



Douglas Partners
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Report on
Detailed Site Investigation (Contamination)

Proposed Residential Subdivision
18 Gosford Road, Wyee

Prepared for
Mrs June Waldon

Project 104136.01
November 2021

Integrated Practical Solutions



Document History

Document details

Project No.	104136.01	Document No.	R.001.Rev0
Document title	Report on Detailed Site Investigation (Contamination) Proposed Residential Subdivision		
Site address	18 Gosford Road, Wyee		
Report prepared for	Mrs June Waldon		
File name	104136.01.R.001.Rev0		

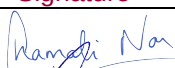
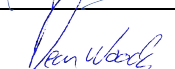
Document status and review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Chamali Nagodavithane	Dean Woods	26 November 2021

Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	0	Chris Oliver, Optima Developments Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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Report on Detailed Site Investigation (Contamination)

Proposed Residential Subdivision

18 Gosford Road, Wyee

1. Introduction

Douglas Partners Pty Ltd (DP) was engaged by Optima Developments Pty Ltd on behalf of Mrs June Waldon to undertake this detailed site investigation for contamination (DSI) for a proposed residential subdivision at 18 Gosford Road, Wyee (the site as shown on Drawing 1, Appendix A). The investigation was undertaken with reference to DP's proposal 104136.01.P.001.Rev0, dated 22 September 2021.

DP has previously prepared a preliminary site investigation (contamination) (PSI) for the site (DP, 2020 – see Section 3 below). The current report incorporates the findings of DP (2020).

The objective of the DSI is to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or management with regard to the proposed development. It is understood that the report will be used to support a development application for the proposed development. This report must be read in conjunction with all appendices including the notes provided in Appendix A.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

2. Proposed Development

Based on concept plans, the proposed subdivision is understood to comprise 42 residential lots with associated roads and services. It is understood that all existing site structures will be demolished. A copy of the proposed concept plans is included in Appendix A.

3. Background

DP has previously prepared a PSI for the site, which involved the drilling of eight boreholes targeting the following identified potential areas of environment concern (PAEC): (1) Former structures / area of potential fill; (2) Former dam; (3) Former agricultural land use; and (4) Mounded area surrounding the residential structure. The PSI commented that the site is generally suitable for the proposed residential development, subject to the recommendations outlined in Section 14 of DP (2020), including undertaking of confirmatory investigations, as stated below:

- **Confirmatory Investigations:** *Given the preliminary nature of the current PSI (completed for rezoning purposes), it is recommended that confirmatory investigations be completed as part of the subdivision development approval process. These investigations should aim to confirm the site's suitability for the proposed residential development from a site contamination standpoint.*

The current DSI, therefore includes intrusive investigations and soil sampling targeting the following PAEC:

- Former structures / area of potential fill (PAEC 1);
- Former dam (PAEC 2); and
- Former agricultural land use (PAEC 3);

The approximate extent of the PAEC are shown on Drawing 1, Appendix A.

4. Scope of Work

DP carried out the following scope of works:

- Review of published geological, soil, topographic, hydrogeological and acid sulfate soil (ASS) risk maps;
- Review of the PSI (DP, 2020) and key site history information including:
 - o Available historical aerial photographs and aerial imagery obtained through Nearmap, included in DP (2020);
 - o NSW EPA public registers for notices and licences issued under the Contaminated Land Management Act 1997 (CLM Act) and the Protection of the Environment Operations Act 1997 (PEOA Act); and
 - o Readily accessible council records
- A site walkover to observe the current land uses and assess the potential for contaminating activities;
- Excavation of twenty-two test pits (Pits 101 to 106 and Pits 110 to 125) using hand tools, terminating in natural soils, at depths of up to 0.7 m;
- Drilling of three boreholes (Bores 107 to 109) using a utility-mounted push-tube rig, terminating in natural soils, at depths of up to 2.2 m;
- Collection of soil samples from regular depth intervals based on field observation;
- Field testing of soil samples with a photo-ionisation detector (PID) to assess the likely presence of volatile organic compounds;
- Laboratory analysis of selected soil samples for a range of commonly encountered contaminants as identified in the conceptual site model (CSM - refer to Section 9);
- Field sampling and laboratory analysis according to standard environmental protocols, including a Quality Assurance / Quality Control (QA/QC) plan, appropriate Chain of Custody procedures and in-house laboratory QA/QC testing; and
- Preparation of this report detailing the findings of the investigation including recommendations for further works.

5. Site Information

The key site information is presented below, and the site boundary is shown in Figure 1.

Site Address	18 Gosford Road, Wyee
Legal Description	Lot 217, Deposited Plan 755242
Area	Approximately 3.1 hectares (ha)
Zoning	RU2 – Rural Landscape
Local Council Area	Lake Macquarie City Council
Current Use	Rural residential
Surrounding Uses	• North and east – Residential • South – Gosford Road and bushland beyond • West – Bushland and a rail line further west



Figure 1: Site Location

6. Environmental Setting

Regional Topography	Undulating low hills and rises, with local relief < 30 m, slope gradients <15%, broad crests and ridges, long gently inclined slopes and broad drainage lines.
Site Topography	The site lies at an elevation ranging from approximately 29 m to 41 m AHD, based on the survey plan (see Appendix A). Based on the site topography, the land slopes from the south-east to the north-west.
Soil Landscape	Reference to the <i>Gosford-Lake Macquarie 1:100 000 Soil Landscape Sheet</i> indicates the site is underlain by the Gorokan (erosional) soil landscape, characterised by lithic sandstones of the Tuggerah Formation. The soils vary from soloths, yellow podzolic soils, grey-brown podzolic soils and <i>gleyed</i> podzolic soils, and typically have very high erosion hazard, localised foundation hazard, seasonal waterlogging, are strongly acid with low fertility.
Geology	Reference to the <i>Gosford-Lake Macquarie 1:100 000 Geology Sheet</i> indicates that the site is underlain by the Tuggerah Formation of the Triassic period of the Mesozoic era, characterised by red, green and grey shale and quartz-lithic sandstone.
Acid Sulfate Soils	Reference to ASS risk maps indicates the site and areas within 500 m of the site are not mapped within an area of ASS occurrence. Furthermore, given the site's elevation (i.e. > 5 m AHD), and given the site is underlain by an erosional soil landscape, assessment of ASS was not considered to be warranted.
Surface Water	A tributary of Spring Creek is mapped approximately 350 m south of the site, and Mannering Creek is mapped approximately 850 m north of the site. Based on the site topography, surface water is anticipated to flow to the north-west, and then to the north towards Mannering Creek.
Groundwater	Based on the site topography, groundwater is anticipated to flow to the north-west, and then to the north towards Mannering Creek. A search of the publicly available registered groundwater bore database on 19 November 2021 indicated that there was one registered groundwater bore within approximately 500 m of the site. The bore, identified as GW064662, is located approximately 250 m east and is generally across gradient or upgradient of the site. Review of the records indicate that the bore is used for domestic purposes.

7. Site History

7.1 Historical Aerial Photography

Historical aerial photographs from 1954 to 2018 obtained from public databases and Nearmap were reviewed as part of DP (2020) to identify possible former land uses and hence the potential for contaminating activities to have impacted the site. The aerial photographs and an approximate site boundary, extracted from DP (2020) are presented in Appendix B. It is noted that data obtained from aerial photos was limited due to the relatively small scale and poor resolutions. A summary of the aerial photograph review is given in Table 1 below.

Table 1: Summary of Historical Aerial Photographs

Year	Site	Surrounding Land Use
1954	The aerial photograph is of a small scale and resolution. It appears that most of the site has been cleared and there appears to be a structure within the central portion of the site.	Gosford Road and the rail line can be seen south and west of the site, respectively. The surrounding land use appears to be predominantly bushland.
1965	The aerial photograph is of a higher resolution. The site comprises predominately cleared land with trees / shrubs along the perimeter of the site. A structure (likely rural residential house) with associated structures can be seen within the central portion of the site. An access path can be seen extending from Gosford Road to the residential house. There appears to be a minor ground disturbance (possible small farm dam) within the north western corner of the site and two minor ground disturbances (possible small farm dams), south west and south east of the house.	The surrounding land use is predominantly bushland, however it appears that a portion of the land north of the site has been cleared. West of the site, beyond the rail line, the land has been used for agricultural purposes.
1976	The structures noted in the 1965 aerial image appears to have been demolished, and there appears to be a ground disturbance / possible mounded area within the central portion of the site, in the general vicinity of the former structures.	The surrounding land use appears much the same as in 1965. It is noted that the land east of the site has been cleared.
1985	The site generally appears similar to 1976.	The land north and east of the site has been developed into residential land use.
1996	The existing residential house and associated structures have been constructed. The northern portion of the site appears to be used for farming / agricultural purposes, evident by the greenhouses present within this area. An access path can be seen from the greenhouses to the shed (near the residential house). A large farm dam exists within the western portion of the site. There appears to be a garden bed / possible vegetable patch west of the residential house. Evidence of exposed surface soils suggests that much of the northern and central portions of the site may have been subject to some regrading (e.g. minor cutting, filling or disturbance).	There has been a general increase in residential development to the north and east.

Year	Site	Surrounding Land Use
2001	The site appears much the same as in 1996, except that the ground disturbance / possible mounded area observed since 1976 is no longer visible. Trees / shrubs can be seen within this area.	The surrounding land use appears much the same as in 1996.
2010	The greenhouses are no longer present, and the access path can no longer be seen. The vegetable patch west of the residential house appears to have been cleared.	There has been an increase in residential land use to the north, east and west.
January 2018	The site appears much the same as in 2010.	The surrounding land use appears much the same as in 2010.
April 2018	The farm dam has been filled and there appears to be a stockpile of vegetation matter north of the filled dam. It is inferred that the stockpile originated from the clearing of trees / vegetation surrounding the former farm dam.	The surrounding land use appears much the same as in January 2018.
2021	The site appears much the same as in April 2018.	The surrounding land use appears much the same as in April 2018.

7.2 Public Registers and Planning Records

The EPA maintains a public database of contaminated sites under Section 58 of the CLM Act. The notices relate to investigation and / or remediation of site contamination considered to be significantly contaminated under the definition in the CLM Act.

A site will appear on the Contaminated Land: Record of Notices if the site has been issued a regulatory notice by the EPA. Sites appearing in the List of NSW Contaminated Sites Notified to the EPA indicate that the site is considered to be contaminated by the notifier and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation and is subject to further review by the EPA. The NSW EPA also issues environmental protection licenses under Section 308 of the POEO Act.

A summary of the EPA and Council records is presented below and the search results are included in Appendix B.

EPA Notices available under Section 58 of the Contaminated Lands Management Act (CLM Act)	There were no records of notices for the site or adjacent sites.
Database searched 22 November 2021	
Sites notified to EPA under Section 60 of the CLM Act	The site and adjacent sites were not listed as a notified contaminated site.
Database searched 22 November 2021	
Licences listed under Section 308 of the Protection of the Environment Operations Act 1997 (POEO Act)	No Licences relevant to the site or immediately adjacent properties. It is noted a licence was previously issued to Flyash Australia Pty Ltd at the Wyee Transfer Station located along Gorokan Road, Wyee (immediately west of the rail line) for 'cement or lime handling', which had since been surrendered.
Database searched 22 November 2021	
Council Records (accessed 22 November 2021)	The following building / development applications were found relating to the site: • RZ – 7 / 2021 – Rezoning proposal • DA-770/1992 – Rural Dwelling (approved in 1992); • ZBA – 182 / 1994 – Farm Machinery Shed (approved in 1994); • ZBA – 3339/1993 – Twelve Proposed Greenhouse Igloos (approved in 1993); • ZBA – 2899 / 1993 – In-ground Concrete Pool (approved in 1993); and • ZBA – 3585 / 1992 – Proposed Brick Veneer / Hardiplank & Tile Residence (approved in 1992).

7.3 Site History Integrity Assessment

The information used to establish the history of the site was obtained from reliable sources including the EPA and government / local government websites. It should be noted that the aerial photographs are only available for certain years / intervals, therefore some data gaps exist in the information from this source. Furthermore, the observed site features are open to different interpretations and can be affected by the time of day and/or year at which they were taken, as well as specific events, such as flooding. Care has been taken to consider different possible interpretations of aerial photographs and to consider them in conjunction with other lines of evidence.

7.4 Summary of Site History

The site history information suggests that the site has been rural residential land use since at least 1965 (likely prior to 1954). It appears that the original structures within the central portion of the site were demolished sometime between 1965 to 1976. Based on the council records and aerial photographs, it is inferred that the existing residential house was likely constructed sometime between 1992 to 1996, and the site was likely used for agricultural land use sometime between 1993 to 2010. The surrounding land uses comprised bushland / cleared land up until at least 1976, and from 1985 to present, there was an increase in residential land uses.

The search of the EPA and Council records did not identify any significant findings relating to contamination of the site.

8. Site Walkover

A site walkover was undertaken by an environmental engineer on 13 October 2021. The site conditions were observed to be generally similar to the conditions observed in September 2020 during the PSI field work (refer to Section 7 of DP (2020)).

No fragments of asbestos containing material were observed on the ground surface during the walkover. However, it should be noted that most of the site was grass covered, therefore preventing adequate visual inspection of the soil surface in most areas. The general site topography was consistent with that described in Section 6, with the land generally sloping toward the north-west.

General site photographs of the PAEC taken as part of the current investigation are shown in Figures 2 to 5 below.



Figure 2: PAEC 1 - Former structures / potential fill. Photo taken 13 October 2021



Figure 3: PAEC 2 – Former dam. Photo taken 13 October 2021.



Figure 4: Close-up of former dam area. Photo taken 13 October 2021.



Figure 5: PAEC 3 - Former agricultural land use. Photo taken 13 October 2021.

9. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination 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 current investigation, the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified.

- S1: Fill: Associated with site regrading, construction/demolition of former buildings, filling of the former dam.
 - o COPC include metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), organophosphate pesticides (OPP), and asbestos.
- S2: Former agricultural land use (greenhouses).
 - o COPC include primarily OCP, OPP, and metals, and also TRH, BTEX, PAH from potential fuel leaks associated with machinery sheds.
- S3: Hazardous building materials in existing structures.
 - o COPC include asbestos, synthetic mineral fibres (SMF), lead (in paint) and PCB.

Based on the surrounding residential land use, the risk of contamination from off-site sources to the site is considered to be relatively low.

Potential Receptors

The following potential human receptors have been identified:

- R1: Current users [residential land use];
- R2: Construction and maintenance workers;
- R3: End users [residential land use]; and
- R4: Adjacent site users [residential land use].

The following potential environmental receptors have been identified:

- R5: Surface water [Mannering Creek];
- R6: Groundwater; and
- R7: Terrestrial ecology.

Potential Pathways

The following potential pathways have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of fibres / dust and/or vapours;
- P3: Surface water run-off;
- P4: Lateral migration of groundwater providing base flow to water bodies;
- P5: Leaching of contaminants and vertical migration into groundwater; and
- P6: Inhalation, ingestion and absorption.

Summary of Potentially Complete Exposure Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S3) and receptors (R1 to R7) are provided in below Table 2.

Table 2: Summary of Potentially Complete Exposure Pathways

Source and COPC	Transport Pathway	Receptor	Risk Management Action Recommended
S1: Fill - metals, TRH, BTEX, PAH, PCB, OCP, OPP and asbestos S2: Former agricultural land-use - OCP, OPP, metals, TRH, BTEX, PAH	P1 – Ingestion and dermal contact	R1 – Current Users	An intrusive investigation of site soils and associated contamination sampling (with respect to the sampling density as per NSW EPA, 1995) is recommended to assess possible contamination issues.
	P2 – Inhalation of fibres/ dust and/or vapours	R2 – Construction and maintenance workers	
		R3 – End users	
	P2 – Inhalation of fibres/ dust and/or vapours	R4 – Adjacent site users	
	P3 – Surface water run-off	R5 – Surface water	
	P4 – Lateral migration of groundwater		
S3: Hazardous building materials in existing structures	P5 – Leaching of contaminants and vertical migration into groundwater	R6 – Groundwater	A hazardous materials survey should be conducted prior to demolition Areas beneath the buildings should be assessed post-demolition.
	P6 – Inhalation, ingestion and absorption	R7 – Terrestrial ecology	
	P1 – Ingestion and dermal contact	R1 – Current Users	A hazardous materials survey should be conducted prior to demolition Areas beneath the buildings should be assessed post-demolition.
	P2 – Inhalation of fibres/ dust and/or vapours	R2 – Construction and maintenance workers	
		R3 – End users	
	P2 – Inhalation of fibres/ dust and/or vapours	R4 – Adjacent site users	

10. Sampling and Analysis Quality Plan

10.1 Data Quality Objectives

The DSI was devised with reference to the seven-step data quality objective process which is provided in Appendix B Schedule B2, NEPC (2013). The data quality objective process is outlined in Appendix H.

10.2 Soil Sampling Rationale

The current DSI targeted the PAEC identified in the PSI. Table A of NSW EPA (1995) recommends a minimum sampling density for site characterisation based on the detection of circular hot spots using a systemic grid sampling pattern. A summary of the area of each PAEC and the sampling density adopted is presented in Table 3.

Table 3: Summary of Sampling Density Adopted for PAEC

PAEC	Approximate Area	Number of recommended sampling points (NSW EPA (1995))	Number of Sampling Locations (PSI)	Number of Sampling Locations (Current DSI)
PAEC 1 (Former structures / area of potential fill)	2,000 m ²	7	1	6
PAEC 2 (Former dam)	500 m ²	5	2	3
PAEC 3 (Former agricultural land use)	9,000 m ²	20	4	16

A summary of the targeted sampling locations is presented in Table 4 below. Borehole and test pit locations are shown on Drawing 1 in Appendix A.

Table 4: Summary of Targeted Sampling Locations

Investigation	Borehole / Test Pit ID	Location Target	Identified From
PSI	Bore 1 to Bore 4	PAEC 3 (Former agricultural land use)	1996 Aerial Photograph
Current DSI	Pits 110 to 125		
PSI	Bores 5 and 6	PAEC 2 (Former dam)	1996 to 2018 Aerial Photographs
Current DSI	Bores 107 to 109		
PSI	Bore 7	PAEC 1 (Former structures / area of potential fill)	1976 to 1996 Aerial Photographs
Current DSI	Pits 101 to 106		
PSI	Bore 8	Mounded area surrounding residential structure	Walkover (DP, 2020)

Soil samples were collected from each borehole / test pit at depths of approximately 0.1 m, 0.5 m, and every 0.5 m thereafter, and changes in lithology or signs of contamination. The general sampling methods are described in the field work methodology, included in Appendix F.

10.3 Analytical Rationale

Based on the site observations and the location of soil samples within the subsoil strata (see Section 12.1), selected samples were analysed for the primary contaminants of concern as identified in Section 9. The analytical scheme was designed to obtain an indication of the potential presence and possible distribution of identified COPC, as outlined below:

- PAEC 1 (Former structures / area of potential fill) – surface samples were analysed for a contaminant suite comprising metals, OCP, OPP and asbestos (500 ml samples). At locations where anthropogenic inclusions were observed in the fill (see Section 12.1), the surface sample was also analysed for TRH, BTEX, PAH and PCB;
- PAEC 2 (Former dam) – samples from depths of up to 1.0 m were analysed for a contaminant suite including metals, TRH, BTEX, PAH, PCB, OCP and OPP; and
- PAEC 3 (Former agricultural land use) – surface samples were analysed for a contaminant suite comprising metals, OCP and OPP. At locations where anthropogenic inclusions were observed in the fill (see Section 12.1), the surface sample was also analysed for TRH, BTEX, PAH and PCB.

11. Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in the current investigation is informed by the CSM, which identified human and ecological receptors to potential contamination on the site, as well as consideration of the proposed development (i.e. residential subdivision). The laboratory analytical results have been assessed against the investigation and screening levels in Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario. The derivation of the SAC is included in Appendix E and the adopted SAC are listed on the summary analytical results tables in Appendix C.

12. Results

12.1 Sub-surface conditions

Details of the subsurface conditions encountered are given in the borehole and test pit logs in Appendix D, together with notes defining classification methods and descriptive terms. A summary of the ground profile encountered is given below. It should be noted that the sub-surface conditions encountered during the PSI (DP, 2020) have been incorporated into the below summary:

- **FILL:** Typically sand or clay fill was encountered at certain borehole or test pit locations as outlined below:
 - o Silty sand fill to depths of up to 0.4 m was encountered in Pits 101 to 103 and 106 excavated in the area of the former structures / area of potential fill (PAEC 1). Anthropogenic inclusions including trace metal, brick, glass and particle board were observed in the test pits;
 - o Sandy clay or gravelly sandy clay fill to depths of up to 2.9 m was encountered in Bores 5, 6, and Bores 107 to 109 drilled in the former dam (PAEC 2);
 - o Sand fill (varying from sand, silty sand and gravelly clayey sand) to depths of up to 0.3 m was encountered in Bore 1 and Pits 111 to 113 and Pit 121 drilled / excavated in the former agricultural land use area (PAEC 3). Anthropogenic inclusions including trace glass and plastic sheeting were encountered in Pits 112 and 121; and
 - o Clayey sand fill, with trace concrete and brick at depths of 0.6 m was encountered in Bore 8, positioned within the mounded area surrounding the house.
- **SAND:** Typically grey-brown or brown silty sand was encountered in Bores 2 to 4, 7, Pits 104, 105, 110, 114 to 118, 120, 122 to 125 from the ground surface, and in Bore 1 underlying fill, to depths of up to 0.5 m; underlain by sand (possible fill) in Pit 123;
- **CLAY or SAND (residual):** Typically yellow-brown, orange/red-brown and / or grey-brown gravelly sand, clayey sand, sandy clay or clay, as outlined below:
 - o Gravelly sand was encountered in Bore 1 from depths of 0.5 m to 1.0 m, and in Bore 2 from depths of 0.2 m to 0.35 m;
 - o Clayey sand was encountered in Pits 101, 103 to 106 and 110 underlying fill or silty sand, to test pit termination at depths of up to 0.7 m,
 - o Sandy clay or gravelly sandy clay was encountered in Bores 2 to 4, 7, 8, 108 and 109; and Pits 102, and 111 to 125 to borehole / test pit termination at depths of up to 2.2 m; and
 - o Clay was encountered in Bore 5, 6 and 107 (drilled in the former dam area) underlying fill to borehole termination at depths of up to 3.2 m. Bore 6 refused on weathered sandstone at depths of approximately 2.5 m.

No free groundwater was observed during drilling or excavation. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

The PID readings were all < 1 ppm indicating a low potential for gross contamination from volatile contaminants to be present in the soil. There were no obvious indicators of contamination (such as staining or odours) within the bores or test pits, with the exception of the trace anthropogenic inclusions noted above.

12.2 Laboratory Analytical Results

The laboratory results are summarised in Table C1, Appendix C, together with the adopted SAC. Laboratory certificates of analysis together with the chain of custody documentation are provided in Appendix I. A summary of the results is provided below:

PSI (DP (2020))

- Concentrations of TRH, BTEX, PAH, OCP, OPP and PCB were below the PQL and the SAC in all soil samples;
- Concentrations of metals were above the PQL in some samples, but below the SAC; and
- No asbestos was detected in the soil samples analysed for asbestos at the reporting limit of 0.1 g/kg.

Current DSI

- Concentrations of TRH, BTEX, PAH, OCP, OPP and PCB were below the PQL and the SAC in all soil samples;
- The following results were obtained for metals:
 - o Concentrations of lead in sample 106/0.1 (710 mg/kg) and the corresponding QC sample (QA3 – 905 mg/kg) exceeded the health-based SAC of 300 mg/kg. Given the concentration of lead is over 2.5 times the SAC, Pit 106 is considered to be a lead contamination hotspot;
 - o Concentrations of zinc in sample 106/0.1 (370 mg/kg) and the corresponding QC sample (QA3 – 437 mg/kg) exceeded the ecological SAC of 320 mg/kg;

Given the concentration of zinc is less than 2.5 times the SAC, the 95% UCL was considered applicable to the dataset. Two different datasets were compared: one dataset comprising surface silty sand fill or gravelly clayey sand fill (i.e. Pit 113/0.1); and a larger dataset comprising surface silty sand fill or silty sand topsoil. The calculated 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL) ranged from 116 to 223 mg/kg, both values which are less than the ecological SAC, and the standard deviation was less than 50% of the SAC. Therefore, the zinc exceedance is not considered to warrant further investigation or management. The 95% UCL was calculated using USEPA ProUCL 5.1 and the output is included in Appendix C.

- o Concentrations of other metals were below the PQL and / or SAC.
- The following results were obtained for asbestos:
 - o Chrysotile and amosite asbestos were detected in fibre cement material > 7mm in sample 106/0.1, but the concentrations of FA and AF in soil were below the PQL;
 - o Chrysotile asbestos was detected in fibre cement material > 7mm in sample 101/0.1, but the concentrations of FA and AF in soil were below the PQL;
 - o Chrysotile and amosite asbestos were detected in loose fibre bundles in sample 103/0-0.1, but the concentrations of FA and AF in soil were below the PQL and SAC; and
 - o No asbestos was detected in the other soil samples analysed for asbestos, and the concentrations of FA and AF were below the PQL and SAC.

DP notes that the SAC states no visible asbestos in surface soils. Given that asbestos was detected in fibre cement material > 7mm at Pits 101 and 106, the results are considered to be an exceedance of the health-based SAC.

12.3 Data Quality Assurance and Quality Control

The data quality assurance and quality control (QA/QC) results are included in Appendix G. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

13. Discussion

The current DSI comprised a review of the PSI (DP, 2020), limited review of site history information, a walkover, and intrusive soil sampling and laboratory testing targeting the following PAEC: (1) former structures / area of potential fill (PAEC 1); (2) former dam (PAEC 2); and (3) former agricultural land use (PAEC 3). The PSI field and laboratory results were incorporated into the current report.

The search of the EPA and Council records did not identify any significant findings relating to contamination of the site. Based on the surrounding residential land use, the risk of contamination from off-site sources to the site is considered to be relatively low.

Fill to depths of up to 2.9 m was encountered in PAEC 2, and relatively shallow fill to depths of up to 0.4 m was encountered in PAEC 1 and PAEC 3. Anthropogenic inclusions including trace glass and plastic sheeting were encountered in Pits 112 and 121 (PAEC 3), and trace metal, brick, glass and particle board were observed in Pits 101 to 103 and 106 (PAEC 1).

The soil laboratory results indicated the following:

- PAEC 2 and PAEC 3: Concentrations of contaminants were below the SAC; and
- PAEC 1: Concentrations of lead and zinc in sample 106/0.1 exceeded the health-based, and ecological SAC, respectively, however the zinc exceedance was not considered to warrant further investigation or management, based on calculation of the 95% UCL. Asbestos was detected in surface samples at Pits 101, 103 and 106. Given that asbestos was detected in fibre cement material > 7mm at Pits 101 and 106, the results are considered to be an exceedance of the health-based SAC.

DP considers that the concentration of lead above the SAC, and the presence of asbestos in PAEC 1 may be associated with the fill in this area, extending to depths of approximately 0.4 m. Based on the field and laboratory results, further investigation is considered to be warranted in PAEC 1 to delineate the lateral and vertical extent of contamination.

14. Conclusions and Recommendations

Based on the results of the DSI, it is considered that the site can be made suitable for the proposed residential subdivision (from a site contamination standpoint), subject to the following recommendations:

- **PAEC 1:** Further investigation and delineation of the extent of contamination at the locations identified on Drawing 2, Appendix A. DP considers that the appropriate remediation options should be considered with respect to the proposed development plans. The remediation/management works are likely to involve a combination of the following options:
 - **Option 1:** Waste Classification for off-site disposal with reference to NSW EPA (2014). This approach may be preferred should the area be subject to excavation as part of the proposed development. A clearance assessment should be conducted by an appropriately qualified environmental consultant following the removal of fill soils; or
 - **Option 2:** Capping of impacted fill and implementation of an environmental management plan (EMP): With this option, ACM impacted fill would remain on-site, but would be “capped” to eliminate the source – receptor pathway. This option may be appropriate for areas where construction of a road or concrete slab (i.e. acting as a capping layer) is proposed but would not generally be suitable for areas comprising private dwellings. It should be noted that further soil testing will be required to assess whether the capping option will be a suitable approach. Furthermore, an EMP will need to be implemented, and notification on the Section 10.7 Certificate will be required; and / or
 - **Option 3:** If fill is to be retained on site, or areas where exposed ground surface will remain (i.e. landscaped areas / garden beds), DP recommend undertaking a detailed asbestos investigation, at double density with reference to WA DoH (2021).
- **Remainder of the site:** Implementation of an unexpected finds protocol (UFP), to establish a strategy / management procedure to be followed during construction works, should unexpected finds of contamination be uncovered; and
- **Existing Structures:** A pre-demolition hazardous building material survey in accordance with SafeWork NSW requirements is recommended to be conducted by an appropriately qualified occupation hygienist prior to the demolition of the existing structures. All demolition work should be undertaken by a licenced demolition contractor and a clearance certificate provided by an occupational hygienist for the ground surface post demolition.

15. References

DP. (2020). *Report on Preliminary Site Investigation (Contamination), Proposed Residential Subdivision, 18 Gosford Road, Wyee*. Ref: 104136.00.R.001.Rev0 dated 23 November 2020: Douglas Partners Pty Ltd .

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (1995). *Contaminated Sites, Sampling Design Guidelines*. NSW Environment Protection Authority.

NSW EPA. (2014). *Waste Classification Guidelines, Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

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

16. Limitations

Douglas Partners (DP) has prepared this report for this project at 18 Gosford Road, Wyee in accordance with DP's proposal 104136.01.P.001.Rev0 dated 22 September 2021 and acceptance received from June Waldon dated 1 October 2021. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Mrs June Waldon and Optima Developments Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

Asbestos has been detected by laboratory analysis in PAEC 1, as documented in this report. Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling, or to vegetation preventing visual inspection and reasonable access. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

About This Report

Drawing 1

Drawing 2

Client-Supplied Plans

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

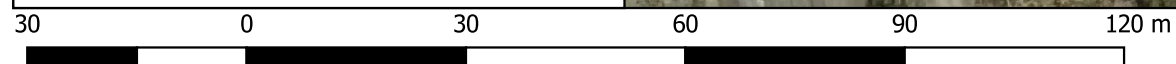
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

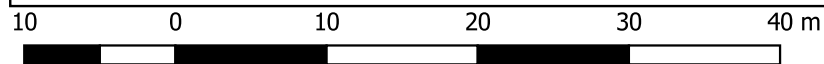
Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



Drawing adapted from MetroMap dated 15 August 2021





Drawing adapted from MetroMap dated 15 August 2021

MGA

APPROXIMATE POSITION OF RAIL LINE
GREAT NORTHERN RAIL
SYDNEY - NEWCASTLE
←- WYEE STATION

MURRAWAL ROAD
(UNFORMED)

PROPOSED ROAD 1
(16 WIDE)

PROPOSED ROAD 1
(16 WIDE)

PROPOSED ROAD 1
(16 WIDE)

MURRAWAL ROAD

GOSFORD ROAD

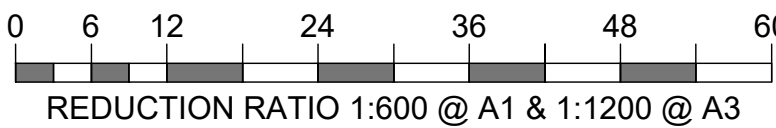
JABBARUP ROAD

SITE PLAN - PROPOSED SUBDIVISION

MINIMUM APZ (BAL 29) BY TRAVERS

AUTHORISED OFFICER
THIS PLAN TO BE READ IN CONJUNCTION
WITH INTRAX REPORT WITH REFERENCE: S#149418
149418_SUR_PROSUB_18 GOSFORD
RD, WYEE

REV	REVISION DETAILS	DATE

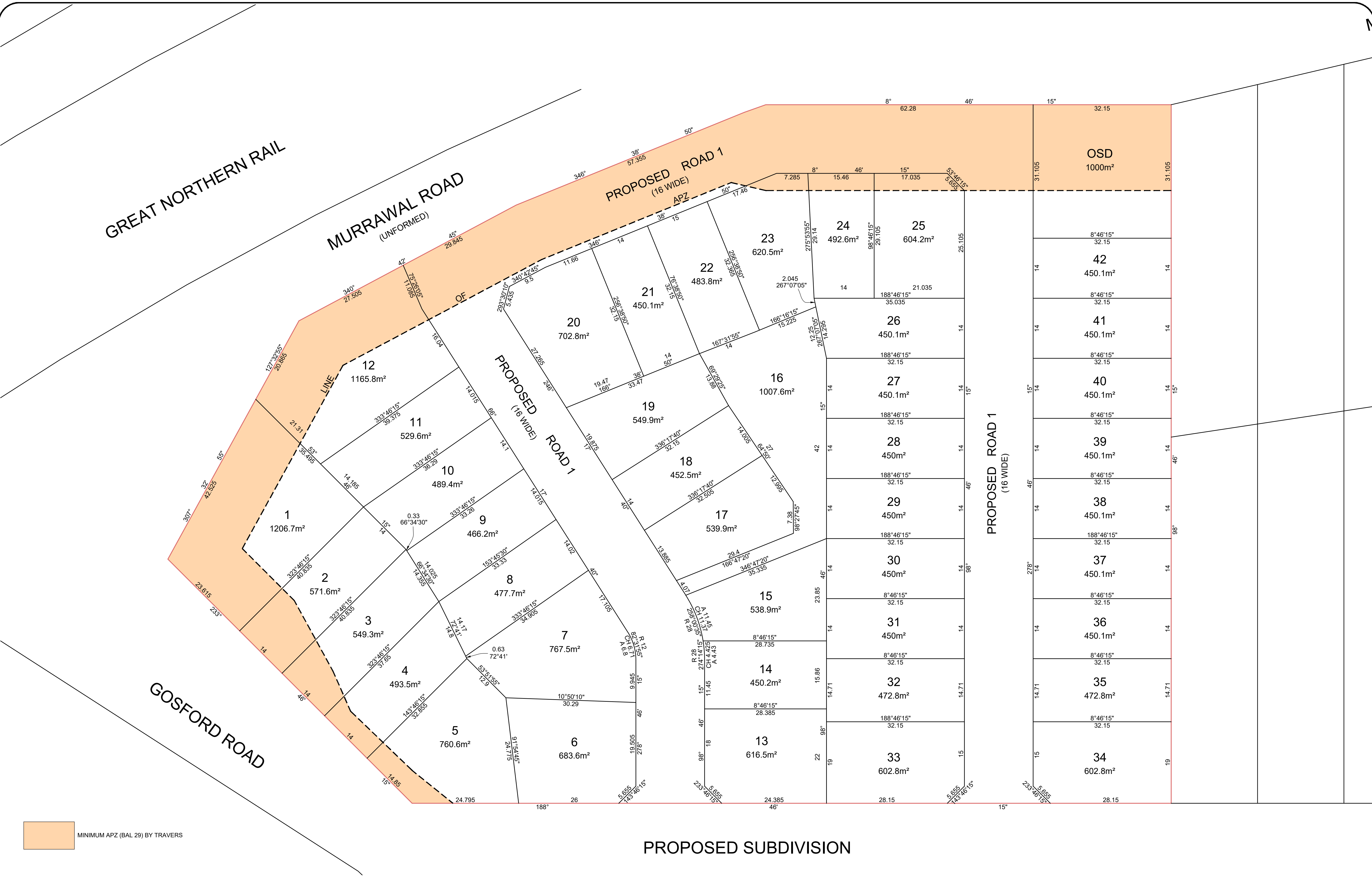


CLIENT:	J. WALDON	LOT No.	217	CONTOUR INTERVAL:	0.5m
REF:	S# 149418	SECTION	-	DATUM:	AHD
SURVEY FILE:	149418_JC_200907_DE	PLAN No.	DP 755242	AUSTRALIAN HEIGHT DATUM	PM 23846
SURVEYED BY:	J. CLEASBY	SUBURB	WYEE	ORIGIN OF LEVELS:	
DATE OF SURVEY:	07.09.20	LGA	LAKE MACQUARIE	R.L.:	37.717
DRAWN BY:	S BRYANT	PARISH	MORISSET		
CHECKED BY:	D ARMSTRONG	COUNTY	NORTHUMBERLAND		

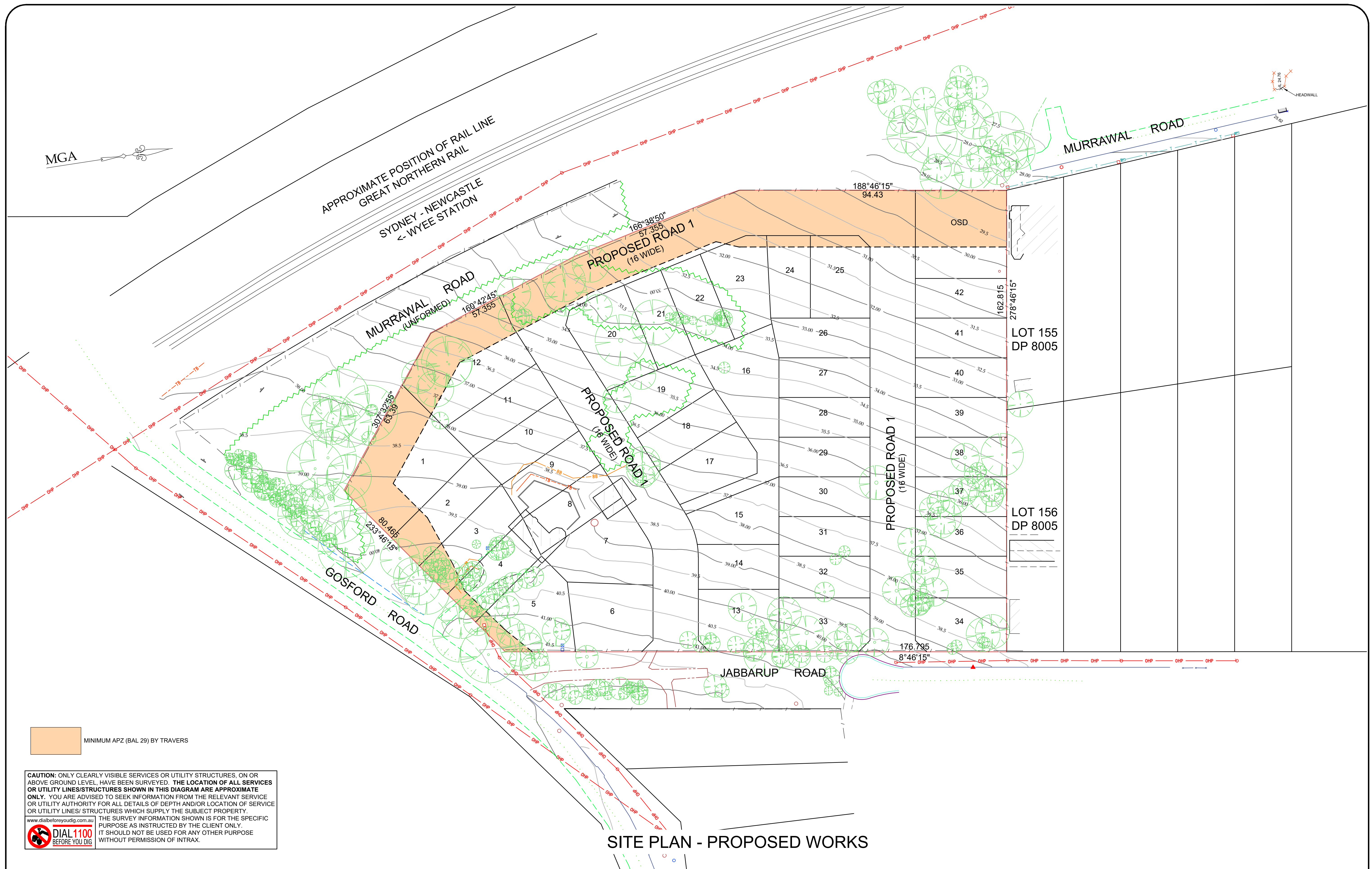


PLAN SHOWING PROPOSED
SUBDIVISION OF
LOT 217 IN DP 755242
"No.18" GOSFORD ROAD
WYEE

SHEET No.	1
No. of SHEETS:	4
REFERENCE No:	S# 149418
REV:	-

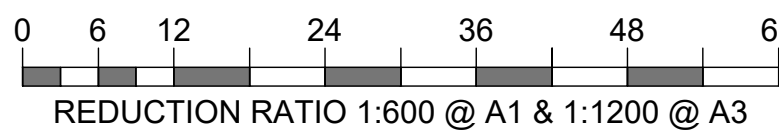


AUTHORISED OFFICER THIS PLAN TO BE READ IN CONJUNCTION WITH INTRAX REPORT WITH REFERENCE: S#149418 149418_SUR_PROSUB_18 GOSFORD RD. WYEE	REV	REVISION DETAILS	DATE	04816 REDUCTION RATIO 1:400 @ A1 & 1:800 @ A3	CLIENT:	J. WALDON		LOT No.	217	CONTOUR INTERVAL:	0.5m	Intrax www.intrax.com.au Intrax Consulting Group VIC NSW SA QLD	PLAN SHOWING PROPOSED SUBDIVISION OF LOT 217 IN DP 755242 "No.18" GOSFORD ROAD WYEE	SHEET No.	2	
					REF:	S# 149418	SURVEY FILE:	149418_JC_200907_DE	PLAN No.	DP 755242	DATUM:			AHD	No. of SHEETS:	4
					SURVEYED BY:	J. CLEASBY	DATE OF SURVEY:	07.09.20	SUBURB	WYEE	AUSTRALIAN HEIGHT DATUM				REFERENCE No:	S# 149418
					DRAWN BY:	S BRYANT	CHECKED BY:	D ARMSTRONG	LGA	LAKE MACQUARIE	ORIGIN OF LEVELS:			PM 23846	REV:	-
									PARISH	MORISSET	R.L.:			37.717		
								COUNTY	NORTHUMBERLAND							



REV	REVISION DETAILS	DATE

AUTHORISED OFFICER
THIS PLAN TO BE READ IN CONJUNCTION
WITH INTRAX REPORT WITH REFERENCE: S#149418
149418_SUR_PROSUB_18 GOSFORD
RD, WYEE



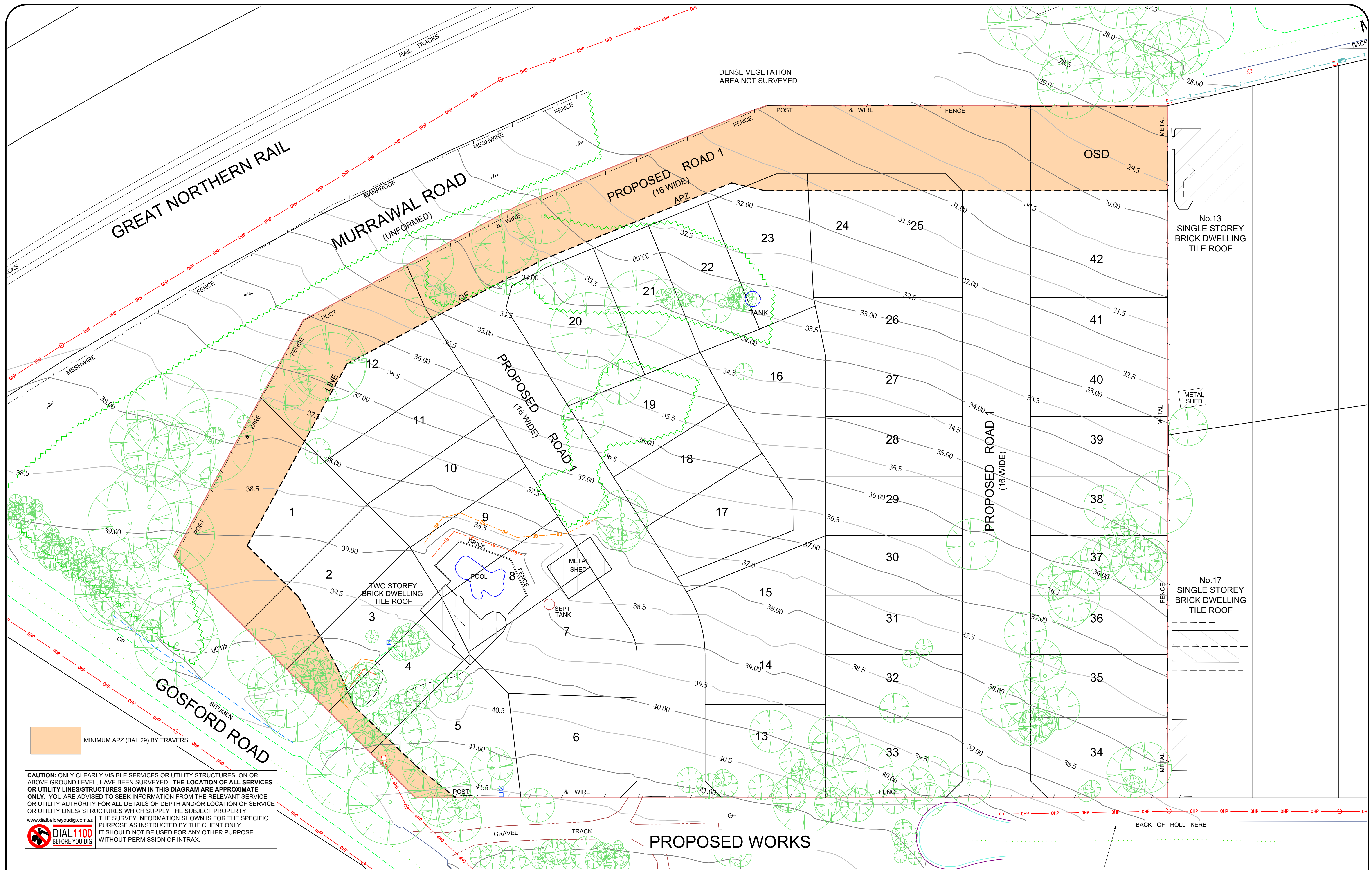
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REF:	S# 149418	SECTION	-
SURVEY FILE:	149418_JC_200907_DE	PLAN No.	DP 755242
SURVEYED BY:	J. CLEASBY	SUBURB	WYEE
DATE OF SURVEY:	07.09.20	LGA	LAKE MACQUARIE
DRAWN BY:	S BRYANT	PARISH	MORISSET
CHECKED BY:	D ARMSTRONG	COUNTY	NORTHUMBERLAND

CONTOUR INTERVAL:	0.5m
DATUM:	AHD
AUSTRALIAN HEIGHT DATUM ORIGIN OF LEVELS:	PM 23846
R.L.:	37.717



PLAN SHOWING PROPOSED
SUBDIVISION OF
LOT 217 IN DP 755242
"No.18" GOSFORD ROAD
WYEE

SHEET No.	3
No. of SHEETS:	4
REFERENCE No:	S# 149418
REV:	-



CAUTION: ONLY CLEARLY VISIBLE SERVICES OR UTILITY STRUCTURES, ON OR ABOVE GROUND LEVEL, HAVE BEEN SURVEYED. THE LOCATION OF ALL SERVICES OR UTILITY LINES/STRUCTURES SHOWN IN THIS DIAGRAM ARE APPROXIMATE ONLY. YOU ARE ADVISED TO SEEK INFORMATION FROM THE RELEVANT SERVICE OR UTILITY AUTHORITY FOR ALL DETAILS OF DEPTH AND/OR LOCATION OF SERVICE OR UTILITY LINES/ STRUCTURES WHICH SUPPLY THE SUBJECT PROPERTY.

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DIAL 1100
BEFORE YOU DIG

THE SURVEY INFORMATION SHOWN IS FOR THE SPECIFIC PURPOSE AS INSTRUCTED BY THE CLIENT ONLY. IT SHOULD NOT BE USED FOR ANY OTHER PURPOSE WITHOUT PERMISSION OF INTRAX.

AUTHORISED OFFICER THIS PLAN TO BE READ IN CONJUNCTION WITH INTRAX REPORT WITH REFERENCE: S#149418 149418_SUR_PROSUB_18 GOSFORD RD, WYEE	REV	REVISION DETAILS	DATE	04816243240 REDUCTION RATIO 1:400 @ A1 & 1:800 @ A3	CLIENT: J. WALDON		LOT No. 217	CONTOUR INTERVAL: 0.5m	Intrax www.intrax.com.au Intrax Consulting Group VIC NSW SA QLD	PLAN SHOWING PROPOSED SUBDIVISION OF LOT 217 IN DP 755242 "No.18" GOSFORD ROAD WYEE		SHEET No. 4
					REF: S# 149418	SURVEY FILE: 149418_JC_200907_DE	SECTION -	DATUM: AHD		No. of SHEETS: 4		
					SURVEYED BY: J. CLEASBY	DATE OF SURVEY: 07.09.20	PLAN No. DP 755242	AUSTRALIAN HEIGHT DATUM		REFERENCE No: S# 149418		
					DRAWN BY: S BRYANT	CHECKED BY: D ARMSTRONG	SUBURB WYEE	ORIGIN OF LEVELS: PM 23846		REV: -		
							LGA LAKE MACQUARIE	R.L.: 37.717				
					PARISH MORISSET							
					COUNTY NORTHUMBERLAND							

Appendix B

Historical Aerial Photographs Extracted from DP (2020)

EPA Searches

Council Records



Photo 1 - 1954



Photo 2 - 1965



Historical Aerial Photographs

Preliminary Site Investigation

18 Gosford Road, Wyee

CLIENT: June Waldon

PROJECT: 104136.00

PLATE No: 1

REV: 0

DATE: 1-Oct-20



Photo 3 - 1976



Photo 4 - 1985



Historical Aerial Photographs

Preliminary Site Investigation

18 Gosford Road, Wyee

CLIENT: June Waldon

PROJECT: 104136.00

PLATE No: 2

REV: 0

DATE: 1-Oct-20



Photo 5 - 1996



Photo 6 - 2001



Historical Aerial Photographs

Preliminary Site Investigation

18 Gosford Road, Wyee

CLIENT: June Waldon

PROJECT: 104136.00

PLATE No: 3

REV: 0

DATE: 1-Oct-20



Photo 7 - 2010



Photo 8 - January 2018



Historical Aerial Photographs

Preliminary Site Investigation

18 Gosford Road, Wyee

CLIENT: June Waldon

PROJECT: 104136.00

PLATE No: 4

REV: 0

DATE: 1-Oct-20



Photo 9 - April 2018



Historical Aerial Photographs

Preliminary Site Investigation

18 Gosford Road, Wyee

CLIENT: June Waldon

PROJECT: 104136.00

PLATE No: 5

REV: 0

DATE: 1-Oct-20

Appendix B

EPA Site Searches

[Your environment](#)
[Reporting and incidents](#)
[Licensing and regulation](#)
[Working together](#)
[About us](#)

Public registers

- POEO Public Register
- Contaminated land record of notices
- About the record of notices
- List of notified sites
- Tips for searching
- Disclaimer
- Dangerous goods licences
- Pesticide licences
- Radiation licences

[Home](#)
[Public registers](#)
[Contaminated land record of notices](#)

Search results

Your search for: Suburb: WYEE

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the [planning process](#).

More information about particular sites may be available from:

- The [POEO public register](#).
- The appropriate planning authority, for example, on a planning certificate issued by the local council under [section 149 of the Environmental Planning and Assessment Act](#).

See [What's in the record](#) and [What's not in the record](#).

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed. This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register [POEO public register](#).

22 November 2021

Search Again

Refine Search

Search TIP
 To search for a specific site, search by LGA (local government area) and carefully review all sites listed.
[more search tips](#)

	A	B	C	D	E	F	G
	Suburb	SiteName	Address	ContaminationActivityType	ManagementClass	Latitude	Longitude
105	WOY WOY	Mobil Former Woy Woy Service Station and adjacent land	177-181 Blackwall ROAD	Service Station	Contamination formerly regulated under the CLM Act	-33.49254403	151.3270829
106	WOY WOY	Rogers Park	Dunbar ROAD	Landfill	Regulation under CLM Act not required	-33.50009693	151.3181347
107	WYALONG	Caltex Service Station	50 Neeld (Newell Highway) STREET	Service Station	Regulation under CLM Act not required	-33.92665025	147.2446546
108	WYOMING	Caltex Service Station Wyoming	485 Pacific HIGHWAY	Service Station	Regulation under CLM Act not required	-33.40945391	151.3499812



[Your environment](#)
[Reporting and incidents](#)
[Licensing and regulation](#)
[Working together](#)
[About us](#)

Public registers

- POEO Public Register
 - Licences, applications and notices search
 - Penalty notices search
 - Enforceable undertakings search
 - Enforceable undertakings media releases
 - Exemptions and approvals search
 - Prosecutions or civil proceedings search
 - Terms of use: POEO public register
 - Licensing FAQs
 - List of licences
 - Unlicensed premises regulated by the EPA
- * Contaminated land record of notices
- Dangerous goods licences
- Pesticide licences
- Radiation licences

[Home](#)
[Public registers](#)
[POEO Public Register](#)
[Licences, applications and notices search](#)

Search results

Your search for: **General Search with the following criteria**

Suburb - Wyee

returned 17 results

[Expand to excel](#)
1 of 1 Pages
[Search Again](#)

Number	Name	Location	Type	Status	Issued date
1023719	ARTHUR YATES & CO LIMITED	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	16 Dec 2002
11470	DULUXGROUP (AUSTRALIA) PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	POEO licence	Issued	02 Jul 2002
1100334	DULUXGROUP (AUSTRALIA) PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	02 Feb 2010
1520401	DULUXGROUP (AUSTRALIA) PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	18 Jun 2015
1532496	DULUXGROUP (AUSTRALIA) PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	22 Sep 2015
1571174	DULUXGROUP (AUSTRALIA) PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	08 Nov 2018
1576540	DULUXGROUP (AUSTRALIA) PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	05 Mar 2019
1502	FLYASH AUSTRALIA PTY LIMITED	GOROKAN ROAD, WYEE, NSW 2259	POEO licence	Surrendered	01 Nov 2000
1025766	FLYASH AUSTRALIA PTY LIMITED	GOROKAN ROAD, WYEE, NSW 2259	s.80 Surrender of a Licence	Issued	19 Mar 2003
1026565	ORICA AUSTRALIA PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	10 Nov 2003
1034071	ORICA AUSTRALIA PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	03 Feb 2004
1035824	ORICA AUSTRALIA PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	08 Jul 2004
1040465	ORICA AUSTRALIA PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	08 Oct 2004
1048909	ORICA AUSTRALIA PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	23 Jun 2005
1055465	ORICA AUSTRALIA PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	06 Mar 2006
1062026	ORICA AUSTRALIA PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	12 Sep 2006
1099114	ORICA AUSTRALIA PTY LTD	34 WYEE ROAD, WYEE, NSW 2259	s.58 Licence Variation	Issued	26 Mar 2009

22 November 2021

Douglas Partners Pty Ltd

Property details for Lot 217 DP 755242, 18 Gosford Road, Wyee

Summary generated: 2:46PM on 22/11/2021

Parcels

Lot 217 DP 755242

Status

Current

Ward

West Ward

Zones

RU2 Rural Landscape

Development applications

DA - 770 / 1992 - Rural dwelling

RZ - 7 / 2021 - Rezoning proposal - 18 Gosford Road Wyee

ZBA - 182 / 1994 - Farm Machinery Shed

ZBA - 3339 / 1993 - Twelve Proposed Greenhouse Igloos

ZBA - 2899 / 1993 - Inground Concrete Pool

ZBA - 3585 / 1992 - Proposed Brick Veneer/ Hardiplank & Tile Residence

Rates

Status: C

Local Government Code: Residential

Notice Group: General

Valuer General Numbers: 1/07/2002 - 171430 (C)

Waste Collection

Bulk Waste Collection Area 20

Domestic Waste Collection Area - Wednesday B

Green/Recycle Waste Collection Area - Wednesday B

State Environmental Planning Policies

SEPP (Affordable Rental Housing) 2009

SEPP (Building Sustainability Index: BASIX) 2004

SEPP (Concurrences) 2018

SEPP (Educational Est Child Care Fac) 2017

SEPP (Exempt and Complying Development Codes) 2008

SEPP (Infrastructure) 2007

SEPP (Koala Habitat Protection) 2020

SEPP (Mining, Petrol Prod, Extractive Ind) 2007

SEPP (Primary Production and Rural Dev) 2019

SEPP (State and Regional Development) 2011

SEPP (State Significant Precincts) 2005

SEPP 19 - Bushland in Urban Areas

SEPP 21 - Caravan Parks

SEPP 33 - Hazardous and Offensive Development

SEPP 50 - Canal Estates

SEPP 55 - Remediation of Land

SEPP 64 - Advertising and Signage

SEPP 65 - Design Quality Residential Apartment Dev

SEPP 70 - Affordable Housing (Revised Schemes)

Development Control Plans

Lake Macquarie DCP 2014

Lake Macquarie Draft DCP 2014

CODES SEPP Conditions

There are no CODES SEPP conditions against this property or land.

LEP 2014 Mapped Development Constraints

LEP14 20 ha minimum lot size

LEP14 8.5m max building height

Main Conditions

Bush Fire Prone Land - Part Parcel - 2018

Geo 6 - Geotech Zone

Lake Macquarie Draft DCP 2014

LEP14 20 ha minimum lot size

LEP14 8.5m max building height

Minor Conditions

Administrative Amendment No 9 LEP 2014

Amendment No 15 to LEP 2014

Amendment No 17 to LEP 2014 Citywide

Amendment No 19 to LEP 2014 min lot size

Amendment No 21 to LEP 2014 Certain Zones

Lake Macquarie LEP 2014

Native Vegetation - 2019

Scenic Management Zone 11

Sewer is unavailable

Waste Water Treatment Device

Significant Tree Register

There are no trees on this property that are recorded in Council's Significant Trees Register.

Appendix C

Table C1: Summary of Laboratory Results

ProUCL Output

Table C1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH

Lab result

HLHSG, excellence ELESJ, excellence HLHSG, and ELESJ, excellence IM, excellence IM, and HLHSG, or ELESJ, excellence

HLHSG, value ELESJ, value

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = CO-excellence **HLHSG** = Q1 Excellence

Bold = Lab detected * Not tested for not HLHSG/ELESJ (as applicable) or Not applicable **NI** = Non-Inerting **AD** = Asbestos detected **NAD** = No Asbestos detected

HLHSG = Health screening level HSG = HLHSG screening level (excluding CO) ELESJ = Ecological investigation level ETS = Ecological screening level ML = Management Level CO = Direct Contact HSG

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Reported naphthalene laboratory result obtained from BTEXN suite

Site Assessment Criteria (SAC)

Reference should be made to the SAC section of the report. Summary information as follows:

SAC based on generic land use thresholds for Residential A with garden/accessible soil

HLA	Residential / Low - High Density (NEPC, 2013)
-----	---

H2L A15 Residential / Low - High Density (vapour intrusion) (NEPC, 2012)

DC H5L A Direct contact H5L A Residential (Low density) (direct contact) (CRC CARE, 2011)

ELES URPOS Urban Residential and Public Open Space (NEPC, 2013)

MLRP/POS Residential, Parkland and Public Open Space (NEPC, 2013)

Table C1: Summary of Laboratory Results – OCP, OPP, PCB, Asbestos

			OCP											OPP	PCB	Asbestos					
			DDO	DDT+DDE+DDD	DDE	DDT	Alkyl & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Heptachlorobenzene	Methoxychlor	Chlorpyrifos	Total PCB	Asbestos ID in soil <0.1µg	Trace Analysis	ACM >7mm Estimation	PA and AF Estimation	PA and AF Estimation	Asbestos (Summary)
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	<0.001	-
Sample ID*	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	g	g	%(ww)	-
1	0 - 0.1 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
2	0 - 0.12 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
3	0 - 0.1 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
4	0 - 0.1 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
5	0.4 - 0.5 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD
6	0 - 0.1 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD
QA1	0 - 0.1 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
7	0.4 - 0.5 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
8	0.5 - 0.6 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD
8	0.9 - 1 m	22/10/2020	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
101/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	0.0134	-	<0.001	AD
101	0.4 - 0.5 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
102/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	<0.001	NAD
103/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	0.0006	<0.001	AD
104/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	<0.001	NAD
105/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	<0.001	NAD
106/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	AD	-	0.2417	-	<0.001	AD
QA3	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
107/0.7	0.6 - 0.7 m	20/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
108/0.5	0.4 - 0.5 m	20/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
109/0.5	0.4 - 0.5 m	20/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
109/L0	0.9 - 1 m	20/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
110/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
111/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
112/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
QA2	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
113/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
114/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
115/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
116/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
117/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
118/0.05	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
QA1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
119/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
120/0.05	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
121/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
122/0.05	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
123/0.05	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
124/0.05	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-
125/0.1	0 - 0.1 m	19/10/2021	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-

Lab result
HL/HSL value EIL/ESL value

■ HL/HSL exceedance ■ EIL/ESL exceedance ■ HL/HSL and EIL/ESL exceedance ■ ML exceedance ■ ML and HL/HSL or EIL/ESL exceedance

■ Indicates that asbestos has been detected by the lab, refer to the lab report Blue = DC exceedance ■ HSL 0-1 Exceedance

Bold = Lab detections - = Not tested or No HL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non Initing AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:
a QA/QC replicate of sample listed directly below the primary sample
c Criteria applies to DDT only

Site Assessment Criteria (SAC):
Reference should be made to the SAC section of the report. Summary information as follows:
SAC based on generic land use thresholds for Residential A with garden/accessible soil
HIL A Residential / Low - High Density (NEPC, 2013)
HSL A/B Residential / Low - High Density (vapour intrusion) (NEPC, 2013)
DC HSL A Direct contact HSL A Residential (Low density) (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS Urban Residential and Public Open Space (NEPC, 2013)
ML R/PP/POS Residential, Parkland and Public Open Space (NEPC, 2013)

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.124/11/2021 7:27:32 AM								
5	From File			WorkSheet.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	Zinc (Dataset 1)											
12												
13	General Statistics											
14	Total Number of Observations				21		Number of Distinct Observations				17	
15							Number of Missing Observations				0	
16	Minimum				6		Mean				70.62	
17	Maximum				437		Median				40	
18	SD				99.25		Std. Error of Mean				21.66	
19	Coefficient of Variation				1.405		Skewness				2.821	
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic				0.643		Shapiro Wilk GOF Test					
23	5% Shapiro Wilk Critical Value				0.908		Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic				0.276		Lilliefors GOF Test					
25	5% Lilliefors Critical Value				0.188		Data Not Normal at 5% Significance Level					
26	Data Not Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL					95% UCLs (Adjusted for Skewness)						
30	95% Student's-t UCL			108		95% Adjusted-CLT UCL (Chen-1995)					120.5	
31						95% Modified-t UCL (Johnson-1978)					110.2	
32												
33	Gamma GOF Test											
34	A-D Test Statistic			0.767		Anderson-Darling Gamma GOF Test						
35	5% A-D Critical Value			0.776		Detected data appear Gamma Distributed at 5% Significance Level						
36	K-S Test Statistic			0.189		Kolmogorov-Smirnov Gamma GOF Test						
37	5% K-S Critical Value			0.196		Detected data appear Gamma Distributed at 5% Significance Level						
38	Detected data appear Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)			0.873		k star (bias corrected MLE)					0.78	
42	Theta hat (MLE)			80.91		Theta star (bias corrected MLE)					90.55	
43	nu hat (MLE)			36.66		nu star (bias corrected)					32.75	
44	MLE Mean (bias corrected)			70.62		MLE Sd (bias corrected)					79.97	
45						Approximate Chi Square Value (0.05)					20.67	
46	Adjusted Level of Significance			0.0383		Adjusted Chi Square Value					19.93	
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50)				111.9		95% Adjusted Gamma UCL (use when n<50)				116	
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic			0.96		Shapiro Wilk Lognormal GOF Test						
53	5% Shapiro Wilk Critical Value			0.908		Data appear Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic			0.126		Lilliefors Lognormal GOF Test						
55	5% Lilliefors Critical Value			0.188		Data appear Lognormal at 5% Significance Level						
56	Data appear Lognormal at 5% Significance Level											
57												

	A	B	C	D	E	F	G	H	I	J	K	L
58	Lognormal Statistics											
59	Minimum of Logged Data					1.792	Mean of logged Data					3.585
60	Maximum of Logged Data					6.08	SD of logged Data					1.164
61												
62	Assuming Lognormal Distribution											
63	95% H-UCL					146.9	90% Chebyshev (MVUE) UCL					126.8
64	95% Chebyshev (MVUE) UCL					153.6	97.5% Chebyshev (MVUE) UCL					190.9
65	99% Chebyshev (MVUE) UCL					264.1						
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data appear to follow a Discernible Distribution at 5% Significance Level											
69												
70	Nonparametric Distribution Free UCLs											
71	95% CLT UCL					106.2	95% Jackknife UCL					108
72	95% Standard Bootstrap UCL					105.6	95% Bootstrap-t UCL					143
73	95% Hall's Bootstrap UCL					236.6	95% Percentile Bootstrap UCL					109
74	95% BCA Bootstrap UCL					130.7						
75	90% Chebyshev(Mean, Sd) UCL					135.6	95% Chebyshev(Mean, Sd) UCL					165
76	97.5% Chebyshev(Mean, Sd) UCL					205.9	99% Chebyshev(Mean, Sd) UCL					286.1
77												
78	Suggested UCL to Use											
79	95% Adjusted Gamma UCL					116						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												
86												
87	Zinc (Dataset 2)											
88												
89	General Statistics											
90	Total Number of Observations					8	Number of Distinct Observations					7
91							Number of Missing Observations					0
92	Minimum					6	Mean					125.6
93	Maximum					437	Median					91.5
94	SD					145.4	Std. Error of Mean					51.42
95	Coefficient of Variation					1.158	Skewness					1.571
96												
97	Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use											
98	guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.											
99	For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).											
100	Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.1											
101												
102	Normal GOF Test											
103	Shapiro Wilk Test Statistic					0.813	Shapiro Wilk GOF Test					
104	5% Shapiro Wilk Critical Value					0.818	Data Not Normal at 5% Significance Level					
105	Lilliefors Test Statistic					0.229	Lilliefors GOF Test					
106	5% Lilliefors Critical Value					0.283	Data appear Normal at 5% Significance Level					
107	Data appear Approximate Normal at 5% Significance Level											
108												
109	Assuming Normal Distribution											
110	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
111	95% Student's-t UCL					223	95% Adjusted-CLT UCL (Chen-1995)					240.7
112							95% Modified-t UCL (Johnson-1978)					227.8
113												
114	Gamma GOF Test											

	A	B	C	D	E	F	G	H	I	J	K	L	
115	A-D Test Statistic					0.331	Anderson-Darling Gamma GOF Test						
116	5% A-D Critical Value					0.748	Detected data appear Gamma Distributed at 5% Significance Level						
117	K-S Test Statistic					0.188	Kolmogorov-Smirnov Gamma GOF Test						
118	5% K-S Critical Value					0.305	Detected data appear Gamma Distributed at 5% Significance Level						
119	Detected data appear Gamma Distributed at 5% Significance Level												
120													
121	Gamma Statistics												
122	k hat (MLE)					0.706	k star (bias corrected MLE)					0.525	
123	Theta hat (MLE)					177.8	Theta star (bias corrected MLE)					239.4	
124	nu hat (MLE)					11.3	nu star (bias corrected)					8.397	
125	MLE Mean (bias corrected)					125.6	MLE Sd (bias corrected)					173.4	
126							Approximate Chi Square Value (0.05)					2.967	
127	Adjusted Level of Significance					0.0195	Adjusted Chi Square Value					2.213	
128													
129	Assuming Gamma Distribution												
130	95% Approximate Gamma UCL (use when n>=50))					355.5	95% Adjusted Gamma UCL (use when n<50)					476.6	
131													
132	Lognormal GOF Test												
133	Shapiro Wilk Test Statistic					0.904	Shapiro Wilk Lognormal GOF Test						
134	5% Shapiro Wilk Critical Value					0.818	Data appear Lognormal at 5% Significance Level						
135	Lilliefors Test Statistic					0.223	Lilliefors Lognormal GOF Test						
136	5% Lilliefors Critical Value					0.283	Data appear Lognormal at 5% Significance Level						
137	Data appear Lognormal at 5% Significance Level												
138													
139	Lognormal Statistics												
140	Minimum of Logged Data					1.792	Mean of logged Data					3.979	
141	Maximum of Logged Data					6.08	SD of logged Data					1.625	
142													
143	Assuming Lognormal Distribution												
144	95% H-UCL					4540	90% Chebyshev (MVUE) UCL					410.3	
145	95% Chebyshev (MVUE) UCL					527.8	97.5% Chebyshev (MVUE) UCL					690.9	
146	99% Chebyshev (MVUE) UCL					1011							
147													
148	Nonparametric Distribution Free UCL Statistics												
149	Data appear to follow a Discernible Distribution at 5% Significance Level												
150													
151	Nonparametric Distribution Free UCLs												
152	95% CLT UCL					210.2	95% Jackknife UCL					223	
153	95% Standard Bootstrap UCL					204.5	95% Bootstrap-t UCL					285.3	
154	95% Hall's Bootstrap UCL					470.3	95% Percentile Bootstrap UCL					206.1	
155	95% BCA Bootstrap UCL					231.8							
156	90% Chebyshev(Mean, Sd) UCL					279.9	95% Chebyshev(Mean, Sd) UCL					349.8	
157	97.5% Chebyshev(Mean, Sd) UCL					446.7	99% Chebyshev(Mean, Sd) UCL					637.2	
158													
159	Suggested UCL to Use												
160	95% Student's-t UCL					223							
161													
162	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test												
163	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL												
164													
165	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
166	Recommendations are based upon data size, data distribution, and skewness.												
167	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
168	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
169													

Appendix D

Borehole and Test pit Logs

Sampling Methods

Soil Descriptions

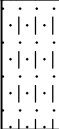
Symbols and Abbreviations

BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 29.88 AHD
EASTING: 359085.9
NORTHING: 6327132.4
DIP/AZIMUTH: 90°/--

BORE No: 1
PROJECT No: 104136.00
DATE: 22/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
29	0.2	FILL/SAND: medium grained, pale grey, trace rootlets, moist, fill		D/E	0.0		PID<1ppm			
					0.1					
		Silty SAND SM: medium grained, grey-brown, trace clay (approximately 2% to 3%), moist		D/E	0.3		PID<1ppm			
					0.4					
	0.5	Gravelly SAND GP: poorly graded, brown and yellow-brown, subrounded ironstone ridge gravels, moist, residual		D/E	0.7		PID<1ppm			
					0.8					
		- From 0.9m: with clay (5% to 10%)								
	1.0	Bore discontinued at 1.0m- limit of investigation								

RIG: TOYOTA 4WD

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm Ø Dynamic Continuous Push Tube Sampling

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
BB	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
EE	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 32.70 AHD
EASTING: 359126
NORTHING: 6327122.52
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 104136.00
DATE: 22/10/2020
SHEET 1 OF 1

[illegible]

RIG: TOYOTA 4WD

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm Ø Dynamic Continuous Push Tube Sampling

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Blank sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

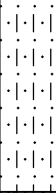


BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 31.52 AHD
EASTING: 359090.1
NORTHING: 6327093.06
DIP/AZIMUTH: 90°/--

BORE No: 3
PROJECT No: 104136.00
DATE: 22/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Well Construction Details		
				Type	Depth	Sample				Results & Comments
31	0.45	Silty SAND SM: medium grained, brown, trace rootlets, trace clay (2% to 3%), moist		D/E	0.0		PID<1ppm			
					0.1					
		Sandy CLAY CL: low plasticity, yellow-brown and red-brown, with subrounded ironstone ridge gravels, w<PL, residual		D/E	0.5					PID<1ppm
					0.6					
1	1.0	Bore discontinued at 1.0m- limit of investigation						1		
30										
2								2		
29										
3								3		

RIG: TOYOTA 4WD

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm Ø Dynamic Continuous Push Tube Sampling

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

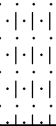


BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 33.68 AHD
EASTING: 359120.98
NORTHING: 6327089.57
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 104136.00
DATE: 22/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details		
				Type	Depth	Sample	Results & Comments				
33	0.3	Silty SAND SM: medium grained, brown, trace rootlets, trace clay (2% to 3%), moist		D/E	0.0		PID<1ppm				
					0.1						
		Sandy CLAY CL: low plasticity, yellow-brown and red-brown, with subrounded ironstone ridge gravels, w<PL, residual			0.4						PID<1ppm
				D/E	0.5						
	1	1.0	Bore discontinued at 1.0m- limit of investigation						1		
	32										
2								2			
31											
3								3			

RIG: TOYOTA 4WD

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm Ø Dynamic Continuous Push Tube Sampling

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 32.76 AHD
EASTING: 359087.54
NORTHING: 6327037
DIP/AZIMUTH: 90°/--

BORE No: 5
PROJECT No: 104136.00
DATE: 22/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
32 <										

RIG: TOYOTA 4WD

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm Ø Dynamic Continuous Push Tube Sampling

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 33.02 AHD
EASTING: 359083.69
NORTHING: 6327017.54
DIP/AZIMUTH: 90°/--

BORE No: 6
PROJECT No: 104136.00
DATE: 22/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
33		FILL/Sandy CLAY: low plasticity, yellow-brown and grey, trace sandstone gravels, w<PL, fill		D/E	0.0		PID<1ppm			
						0.1				
	0.45	FILL/Sandy CLAY: high plasticity, grey and yellow-brown, trace sandstone and ironstone gravels, trace organics, w>PL (wet), fill		D/E	0.5		PID<1ppm			
						0.6				
32	1			D/E	1.0		PID<1ppm		1	
						1.1				
				D/E	1.5		PID<1ppm			
						1.6				
31	2		D/E	2.0		PID<1ppm		2		
					2.1					
	2.4	CLAY CL: medium plasticity, red-brown, trace sand, w<PL (wet), residual	D/E	2.4		PID<1ppm				
	2.55	- From 2.5m: weathered sandstone with soil like properties			2.5					
		Bore discontinued at 2.55m- refusal on weathered sandstone								

RIG: TOYOTA 4WD

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm Ø Dynamic Continuous Push Tube Sampling

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)



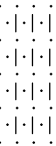
Douglas Partners
 Geotechnics | Environment | Groundwater

BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 34.77 AHD
EASTING: 359114.96
NORTHING: 6327033.75
DIP/AZIMUTH: 90°/--

BORE No: 7
PROJECT No: 104136.00
DATE: 22/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		Silty SAND SM: medium grained, brown, trace rootlets, trace clay (2% to 3%), moist		D/E	0.0		PID<1ppm			
					0.1					
	0.35	Sandy CLAY CL: low plasticity, yellow-brown and red-brown, trace ironstone gravels, w<PL, residual		D/E	0.4		PID<1ppm			
					0.5					
1	1.0	Bore discontinued at 1.0m- limit of investigation								

RIG: TOYOTA 4WD

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm Ø Dynamic Continuous Push Tube Sampling

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 39.08 AHD
EASTING: 359146.36
NORTHING: 6326981.34
DIP/AZIMUTH: 90°/--

BORE No: 8
PROJECT No: 104136.00
DATE: 22/10/2020
SHEET 1 OF 1

[illegible]

RIG: TOYOTA 4WD

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm Ø Dynamic Continuous Push Tube Sampling

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56 H.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 38.3 AHD
EASTING: 359154.5
NORTHING: 6327004

PIT No: 101
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
38		FILL/Silty SAND: medium grained, brown, with rootlets, trace metal (1 piece rebar), trace brick (1 piece), moist, fill		D/E	0.1		PID<1ppm					
	0.4	Clayey SAND (SC): medium grained, yellow brown and grey brown, moist, residual		D/E	0.5		PID<1ppm					
	0.7	Pit discontinued at 0.7m- limit of investigation										
1												
37												

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 35.3 AHD
EASTING: 359128.3
NORTHING: 6327045.2

PIT No: 102
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL/Silty SAND: medium grained, brown, trace glass (1 fragment), trace brick (1 fragment), trace rootlets, moist, fill		D/E	0.1		PID<1ppm					
35	0.3	Sandy CLAY (CL): medium plasticity, yellow brown and orange brown, w<PL, residual		D/E	0.4		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										
1												
34												

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 36.2 AHD
EASTING: 359141.4
NORTHING: 6327047.2

PIT No: 103
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL/Silty SAND: medium grained, brown and mottled grey brown, trace glass (1 fragment), trace ironstone, moist, fill		D/E	0.1		PID<1ppm					
	0.4	Clayey SAND (SC): medium grained, grey and slightly orange brown, moist, residual		D/E	0.5		PID<1ppm					
	0.6	Pit discontinued at 0.6m- limit of investigation										
	1											

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 37.4 AHD
EASTING: 359162.1
NORTHING: 6327049.5

PIT No: 104
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
37	0.2	Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.1		PID<1ppm					
		Clayey SAND (SC): medium grained, grey and slightly orange brown, moist, residual		D/E	0.4		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										
36	1											

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

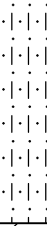
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 37.7 AHD
EASTING: 359157.9
NORTHING: 6327028.5

PIT No: 105
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.1		PID<1ppm					
	0.3	Clayey SAND (SC): medium grained, yellow brown and grey brown, moist, residual										
	0.4	Pit discontinued at 0.4m- limit of investigation		D/E	0.4		PID<1ppm					
37												
1												
36												

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

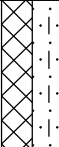
SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 36.4 AHD
EASTING: 359136.6
NORTHING: 6327026

PIT No: 106
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL/Silty SAND: medium grained, brown, trace brick (1 piece), trace particle board (2 pieces), moist, fill		D/E	0.1	QA3	PID<1ppm					
	0.2	Clayey SAND (SC): medium grained, yellow brown and grey brown, moist, residual		D/E	0.3		PID<1ppm					
	0.4	Pit discontinued at 0.4m- limit of investigation										

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 33.1 AHD
EASTING: 359080.4
NORTHING: 6327008.5
DIP/AZIMUTH: 90°/--

BORE No: 107
PROJECT No: 104136.01
DATE: 21/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
33.1		FILL/SANDY CLAY: high plasticity, yellow brown and brown, trace sandstone and conglomerate gravels, w>PL, fill		D/E	0.1		PID<1ppm			
				D/E	0.7		PID<1ppm			
	1.0	CLAY (CL): medium plasticity, grey and yellow brown, w=PL, residual		D/E	1.2		PID<1ppm			
	1.7	Bore discontinued at 1.7m- limit of investigation		D/E	1.6		PID<1ppm			

RIG: UTILITY MOUNTED RIG

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm diameter Continuous Push Tube Sampler

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56H.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 32.3 AHD
EASTING: 359072.9
NORTHING: 6327027.1
DIP/AZIMUTH: 90°/--

BORE No: 108
PROJECT No: 104136.01
DATE: 21/10/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
		FILL/Gravelly Sandy CLAY: medium plasticity, medium to coarse grained, yellow brown and brown, gravels subrounded sandstone, w=PL, (wet), fill		D/E	0.1		PID<1ppm			
				D/E	0.5		PID<1ppm			
				D/E	1.0		PID<1ppm			
	1.7	Sandy CLAY (CL): poorly graded pale grey, with gravels conglomerate, w<PL, residual		D/E	1.8		PID<1ppm			
				D/E	2.0		PID<1ppm			

DRILLER: MJH

CASING:

TYPE OF BORING: 60mm diameter Continuous Push Tube Sampler

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56H.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 32.3 AHD
EASTING: 359072.9
NORTHING: 6327027.1
DIP/AZIMUTH: 90°/--

BORE No: 108
PROJECT No: 104136.01
DATE: 21/10/2021
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
	2.2	Sandy CLAY (CL): poorly graded pale grey, with gravels conglomerate, w<PL, residual <i>(continued)</i>								
		Bore discontinued at 2.2m- limit of investigation								

DRILLER: MJH

CASING:

TYPE OF BORING: 60mm diameter Continuous Push Tube Sampler

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56H.

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Blank sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



BOREHOLE LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 32.4 AHD
EASTING: 359080.1
NORTHING: 6327040
DIP/AZIMUTH: 90°/--

BORE No: 109
PROJECT No: 104136.01
DATE: 21/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details	
				Type	Depth	Sample	Results & Comments			
32.4		FILL/Sandy CLAY: low plasticity, orange brown and red brown, trace gravels subrounded conglomerate, trace organics, w<PL, fill		D/E	0.1		PID<1ppm			
				D/E	0.5		PID<1ppm			
	0.8	Sandy CLAY (CL): low plasticity, coarse grained, pale grey and red brown, w<PL, residual								
	1.0			D/E	1.0		PID<1ppm			
31.1		- from 1.3m: red brown and pale grey - from 1.35m: trace ironstone								
1.6		Bore discontinued at 1.6m- limit of investigation		D/E	1.6		PID<1ppm			

RIG: UTILITY MOUNTED RIG

DRILLER: MJH

LOGGED: MJH

CASING:

TYPE OF BORING: 60mm diameter Continuous Push Tube Sampler

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Location coordinates are in MGA94 Zone 56H.

SAMPLING & IN SITU TESTING LEGEND

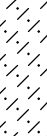
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 37.7 AHD
EASTING: 359176
NORTHING: 6327061.2

PIT No: 110
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.1		PID<1ppm					
	0.3	Clayey SAND (SC): medium grained, yellow brown and grey brown, moist, residual		D/E	0.3		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										
37												
1												
36												

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 36.7 AHD
EASTING: 359155
NORTHING: 6327062.5

PIT No: 111
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

[illegible]

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 35.1 AHD
EASTING: 359132.8
NORTHING: 6327064.6

PIT No: 112
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
34.8		FILL/Silty SAND: medium grained, grey, trace glass (2 pieces), trace ironstone, moist, fill		D/E	0.1	QA2	PID<1ppm					
	0.2	Sandy CLAY (CL): medium plasticity, yellow brown and orange brown, with gravels ironstone, w<PL, residual		D/E	0.3		PID<1ppm					
	0.4	Pit discontinued at 0.4m- limit of investigation										
34.4	1											

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W _s	Water seep	S	Standard penetration test
E	Environmental sample	W _L	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 33.1 AHD
EASTING: 359103.5
NORTHING: 6327067.3

PIT No: 113
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
33.1		FILL/Gravelly Clayey SAND: poorly graded, grey and brown, gravels subrounded ironstone, with rootlets, moist, fill		D/E	0.1		PID<1ppm					
	0.25	Sandy CLAY (CL): medium plasticity, yellow brown and orange brown, w<PL, residual		D/E	0.4		PID<1ppm					
	0.6	Pit discontinued at 0.6m- limit of investigation										
	1											

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

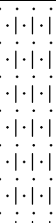
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U _s	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W _s	Water seep	S	Standard penetration test
E	Environmental sample	W _L	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 31.2 AHD
EASTING: 359072
NORTHING: 6327071.2

PIT No: 114
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
31		Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.1		PID<1ppm					
	0.3	Sandy CLAY (CL): medium plasticity, yellow brown and orange brown, w<PL, residual		D/E	0.4		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										
1												
30												

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

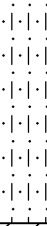
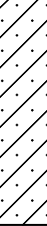
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 30.3 AHD
EASTING: 359065
NORTHING: 6327093.3

PIT No: 115
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.1	<1ppm						
	0.3	Sandy CLAY (CL): medium plasticity, yellow brown and orange brown, w<PL, residual		D/E	0.5	<1ppm						
	0.6	Pit discontinued at 0.6m- limit of investigation										
	1											
	2											
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
	11											
	12											
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	22											
	23											
	24											
	25											
	26											
	27											
	28											
	29											
	30											

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

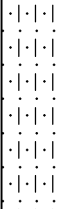
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 31.8 AHD
EASTING: 359092.7
NORTHING: 6327089.4

PIT No: 116
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.1		PID<1ppm					
	0.3	Gravelly Sandy CLAY (GC): medium plasticity, yellow brown and red brown, gravels subrounded ironstone, w<PL, residual (Munmorah Conglomerate)		D/E	0.4		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										
31												
1												
30												

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

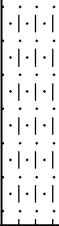
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 33.9 AHD
EASTING: 359121.8
NORTHING: 6327085.3

PIT No: 117
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.1		PID<1ppm					
	0.3	Gravelly Sandy CLAY (GC): medium plasticity, yellow brown and red brown, gravels subrounded ironstone, w<PL, residual (Munmorah Conglomerate)		D/E	0.4		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										
33	1											
32												

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
		V		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 35.4 AHD
EASTING: 359145.1
NORTHING: 6327084.5

PIT No: 118
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.05	QA1	PID<1ppm					
		Sandy CLAY (CL): medium plasticity, red brown and orange brown, w<PL, residual		D/E	0.3		PID<1ppm					
	0.4	Pit discontinued at 0.4m- limit of investigation										

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 36.6 AHD
EASTING: 359165.6
NORTHING: 6327080.2

PIT No: 119
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

[illegible]

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 34.3 AHD
EASTING: 359139.9
NORTHING: 6327103.5

PIT No: 120
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	Silty SAND (SM): medium grained, brown, with rootlets, with gravels ironstone, moist, topsoil		D/E	0.05		PID<1ppm					
	0.3	Gravelly Sandy CLAY (CL): medium plasticity, yellow brown and orange brown, gravels ironstone, w=PL, residual										
	0.3	Pit discontinued at 0.3m- limit of investigation		D/E	0.3		PID<1ppm					

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 32.2 AHD
EASTING: 359110.5
NORTHING: 6327108.2

PIT No: 121
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILL/Silty SAND: fine grained, brown, with organics, with gravels ironstone, trace clay, moist, fill		D/E	0.1		PID<1ppm					
	0.3	- at 0.2m: plastic sheeting, most likely blinding layer used for irrigation or planting purposes										
		Gravelly Sandy CLAY (GC): medium plasticity, yellow brown and red brown, gravels subrounded ironstone, w<PL, residual (Munmorah Conglomerate)		D/E	0.4		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 30.3 AHD
EASTING: 359078.4
NORTHING: 6327113.2

PIT No: 122
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.05		PID<1ppm					
		Sandy CLAY (CL): medium plasticity, yellow brown and orange brown, w<PL, residual										
	0.3			D/E	0.3		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 29.1 AHD
EASTING: 359071.9
NORTHING: 6327137.9

PIT No: 123
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
28.8	0.1	Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.05		PID<1ppm					
		SAND (SP): coarse grained, yellow brown, trace clay, trace organics, moist (possible FILL)		D/E	0.3		PID<1ppm					
	0.5	Sandy CLAY (CL): medium plasticity, yellow brown, w<PL, residual										
	0.6	Pit discontinued at 0.6m- limit of investigation		D/E	0.6		PID<1ppm					
1												
28												

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 30.8 AHD
EASTING: 359103.6
NORTHING: 6327133.1

PIT No: 124
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.05		PID<1ppm					
	0.1	Sandy CLAY (CL): medium plasticity, yellow brown and orange brown, w<PL, residual		D/E	0.3		PID<1ppm					
	0.4	Pit discontinued at 0.4m- limit of investigation										

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

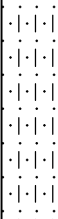
SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: June Waldon
PROJECT: Proposed Residential Subdivision
LOCATION: 18 Gosford Road, Wyee

SURFACE LEVEL: 32.7 AHD
EASTING: 359129.8
NORTHING: 6327129.2

PIT No: 125
PROJECT No: 104136.01
DATE: 19/10/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
32		Silty SAND (SM): medium grained, brown, with rootlets, moist, topsoil		D/E	0.1		PID<1ppm					
	0.3	Gravelly Sandy CLAY (GC): medium plasticity, yellow brown and red brown, gravels subrounded ironstone, w<PL, residual (Munmorah Conglomerate)		D/E	0.4		PID<1ppm					
	0.5	Pit discontinued at 0.5m- limit of investigation										
31	1							1				

RIG: HAND TOOLS

LOGGED: MJH

SURVEY DATUM: MGA94 Zone 56H

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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Appendix E

Site Assessment Criteria

Appendix E

Site Assessment Criteria

E1.0 Introduction

E1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM] (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).

E1.2 General

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination at the site. Analytical results were assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC:

- Land use: residential
 - o Corresponding to land use category 'A', residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry));
- Soil type: sand (based on dominant soil type – see Logs, Appendix D).

E2.0 Soils

E2.1 Health Investigation and Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table E1 and Table E2.

Table E1: Health Investigation Levels (mg/kg)

Contaminant	HIL-A
Metals	
Arsenic	100
Cadmium	20
Chromium (VI)	100
Copper	6000
Lead	300
Mercury (inorganic)	40
Nickel	400
Zinc	7400
PAH	
B(a)P TEQ	3
Total PAH	300
OCP	
DDT+DDE+DDD	240
Aldrin and dieldrin	6
Chlordane	50
Endosulfan	270
Endrin	10
Heptachlor	6
HCB	10
Methoxychlor	300
OPP	
Chlorpyrifos	160

Contaminant	HIL-A
PCB	
PCB	1

Table E2: Health Screening Levels (mg/kg)

Contaminant	HSL-A&B
SAND	0 m to <1 m
Benzene	0.5
Toluene	160
Ethylbenzene	55
Xylenes	40
Naphthalene	3
TRH F1	45
TRH F2	110

Notes: TRH F1 is TRH C₆-C₁₀ minus BTEX

TRH F2 is TRH >C₁₀-C₁₆ minus naphthalene

The soil saturation concentration (C_{sat}) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds C_{sat}, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

The HSL for direct contact derived from CRC CARE (2011) are in Table E3.

Table E3: Health Screening Levels for Direct Contact (mg/kg)

Contaminant	DC HSL-A
Benzene	100
Toluene	14 000
Ethylbenzene	4500
Xylenes	12 000
Naphthalene	1400
TRH F1	4400
TRH F2	3300
TRH F3	4500
TRH F4	6300

Notes: TRH F1 is TRH C₆-C₁₀ minus BTEX

TRH F2 is TRH >C₁₀-C₁₆ minus naphthalene

E2.2 Asbestos in Soil

The HSL for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table E4.

Table E4: Health Screening Levels for Asbestos

Form of Asbestos	HSL-A
ACM	0.01%
FA and AF	0.001%
FA and AF and ACM	No visible asbestos for surface soil *

Notes: Surface soils defined as top 10 cm.

* Based on site observations at the sampling points and the analytical results of surface samples.

E2.3 Ecological Investigation Levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are shown in Table E6, with inputs into their derivation shown in Table E5.

Table E5: Inputs to the Derivation of the Ecological Investigation Levels

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Given the likely source of soil contaminants (i.e. historical site use / fill), the contamination is considered as "aged"
pH	7.2	Based on the average of two samples (DP, 2020)
CEC	5.3 cmol _c /kg	Based on the average of two samples (DP, 2020)
Clay content	1%	Consistent with a 'sand' soil type
Traffic volumes	low	The site is in an area of low traffic volume
State / Territory	NSW	The site is located in NSW

Table E6: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-A-B-C
Metals	
Arsenic	100
Copper	120
Nickel	40
Chromium III	190
Lead	1100
Zinc	320
PAH	
Naphthalene	170
OCP	
DDT	180

Notes: EIL-AES area of ecological significance

EIL-A-B-C urban residential and public open space

E2.4 Ecological Screening Levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table E7.

Table E7: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	EIL-A-B-C
Benzene	Coarse	50
Toluene	Coarse	85
Ethylbenzene	Coarse	70
Xylenes	Coarse	105
TRH F1	Coarse/ Fine	180*
TRH F2	Coarse/ Fine	120*
TRH F3	Coarse	300
TRH F4	Coarse	2800
B(a)P	Coarse	0.7

Notes: ESL are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability
 TRH F1 is TRH C₆-C₁₀ minus BTEX
 TRH F2 is TRH >C₁₀-C₁₆ including naphthalene
 EIL-A-B-C urban residential and public open space

E2.5 Management Limits

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards;
- Effects on buried infrastructure eg: penetration of, or damage to, in-ground services.

The adopted management limits are in Table E8.

Table E8: Management Limits (mg/kg)

Contaminant	Soil Type	ML-A-B-C
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	2500
TRH F4	Coarse	10 000

Notes: TRH F1 is TRH C₆-C₁₀ including BTEX
TRH F2 is TRH >C₁₀-C₁₆ including naphthalene
ML-A-B-C residential, parkland and public open space

Appendix F

Field Work Methodology

Appendix F

Field Work Methodology

F1.0 Guidelines

The following key guideline was consulted for the field work methodology:

F1.0 NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM] (NEPC, 2013).

Field Work

Field work was undertaken on 19 and 21 October 2021 by a DP engineering geologist. The field work comprised the excavation of 22 test pits (Pits 101 to 106 and Pits 110 to 125) using hand tools, and drilling of three boreholes (Bores 107 to 109) using a utility mounted push tube drill rig to depths terminating in natural soils.

Soil Sampling

Soil sampling was carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprised:

- Collection of soil samples directly from the hand tools or the push tube at the nominated sample depth;
- Use of disposable nitrile gloves when collecting all samples. Gloves were replaced prior to the collection of each sample thereby minimising potential for cross-contamination;
- Samples collected for laboratory analysis were transferred into a new laboratory prepared glass jar, with minimal headspace, and sealed with a Teflon lined lid. Each jar was individually sealed to reduce the potential for cross contamination during transportation to the laboratory;
- Collection of ~500 ml samples for FA and AF analysis;
- Collection of 10% replicate samples for QC purposes;
- Collection of replicate samples in zip-lock bags for PID screening;
- Sample containers were labelled with individual and unique identification including project number, sample ID, depth and date of sampling;
- Placement of sample containers and bags into a cooled, insulated and sealed container for transport to the laboratory; and

- Use of chain of custody documentation so that sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory. Copies of completed chain of custody forms are included in Appendix I.

Field Testing

Field testing was carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprised:

PID Field Test

- Calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;
- Allow the headspace in the PID zip-lock bag samples to equilibrate; and
- Screen using the PID.

Appendix G

Quality Assurance / Quality Control

Appendix G

Quality Assurance and Quality Control

G1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table G1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included at the end of this appendix. Reference should also be made to Appendix H of DP (2020); however, based on the results of the field QA and field and laboratory QC, and evaluation against the DQIs it is concluded that the field and laboratory test data obtained from DP (2020) are reliable and useable for this assessment.

Table G1: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	NATA accreditation for the analyses performed	C*
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	5% of primary samples (i.e. 1 sample per 20 samples collected); <30% RPD	C PC (see Section G1.1)
Inter-laboratory replicates	5% of primary samples (i.e. 1 sample per 20 samples collected); <30% RPD	C PC (see Section G1.1)
Rinsates	1 per sampling event; <PQL	C
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

Notes:

C = compliance; PC = partial compliance; NC = non-compliance

* DP notes that the asbestos analysis is reported outside Envirolab's scope of NATA accreditation

G1.1 Replicate Analysis

The results from the replicate analysis (RPD values) indicated in bold in Table QA1 were outside the acceptable range. All other replicate results were within the acceptable range. However, the results outside the acceptable range are not considered to be of concern because:

- In many cases, the high RPD value reflects small differences between small absolute values;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations were relatively close to the PQL and, so the variability observed was unlikely to result in a false negative result when comparing concentrations against the SAC.

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

G2.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table G2: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Stratified sampling was undertaken targeting PAEC 1 to PAEC 3. Within each PAEC a systematic sampling pattern was adopted.
	Preparation of borehole/ test pit logs, sample location plan and chain of custody records.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced sampler(s) used.
	Use of a NATA registered laboratory.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Number of samples recovered and analysed are considered to be representative of the target media and complying with DQOs.
	Samples were extracted and analysed within holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates (refer to Section G1.1).
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been generally complied with.

G3.0 Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQIs it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

Table QA1: Relative Percentage Difference Results – Intra and Inter - Laboratory Replicates

			Metals							
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
QA3	0 - 0.1 m	19/10/2021	<5	<1	5	20	905	<0.1	<2	437
106/0.1	0 - 0.1 m	19/10/2021	<4	0.7	5	17	710	<0.1	2	370
		Difference	1	0.3	0	3	195	0	0	67
		RPD	22%	35%	0%	16%	24%	0%	0%	17%
QA2	0 - 0.1 m	19/10/2021	6	<0.4	15	20	14	<0.1	10	37
112/0.1	0 - 0.1 m	19/10/2021	8	<0.4	13	11	59	<0.1	2	170
		Difference	2	0	2	9	45	0	8	133
		RPD	29%	0%	14%	58%	123%	0%	133%	129%
QA1	0 - 0.1 m	19/10/2021	8	<0.4	14	4	23	<0.1	<1	60
118/0.05	0 - 0.1 m	19/10/2021	<4	<0.4	8	4	21	<0.1	1	75
		Difference	4	0	6	0	2	0	0	15
		RPD	67%	0%	55%	0%	9%	0%	0%	22%

Table QA2: Rinsate Blank Results

		Metals							
		Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc
	PQL	0.05	0.01	0.01	0.01	0.03	0.0005	0.02	0.02
Sample ID	Sample Date	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
RB1	02/11/2021	<0.05	<0.01	<0.01	<0.01	<0.03	<0.0005	<0.02	<0.02

Appendix H

Data Quality Objectives

Appendix H

Data Quality Objectives

H1.0 Data Quality Objectives

The DSI has been devised broadly in accordance with the seven-step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

Step	Summary
1: State the problem	The objective of the investigation was to confirm the contamination status of the site with respect to the proposed land use. DP has previously prepared a PSI for the site, which commented that the site is generally suitable for the proposed residential development, subject to the recommendations outlined in Section 14 of DP (2020), including undertaking of confirmatory investigations, as stated below: - Confirmatory Investigations: <i>Given the preliminary nature of the current PSI (completed for rezoning purposes), it is recommended that confirmatory investigations be completed as part of the subdivision development approval process. These investigations should aim to confirm the site's suitability for the proposed residential development from a site contamination standpoint.</i> The current DSI therefore included intrusive investigations and soil sampling targeting the following PAEC identified in the PSI: - Former structures / area of potential fill (PAEC 1); - Former dam (PAEC 2); and - Former agricultural land use (PAEC 3). A preliminary conceptual site model (CSM) has been prepared (Section 9) for the site.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM (Section 9). The CSM identified the associated contaminants of potential concern (COPC) and the likely impacted media. The site assessment criteria (SAC) for each of the COPC are detailed in Appendix E. The decision is to establish whether or not the results fall below the SAC or whether or not the 95% upper confidence limit of the sample population falls below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective and whether (or not) further assessment and / or remediation is required will be derived.

Step	Summary
3: Identify the information inputs	The inputs to the investigation include; • Review of site history and DP (2020); • Observations made during the site walkover (see Section 8); • The lithology of the site as described in the logs and field observations (see Section 12.1); • Laboratory results of samples, analysed using NATA accredited laboratories and methods, where possible; • Field and laboratory QA/QC data (see Appendix G); and • Adopted SAC (see Appendix E).
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken.
5: Develop the analytical approach (or decision rule)	• The decision rule is to compare all analytical results with the SAC (Appendix E) based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible; • Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s); • Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL) to assess potential risks posed by the site contamination; • Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%. The field and laboratory quality assurance assessment is included in Appendix G.
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site and/or statistical analysis of data (in line with NEPC (2013)) exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site and statistical analysis of data (in line with NEPC (2013)) comply with human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true. Uncertainty that may exist due to the above potential decision errors were mitigated as follows: • As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) was applied, i.e.: 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95%UCL was subsequently screened against the corresponding SAC.

Step	Summary
6: Specify the performance or acceptance criteria (continued)	Given the site is proposed to be subdivided into individual residential lots, the 95% UCL was not considered applicable to the health-based SAC.
7: Optimise the design for obtaining data	Sampling design and procedures that were implemented to optimise data collection for achieving the DQOs included the following: - Suitably experienced engineers and scientists were chosen to conduct field work and sample analysis interpretation; - Professional judgement to identify and sample potentially affected areas; and - Only NATA accredited laboratories using NATA endorsed methods were used to perform laboratory analysis whenever possible.

Douglas Partners Pty Ltd

Appendix I

Laboratory Certificates of Analysis and Chain-of-Custody
Documentation

CERTIFICATE OF ANALYSIS 280943

Client Details

Client	Douglas Partners Tuggerah
Attention	Brent Kerry
Address	Unit 5, 3 Teamster Close, Tuggerah, NSW, 2259

Sample Details

Your Reference	<u>104136.01, Wyee</u>
Number of Samples	28 Soil, 1 Water
Date samples received	22/10/2021
Date completed instructions received	22/10/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	29/10/2021
Date of Issue	29/10/2021
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Asbestos Approved By

Analysed by Asbestos Approved Analyst: Nyovan Moonean
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Dragana Tomas, Senior Chemist
 Hannah Nguyen, Metals Supervisor
 Josh Williams, LC Supervisor
 Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		280943-1	280943-2	280943-3	280943-6	280943-7
Your Reference	UNITS	101/0.1	102/0.1	103/0.1	106/0.1	107/0.7
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.6-0.7
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	20/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	101	98	112	107	106

vTRH(C6-C10)/BTEXN in Soil

Our Reference		280943-10	280943-13	280943-22
Your Reference	UNITS	109/1.0	112/0.1	121/0.1
Depth		0.9-1	0-0.1	0-0.1
Date Sampled		20/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	28/10/2021	28/10/2021	28/10/2021
TRH C ₆ - C ₉	mg/kg	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	108	109	109

svTRH (C10-C40) in Soil						
Our Reference	UNITS	280943-1	280943-2	280943-3	280943-6	280943-7
Your Reference		101/0.1	102/0.1	103/0.1	106/0.1	107/0.7
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.6-0.7
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	20/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	97	97	96	94	96

svTRH (C10-C40) in Soil				
Our Reference	UNITS	280943-10	280943-13	280943-22
Your Reference		109/1.0	112/0.1	121/0.1
Depth		0.9-1	0-0.1	0-0.1
Date Sampled		20/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	26/10/2021	27/10/2021	27/10/2021
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	94	96	86

PAHs in Soil						
Our Reference		280943-1	280943-2	280943-3	280943-6	280943-7
Your Reference	UNITS	101/0.1	102/0.1	103/0.1	106/0.1	107/0.7
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.6-0.7
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	20/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	89	91	107	94	89

PAHs in Soil				
Our Reference		280943-10	280943-13	280943-22
Your Reference	UNITS	109/1.0	112/0.1	121/0.1
Depth		0.9-1	0-0.1	0-0.1
Date Sampled		20/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	92	89	77

Organochlorine Pesticides in soil						
Our Reference		280943-1	280943-2	280943-3	280943-4	280943-5
Your Reference	UNITS	101/0.1	102/0.1	103/0.1	104/0.1	105/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	86	89	88	82

Organochlorine Pesticides in soil						
Our Reference		280943-6	280943-7	280943-8	280943-9	280943-10
Your Reference	UNITS	106/0.1	107/0.7	108/0.5	109/0.5	109/1.0
Depth		0-0.1	0.6-0.7	0.4-0.5	0.4-0.5	0.9-1
Date Sampled		19/10/2021	20/10/2021	20/10/2021	20/10/2021	20/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	87	84	88	89

Organochlorine Pesticides in soil						
Our Reference		280943-11	280943-12	280943-13	280943-14	280943-15
Your Reference	UNITS	110/0.1	111/0.1	112/0.1	113/0.1	114/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	85	83	87	83	80

Organochlorine Pesticides in soil						
Our Reference		280943-16	280943-17	280943-18	280943-19	280943-20
Your Reference	UNITS	115/0.1	116/0.1	117/0.1	118/0.05	119/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	85	81	79	79

Organochlorine Pesticides in soil						
Our Reference		280943-21	280943-22	280943-23	280943-24	280943-25
Your Reference	UNITS	120/0.05	121/0.1	122/0.05	123/0.05	124/0.05
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	80	78	76	78	79

Organochlorine Pesticides in soil		
Our Reference		280943-26
Your Reference	UNITS	125/0.1
Depth		0-0.1
Date Sampled		19/10/2021
Type of sample		Soil
Date extracted	-	26/10/2021
Date analysed	-	27/10/2021
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	79

Organophosphorus Pesticides in Soil						
Our Reference		280943-1	280943-2	280943-3	280943-4	280943-5
Your Reference	UNITS	101/0.1	102/0.1	103/0.1	104/0.1	105/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	86	89	88	82

Organophosphorus Pesticides in Soil						
Our Reference		280943-6	280943-7	280943-8	280943-9	280943-10
Your Reference	UNITS	106/0.1	107/0.7	108/0.5	109/0.5	109/1.0
Depth		0-0.1	0.6-0.7	0.4-0.5	0.4-0.5	0.9-1
Date Sampled		19/10/2021	20/10/2021	20/10/2021	20/10/2021	20/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	87	84	88	89

Organophosphorus Pesticides in Soil						
Our Reference		280943-11	280943-12	280943-13	280943-14	280943-15
Your Reference	UNITS	110/0.1	111/0.1	112/0.1	113/0.1	114/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	85	83	87	83	80

Organophosphorus Pesticides in Soil

Our Reference		280943-16	280943-17	280943-18	280943-19	280943-20
Your Reference	UNITS	115/0.1	116/0.1	117/0.1	118/0.05	119/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	85	81	79	79

Organophosphorus Pesticides in Soil						
Our Reference		280943-21	280943-22	280943-23	280943-24	280943-25
Your Reference	UNITS	120/0.05	121/0.1	122/0.05	123/0.05	124/0.05
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	80	78	76	78	79

Organophosphorus Pesticides in Soil		
Our Reference		280943-26
Your Reference	UNITS	125/0.1
Depth		0-0.1
Date Sampled		19/10/2021
Type of sample		Soil
Date extracted	-	26/10/2021
Date analysed	-	27/10/2021
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyrifos	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	79

PCBs in Soil						
Our Reference		280943-1	280943-2	280943-3	280943-6	280943-7
Your Reference	UNITS	101/0.1	102/0.1	103/0.1	106/0.1	107/0.7
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.6-0.7
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	20/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	86	89	90	87

PCBs in Soil				
Our Reference		280943-10	280943-13	280943-22
Your Reference	UNITS	109/1.0	112/0.1	121/0.1
Depth		0.9-1	0-0.1	0-0.1
Date Sampled		20/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	87	78

Acid Extractable metals in soil

Our Reference		280943-1	280943-2	280943-3	280943-4	280943-5
Your Reference	UNITS	101/0.1	102/0.1	103/0.1	104/0.1	105/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	0.5	<0.4	<0.4
Chromium	mg/kg	3	4	3	1	2
Copper	mg/kg	6	12	11	2	4
Lead	mg/kg	18	56	40	8	25
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	2	1	<1	<1
Zinc	mg/kg	43	180	140	40	71

Acid Extractable metals in soil

Our Reference		280943-6	280943-7	280943-8	280943-9	280943-10
Your Reference	UNITS	106/0.1	107/0.7	108/0.5	109/0.5	109/1.0
Depth		0-0.1	0.6-0.7	0.4-0.5	0.4-0.5	0.9-1
Date Sampled		19/10/2021	20/10/2021	20/10/2021	20/10/2021	20/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	0.7	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	4	10	9	6
Copper	mg/kg	17	1	<1	<1	<1
Lead	mg/kg	710	8	11	2	2
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	<1	<1	<1	<1
Zinc	mg/kg	370	4	4	<1	1

Acid Extractable metals in soil

Our Reference		280943-11	280943-12	280943-13	280943-14	280943-15
Your Reference	UNITS	110/0.1	111/0.1	112/0.1	113/0.1	114/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Arsenic	mg/kg	<4	<4	8	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	3	1	13	15	4
Copper	mg/kg	9	8	11	<1	3
Lead	mg/kg	36	12	59	7	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	<1	2	<1	<1
Zinc	mg/kg	100	23	170	6	13

Acid Extractable metals in soil

Our Reference		280943-16	280943-17	280943-18	280943-19	280943-20
Your Reference	UNITS	115/0.1	116/0.1	117/0.1	118/0.05	119/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	2	6	5	8	5
Copper	mg/kg	4	10	5	4	<1
Lead	mg/kg	3	10	13	21	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	<1	1	<1
Zinc	mg/kg	19	42	40	75	4

Acid Extractable metals in soil

Our Reference		280943-21	280943-22	280943-23	280943-24	280943-25
Your Reference	UNITS	120/0.05	121/0.1	122/0.05	123/0.05	124/0.05
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Arsenic	mg/kg	6	4	<4	7	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	9	4	12	7
Copper	mg/kg	1	1	4	3	4
Lead	mg/kg	12	8	4	11	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	<1	<1	<1
Zinc	mg/kg	14	5	14	22	15

Acid Extractable metals in soil

Our Reference		280943-26	280943-27	280943-28
Your Reference	UNITS	125/0.1	QA1	QA2
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	26/10/2021	26/10/2021	26/10/2021
Arsenic	mg/kg	<4	8	6
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	6	14	15
Copper	mg/kg	4	4	20
Lead	mg/kg	6	23	14
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	10
Zinc	mg/kg	13	60	37

Moisture						
Our Reference	UNITS	280943-1	280943-2	280943-3	280943-4	280943-5
Your Reference		101/0.1	102/0.1	103/0.1	104/0.1	105/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Moisture	%	9.9	8.9	10	10	9.7

Moisture						
Our Reference	UNITS	280943-6	280943-7	280943-8	280943-9	280943-10
Your Reference		106/0.1	107/0.7	108/0.5	109/0.5	109/1.0
Depth		0-0.1	0.6-0.7	0.4-0.5	0.4-0.5	0.9-1
Date Sampled		19/10/2021	20/10/2021	20/10/2021	20/10/2021	20/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Moisture	%	14	19	18	12	20

Moisture						
Our Reference	UNITS	280943-11	280943-12	280943-13	280943-14	280943-15
Your Reference		110/0.1	111/0.1	112/0.1	113/0.1	114/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Moisture	%	15	19	14	14	9.4

Moisture						
Our Reference	UNITS	280943-16	280943-17	280943-18	280943-19	280943-20
Your Reference		115/0.1	116/0.1	117/0.1	118/0.05	119/0.1
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Moisture	%	8.2	9.6	12	15	17

Moisture						
Our Reference	UNITS	280943-21	280943-22	280943-23	280943-24	280943-25
Your Reference		120/0.05	121/0.1	122/0.05	123/0.05	124/0.05
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021	27/10/2021	27/10/2021
Moisture	%	15	8.4	9.1	17	9.2

Moisture				
Our Reference	UNITS	280943-26	280943-27	280943-28
Your Reference		125/0.1	QA1	QA2
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	26/10/2021	26/10/2021	26/10/2021
Date analysed	-	27/10/2021	27/10/2021	27/10/2021
Moisture	%	8.5	15	14

Asbestos ID - soils NEPM				
Our Reference		280943-1	280943-2	280943-6
Your Reference	UNITS	101/0.1	102/0.1	106/0.1
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil
Date analysed	-	29/10/2021	29/10/2021	29/10/2021
Sample mass tested	g	701.82	503.44	504.14
Sample Description	-	Brown fine-grained soil & rocks	Brown clayey soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	Chrysotile asbestos detected Amosite asbestos detected Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1	0.4794
Asbestos ID in soil <0.1g/kg*	-	Chrysotile	No visible asbestos detected	See Above
ACM >7mm Estimation*	g	0.0134	—	0.2417
FA and AF Estimation*	g	—	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

Metals in Water - Dissolved		
Our Reference		280943-29
Your Reference	UNITS	RB1
Depth		0-0.1
Date Sampled		19/10/2021
Type of sample		Water
Date digested	-	26/10/2021
Date analysed	-	26/10/2021
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	280943-2
Date extracted	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			28/10/2021	1	28/10/2021	28/10/2021		28/10/2021	28/10/2021
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	1	<25	<25	0	98	97
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	1	<25	<25	0	98	97
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	91	88
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	93	91
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	104	103
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	101	101
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	100	98
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	117	1	101	105	4	108	105

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	10	28/10/2021	28/10/2021		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	[NT]	10	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	[NT]	10	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	10	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	10	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	10	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	10	108	106	2	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	22	28/10/2021	28/10/2021		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	[NT]	22	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	[NT]	22	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	22	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	22	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	22	109	114	4	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	280943-2
Date extracted	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	1	<50	<50	0	108	80
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	1	<100	<100	0	110	72
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	1	<100	<100	0	128	72
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	1	<50	<50	0	108	80
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	1	<100	<100	0	110	72
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	1	<100	<100	0	128	72
Surrogate o-Terphenyl	%		Org-020	96	1	97	98	1	121	97

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	10	26/10/2021	26/10/2021		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	[NT]	10	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	[NT]	10	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	[NT]	10	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	[NT]	10	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	[NT]	10	<100	<100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	[NT]	10	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	10	94	98	4	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	22	27/10/2021	27/10/2021		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	[NT]	22	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	[NT]	22	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	22	86	88	2	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	280943-2
Date extracted	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			27/10/2021	1	27/10/2021	27/10/2021		27/10/2021	27/10/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	86
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	73
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	93
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	82
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	73
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	75
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	73
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	108	106
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	84	1	89	93	4	100	87

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			[NT]	10	26/10/2021	26/10/2021		26/10/2021	[NT]
Date analysed	-			[NT]	10	27/10/2021	27/10/2021		27/10/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	105	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	71	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	92	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	102	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	90	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	89	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	77	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	10	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	10	<0.05	<0.05	0	108	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	10	92	86	7	98	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	22	27/10/2021	27/10/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	22	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	22	77	80	4	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	280943-2
Date extracted	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			27/10/2021	1	27/10/2021	27/10/2021		27/10/2021	27/10/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	80
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	89
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	77
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	70
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	74
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	74
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	81
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	78
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	80
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	78
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	84	1	86	89	3	87	87

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	280943-21
Date extracted	-			[NT]	10	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			[NT]	10	27/10/2021	27/10/2021		27/10/2021	27/10/2021
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	76	76
HCB	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	89	86
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	89	91
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	81	83
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	86	86
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	86	88
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	98	96
Endrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	70	70
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	88	90
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	86	86
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	10	89	85	5	79	80

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	22	27/10/2021	27/10/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	22	78	80	3	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	280943-2
Date extracted	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			27/10/2021	1	27/10/2021	27/10/2021		27/10/2021	27/10/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	132
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	79
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	71
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	95
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	80
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	68	68
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	68
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	84	1	86	89	3	87	87

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	280943-21
Date extracted	-			[NT]	10	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			[NT]	10	27/10/2021	27/10/2021		27/10/2021	27/10/2021
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	74	76
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	91	91
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	73	73
Malathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	93	97
Chlorpyrifos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	92	92
Parathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	68	68
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	72	72
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	10	89	85	5	79	80

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	22	27/10/2021	27/10/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	22	78	80	3	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	280943-2
Date extracted	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			27/10/2021	1	27/10/2021	27/10/2021		27/10/2021	27/10/2021
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	100	80
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	84	1	86	89	3	87	87

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			[NT]	10	26/10/2021	26/10/2021		26/10/2021	[NT]
Date analysed	-			[NT]	10	27/10/2021	27/10/2021		27/10/2021	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	10	89	85	5	79	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	22	27/10/2021	27/10/2021		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	22	78	80	3	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	280943-2
Date prepared	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			26/10/2021	1	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	96	96
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	99	96
Chromium	mg/kg	1	Metals-020	<1	1	3	3	0	103	106
Copper	mg/kg	1	Metals-020	<1	1	6	6	0	106	97
Lead	mg/kg	1	Metals-020	<1	1	18	17	6	116	108
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	111	94
Nickel	mg/kg	1	Metals-020	<1	1	<1	<1	0	98	92
Zinc	mg/kg	1	Metals-020	<1	1	43	42	2	93	83

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	280943-21
Date prepared	-			[NT]	10	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Date analysed	-			[NT]	10	26/10/2021	26/10/2021		26/10/2021	26/10/2021
Arsenic	mg/kg	4	Metals-020	[NT]	10	<4	<4	0	91	81
Cadmium	mg/kg	0.4	Metals-020	[NT]	10	<0.4	<0.4	0	94	75
Chromium	mg/kg	1	Metals-020	[NT]	10	6	6	0	93	87
Copper	mg/kg	1	Metals-020	[NT]	10	<1	<1	0	101	93
Lead	mg/kg	1	Metals-020	[NT]	10	2	2	0	102	73
Mercury	mg/kg	0.1	Metals-021	[NT]	10	<0.1	<0.1	0	92	81
Nickel	mg/kg	1	Metals-020	[NT]	10	<1	<1	0	90	81
Zinc	mg/kg	1	Metals-020	[NT]	10	1	<1	0	91	88

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	26/10/2021	26/10/2021		[NT]	[NT]
Date analysed	-			[NT]	22	26/10/2021	26/10/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	22	4	6	40	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	22	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	22	9	12	29	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	22	1	2	67	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	22	8	10	22	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	22	<1	<1	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	22	5	6	18	[NT]	[NT]

QUALITY CONTROL: Metals in Water - Dissolved					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			26/10/2021	[NT]	[NT]	[NT]	[NT]	26/10/2021	[NT]
Date analysed	-			26/10/2021	[NT]	[NT]	[NT]	[NT]	26/10/2021	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	120	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	115	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	116	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	120	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	118	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	109	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	118	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	115	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Factual description of asbestos identified in the soil samples: NEPM

Sample 280943-1; Chrysotile asbestos identified in 0.0891g of fibre cement material >7mm

Sample 280943-6; Chrysotile and Amosite asbestos identified in 1.6112g of fibre cement material >7mm

Project No: 104136.01					Suburb: Wyee					To: Envirolab Services				
Project Manager: Brent Kerry					Order Number:					Sampler: MJH				
Email: Brent.Kerry@douglaspartners.com.au										Attn: Sample Receipt				
Turnaround time: ☒ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day										Contact: (02) 9910 6200 samlereceipt@envirolab.com.au				
Prior Storage: ☒ Fridge ☐ Freezer ☐ Shelf					Do samples contain 'potential' HBM? ☒ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)									

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes										Notes/ Preservation/ Additional Requirements	
	Location / Other ID	Depth From	Depth To		S - soil W - water	G - glass P - plastic	Combo#6A	Combo#6	HM	OCP/OPP								
1	101/0.1	0	0.1	19/10/21	S	G+P	X											All Asbestos analysis = 500ml (NEPC, 2013)
2	102/0.1	0	0.1	19/10/21	S	G+P	X											
3	103/0.1	0	0.1	19/10/21	S	G		X										
4	104/0.1	0	0.1	19/10/21	S	G			X	X								
5	105/0.1	0	0.1	19/10/21	S	G			X	X								
6	106/0.1	0	0.1	19/10/21	S	G+P	X											
7	107/0.7	0.6	0.7	20/10/21	S	G		X										
8	108/0.5	0.4	0.5	20/10/21	S	G			X	X								
9	109/0.5	0.4	0.5	20/10/21	S	G			X	X								
10	109/1.0	0.9	1	20/10/21	S	G		X										
11	110/0.1	0	0.1	19/10/21	S	G			X	X								
12	111/0.1	0	0.1	19/10/21	S	G			X	X								
13	112/0.1	0	0.1	19/10/21	S	G		X										
14	113/0.1	0	0.1	19/10/21	S	G			X	X								

Metals to analyse:

Number of samples in container:

Send results to: Douglas Partners Pty Ltd

Address: Unit 5, 3 Teamster Close, Tuggerah NSW

Relinquished by: Brent Kerry

Transported to laboratory by: TNT

Phone: (02) 4351 1422

Date: 21/10/2021

Signed: *[Signature]*

LAB RECEIPT

Lab Ref. No: 280993

Received by: TSHAW

Date & Time: 22-10-21 1045

Signed: *[Signature]*

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 280993

Date Received: 22-10-21

Time Received: 1045

Received By: TSHAW

Temp: Cool/Ambient

Cooling: Ice/icepack

Security: Intact/Broken/Altered

Project No: 104136.01					Suburb: Wyee					To: Envirolab Services									
Project Manager: Brent Kerry					Order Number:					Dispatch date: 21/10/2021					12 Ashley St, Chatswood NSW 2067				

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes										Notes/ Preservation/ Additional Requirements	
	Location / Other ID	Depth From	Depth To		S - soil W - water	G - glass P - plastic	Combo#6A	Combo#6	HM	OCP/OPP								
15	114/0.1	0	0.1	19/10/21	S	G			X	X								
16	115/0.1	0	0.1	19/10/21	S	G			X	X								
17	116/0.1	0	0.1	19/10/21	S	G			X	X								
18	117/0.1	0	0.1	19/10/21	S	G			X	X								
19	118/0.05	0	0.1	19/10/21	S	G			X	X								
20	119/0.1	0	0.1	19/10/21	S	G			X	X								
21	120/0.05	0	0.1	19/10/21	S	G			X	X								
22	121/0.1	0	0.1	19/10/21	S	G		X										
23	122/0.05	0	0.1	19/10/21	S	G			X	X								
24	123/0.05	0	0.1	19/10/21	S	G			X	X								
25	124/0.05	0	0.1	19/10/21	S	G			X	X								
26	125/0.1	0	0.1	19/10/21	S	G			X	X								
27	QA1	0	0.1	19/10/21	S	G			X									
28	QA2	0	0.1	19/10/21	S	G			X									
29	RB1	0	0.1	19/10/21	S	G			X									

CERTIFICATE OF ANALYSIS 282343

Client Details

Client	Douglas Partners Tuggerah
Attention	Brent Kerry
Address	Unit 5, 3 Teamster Close, Tuggerah, NSW, 2259

Sample Details

Your Reference	<u>104136.01, Wyee</u>
Number of Samples	4 Soil
Date samples received	09/11/2021
Date completed instructions received	09/11/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	16/11/2021
Date of Issue	16/11/2021
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Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Analyst: Nyovan Moonean
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Giovanni Agosti, Group Technical Manager
Jeremy Faircloth, Operations Manager, Sydney
Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Acid Extractable metals in soil		
Our Reference		282343-1
Your Reference	UNITS	101
Depth		0.4-0.5
Date Sampled		19/10/2021
Type of sample		Soil
Date prepared	-	11/11/2021
Date analysed	-	15/11/2021
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	1
Copper	mg/kg	5
Lead	mg/kg	6
Mercury	mg/kg	<0.1
Nickel	mg/kg	<1
Zinc	mg/kg	17

Moisture		
Our Reference		282343-1
Your Reference	UNITS	101
Depth		0.4-0.5
Date Sampled		19/10/2021
Type of sample		Soil
Date prepared	-	10/11/2021
Date analysed	-	12/11/2021
Moisture	%	7.4

Asbestos ID - soils NEPM				
Our Reference		282343-2	282343-3	282343-4
Your Reference	UNITS	103	104	105
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		19/10/2021	19/10/2021	19/10/2021
Type of sample		Soil	Soil	Soil
Date analysed	-	15/11/2021	15/11/2021	15/11/2021
Sample mass tested	g	640.03	626.57	596.15
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	Chrysotile Amosite	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—
FA and AF Estimation*	g	0.0006	—	—
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE ^{#1} Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE ^{#2} The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date prepared	-			11/11/2021	[NT]	[NT]	[NT]	[NT]	11/11/2021	[NT]
Date analysed	-			15/11/2021	[NT]	[NT]	[NT]	[NT]	15/11/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	102	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Factual description of asbestos identified in the soil samples: NEPM

Sample 282343-2; Chrysotile and Amosite asbestos identified in 0.0006g of loose fibre bundles

Rev5/February 2021

CERTIFICATE OF ANALYSIS

Work Order : **ES2138339**
Client : **DOUGLAS PARTNERS PTY LTD**
Contact : BRENT KERRY
Address : 5/3 TEANSTER CL
 TUGGERAH 2259
Telephone : ----
Project : 104136.01
Order number : ----
C-O-C number : ----
Sampler : MJH
Site : Wyee
Quote number : EN/222
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 2
Laboratory : Environmental Division Sydney
Contact : Sepan Mahamad
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 22-Oct-2021 17:10
Date Analysis Commenced : 27-Oct-2021
Issue Date : 29-Oct-2021 13:12



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 ^ = This result is computed from individual analyte detections at or above the level of reporting
 Ø = ALS is not NATA accredited for these tests.
 ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **SOIL**
 (Matrix: **SOIL**)

Sample ID

				QA3	----	----	----	----
Sampling date / time				19-Oct-2021 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2138339-001	-----	-----	-----	-----
Result					----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	15.2	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	5	----	----	----	----
Copper	7440-50-8	5	mg/kg	20	----	----	----	----
Lead	7439-92-1	5	mg/kg	905	----	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg	437	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----

QUALITY CONTROL REPORT

Work Order : **ES2138339**

Page : 1 of 3

Client : **DOUGLAS PARTNERS PTY LTD**

Contact : **BRENT KERRY**

Address : **5/3 TEANSTER CL
TUGGERAH 2259**

Telephone : ----

Project : **104136.01**

Order number : ----

C-O-C number : ----

Sampler : **MJH**

Site : **Wyee**

Quote number : **EN/222**

No. of samples received : **1**

No. of samples analysed : **1**

Laboratory : **Environmental Division Sydney**

Contact : **Sepan Mahamad**

Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**

Telephone : **+61 2 8784 8555**

Date Samples Received : **22-Oct-2021**

Date Analysis Commenced : **27-Oct-2021**

Issue Date : **29-Oct-2021**



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3979516)									
ES2138393-005	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	21	24	14.4	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	14	16	12.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	12	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
ES2137626-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	3	39.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	7	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	242	287	17.4	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	52	51	0.0	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3979526)									
ES2137626-016	Anonymous	EA055: Moisture Content	----	0.1	%	4.1	3.7	11.0	No Limit
ES2138726-001	Anonymous	EA055: Moisture Content	----	0.1	%	10.5	11.0	4.5	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3979517)									
ES2138393-005	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2137626-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3979516)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	105	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	101	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	125	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	111	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	103	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	104	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	89.6	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3979517)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	108	70.0	125

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3979516)							
ES2137626-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.7	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	88.0	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	91.7	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	98.6	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	89.9	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	89.7	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	80.6	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3979517)							
ES2137626-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	98.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2138339	Page	: 1 of 4
Client	: DOUGLAS PARTNERS PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: BRENT KERRY	Telephone	: +61 2 8784 8555
Project	: 104136.01	Date Samples Received	: 22-Oct-2021
Site	: Wyee	Issue Date	: 29-Oct-2021
Sampler	: MJH	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QA3	19-Oct-2021	----	----	----	27-Oct-2021	02-Nov-2021	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QA3	19-Oct-2021	27-Oct-2021	17-Apr-2022	✓	27-Oct-2021	17-Apr-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QA3	19-Oct-2021	27-Oct-2021	16-Nov-2021	✓	28-Oct-2021	16-Nov-2021	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	15	13.33	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2138339

Client : DOUGLAS PARTNERS PTY LTD Contact : BRENT KERRY Address : 5/3 TEANSTER CL TUGGERAH 2259 E-mail : brent.kerry@douglaspartners.com.au Telephone : ---- Facsimile : ---- Project : 104136.01 Order number : ---- C-O-C number : ---- Site : Wyee Sampler : MJH	Laboratory : Environmental Division Sydney Contact : Sepan Mahamad Address : 277-289 Woodpark Road Smithfield NSW Australia 2164 E-mail : Sepan.Mahamad@ALSGlobal.com Telephone : +61 2 8784 8555 Facsimile : +61-2-8784 8500 Page : 1 of 2 Quote number : EM2017DOUPAR0002 (EN/222) QC Level : NEPM 2013 B3 & ALS QC Standard
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Dates

Date Samples Received : 22-Oct-2021 17:10 Client Requested Due : 29-Oct-2021 Date :	Issue Date : 23-Oct-2021 Scheduled Reporting Date : 29-Oct-2021
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Delivery Details

Mode of Delivery : Carrier No. of coolers/boxes : 1 Receipt Detail :	Security Seal : Intact. Temperature : 12.6°C - Ice Bricks present No. of samples received / analysed : 1 / 1
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General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Rev5/February 2021

CERTIFICATE OF ANALYSIS 254343

Client Details

Client	Douglas Partners Pty Ltd
Attention	Chamali Nagodavithane
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>104136.00. Wyee</u>
Number of Samples	12 soil
Date samples received	27/10/2020
Date completed instructions received	27/10/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	03/11/2020
Date of Issue	02/11/2020
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
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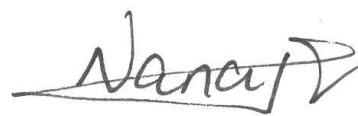
Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Dragana Tomas, Senior Chemist
 Hannah Nguyen, Senior Chemist
 Josh Williams, Senior Chemist
 Lucy Zhu, Asbestos Supervisor
 Manju Dewendrage, Chemist
 Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		254343-1	254343-2	254343-3	254343-4	254343-5
Your Reference	UNITS	1	2	3	4	5
Depth		0-0.1	0-0.12	0-0.1	0-0.1	0.4-0.5
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	115	98	131	121	129

vTRH(C6-C10)/BTEXN in Soil

Our Reference		254343-6	254343-7	254343-8	254343-9	254343-10
Your Reference	UNITS	6	7	8	QA1	TB
Depth		0-0.1	0.4-0.5	0.5-0.6	-	-
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	125	120	108	125	129

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		254343-11	254343-12
Your Reference	UNITS	TS	8
Depth		-	0.9-1.0
Date Sampled		22/10/2020	22/10/2020
Type of sample		soil	soil
Date extracted	-	28/10/2020	28/10/2020
Date analysed	-	29/10/2020	29/10/2020
TRH C ₆ - C ₉	mg/kg	[NA]	<25
TRH C ₆ - C ₁₀	mg/kg	[NA]	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	[NA]	<25
Benzene	mg/kg	73%	<0.2
Toluene	mg/kg	73%	<0.5
Ethylbenzene	mg/kg	75%	<1
m+p-xylene	mg/kg	72%	<2
o-Xylene	mg/kg	70%	<1
naphthalene	mg/kg	[NA]	<1
Total +ve Xylenes	mg/kg	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	117	125

svTRH (C10-C40) in Soil

Our Reference		254343-1	254343-2	254343-3	254343-4	254343-5
Your Reference	UNITS	1	2	3	4	5
Depth		0-0.1	0-0.12	0-0.1	0-0.1	0.4-0.5
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	76	79	79	76	75

svTRH (C10-C40) in Soil

Our Reference		254343-6	254343-7	254343-8	254343-9	254343-12
Your Reference	UNITS	6	7	8	QA1	8
Depth		0-0.1	0.4-0.5	0.5-0.6	-	0.9-1.0
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	77	74	72	70	76

PAHs in Soil						
Our Reference		254343-1	254343-2	254343-3	254343-4	254343-5
Your Reference	UNITS	1	2	3	4	5
Depth		0-0.1	0-0.12	0-0.1	0-0.1	0.4-0.5
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	90	88	86	89	88

PAHs in Soil						
Our Reference		254343-6	254343-7	254343-8	254343-9	254343-12
Your Reference	UNITS	6	7	8	QA1	8
Depth		0-0.1	0.4-0.5	0.5-0.6	-	0.9-1.0
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	87	88	92	92	92

Organochlorine Pesticides in soil						
Our Reference		254343-1	254343-2	254343-3	254343-4	254343-5
Your Reference	UNITS	1	2	3	4	5
Depth		0-0.1	0-0.12	0-0.1	0-0.1	0.4-0.5
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	88	90	87	89

Organochlorine Pesticides in soil				
Our Reference		254343-6	254343-8	254343-9
Your Reference	UNITS	6	8	QA1
Depth		0-0.1	0.5-0.6	-
Date Sampled		22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	88	93	91

Organophosphorus Pesticides in Soil						
Our Reference		254343-1	254343-2	254343-3	254343-4	254343-5
Your Reference	UNITS	1	2	3	4	5
Depth		0-0.1	0-0.12	0-0.1	0-0.1	0.4-0.5
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	88	90	87	89

Organophosphorus Pesticides in Soil				
Our Reference		254343-6	254343-8	254343-9
Your Reference	UNITS	6	8	QA1
Depth		0-0.1	0.5-0.6	-
Date Sampled		22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	88	93	91

PCBs in Soil					
Our Reference		254343-5	254343-6	254343-8	254343-9
Your Reference	UNITS	5	6	8	QA1
Depth		0.4-0.5	0-0.1	0.5-0.6	-
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil
Date extracted	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	88	93	91

Acid Extractable metals in soil

Our Reference		254343-1	254343-2	254343-3	254343-4	254343-5
Your Reference	UNITS	1	2	3	4	5
Depth		0-0.1	0-0.12	0-0.1	0-0.1	0.4-0.5
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	2	4	4	4	7
Copper	mg/kg	3	7	5	14	<1
Lead	mg/kg	3	6	8	12	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	<1	1	<1
Zinc	mg/kg	14	25	21	69	5

Acid Extractable metals in soil

Our Reference		254343-6	254343-7	254343-8	254343-9	254343-12
Your Reference	UNITS	6	7	8	QA1	8
Depth		0-0.1	0.4-0.5	0.5-0.6	-	0.9-1.0
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Arsenic	mg/kg	<4	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	21	6	5	2
Copper	mg/kg	<1	<1	1	3	<1
Lead	mg/kg	4	10	6	6	3
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	3	1	<1
Zinc	mg/kg	5	10	110	19	5

Moisture						
Our Reference	UNITS	254343-1	254343-2	254343-3	254343-4	254343-5
Your Reference		1	2	3	4	5
Depth		0-0.1	0-0.12	0-0.1	0-0.1	0.4-0.5
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
Moisture	%	9.2	14	8.8	18	24

Moisture						
Our Reference	UNITS	254343-6	254343-7	254343-8	254343-9	254343-12
Your Reference		6	7	8	QA1	8
Depth		0-0.1	0.4-0.5	0.5-0.6	-	0.9-1.0
Date Sampled		22/10/2020	22/10/2020	22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
Moisture	%	24	22	7.1	20	6.8

Asbestos ID - soils				
Our Reference		254343-5	254343-6	254343-8
Your Reference	UNITS	5	6	8
Depth		0.4-0.5	0-0.1	0.5-0.6
Date Sampled		22/10/2020	22/10/2020	22/10/2020
Type of sample		soil	soil	soil
Date analysed	-	30/10/2020	30/10/2020	30/10/2020
Sample mass tested	g	Approx. 15g	Approx. 30g	Approx. 15g
Sample Description	-	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Misc Inorg - Soil			
Our Reference		254343-4	254343-12
Your Reference	UNITS	4	8
Depth		0-0.1	0.9-1.0
Date Sampled		22/10/2020	22/10/2020
Type of sample		soil	soil
Date prepared	-	29/10/2020	29/10/2020
Date analysed	-	29/10/2020	29/10/2020
pH 1:5 soil:water	pH Units	6.4	7.9

CEC			
Our Reference		254343-4	254343-12
Your Reference	UNITS	4	8
Depth		0-0.1	0.9-1.0
Date Sampled		22/10/2020	22/10/2020
Type of sample		soil	soil
Date prepared	-	30/10/2020	30/10/2020
Date analysed	-	30/10/2020	30/10/2020
Exchangeable Ca	meq/100g	6.9	1.4
Exchangeable K	meq/100g	0.3	<0.1
Exchangeable Mg	meq/100g	1.9	<0.1
Exchangeable Na	meq/100g	<0.1	<0.1
Cation Exchange Capacity	meq/100g	9.1	1.5

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	254343-6
Date extracted	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Date analysed	-			29/10/2020	5	29/10/2020	29/10/2020		29/10/2020	29/10/2020
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	5	<25	<25	0	119	112
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	5	<25	<25	0	119	112
Benzene	mg/kg	0.2	Org-023	<0.2	5	<0.2	<0.2	0	126	114
Toluene	mg/kg	0.5	Org-023	<0.5	5	<0.5	<0.5	0	121	112
Ethylbenzene	mg/kg	1	Org-023	<1	5	<1	<1	0	129	110
m+p-xylene	mg/kg	2	Org-023	<2	5	<2	<2	0	109	113
o-Xylene	mg/kg	1	Org-023	<1	5	<1	<1	0	108	112
naphthalene	mg/kg	1	Org-023	<1	5	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	130	5	129	107	19	127	128

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	254343-6
Date extracted	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Date analysed	-			28/10/2020	5	29/10/2020	29/10/2020		28/10/2020	28/10/2020
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	5	<50	<50	0	114	99
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	5	<100	<100	0	96	81
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	5	<100	<100	0	77	99
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	5	<50	<50	0	114	99
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	5	<100	<100	0	96	81
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	5	<100	<100	0	77	99
Surrogate o-Terphenyl	%		Org-020	72	5	75	78	4	81	90

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	254343-6
Date extracted	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Date analysed	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	97	95
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	104	103
Fluorene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	100	95
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	111	111
Anthracene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	107	109
Pyrene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	109	113
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	116	112
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	5	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	5	<0.05	<0.05	0	90	93
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	85	5	88	91	3	82	83

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	254343-6
Date extracted	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Date analysed	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	94	94
HCB	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	100	92
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	113	99
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	103	110
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	101	107
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	101	104
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	97	103
Endrin	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	77	111
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	79	83
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	84	86
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	92	5	89	90	1	86	83

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	254343-6
Date extracted	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Date analysed	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	78	104
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	96	98
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	81	83
Malathion	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	80	100
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	93	99
Parathion	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	82	90
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	89	101
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	92	5	89	90	1	86	83

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	254343-6
Date extracted	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Date analysed	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	5	<0.1	<0.1	0	100	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	5	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	92	5	89	90	1	86	83

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	254343-6
Date prepared	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Date analysed	-			28/10/2020	5	28/10/2020	28/10/2020		28/10/2020	28/10/2020
Arsenic	mg/kg	4	Metals-020	<4	5	<4	<4	0	104	78
Cadmium	mg/kg	0.4	Metals-020	<0.4	5	<0.4	<0.4	0	108	84
Chromium	mg/kg	1	Metals-020	<1	5	7	6	15	99	83
Copper	mg/kg	1	Metals-020	<1	5	<1	<1	0	115	85
Lead	mg/kg	1	Metals-020	<1	5	7	5	33	111	80
Mercury	mg/kg	0.1	Metals-021	<0.1	5	<0.1	<0.1	0	90	78
Nickel	mg/kg	1	Metals-020	<1	5	<1	<1	0	98	75
Zinc	mg/kg	1	Metals-020	<1	5	5	5	0	108	81

QUALITY CONTROL: Misc Inorg - Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			29/10/2020	[NT]	[NT]	[NT]	[NT]	29/10/2020	[NT]
Date analysed	-			29/10/2020	[NT]	[NT]	[NT]	[NT]	29/10/2020	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: CEC					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			30/10/2020	[NT]	[NT]	[NT]	[NT]	30/10/2020	[NT]
Date analysed	-			30/10/2020	[NT]	[NT]	[NT]	[NT]	30/10/2020	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]

Result Definitions	
NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 254343-5,6,8 were sub-sampled from jars provided by the client.

Project No: 104136.00				Suburb: Wyee				To: Envirolab Services Sydney			
Project Name: Wyee				Order Number							
Project Manager: Chamali				Sampler: CLN				Attn: Aileen Hie			
Emails: chamali.n@douglaspartners.com.au				Phone:							
Date Required: Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☒				Email: ahie@envirolab.com.au							
Prior Storage: ☐ Esky ☒ Fridge ☐ Shelved				Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)							

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes								Notes/preservation			
			S - soil W - water	G - glass P - plastic	Combo 6a	Combo 5b	TRH and BTEXN	pH and CEC	Combo 6	BTEX	Combo 3					
1/0-0.1	1	22/10/20	S	G		x										
2/0-0.1 2/0-0.2	2	22/10/20	S	G		x										
3/0-0.1	3	22/10/20	S	G		x										
4/0-0.1	4	22/10/20	S	G		x		x								
5/0.4-0.5	5	22/10/20	S	G	x											
6/0-0.1	6	22/10/20	S	G	x											
7/0.4-0.5	7	22/10/20	S	G							x					
8/0.5-0.6	8	22/10/20	S	G	x											
QA1	9	22/10/20	S	G				x								
TB	10		S	G				x								
TS	11		S	G							x					
8/0.9-1.0	12	22/10/20	S	G				x				x				
PQL (S) mg/kg										ANZECC PQLs req'd for all water analytes ☐						
PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit Metals to Analyse: 8HM unless specified here:													Lab Report/Reference No: 254343			
Total number of samples in container:					Relinquished by:					Transported to laboratory by:						
Send Results to: Douglas Partners Pty Ltd					Address:					Phone:					Fax:	
Signed: <i>[Signature]</i>					Received by: Ming Yan To					Date & Time: 27/10/2020 10:45					12-3°C	


Envirolab Services
 12 Ashley St
 Chalmers NSW 2067
 Ph: (02) 9910 6200
Job No: 254343
Date Received: 27/10/2020
Time Received: 10:45
Received by: M.T.
Temp: 12-3
Condition: Ice/Icepack
Security: Intact/Broken/None