B-10-0070	BASEMENT 06 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-0071	BASEMENT 03-05 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-0080	BASEMENT 02 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-0090	BASEMENT 01 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1000	GROUND FLOOR PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1100	LEVEL 01	A	D.A. SUBMISSION	09.12.22
DA-B-10-1200	LEVEL 02-03 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1300	LEVEL 04-07 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1400	LEVEL 08-10 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1500	LEVEL 11 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1600	LEVEL 12 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1700	LEVEL 13-15 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1800	LEVEL 16 PLAN	A	D.A. SUBMISSION	09.12.22
DA-B-10-1901	ROOF PLAN	A	D.A. SUBMISSION	09.12.22
DA-20-ELEVATIONS				
DA-B-20-0010	STREETSCAPE ELEVATIONS OVERALL	A	D.A. SUBMISSION	09.12.22
DA-B-20-0100	BUILDING B - NORTH-WEST & NORTH-EAST	A	D.A. SUBMISSION	09.12.22
DA-B-20-0200	BUILDING B - SOUTH-EAST & SOUTH-WEST	A	D.A. SUBMISSION	09.12.22
DA-B-20-0300	BUILDING C - NORTH-WEST & NORTH-EAST	A	D.A. SUBMISSION	09.12.22
DA-B-20-0400	BUILDING C - SOUTH-EAST & SOUTH-WEST	A	D.A. SUBMISSION	09.12.22
DA-B-20-0500	BUILDING D - NORTH-WEST	A	D.A. SUBMISSION	09.12.22
DA-B-20-0600	BUILDING D - NORTH-EAST	A	D.A. SUBMISSION	09.12.22
DA-B-20-0700	BUILDING D - SOUTH-EAST	A	D.A. SUBMISSION	09.12.22
DA-B-20-0800	BUILDING D - SOUTH-WEST	A	D.A. SUBMISSION	09.12.22
DA-30-SECTIONS				
DA-B-30-0100	SECTION N-S	A	D.A. SUBMISSION	09.12.22
DA-B-30-0200	SECTION E-W	A	D.A. SUBMISSION	09.12.22
DA-B-30-0300	SECTION E-W2	A	D.A. SUBMISSION	09.12.22
DA-B-30-0400	SECTION E-W3	A	D.A. SUBMISSION	09.12.22
DA-50-DETAILS PLANS				
DA-B-50-0200	ADAPTABLE APARTMENTS 1	A	D.A. SUBMISSION	09.12.22
DA-B-50-0210	ADAPTABLE APARTMENTS 2	A	D.A. SUBMISSION	09.12.22
DA-B-50-0211	ADAPTABLE APARTMENTS 3	A	D.A. SUBMISSION	09.12.22
DA-B-50-0212	ADAPTABLE APARTMENTS 4	A	D.A. SUBMISSION	09.12.22
DA-B-50-0213	ADAPTABLE APARTMENTS 5	A	D.A. SUBMISSION	09.12.22
DA-B-50-0214	ADAPTABLE APARTMENTS 6	A	D.A. SUBMISSION	09.12.22
DA-B-50-0215	ADAPTABLE APARTMENTS 7	A	D.A. SUBMISSION	09.12.22
DA-70-GENERAL INFORMATION				
DA-B-70-0100	EXTERNAL MATERIAL AND FINISHES	A	D.A. SUBMISSION	09.12.22
DA-B-70-0200	EXTERNAL MATERIAL AND FINISHES - BLDG B	A	D.A. SUBMISSION	09.12.22
DA-B-70-0300	EXTERNAL MATERIAL AND FINISHES - BLDG C	A	D.A. SUBMISSION	09.12.22
DA-B-70-0400	EXTERNAL MATERIAL AND FINISHES - BLDG D	A	D.A. SUBMISSION	09.12.22
DA-91-SCHEDULES (AREA) / AREA PLANS				
DA-B-91-0200	COMMUNAL OPEN SPACE DIAGRAMS	A	D.A. SUBMISSION	09.12.22
DA-B-91-0300	GFA DIAGRAMS	A	D.A. SUBMISSION	09.12.22
DA-93-SOLAR ACCESS				
DA-B-93-0100	SOLAR ACCESS DIAGRAMS SHEET 1	A	D.A. SUBMISSION	09.12.22
DA-B-93-0110	SOLAR ACCESS DIAGRAMS SHEET 2	A	D.A. SUBMISSION	09.12.22
DA-B-93-0200	SHADOW DIAGRAM SHEET 1	A	D.A. SUBMISSION	09.12.22
DA-B-93-0210	SHADOW DIAGRAM SHEET 2	A	D.A. SUBMISSION	09.12.22
DA-B-93-1200	SUN EYE VIEW_SITE 2 SHEET 1	A	D.A. SUBMISSION	09.12.22
DA-B-93-1210	SUN EYE VIEW_SITE 2 SHEET 2	A	D.A. SUBMISSION	09.12.22
DA-B-93-1220	SUN EYE VIEW_SITE 2 SHEET 3	A	D.A. SUBMISSION	09.12.22
DA-94-CROSS VENTILATION				
DA-B-94-0100	CROSS VENTILATION DIAGRAMS SHEET 1	A	D.A. SUBMISSION	09.12.22
DA-95-COMPLIANCE DIAGRAMS				
DA-B-95-0300	SITE 2 - LEP HEIGHT DIAGRAMS	A	D.A. SUBMISSION	09.12.22
DA-B-95-0400	SITE 2 - LEP HEIGHT BLANKET PLAN	A	D.A. SUBMISSION	09.12.22
DA-E-RAILWAY CORRIDOR				
DA-B-1103	TYPICAL BOUNDARY FENCE DETAIL TO RAILWAY SIDE	A	D.A. SUBMISSION	09.12.22

Grand total: 59

DEVELOPMENT APPLICATION SUBMISSION

4A TERMINAL PLACE, MERRYLANDS LOT 1 DP1173048
4 TERMINAL PLACE, MERRYLANDS LOT 1 DP229589
GLADSTONE STREET, MERRYLANDS LOT 2 DP1217412

Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			09.12.22

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Peddle Thorp & Walker P/L
ABN 23 000 454 624
trading as PTW Architects

NSW Nominated Architects
S Parsons Architect No.6098
D Jones Architect No.4778

PTW

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@ A1

Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
4 TERMINAL PLACE MERRYLANDS, LOT 1/ DP229589
4A TERMINAL PLACE MERRYLANDS, LOT 1/ DP 1173048
GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status
DEVELOPMENT APPLICATION

Title
DA-00-GENERAL INFORMATION
COVER SHEET & DRAWING LIST

Drawing Number DA-B-00-0000 **Revision** A

13/12/2022 8:09:07 PM

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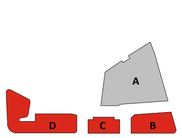
Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			09.12.22

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D Jones Architect No.4778

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Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
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4A TERMINAL PLACE MERRYLANDS, LOT 1/ DP 1173048
GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status
DEVELOPMENT APPLICATION

Title
DA-00-GENERAL INFORMATION
SITE PLAN

Drawing Number DA-B-00-1002

Revision A

12/12/2022 5:03:10 PM

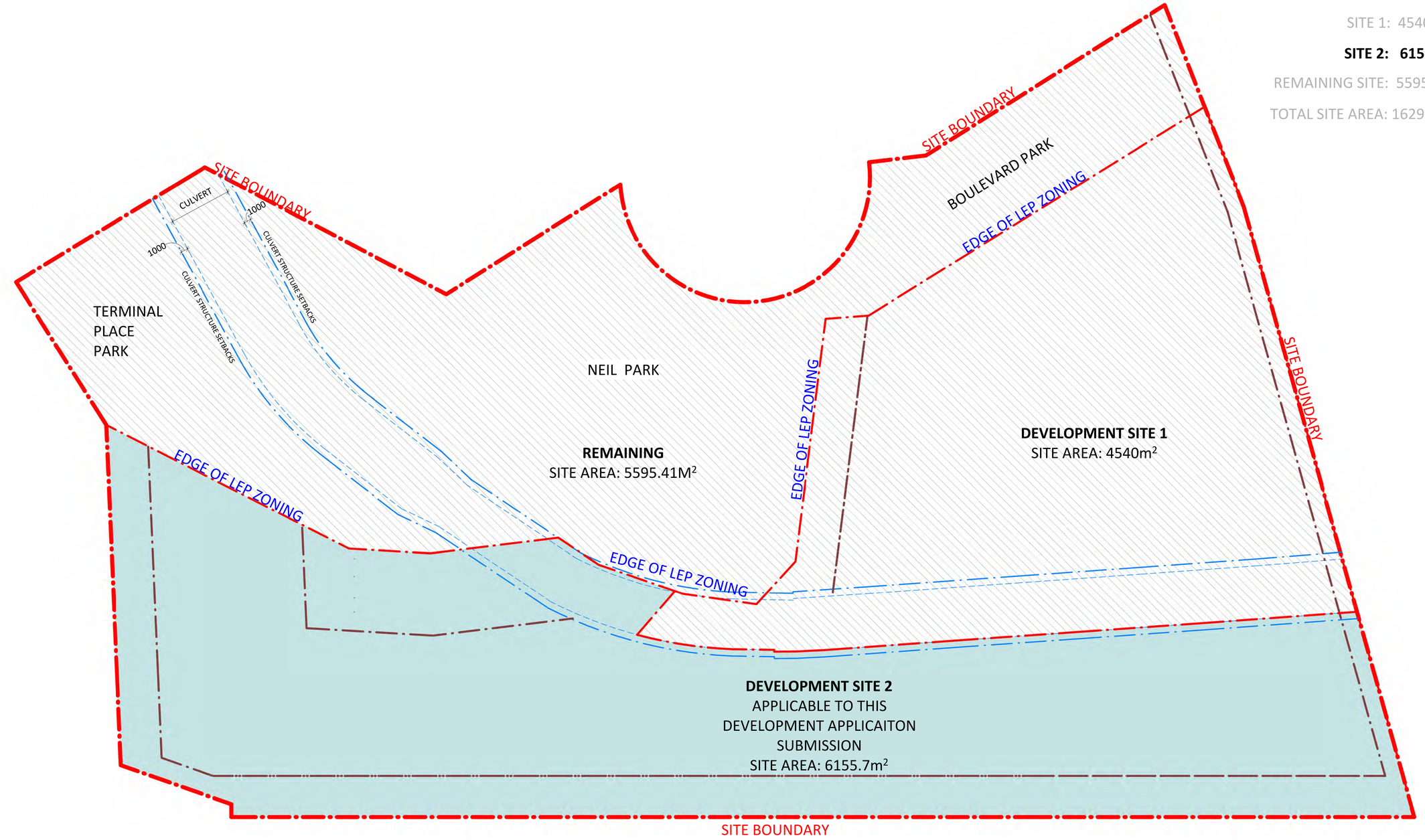
Autodesk Docs://ALand Pitt Street Merrylands/PA030522_ALandPittStMerrylands_BB_AR_SK.rvt

SITE 1: 4540.00m²

SITE 2: 6155.70m²

REMAINING SITE: 5595.41m²

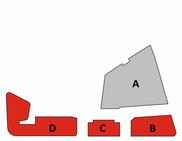
TOTAL SITE AREA: 16291.11m²



1 SUBDIVISION PLAN
1 : 300

DISCLAIMER: EDGE OF LEP ZONING BOUNDARY HAS BEEN TRACED FROM INFORMATION SUPPLIED BY CLIENT

Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			09.12.22

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S Parsons Architect No.6098
D Jones Architect No.4778

PTW

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Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
4 TERMINAL PLACE MERRYLANDS, LOT 1/ DP229589
4A TERMINAL PLACE MERRYLANDS, LOT 1/ DP 1173048
GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status
DEVELOPMENT APPLICATION

Title
DA-00-GENERAL INFORMATION
SUBDIVISION PLAN & AREA

Drawing Number DA-B-00-1003 **Revision** A

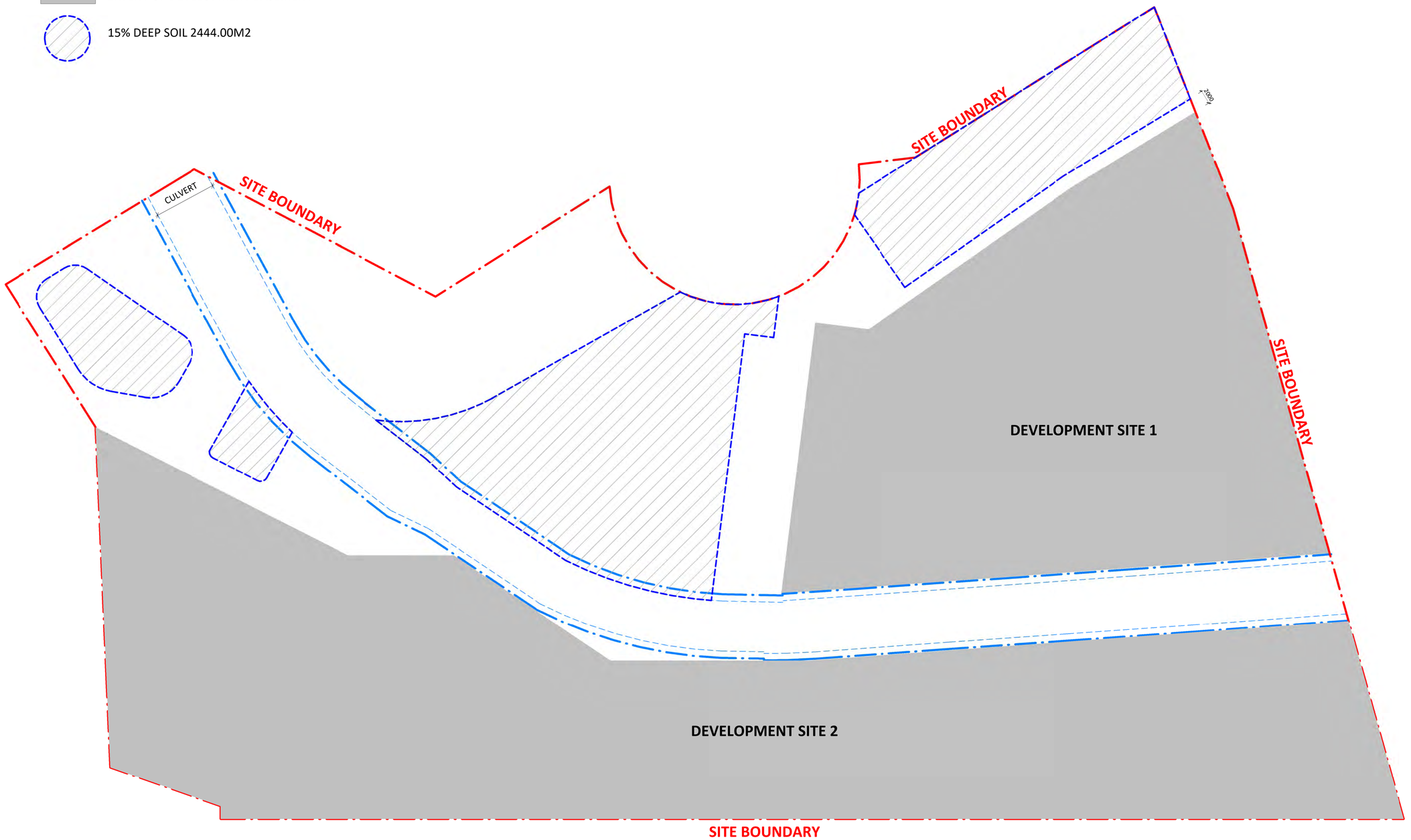
13/12/2022 12:34:27 PM

Autodesk Docs://ALand Pitt Street Merrylands/PA030522_AlandPittStMerrylands_BB_AR_SK.rvt

TOTAL SITE AREA: 16291.11M^2

EXTENT OF DEVELOPMENT BASEMENT

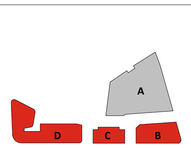
15% DEEP SOIL 2444.00M2



1 DEEP SOIL DIAGRAM

1 : 300

Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			09.12.22

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Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
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GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status
DEVELOPMENT APPLICATION

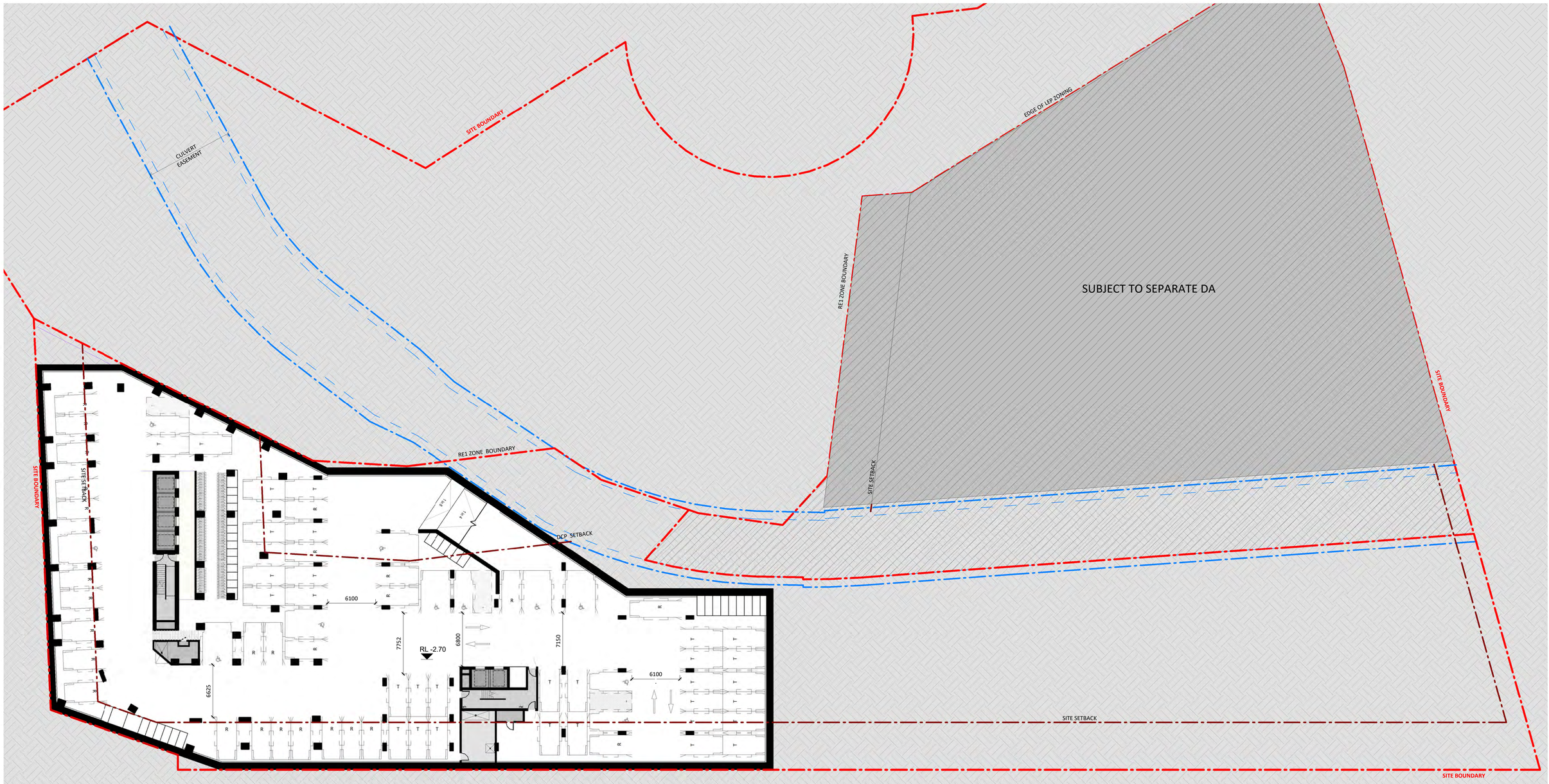
Title
DA-00-GENERAL INFORMATION
DEEP SOIL DIAGRAM

Drawing Number DA-B-00-1004

Revision A

12/12/2022 5:04:39 PM

Autodesk Docs://ALand Pitt Street Merrylands/PA030522_ALandPittStMerrylands_BB_AR_SK.rvt



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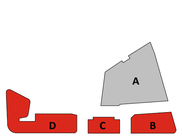
LB2	40	24	18	38	0	0	0	120
LB3	78	24	19	0	0	0	0	121
LB4	78	24	19	0	0	0	0	121
LB5	78	24	19	0	0	0	0	121
LB6	27	32	11	0	0	0	0	70
TOTAL	301	148	94	116	2	5	1	667

Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			09.12.22

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NSW Nominated Architects
S Parsons Architect No.6098
D Jones Architect No.4778

PTW

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Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
4 TERMINAL PLACE MERRYLANDS, LOT 1/ DP229589
4A TERMINAL PLACE MERRYLANDS, LOT 1/ DP 1173048
GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 06 PLAN

Drawing Number DA-B-10-0070
Revision A

12/15/2022 12:41:50 PM

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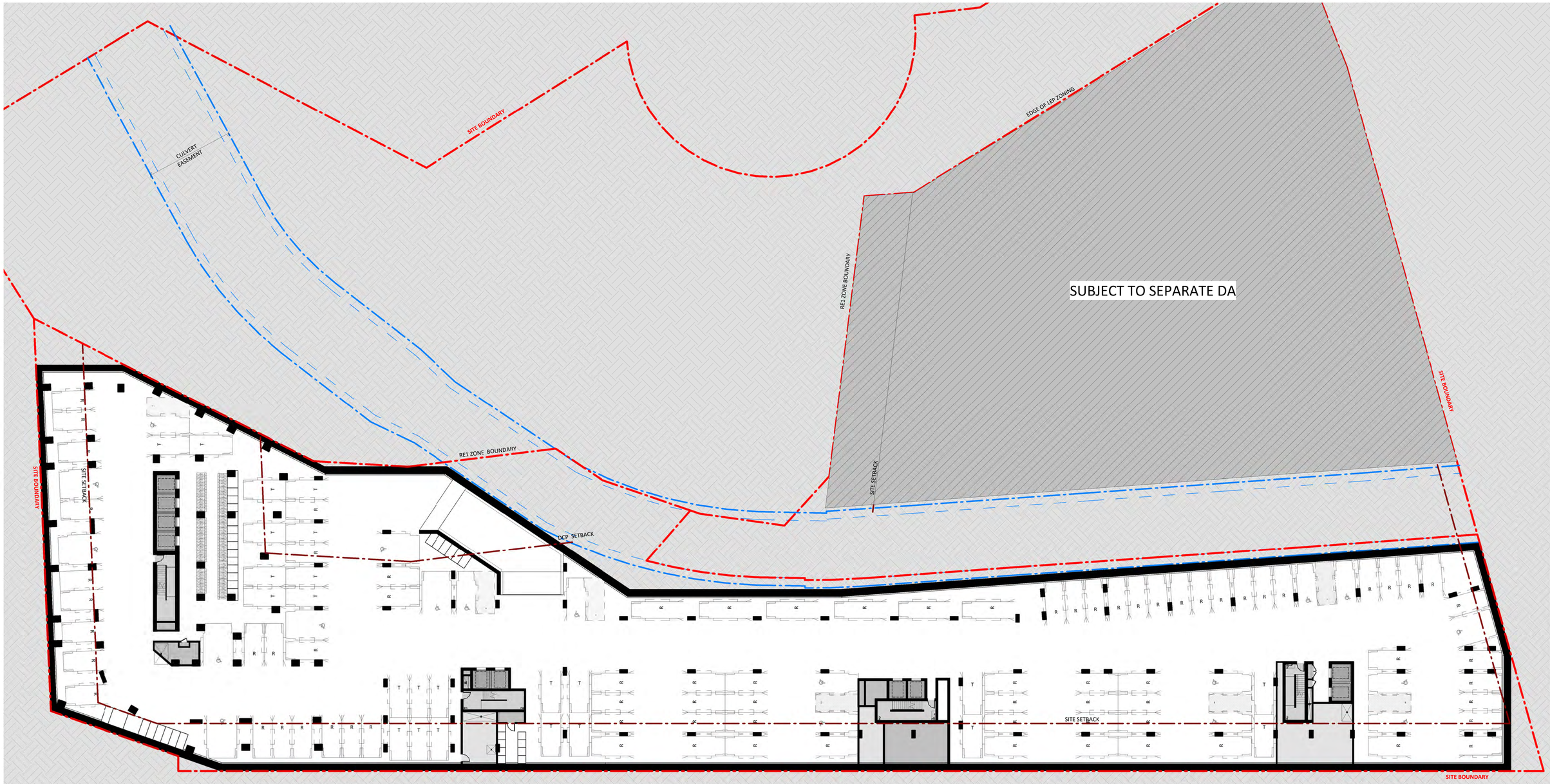

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LB3	78	24	19	0	0	0	0	121
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LB5	78	24	19	0	0	0	0	121
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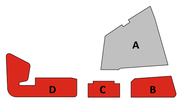
Key Plan



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A	D.A. SUBMISSION			09.12.22

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D Jones Architect No.4778

PTW

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Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
4 TERMINAL PLACE MERRYLANDS, LOT 1/ DP229589
4A TERMINAL PLACE MERRYLANDS, LOT 1/ DP 1173048
GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 03-05 PLAN

Drawing Number DA-B-10-0071 **Revision** A

12/15/2022 12:42:38 PM

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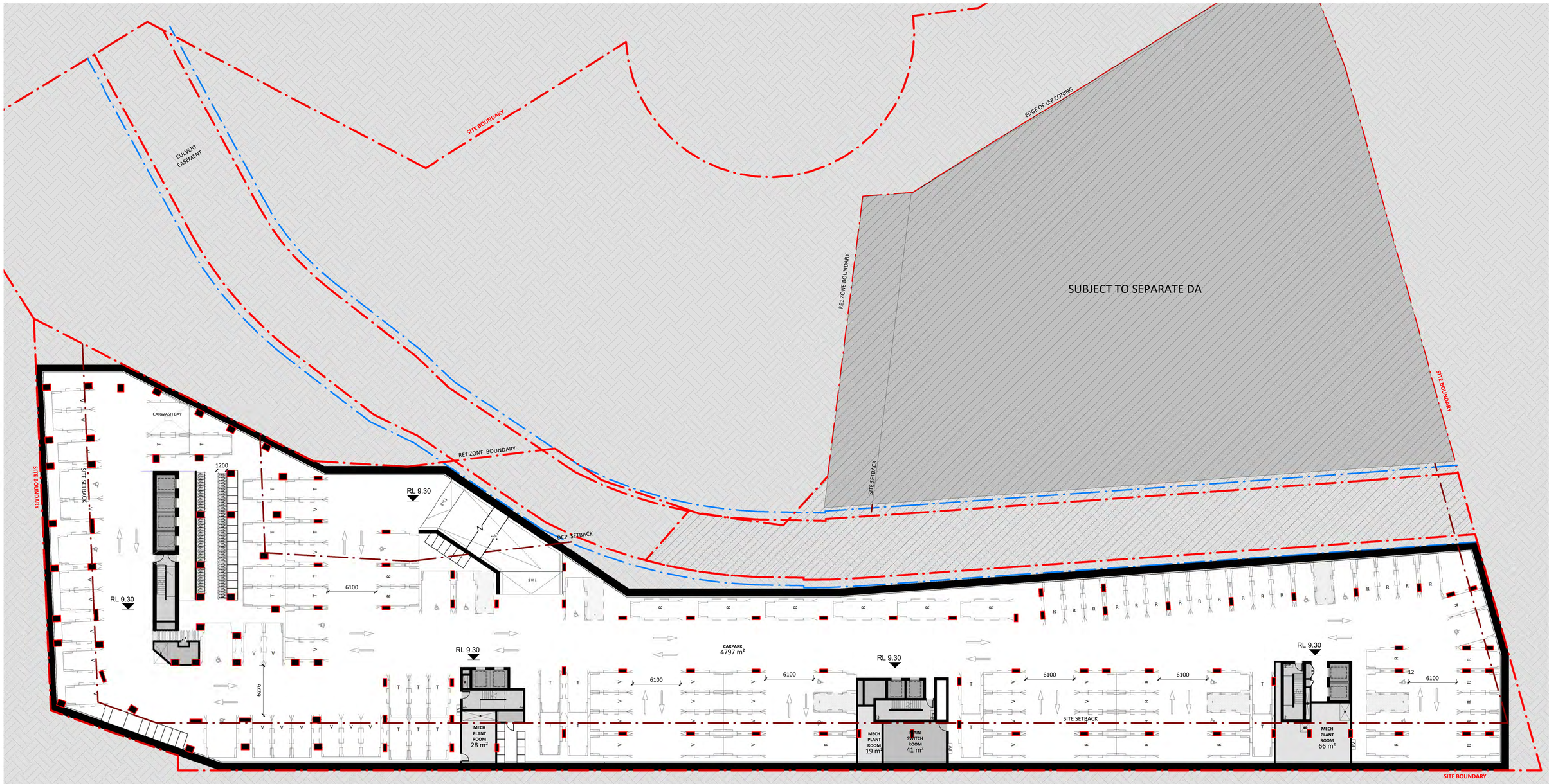

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LB3	78	24	19	0	0	0	0	121
LB4	78	24	19	0	0	0	0	121
LB5	78	24	19	0	0	0	0	121
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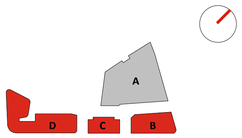
Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			09.12.22

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D Jones Architect No.4778

PTW

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Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
4 TERMINAL PLACE MERRYLANDS, LOT 1/ DP229589
4A TERMINAL PLACE MERRYLANDS, LOT 1/ DP 1173048
GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 02 PLAN

Drawing Number DA-B-10-0080
Revision A

12/15/2022 12:43:28 PM

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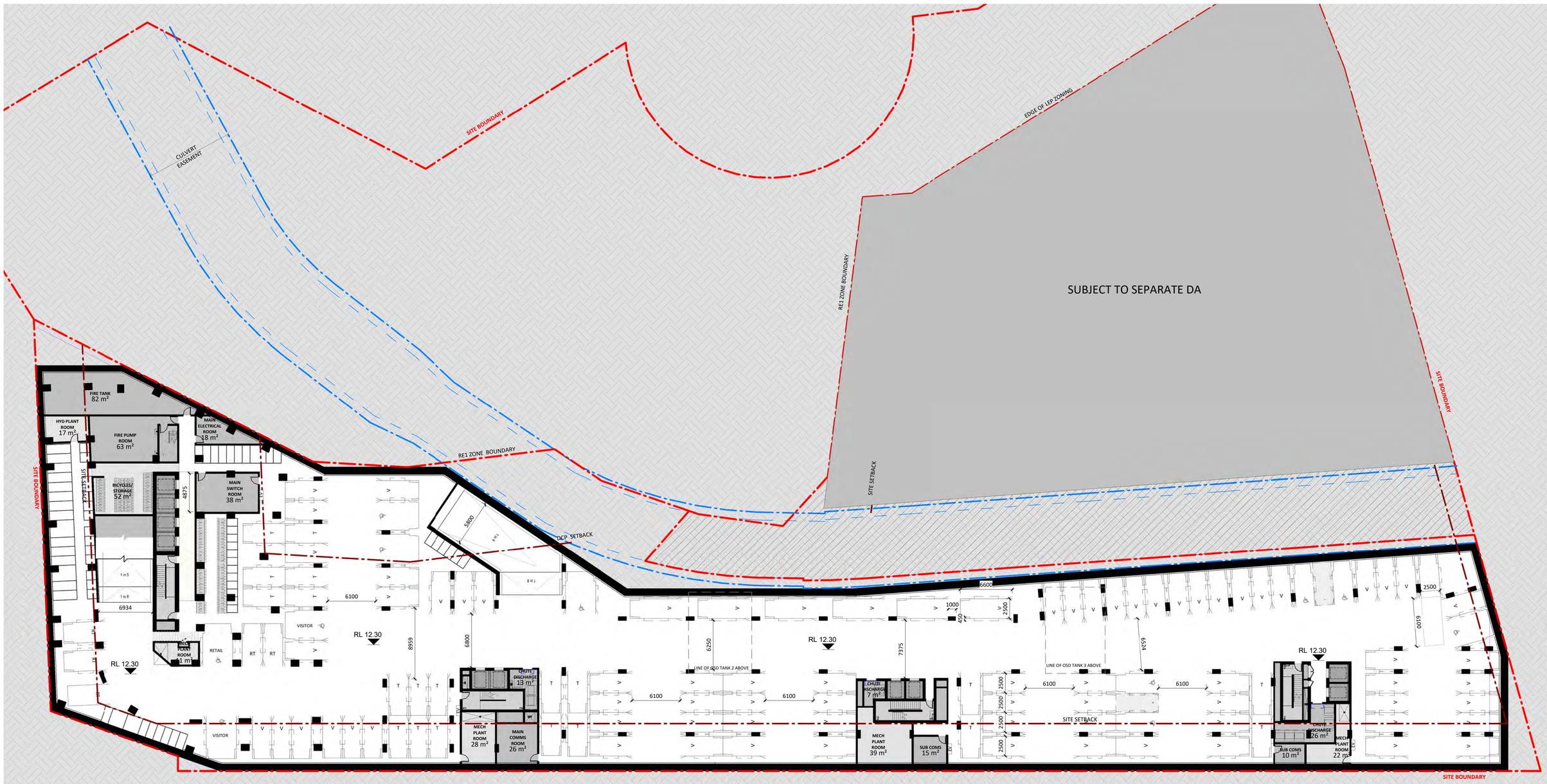

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LB5	78	24	19	0	0	0	0	121
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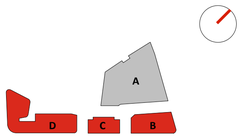
Key Plan



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Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			09.12.22

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PTW takes no responsibility for external building elements. Anything connected with any design, materials selection, construction or installation of any cladding, facade or external building element must be checked by and remains the responsibility of others, including suitably qualified experts as may be required.

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Peddle Thorp & Walker P/L
ABN 23 000 454 624
trading as PTW Architects

NSW Nominated Architects
S Parsons Architect No.6098
D Jones Architect No.4778

PTW

0 1 2 5 8m
1 : 250 @ A1

Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
4 TERMINAL PLACE MERRYLANDS, LOT 1/ DP229589
4A TERMINAL PLACE MERRYLANDS, LOT 1/ DP 1173048
GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
BASEMENT 01 PLAN

Drawing Number DA-B-10-0090
Revision A

12/15/2022 12:44:19 PM

Autodesk Docs://ALand Pitt Street Merrylands/PA030522_AlandPittStMerrylands_BB_AR_SK.rvt

SITE BOUNDARY
MCLEOD ROAD
CULVERT EASEMENT
RL 15.500
1:20
6500
D1
OVER THE AWNING ABOVE
RL 16.700
NEIGHBOURHOOD SHOP 67 m²
NEIGHBOURHOOD SHOP 68 m²
OSD TANK 78 m²
RL 18.500
RL 16.700
BUILDING MANAGER 22 m²
BULKY WASTE 31 m²
FIRE ISOLATE CORRIDOR
RESIDENTIAL WASTE 33 m²
LOADING DOCK 281 m²
NEIGHBOURHOOD SHOP 48 m²
NEIGHBOURHOOD SHOP 38 m²
GARBAGE COLLECTION 126 m²
BIN LIFTER
RETAIL BIN ROOM 7 m²
BULKY WASTE 34 m²
RL 16.700
GATE
SITE SETBACK
SUBSTATION
RE1 ZONE BOUNDARY
SUBJECT TO SEPARATE APPLICATION
PUBLIC PARK
RL 16.60
RL 15.53
RL 16.25
RL 16.65
RL 16.50
RL 16.65
RL 16.65
A
EDGE OF LEP ZONING
BOOSTER
SUBJECT TO SEPARATE DA
NEIL STREET
ex 16.50
ex 17.00
ex 17.50
+ ex 15.79
+ ex 16.88
+ ex 15.87
+ ex 16.05
+ ex 15.70
+ ex 16.05
+ ex 15.50
+ ex 15.58
+ ex 16.05
+ RL 15.65
+ ex 15.75
+ ex 15.61
+ ex 16.50
+ ex 17.0
+ ex 15.64
+ ex 15.00
+ ex 16.00
+ ex 15.83
SITE BOUNDARY
+ ex 15.83
POS
+ RL 16.70
+ RL 16.65
+ 500
DCP SETBACK
COMMUNAL OPEN SPACE
GATE
GATE
GATE
SITE SETBACK
OSD 2 TANK BELOW
OSD 3 TANK BELOW
BALC 11 m²
BALC 10 m²
3675
RL 16.750
GARDENERS AREA ONLY
+ ex 16.71
+ ex 16.31
+ ex 16.00
+ ex 16.00
D2
C
B
19507
19691
19605
19823
RAILWAY
RAILWAY
RAILWAY

Autodesk Docs://ALand Pitt Street Merrylands/PA030522_AlandPittStMerrylands_BB_AR_Sk.rvt

Key Plan

A1

Rv	Amendment	By	Ck	Date
A	D.A. SUBMISSION			09.12.22

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Do not scale from drawings.
Verify all dimensions on site before commencing work.
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Note
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S Parsons Architect No.6098
D Jones Architect No.4778

0 1 2 5 8m
1 : 250 @ A1

Project PA030522
MERRYLANDS (B) 88 DEVELOPMENT PTY LTD
SITE 2
4 TERMINAL PLACE MERRYLANDS, LOT 1/ DP229589
4A TERMINAL PLACE MERRYLANDS, LOT 1/ DP 1173048
GLADSTONE STREET MERRYLANDS, LOT 2/ DP 1217412

Status
DEVELOPMENT APPLICATION

Title
DA-10-GENERAL ARRANGEMENT PLANS
GROUND FLOOR PLAN

Drawing Number DA-B-10-1000
Revision A

12/14/2022 12:27:25 PM

APPENDIX 2

Environmental Consulting Services
10 Fort Street
Petersham
NSW 2049

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.

Attention: **Simon Caples**

Report **952970-W**
Project name MERRYLANDS
Project ID MERRYLANDS
Received Date Dec 22, 2022

Client Sample ID			**BH2**	**BH4**	**BH5**	**D**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S22-De0055026**	**S22-De0055027**	**S22-De0055028**	**S22-De0055030**
Date Sampled			**Dec 22, 2022**	**Dec 22, 2022**	**Dec 22, 2022**	**Dec 22, 2022**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	0.11	0.08	0.42	< 0.05
TRH C15-C28	0.1	mg/L	0.1	0.6	1.4	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	0.1	0.2	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	0.21	0.78	2.02	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	0.84	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	0.66	< 0.02
TRH >C10-C16	0.05	mg/L	0.15	0.16	0.51	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	0.15	0.16	0.48	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	0.6	1.3	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	0.15	0.76	1.81	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	0.002	0.007	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	0.004	0.019	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	0.005	0.11	< 0.002
o-Xylene	0.001	mg/L	< 0.001	0.002	0.048	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	0.007	0.16	< 0.003
4-Bromofluorobenzene (surr.)	1	%	74	78	82	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	0.002	0.056	< 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

Client Sample ID			BH2	BH4	BH5	D
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S22-De0055026	S22-De0055027	S22-De0055028	S22-De0055030
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
Test/Reference	LOR	Unit				
Volatile Organics						
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	0.016	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
2-Propanone (Acetone)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
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	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	0.002	< 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	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
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	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	0.001	mg/L	< 0.001	0.004	0.019	< 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	0.003	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	0.005	0.11	< 0.002
Methylene Chloride	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
o-Xylene	0.001	mg/L	< 0.001	0.002	0.048	< 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	0.002	0.007	< 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	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl chloride	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Xylenes - Total*	0.003	mg/L	< 0.003	0.007	0.16	< 0.003
Total MAH*	0.003	mg/L	< 0.003	0.013	0.187	< 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	%	74	78	82	74
Toluene-d8 (surr.)	1	%	87	83	93	88
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	0.03	< 0.01

Client Sample ID			BH2	BH4	BH5	D
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S22-De0055026	S22-De0055027	S22-De0055028	S22-De0055030
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
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	0.002	0.015	< 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	0.002	0.018	< 0.001
2-Fluorobiphenyl (surr.)	1	%	78	71	52	68
p-Terphenyl-d14 (surr.)	1	%	INT	INT	INT	INT
Organochlorine Pesticides						
Chlordanes - Total	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
4.4'-DDD	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
4.4'-DDE	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
4.4'-DDT	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
a-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Aldrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
b-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
d-HCH	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Dieldrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endosulfan I	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endosulfan II	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endosulfan sulphate	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin aldehyde	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin ketone	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
g-HCH (Lindane)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Heptachlor	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Heptachlor epoxide	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Hexachlorobenzene	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Methoxychlor	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Toxaphene	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Aldrin and Dieldrin (Total)*	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
DDT + DDE + DDD (Total)*	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Vic EPA IWRG 621 OCP (Total)*	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Vic EPA IWRG 621 Other OCP (Total)*	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Dibutylchlorendate (surr.)	1	%	INT	INT	INT	INT
Tetrachloro-m-xylene (surr.)	1	%	INT	INT	144	INT

Client Sample ID			BH2	BH4	BH5	D
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S22-De0055026	S22-De0055027	S22-De0055028	S22-De0055030
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
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	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Chlorpyrifos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
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	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
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	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
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	INT	INT	INT
pH (at 25 °C)	0.1	pH Units	8.4	8.3	12	8.0
Heavy Metals						
Arsenic	0.001	mg/L	< 0.001	0.001	0.003	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	0.005	0.008	< 0.001
Copper	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.002
Lead	0.001	mg/L	< 0.001	0.001	0.003	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	0.003	0.003	0.007	0.003
Zinc	0.005	mg/L	0.009	0.044	0.031	0.009

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Dec 30, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 23, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 30, 2022	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Dec 23, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Sydney	Dec 30, 2022	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jan 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Volatile Organics	Sydney	Dec 23, 2022	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
pH (at 25 °C)	Sydney	Dec 30, 2022	0 Hour
- Method: LTM-GEN-7090 pH in water by ISE			
Organochlorine Pesticides	Sydney	Dec 30, 2022	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Dec 30, 2022	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			

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Company Name: Environmental Consulting Services
Address: 10 Fort Street
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NSW 2049

Project Name: MERRYLANDS
Project ID: MERRYLANDS

Order No.:
Report #: 952970
Phone: 02 9518 1161
Fax:

Received: Dec 22, 2022 11:20 AM
Due: Jan 10, 2023
Priority: 10 Day
Contact Name: Simon Caples

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	pH (at 25 °C)	Volatile Organics	Moisture Set	Eurofins Suite B10: BTEX/TRH/PAH/OCP/OPP	Eurofins Suite B7
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	S1	Dec 22, 2022		Soil	S22-De0055014	X			X		X
2	S2	Dec 22, 2022		Soil	S22-De0055015	X			X		X
3	S3	Dec 22, 2022		Soil	S22-De0055016	X			X		X
4	S4	Dec 22, 2022		Soil	S22-De0055017	X			X		X
5	S5	Dec 22, 2022		Soil	S22-De0055018	X			X		X
6	S6	Dec 22, 2022		Soil	S22-De0055019	X			X		X
7	S7	Dec 22, 2022		Soil	S22-De0055020	X			X		X
8	S8	Dec 22, 2022		Soil	S22-De0055021	X			X		X
9	S9	Dec 22, 2022		Soil	S22-De0055022	X			X		X
10	S10	Dec 22, 2022		Soil	S22-De0055023	X			X		X
11	S11	Dec 22, 2022		Soil	S22-De0055024	X			X		X
12	S12	Dec 22, 2022		Soil	S22-De0055025	X			X		X
13	BH2	Dec 22, 2022		Water	S22-De0055026		X	X		X	

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Sample Detail						Asbestos - AS4964	pH (at 25 °C)	Volatile Organics	Moisture Set	Eurofins Suite B10: BTEX/TRH/PAH/OCP/OPP	Eurofins Suite B7
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X
14	BH4	Dec 22, 2022		Water	S22-De0055027		X	X		X	
15	BH5	Dec 22, 2022		Water	S22-De0055028		X	X		X	
16	D	Dec 22, 2022		Soil	S22-De0055029				X		X
17	D	Dec 22, 2022		Water	S22-De0055030		X	X		X	
Test Counts						12	4	4	13	4	13

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.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
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.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

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%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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. 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.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. 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							
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	
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							
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	< 0.005			0.005	Pass	
2-Propanone (Acetone)	mg/L	< 0.005			0.005	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.005			0.005	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	< 0.005			0.005	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	< 0.005			0.005	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
Dichlorodifluoromethane	mg/L	< 0.005			0.005	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
Methylene Chloride	mg/L	< 0.005			0.005	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	< 0.005			0.005	Pass	
Vinyl chloride	mg/L	< 0.005			0.005	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	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	< 0.002			0.002	Pass	
4.4'-DDD	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDE	mg/L	< 0.0002			0.0002	Pass	
4.4'-DDT	mg/L	< 0.0002			0.0002	Pass	
a-HCH	mg/L	< 0.0002			0.0002	Pass	
Aldrin	mg/L	< 0.0002			0.0002	Pass	
b-HCH	mg/L	< 0.0002			0.0002	Pass	
d-HCH	mg/L	< 0.0002			0.0002	Pass	
Dieldrin	mg/L	< 0.0002			0.0002	Pass	
Endosulfan I	mg/L	< 0.0002			0.0002	Pass	
Endosulfan II	mg/L	< 0.0002			0.0002	Pass	
Endosulfan sulphate	mg/L	< 0.0002			0.0002	Pass	
Endrin	mg/L	< 0.0002			0.0002	Pass	
Endrin aldehyde	mg/L	< 0.0002			0.0002	Pass	
Endrin ketone	mg/L	< 0.0002			0.0002	Pass	
g-HCH (Lindane)	mg/L	< 0.0002			0.0002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor	mg/L	< 0.0002			0.0002	Pass	
Heptachlor epoxide	mg/L	< 0.0002			0.0002	Pass	
Hexachlorobenzene	mg/L	< 0.0002			0.0002	Pass	
Methoxychlor	mg/L	< 0.0002			0.0002	Pass	
Toxaphene	mg/L	< 0.005			0.005	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	< 0.02			0.02	Pass	
Chlorpyrifos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.002			0.002	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	< 0.02			0.02	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							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	117			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	85			70-130	Pass	
TRH C6-C10	%	111			70-130	Pass	
TRH >C10-C16	%	82			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	125			70-130	Pass	
Toluene	%	104			70-130	Pass	
Ethylbenzene	%	102			70-130	Pass	
m&p-Xylenes	%	85			70-130	Pass	
o-Xylene	%	88			70-130	Pass	
Xylenes - Total*	%	86			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	97			70-130	Pass	
1.1.1-Trichloroethane	%	106			70-130	Pass	
1.2-Dichlorobenzene	%	118			70-130	Pass	
1.2-Dichloroethane	%	104			70-130	Pass	
Trichloroethene	%	94			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	109			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	72			70-130	Pass	
Acenaphthylene	%	71			70-130	Pass	
Anthracene	%	87			70-130	Pass	
Benz(a)anthracene	%	73			70-130	Pass	
Benzo(a)pyrene	%	76			70-130	Pass	
Benzo(g.h.i)perylene	%	86			70-130	Pass	
Benzo(k)fluoranthene	%	91			70-130	Pass	
Chrysene	%	102			70-130	Pass	
Dibenz(a.h)anthracene	%	75			70-130	Pass	
Fluoranthene	%	77			70-130	Pass	
Fluorene	%	75			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	75			70-130	Pass	
Phenanthrene	%	70			70-130	Pass	
Pyrene	%	77			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	95			70-130	Pass	
4.4'-DDD	%	78			70-130	Pass	
4.4'-DDE	%	86			70-130	Pass	
4.4'-DDT	%	93			70-130	Pass	
a-HCH	%	82			70-130	Pass	
Aldrin	%	87			70-130	Pass	
b-HCH	%	74			70-130	Pass	
d-HCH	%	89			70-130	Pass	
Dieldrin	%	88			70-130	Pass	
Endosulfan I	%	95			70-130	Pass	
Endosulfan II	%	84			70-130	Pass	
Endosulfan sulphate	%	83			70-130	Pass	
Endrin	%	92			70-130	Pass	
Endrin aldehyde	%	92			70-130	Pass	
Endrin ketone	%	88			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
g-HCH (Lindane)	%	81			70-130	Pass	
Heptachlor	%	91			70-130	Pass	
Heptachlor epoxide	%	97			70-130	Pass	
Hexachlorobenzene	%	88			70-130	Pass	
Methoxychlor	%	88			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	92			70-130	Pass	
Dimethoate	%	71			70-130	Pass	
Ethion	%	100			70-130	Pass	
Fenitrothion	%	91			70-130	Pass	
Methyl parathion	%	100			70-130	Pass	
Mevinphos	%	85			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	99			80-120	Pass	
Cadmium	%	104			80-120	Pass	
Chromium	%	100			80-120	Pass	
Copper	%	96			80-120	Pass	
Lead	%	104			80-120	Pass	
Mercury	%	90			80-120	Pass	
Nickel	%	98			80-120	Pass	
Zinc	%	100			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C10-C14	S22-De0055967	NCP	%	113			70-130	Pass	
TRH >C10-C16	S22-De0055967	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S22-De0057201	NCP	%	72			70-130	Pass	
Acenaphthylene	S22-De0057201	NCP	%	70			70-130	Pass	
Anthracene	S22-De0057201	NCP	%	78			70-130	Pass	
Benz(a)anthracene	S22-De0057201	NCP	%	72			70-130	Pass	
Benzo(a)pyrene	S22-De0057201	NCP	%	76			70-130	Pass	
Benzo(g.h.i)perylene	S22-De0057201	NCP	%	78			70-130	Pass	
Benzo(k)fluoranthene	S22-De0057201	NCP	%	88			70-130	Pass	
Chrysene	S22-De0057201	NCP	%	101			70-130	Pass	
Dibenz(a.h)anthracene	S22-De0057201	NCP	%	78			70-130	Pass	
Fluoranthene	S22-De0057201	NCP	%	78			70-130	Pass	
Fluorene	S22-De0057201	NCP	%	75			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S22-De0057201	NCP	%	76			70-130	Pass	
Pyrene	S22-De0057201	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S22-De0057201	NCP	%	92			70-130	Pass	
4.4'-DDD	S22-De0057201	NCP	%	76			70-130	Pass	
4.4'-DDE	S22-De0057201	NCP	%	83			70-130	Pass	
4.4'-DDT	S22-De0057201	NCP	%	89			70-130	Pass	
a-HCH	S22-De0057201	NCP	%	78			70-130	Pass	
Aldrin	S22-De0057201	NCP	%	82			70-130	Pass	
b-HCH	S22-De0057201	NCP	%	72			70-130	Pass	
d-HCH	S22-De0057201	NCP	%	84			70-130	Pass	
Dieldrin	S22-De0057201	NCP	%	85			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan I	S22-De0057201	NCP	%	89			70-130	Pass	
Endosulfan II	S22-De0057201	NCP	%	82			70-130	Pass	
Endosulfan sulphate	S22-De0057201	NCP	%	79			70-130	Pass	
Endrin	S22-De0057201	NCP	%	89			70-130	Pass	
Endrin aldehyde	S22-De0057201	NCP	%	75			70-130	Pass	
Endrin ketone	S22-De0057201	NCP	%	83			70-130	Pass	
g-HCH (Lindane)	S22-De0057201	NCP	%	78			70-130	Pass	
Heptachlor	S22-De0057201	NCP	%	86			70-130	Pass	
Heptachlor epoxide	S22-De0057201	NCP	%	91			70-130	Pass	
Hexachlorobenzene	S22-De0057201	NCP	%	82			70-130	Pass	
Methoxychlor	S22-De0057201	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S22-De0057201	NCP	%	86			70-130	Pass	
Ethion	S22-De0057201	NCP	%	94			70-130	Pass	
Fenitrothion	S22-De0057201	NCP	%	86			70-130	Pass	
Methyl parathion	S22-De0057201	NCP	%	92			70-130	Pass	
Mevinphos	S22-De0057201	NCP	%	80			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S22-De0056622	NCP	%	113			75-125	Pass	
Cadmium	S22-De0056622	NCP	%	104			75-125	Pass	
Chromium	S22-De0056622	NCP	%	96			75-125	Pass	
Copper	S22-De0056622	NCP	%	87			75-125	Pass	
Lead	S22-De0056622	NCP	%	95			75-125	Pass	
Mercury	S22-De0056622	NCP	%	90			75-125	Pass	
Nickel	S22-De0056622	NCP	%	90			75-125	Pass	
Zinc	S22-De0056622	NCP	%	88			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	S23-Ja0000342	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S23-Ja0000342	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S23-Ja0000342	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C10-C16	S23-Ja0000342	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S23-Ja0000342	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S23-Ja0000342	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	S22-De0058116	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
4.4'-DDD	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDE	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
4.4'-DDT	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
a-HCH	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Aldrin	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
b-HCH	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
d-HCH	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Dieldrin	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan I	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan II	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endosulfan sulphate	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin aldehyde	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Endrin ketone	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
g-HCH (Lindane)	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Heptachlor epoxide	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Hexachlorobenzene	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Methoxychlor	S22-De0058116	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Toxaphene	S22-De0058116	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Bolstar	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorfenvinphos	S22-De0058116	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chlorpyrifos	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorpyrifos-methyl	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Coumaphos	S22-De0058116	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Demeton-S	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Demeton-O	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Diazinon	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dichlorvos	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dimethoate	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Disulfoton	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
EPN	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethion	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethoprop	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethyl parathion	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenitrothion	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fensulfothion	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenthion	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Malathion	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Merphos	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Methyl parathion	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Mevinphos	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Monocrotophos	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Naled	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Omethoate	S22-De0058116	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phorate	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Pirimiphos-methyl	S22-De0058116	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Pyrazophos	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ronnel	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Terbufos	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Tetrachlorvinphos	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tokuthion	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Trichloronate	S22-De0058116	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S22-De0058116	NCP	mg/L	0.002	0.002	2.6	30%	Pass	
Cadmium	S22-De0058248	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S22-De0058116	NCP	mg/L	0.002	0.002	11	30%	Pass	
Copper	S22-De0058116	NCP	mg/L	0.002	0.002	7.4	30%	Pass	
Lead	S22-De0058116	NCP	mg/L	0.004	0.004	<1	30%	Pass	
Mercury	S22-De0058116	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S22-De0058116	NCP	mg/L	0.002	0.002	22	30%	Pass	
Zinc	S22-De0058116	NCP	mg/L	0.020	0.019	4.6	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S22-De0055030	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C6-C10	S22-De0055030	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S22-De0055030	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S22-De0055030	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1-Dichloroethene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1-Trichloroethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2-Trichloroethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dibromoethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichlorobenzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloroethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloropropane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.3-Trichloropropane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.4-Trimethylbenzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichlorobenzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichloropropane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3.5-Trimethylbenzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.4-Dichlorobenzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Butanone (MEK)	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
2-Propanone (Acetone)	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
4-Chlorotoluene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Allyl chloride	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromobenzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromochloromethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromodichloromethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromoform	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromomethane	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Carbon disulfide	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Carbon Tetrachloride	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorobenzene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroethane	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloroform	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloromethane	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
cis-1.2-Dichloroethene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.3-Dichloropropene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromochloromethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromomethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dichlorodifluoromethane	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Iodomethane	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Isopropyl benzene (Cumene)	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Methylene Chloride	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Styrene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tetrachloroethene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.2-Dichloroethene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.3-Dichloropropene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichloroethene	S22-De0055030	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichlorofluoromethane	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Vinyl chloride	S22-De0055030	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S22-De0055030	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	

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

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

Authorised by:

Bonnie Pu	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile
Ryan Phillips	Senior Analyst-Inorganic

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.

Environmental Consulting Services
10 Fort Street
Petersham
NSW 2049

Attention: **Simon Caples**

Report **952970-S**
Project name MERRYLANDS
Project ID MERRYLANDS
Received Date Dec 22, 2022

Client Sample ID			**S1**	**S2**	**S3**	**S4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S22-De0055014**	**S22-De0055015**	**S22-De0055016**	**S22-De0055017**
Date Sampled			**Dec 22, 2022**	**Dec 22, 2022**	**Dec 22, 2022**	**Dec 22, 2022**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
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
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
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	104	103	105
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
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			S1	S2	S3	S4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S22-De0055014	S22-De0055015	S22-De0055016	S22-De0055017
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
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	87	90
p-Terphenyl-d14 (surr.)	1	%	69	75	89	86
Heavy Metals						
Arsenic	2	mg/kg	9.3	7.6	4.7	7.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	25	35	15	20
Copper	5	mg/kg	28	45	13	36
Lead	5	mg/kg	43	63	13	62
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	27	51	6.5	25
Zinc	5	mg/kg	190	180	11	110
% Moisture	1	%	13	7.3	14	4.1

Client Sample ID			S5	S6	S7	S8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S22-De0055018	S22-De0055019	S22-De0055020	S22-De0055021
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
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	84	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	130	< 50	57	< 50
TRH C10-C36 (Total)	50	mg/kg	214	< 50	57	< 50
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	170	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	170	< 100	< 100	< 100
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	%	146	134	114	113

Client Sample ID			S5	S6	S7	S8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S22-De0055018	S22-De0055019	S22-De0055020	S22-De0055021
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
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	%	68	83	82	100
p-Terphenyl-d14 (surr.)	1	%	62	72	72	85
Heavy Metals						
Arsenic	2	mg/kg	14	11	6.6	7.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	22	20	29	15
Copper	5	mg/kg	26	17	44	19
Lead	5	mg/kg	61	13	68	18
Mercury	0.1	mg/kg	< 0.1	< 0.1	1.1	< 0.1
Nickel	5	mg/kg	17	5.0	48	12
Zinc	5	mg/kg	170	14	300	60
% Moisture	1	%	10	12	8.5	11

Client Sample ID			S9	S10	S11	S12
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S22-De0055022	S22-De0055023	S22-De0055024	S22-De0055025
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
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

Client Sample ID			S9	S10	S11	S12
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S22-De0055022	S22-De0055023	S22-De0055024	S22-De0055025
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
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
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	%	139	143	139	133
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
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	%	109	77	79	86
p-Terphenyl-d14 (surr.)	1	%	113	81	82	88
Heavy Metals						
Arsenic	2	mg/kg	20	15	52	17
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	24	25	24	20
Copper	5	mg/kg	36	36	36	17
Lead	5	mg/kg	58	45	49	16
Mercury	0.1	mg/kg	0.2	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	22	24	24	5.0
Zinc	5	mg/kg	150	130	140	24

Client Sample ID			S9	S10	S11	S12
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S22-De0055022	S22-De0055023	S22-De0055024	S22-De0055025
Date Sampled			Dec 22, 2022	Dec 22, 2022	Dec 22, 2022	Dec 22, 2022
Test/Reference	LOR	Unit				
% Moisture	1	%	20	9.7	14	18

Client Sample ID			D
Sample Matrix			Soil
Eurofins Sample No.			S22-De0055029
Date Sampled			Dec 22, 2022
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
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	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
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
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	%	137
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5

Client Sample ID			D
Sample Matrix			Soil
Eurofins Sample No.			S22-De0055029
Date Sampled			Dec 22, 2022
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	87
p-Terphenyl-d14 (surr.)	1	%	94
Heavy Metals			
Arsenic	2	mg/kg	6.6
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	19
Copper	5	mg/kg	25
Lead	5	mg/kg	35
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	23
Zinc	5	mg/kg	97
% Moisture	1	%	13

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Dec 28, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 28, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Dec 28, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Dec 28, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Polycyclic Aromatic Hydrocarbons	Sydney	Dec 28, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Dec 28, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Dec 23, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: Environmental Consulting Services
Address: 10 Fort Street
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NSW 2049

Project Name: MERRYLANDS
Project ID: MERRYLANDS

Order No.:
Report #: 952970
Phone: 02 9518 1161
Fax:

Received: Dec 22, 2022 11:20 AM
Due: Jan 10, 2023
Priority: 10 Day
Contact Name: Simon Caples

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	pH (at 25 °C)	Volatile Organics	Moisture Set	Eurofins Suite B10: BTEX/TRH/PAH/OCP/OPP	Eurofins Suite B7
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	S1	Dec 22, 2022		Soil	S22-De0055014	X			X		X
2	S2	Dec 22, 2022		Soil	S22-De0055015	X			X		X
3	S3	Dec 22, 2022		Soil	S22-De0055016	X			X		X
4	S4	Dec 22, 2022		Soil	S22-De0055017	X			X		X
5	S5	Dec 22, 2022		Soil	S22-De0055018	X			X		X
6	S6	Dec 22, 2022		Soil	S22-De0055019	X			X		X
7	S7	Dec 22, 2022		Soil	S22-De0055020	X			X		X
8	S8	Dec 22, 2022		Soil	S22-De0055021	X			X		X
9	S9	Dec 22, 2022		Soil	S22-De0055022	X			X		X
10	S10	Dec 22, 2022		Soil	S22-De0055023	X			X		X
11	S11	Dec 22, 2022		Soil	S22-De0055024	X			X		X
12	S12	Dec 22, 2022		Soil	S22-De0055025	X			X		X
13	BH2	Dec 22, 2022		Water	S22-De0055026		X	X		X	

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Sample Detail						Asbestos - AS4964	pH (at 25 °C)	Volatile Organics	Moisture Set	Eurofins Suite B10: BTEX/TRH/PAH/OCP/OPP	Eurofins Suite B7
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X
14	BH4	Dec 22, 2022		Water	S22-De0055027		X	X		X	
15	BH5	Dec 22, 2022		Water	S22-De0055028		X	X		X	
16	D	Dec 22, 2022		Soil	S22-De0055029				X		X
17	D	Dec 22, 2022		Water	S22-De0055030		X	X		X	
Test Counts						12	4	4	13	4	13

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.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
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.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

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%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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. 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.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. 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							
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	
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							
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	
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							
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							
TRH C6-C9	%	94			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	109			70-130	Pass	
TRH C6-C10	%	96			70-130	Pass	
TRH >C10-C16	%	111			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	105			70-130	Pass	
Toluene	%	110			70-130	Pass	
Ethylbenzene	%	102			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
o-Xylene	%	93			70-130	Pass	
Xylenes - Total*	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	82			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	87			70-130	Pass	
Acenaphthylene	%	86			70-130	Pass	
Anthracene	%	87			70-130	Pass	
Benz(a)anthracene	%	87			70-130	Pass	
Benzo(a)pyrene	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	%	87			70-130	Pass	
Benzo(g.h.i)perylene	%	99			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	84			70-130	Pass	
Dibenz(a.h)anthracene	%	87			70-130	Pass	
Fluoranthene	%	88			70-130	Pass	
Fluorene	%	86			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	86			70-130	Pass	
Naphthalene	%	87			70-130	Pass	
Phenanthrene	%	86			70-130	Pass	
Pyrene	%	92			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	100			80-120	Pass	
Cadmium	%	100			80-120	Pass	
Chromium	%	101			80-120	Pass	
Copper	%	99			80-120	Pass	
Lead	%	103			80-120	Pass	
Mercury	%	101			80-120	Pass	
Nickel	%	98			80-120	Pass	
Zinc	%	102			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S22-De0055526	NCP	%	102			70-130	Pass	
TRH C10-C14	S22-De0056338	NCP	%	99			70-130	Pass	
TRH C6-C10	S22-De0055526	NCP	%	104			70-130	Pass	
TRH >C10-C16	S22-De0056338	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S22-De0055255	NCP	%	70			70-130	Pass	
Acenaphthylene	S22-De0055255	NCP	%	70			70-130	Pass	
Anthracene	R22-De0048963	NCP	%	83			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	R22-De0048963	NCP	%	85			70-130	Pass	
Benzo(a)pyrene	S22-De0055255	NCP	%	70			70-130	Pass	
Benzo(b&j)fluoranthene	R22-De0048963	NCP	%	81			70-130	Pass	
Benzo(g.h.i)perylene	R22-De0048963	NCP	%	104			70-130	Pass	
Benzo(k)fluoranthene	S22-De0055255	NCP	%	83			70-130	Pass	
Chrysene	S22-De0055255	NCP	%	90			70-130	Pass	
Dibenz(a.h)anthracene	R22-De0048963	NCP	%	94			70-130	Pass	
Fluoranthene	R22-De0048963	NCP	%	89			70-130	Pass	
Fluorene	R22-De0048963	NCP	%	97			70-130	Pass	
Indeno(1.2.3-cd)pyrene	R22-De0048963	NCP	%	87			70-130	Pass	
Naphthalene	R22-De0048963	NCP	%	97			70-130	Pass	
Phenanthrene	R22-De0048963	NCP	%	85			70-130	Pass	
Pyrene	R22-De0048963	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Zinc	S22-De0054985	NCP	%	100			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S22-De0055021	CP	%	109			75-125	Pass	
Cadmium	S22-De0055021	CP	%	105			75-125	Pass	
Chromium	S22-De0055021	CP	%	106			75-125	Pass	
Copper	S22-De0055021	CP	%	115			75-125	Pass	
Lead	S22-De0055021	CP	%	117			75-125	Pass	
Mercury	S22-De0055021	CP	%	106			75-125	Pass	
Nickel	S22-De0055021	CP	%	111			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S22-De0055022	CP	%	109			75-125	Pass	
Cadmium	S22-De0055022	CP	%	121			75-125	Pass	
Chromium	S22-De0055022	CP	%	104			75-125	Pass	
Copper	S22-De0055022	CP	%	94			75-125	Pass	
Lead	S22-De0055022	CP	%	78			75-125	Pass	
Mercury	S22-De0055022	CP	%	116			75-125	Pass	
Nickel	S22-De0055022	CP	%	98			75-125	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S22-De0055025	CP	%	93			70-130	Pass	
Toluene	S22-De0055025	CP	%	95			70-130	Pass	
Ethylbenzene	S22-De0055025	CP	%	89			70-130	Pass	
m&p-Xylenes	S22-De0055025	CP	%	96			70-130	Pass	
o-Xylene	S22-De0055025	CP	%	93			70-130	Pass	
Xylenes - Total*	S22-De0055025	CP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S22-De0055025	CP	%	81			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	S22-De0056363	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S22-De0056363	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S22-De0056363	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C10-C16	S22-De0056363	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S22-De0056363	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S22-De0056363	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S22-De0055525	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Copper	S22-De0055036	NCP	mg/kg	39	33	16	30%	Pass	
Nickel	S22-De0055036	NCP	mg/kg	11	13	17	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S22-De0055020	CP	mg/kg	6.6	6.2	5.8	30%	Pass	
Cadmium	S22-De0055020	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S22-De0055020	CP	mg/kg	29	36	19	30%	Pass	
Lead	S22-De0055020	CP	mg/kg	68	59	14	30%	Pass	
Mercury	S22-De0055020	CP	mg/kg	1.1	0.9	13	30%	Pass	
Zinc	S22-De0055020	CP	mg/kg	300	240	19	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S22-De0055023	CP	%	9.7	9.9	1.5	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S22-De0055024	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10	S22-De0055024	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S22-De0055024	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S22-De0055024	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S22-De0055024	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S22-De0055024	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S22-De0055024	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S22-De0055024	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S22-De0055024	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

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

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

Authorised by:

Bonnie Pu	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Volatile
Roopesh Rangarajan	Senior Analyst-Organic
Laxman Dias	Senior Analyst-Asbestos

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.

Certificate of Analysis

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Environmental Consulting Services
10 Fort Street
Petersham
NSW 2049

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.

Attention:	Simon Caples
Report	952970-AID
Project Name	MERRYLANDS
Project ID	MERRYLANDS
Received Date	Dec 22, 2022
Date Reported	Jan 05, 2023

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 MERRYLANDS
Project ID MERRYLANDS
Date Sampled Dec 22, 2022
Report 952970-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
S1	22-De0055014	Dec 22, 2022	Approximate Sample 33g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S2	22-De0055015	Dec 22, 2022	Approximate Sample 57g Sample consisted of: Brown fine-grained clayey soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S3	22-De0055016	Dec 22, 2022	Approximate Sample 42g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S4	22-De0055017	Dec 22, 2022	Approximate Sample 34g Sample consisted of: Brown fine-grained clayey soil and rocks	Chrysotile asbestos detected in the form of loose fibre bundles. Approximate raw weight of asbestos containing material = 0.00080g* Total estimated asbestos content in the sample = 0.00076g* Total estimated asbestos concentration = 0.0023% w/w* No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S5	22-De0055018	Dec 22, 2022	Approximate Sample 34g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S6	22-De0055019	Dec 22, 2022	Approximate Sample 47g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
S7	22-De0055020	Dec 22, 2022	Approximate Sample 35g Sample consisted of: Brown fine-grained clayey soil and rocks	Chrysotile and amosite asbestos detected in weathered fibre plaster cement material. Chrysotile asbestos detected in the form of loose fibre bundles. Approximate raw weight of asbestos containing material = 0.069g* Total estimated asbestos content in the sample = 0.040g* Total estimated asbestos concentration = 0.11% w/w* Organic fibre detected. No trace asbestos detected.
S8	22-De0055021	Dec 22, 2022	Approximate Sample 31g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S9	22-De0055022	Dec 22, 2022	Approximate Sample 55g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S10	22-De0055023	Dec 22, 2022	Approximate Sample 53g Sample consisted of: Brown fine-grained clayey soil and rocks	Chrysotile asbestos detected in the form of loose fibre bundles. Approximate raw weight of asbestos containing material = 0.00070g* Total estimated asbestos content in the sample = 0.00063g* Total estimated asbestos concentration = 0.0012% w/w* No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S11	22-De0055024	Dec 22, 2022	Approximate Sample 53g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
S12	22-De0055025	Dec 22, 2022	Approximate Sample 51g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% 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	Dec 23, 2022	Indefinite

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Company Name: Environmental Consulting Services
Address: 10 Fort Street
Petersham
NSW 2049

Project Name: MERRYLANDS
Project ID: MERRYLANDS

Order No.:
Report #: 952970
Phone: 02 9518 1161
Fax:

Received: Dec 22, 2022 11:20 AM
Due: Jan 10, 2023
Priority: 10 Day
Contact Name: Simon Caples

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	pH (at 25 °C)	Volatile Organics	Moisture Set	Eurofins Suite B10: BTEX/TRH/PAH/OCP/OPP	Eurofins Suite B7
Melbourne Laboratory - NATA # 1261 Site # 1254										X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	S1	Dec 22, 2022		Soil	S22-De0055014	X			X		X
2	S2	Dec 22, 2022		Soil	S22-De0055015	X			X		X
3	S3	Dec 22, 2022		Soil	S22-De0055016	X			X		X
4	S4	Dec 22, 2022		Soil	S22-De0055017	X			X		X
5	S5	Dec 22, 2022		Soil	S22-De0055018	X			X		X
6	S6	Dec 22, 2022		Soil	S22-De0055019	X			X		X
7	S7	Dec 22, 2022		Soil	S22-De0055020	X			X		X
8	S8	Dec 22, 2022		Soil	S22-De0055021	X			X		X
9	S9	Dec 22, 2022		Soil	S22-De0055022	X			X		X
10	S10	Dec 22, 2022		Soil	S22-De0055023	X			X		X
11	S11	Dec 22, 2022		Soil	S22-De0055024	X			X		X
12	S12	Dec 22, 2022		Soil	S22-De0055025	X			X		X

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Company Name: Environmental Consulting Services
Address: 10 Fort Street
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NSW 2049

Project Name: MERRYLANDS
Project ID: MERRYLANDS

Order No.:
Report #: 952970
Phone: 02 9518 1161
Fax:

Received: Dec 22, 2022 11:20 AM
Due: Jan 10, 2023
Priority: 10 Day
Contact Name: Simon Caples

Eurofins Analytical Services Manager : Robert Biviano

Sample Detail						Asbestos - AS4964	pH (at 25 °C)	Volatile Organics	Moisture Set	Eurofins Suite B10: BTEX/TRH/PAH/OCP/OPP	Eurofins Suite B7
Melbourne Laboratory - NATA # 1261 Site # 1254										X	X
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X
13	BH2	Dec 22, 2022		Water	S22-De0055026		X	X		X	
14	BH4	Dec 22, 2022		Water	S22-De0055027		X	X		X	
15	BH5	Dec 22, 2022		Water	S22-De0055028		X	X		X	
16	D	Dec 22, 2022		Soil	S22-De0055029				X		X
17	D	Dec 22, 2022		Water	S22-De0055030		X	X		X	
Test Counts						12	4	4	13	4	13

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. Information identified on this report with the colour **orange** indicates sections of the report not covered by the laboratory's scope of NATA accreditation.
6. 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**).
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.
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

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

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:

Chamath JHM Annakkage	Senior Analyst-Asbestos

Authorised by:

Laxman Dias	Senior Analyst-Asbestos

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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Sample Receipt Advice

Company name:	Environmental Consulting Services
Contact name:	Simon Caples
Project name:	MERRYLANDS
Project ID:	MERRYLANDS
Turnaround time:	10 Day
Date/Time received	Dec 22, 2022 11:20 AM
Eurofins reference	952970

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 22.5 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✗	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Robert Biviano on phone : or by email: RobertoBiviano@eurofins.com

Results will be delivered electronically via email to Simon Caples - simon@ecsgroup.com.au.

ENVIRONMENTAL CONSULTING SERVICES

Chain of Custody

Project: MERRYLANDS																						
Environmental Consulting Services Pty Ltd			Manager: Simon Caples								Ph: 0415 225 474					Email: simon@ecsgroup.com.au						
Event Number:			Matrix			Analysis																
Lab Number	Sample Number	Sample Date	Soil	Water	Other	BTEX	TPH	PAH	Phenol	Metals	Asbestos	Suite B7	Suite B10	Suite R16	VOCs	pH						
	S1	22/12	X								X	X										
	S2		X								X	X										
	S3		X								X	X										
	S4		X								X	X										
	S5		X								X	X										
	S6		X								X	X										
	S7		X								X	X										
	S8		X								X	X										
	S9		X								X	X										
	S10		X								X	X										
	S11		X								X	X										
	S12		X								X	X										
	BH 2				X								X		X	X						
	BH 4				X								X		X	X						
	BH 5				X								X		X	X						
	D		X									X										
	D				X								X		X	X						

Turn Around Time: 5 DAYS

Comments:

Relinquished By: SIMON Signed: Date: 22/12 Received By: Signed: Date: 22/12

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