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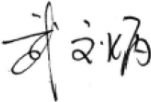
Preliminary Site Investigation

74 Deepwater Road, Castle Cove NSW 2069

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EXECUTIVE SUMMARY

Taylor Developments Group Pty Ltd ('the client') engaged EI Australia (EI) to conduct a Preliminary Site Investigation (PSI) for the property located at 74 Deepwater Road, Castle Cove NSW, 2069 ('the site') to assess the nature and degree of on-site contamination associated with former and current land uses.

The site is located 7 kilometres (km) north of the Sydney Central Business District (CBD), within the Local Government Area (LGA) of Willoughby City Council (**Figure A.1, Appendix A**). It is identified as Lot 1 in Deposited Plan (DP) 610360, covering a total area of approximately 5,723 m² (**Figure A.2, Appendix A**). At the time of this investigation, the buildings on the site were occupied as golf course facilities and associated amenities. Concrete hardstand covered the majority of the surfaces surrounding the building parameter.

The purpose of this PSI is to identify the site characteristics, assess the potential contamination status of the site, and comply with the *State Environmental Planning Policy (Resilience and Hazards) 2021*, as well as provide recommendations on further investigation and appropriate management of contaminated soils / groundwater, should these be identified.

Key Findings

The key findings were as follows:

- The subject site had been used as a golf course country Clubhouse since at least the 1960s. Surrounding lands are the golf course fairways and greens, and predominantly residential properties. No heavy industrial properties are present in the vicinity of the subject site.
- No evidence of gross contamination was noted during the inspection.
- No visual evidence of infrastructure associated with an underground storage tank (UST) was observed on the subject site.
- The site and surrounding lands within a 500m radius were found to be free of statutory notices and licensing agreements issued under the Contaminated Land Management Act 1997 and Protection of the Environment Operations Act 1997.
- The site was not included on the List of NSW Contaminated Sites Notified to the NSW EPA.
- The site is within an area of 'no known occurrence' for acid sulfate soil (ASS).
- The previous investigation for preliminary waste classification (DP 2023) described the subsurface lithology as fill materials consisting of fine to medium dark grey sand and pale grey sandstone boulders (to 1.8 mBGL) with foreign inclusions such as metal, lead, glass, and rubble (at borehole BH7), overlying pale grey sandstone bedrock. Groundwater was observed between 1.5 mBGL (BH1) and 10 mBGL (BH7).

Based on the findings of this PSI, and with consideration of EI's *Statement of Limitations (Section 7)*, there was a low potential for contamination to exist on the site. In accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021*, the site is suitable for the proposed redevelopment works, subject to the implementation of the recommendations outlined under **Section 6**.

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1. INTRODUCTION

1.1 Background and Purpose

Taylor Developments Group Pty Ltd ('the client') engaged EI Australia (EI) to conduct a Preliminary Site Investigation (PSI) for the property located at 74 Deepwater Road, Castle Cove NSW, 2069 ('the site').

The site is located 7 km north of the Sydney Central Business District (CBD), within the Local Government Area (LGA) of Willoughby City Council (**Figure A.1, Appendix A**). It is identified as Lot 1 in Deposited Plan (DP) 610360, covering a total area of approximately 5,723 m² (**Figure A.2, Appendix A**). At the time of this investigation, the buildings on the site were occupied as the golf course facilities and their associated amenities. Concrete hardstand covered the majority of the surfaces surrounding the building perimeter.

This PSI was conducted to support the Request for Information (RFI) process following the submission of a Development Application (DA) for the Castle Cove Development works. The purpose of this PSI is to identify the site characteristics, assess the potential contamination status of the site, and comply with the *State Environmental Planning Policy (Resilience and Hazards) 2021*, as well as provide recommendations on further investigation and appropriate management of contaminated soils / groundwater, should these be identified.

A Preliminary In-situ Waste Classification Report (Ref: 218311.00.R.002.Rev0) was prepared by Douglas Partners Pty Ltd (DP) on 23 February 2023 for the site. The summary of the report (DP, 2023) is provided in **Section 3.7**.

1.2 Proposed Development

The following architectural plans were provided by the client and entitled (**Appendix B**):

- Antoniades Architects Pty Ltd (Antoniades Architects, 2023), *Site Plan, Castle Cove Country Club*, Project Number 22015DA, DA 3.01, RevA, dated 14 December 2023; and
- Antoniades Architects (2023), *Deep Soil Calculations, CC Country Club*, Project Number 22015DA, DA 6.33, RevA, dated 14 December 2023.

Based on the supplied plans, the proposed development will involve the demolition of existing structures, followed by the construction of a Seniors Living Building with a single level basement carpark in the north-eastern portion of the site and a two-storey Country Club with on-ground carpark in the south-western portion of the site. Two carparks are to be connected via an access way that proposed to be constructed by cutting into the existing hillside.

A building set back of 5 m setback is proposed along the southern boundary (Deepwater Road) and a set-back of ranging between 3 m and 19.6 m is proposed along the eastern boundary. The lowest finished floor level (FFL) of the proposed Senior Living Building is a Reduced Level (RL) of 76.20 metres Australian Datum Height (mAHD), and the lowest FFL of the proposed Country Club building is RL of 67.00 mAHD. A minimum of 858 m² of deep soil area is proposed surrounding the perimeter of both proposed buildings. Locally deeper excavations may be required for footings, service trenches, and crane pads and lift overrun pits.

The proposed development will require excavation and removal of surplus soil for construction of the Seniors Living Building and its associated single level basement carpark and the Country Club building.

1.3 Project Objectives

The objectives of the investigation were to:

- Provide a qualitative assessment of the environmental conditions of the site, by assessing the potential for contamination on the basis of field observations, historical land uses, anecdotal information and other documentary evidences;
- Provide a conclusion regarding the suitability of the site for its proposed use; and
- Provide recommendations for further investigations and the appropriate management of any potential soils and/or groundwater, should site contamination be confirmed.

1.4 Scope of Works

To achieve the above objectives, the following scope of works was completed:

- Review of relevant topographical, geological and soil landscape maps for the project area;
- A search of groundwater bores located within a 500 m radius of the site;
- A detailed site walkover;
- Review of site history, based on land title records, aerials imagery (dating back to 1943), a data base search report (Lotsearch, 2024) and property files archived by Willoughby City Council;
- Review of NSW EPA regulatory databases for any former or current notices, orders, voluntary management proposals or audits issued either the Contaminated Land Management Act 1997 or the Protection of the Environment Operations Act 1997 for potential contamination on or near the site;
- Conducted a SafeWork NSW Site Search of Schedule 11 Hazardous Chemicals on Premises for the site as per *Work Health and Safety Act 2011 (WHS Act)*, and *Work Health and Safety Regulation 2017 (WHS Regulation)*;
- Review of the previous waste classification report (DP, 2023); and
- Data interpretation and reporting.

This PSI report was completed with reference to the NSW EPA (2020) *Consultants Reporting on Contaminated Land: Contaminated Land Guidelines*. It documents the investigation works, with discussion of the findings in regards to potential exposure pathways to human health and the environment. It concludes with statements concerning the potential for contamination to exist on the land and the site suitability for its proposed redevelopment works.

1.5 Regulatory Framework

The following regulatory framework and guidelines were primarily considered during this PSI:

- *Contaminated Land Management Act 1997* (the CLM Act 1997);
- *Environmental Planning and Assessment Act 1979* (the EP&A Act 1979);
- NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme*;
- NSW EPA (2020) *Consultants Reporting on Contaminated Land: Contaminated Land Guidelines*;
- NSW EPA (2014) *Waste Classification Guideline Part 1: Classifying waste*;

- NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 1999 (as amended 2013)*;
- *Protection of the Environment Operations Act 1997* (the POEO Act 1997);
- *State Environmental Planning Policy (Resilience and Hazards) 2021*;
- *Willoughby Local Environmental Plan 2012*; and
- *Willoughby Development Control Plan 2006 – Amendment 34*.

2. SITE DESCRIPTION

2.1 Property Identification, Location and Physical Setting

The site identification details and associated information are presented in **Table 2-1**. The site locality and layout plans are shown in **Figures A.1** and **A.2, Appendix A**.

Table 2-1 Site Identification, Location and Zoning

Attribute	Description
Street Address	74 Deepwater Road, Castle Cove NSW 2069
Location Description	The site borders on Deepwater Road to the east. Nearby properties comprise mostly residential and Castle Cove Golf Club grounds. The buildings on the site are currently occupied as the golf course facilities and their associated amenities.
Geographical Coordinates	The main building (GDA2020-MGA56): Easting: 334274.68 Northing: 6260139.843 (Source: http://maps.six.nsw.gov.au)
Site Area	Approximately 5,723 m ² (Source: Appendix B)
Lot and DP	Lot 1 in DP610360
State Survey Marks	Two survey marks were noted within a 100 m radius of the site: SS108333: at the entry of the tennis court, 30m west of the site. SS164558: near the exit of the visitor carpark, along southern boundary of the site. (Source: http://maps.six.nsw.gov.au).
LGA	Willoughby City Council
Current Zoning	R2 – Low Density Residential (Willoughby Local Environmental Plan 2012)

2.2 Surrounding Land Use

The site is located within a local commercial centre. Neighbouring properties, businesses and off-site sensitive receptors within a 500 metres radius of the site are identified in **Table 2-2**.

Table 2-2 Surrounding Land Uses

Direction	Land Use Description	Off-site Sensitive Receptors
North	Public golf course playground, followed by residential dwellings.	Golf course users (on-site); and Residents (<300 m).
East	Residential dwellings, followed by Robb Reserve and Port Jackson.	Residents (<50 m); and Robb Reserve and Port Jackson (<400 m).

Direction	Land Use Description	Off-site Sensitive Receptors
South	Deepwater Road, followed by residential dwellings and Scotts Creek.	Residents (<100 m); and Scotts Creek (<200 m).
West	Public golf course playground, followed by residential dwellings.	Golf course users (on-site); and Residents (<400 m).

2.3 Regional Setting

Local topography, geology and soil landscape information are summarised in **Table 2-3**.

Table 2-3 Regional Setting Information

Attribute	Description
Topography	Surface elevations range from 68 to 88 mAHD, sloping from north-east to south-west (https://meconemosaic.au).
Site Drainage	Likely to be consistent with the general slope of the site. Stormwater is also expected infiltrate through soil (unpaved surfaces) across the site.
Flood Zone and Bushfire Zone	<p>A review of the Archistar Mapping Website¹, assessed on 3 June 2024, indicated that the site does not fall within a flooding zone, with a low likelihood of flood occurrence.</p> <p>A review of the Archistar Mapping Website², assessed on 3 June 2024, indicated that the site does fall within the local bushfire zone</p> <p>Mapped bushfire zones in relation to the site are presented in Appendix C.</p>
Geology	A review of eSPADE v2.2 NSW Government soil database ² , accessed on 3 June 2024, indicated that the site is underlain by Hawkesbury Sandstone, which is a medium to coarse-grained quartz sandstone with minor shale and laminite lenses.
Soil Landscape	A review of eSPADE v2.2 NSW Government soil database ³ , accessed on 3 June 2024, indicated that the original dry sclerophyll woodland and open-forest have been extensively cleared. Severe sheet erosion occurs following bushfires, which destroy or damage stabilising vegetative cover.

¹ <https://app.archistar.ai>

² environment.nsw.gov.au/eSpade2Webapp/

Attribute	Description
Acid Sulfate Soil (ASS)	<p>A review of eSPADE v2.2 NSW Government soil database³, accessed on 3 June 2024, indicated that the site is within an area of 'no known occurrence' for acid sulfate soil.</p> <p>A review of NSW Planning Portal Digital EPI Viewer³, accessed on 3 June 2024, indicated that the site is located within an area identified as 'Class 5', where ASS is not known or expected to occur and "land management activities are not likely to be affected by ASS materials". Therefore, the potential for the presence of ASS on the site can be considered low.</p> <p>As per Section 6.1, Willoughby Local Environmental Plan 2012, council consent is required prior to commencing any works within 500m of adjacent Class 1, 2, 3, and 4 land that is below 5 mAHD and where the water table is likely to be lowered below 1 mAHD on adjacent Class 1, 2, 3 and 4 land.</p> <p>Mapped ASS zones in relation to the site are presented in Appendix C.</p> <p>Management of acid sulfate soil is not required for the subject site.</p>
Nearest Surface Water Feature	Scotts Creek, approximately 150m south-west of the site, connected to Sydney Harbour and eventually the Pacific Ocean.
Groundwater Flow Direction	Groundwater flow is inferred to be in a south-westerly direction, towards Scotts Creek, eventually the Pacific Ocean.

2.4 Site Walkover Inspection

A site walkover inspection was conducted on the site, by a competent EI consultant on 30 May 2024 (**Photograph 1**). The inspection covered observations made in five areas. Identified Areas are shown on **Figure 2**. Photographs taken during the inspection are presented in **Appendix D**.

A collective summary of key findings is outlined below:

2.4.1 Development area (the Subject site)

▪ Area 1 and Area 2

- An asphalt-paved hardstand, covered with mulch on the surface, is located north, down-gradient of the site, near the site entrance, along Deepwater Road (**Photograph 2**).
- One stockpile, approximately 70m³ in size, was observed in the area. The soil materials consisted of blue metal road base gravels, no unusual odours or anthropogenic materials were noted in the stockpile (**Photograph 3**).
- One groundwater monitoring well (GMW 1) and one backfilled borehole were noted near the entrance, indicating that previous environmental and/or geotechnical investigations were conducted on the site (**Photograph 4**).
- No distressed vegetation or bare soil patches were noted in the area. The surfaces are relatively flat (**Photograph 5**).

³ planningportal.nsw.gov.au/spatialviewer

▪ **Area 3**

- The area is primarily used as a visitor carpark for the golf course. The bitumen hardstand surface was observed to be in poor condition. No significant hydrocarbon odour or surface staining was noted across the carpark (**Photograph 6**).
- One stockpile was observed along the south-east boundary of the site. The soil materials consisted of sandy gravels, and fine to coarse grained sand, with no unusual odour or anthropogenic materials were noted in the stockpile (**Photograph 7**).
- Hillside to the east of the area. The slope ranges between 3 and 10 m in height difference from east to west (**Photograph 8**).
- One storm water sump and one drainage sump were noted along the south-west boundary of the site (**Photograph 9**).

▪ **Area 4**

- A rectangular-shaped, three-storey brick building structure (Building A) and its associated carpark, featuring a poorly surfaced bitumen hardstand, occupy the majority of the area, with minimal space used for garden beds and golf practice unit. They are located on an elevated sandstone surface on the hill (**Photograph 10**).
- A veranda was observed attached to the west of the building, which was used as a temporary mechanical garage (**Photograph 11**). A group of items was noted in the area:
 - Hydrocarbon staining, grease, coolant spills were noted on the surface;
 - One water tank/cylinder, along the western border, hillside;
 - A grease trap unit, covered with blue plastic sheeting, was observed along the eastern perimeter of the building (**Photograph 12**);
 - Three cylinder-shaped carbon dioxide liquefied gas containers, along with a decommissioned electrical/gas generator unit, were observed in the cage located at the ground level of the building A (**Photographs 13-14**).

▪ **Area 5**

- A square shaped, two-storey brick building structure (Building B), adjoining Building A, occupies the majority of the land in the area. It is surrounded by a bitumen-paved driveway, providing access to the carpark for building A (**Photograph 15**).
- Two water tanks/cylinders were observed in the subfloor of Building B, located at the eastern corner of the area (**Photograph 16**).
- One groundwater monitoring well (GMW 2) was noted located on the driveway. The condition of the well was good at the time of inspection (**Photograph 17**).
- Shells were observed on the soil surface surrounding the building perimeter (**Photograph 18**).
- An elevated hilly area covered with dense vegetation, located at the north-east border of the site, was inaccessible at the time of inspection (**Photograph 19**).

2.4.2 Golf Course and surrounds

Residential houses are located to the east and south of the subject site. A public golf course, with grassed surfaces, is located north-west of the site. No gross contamination was observed in the vicinity of the subject site. Coarse gravel and mulch were observed to stockpile in the golf course area for general landscaping maintenance purposes. An aboveground fuel storage unit (concrete-paved, **Photograph 20**), is located in the public golf course area. No hydrocarbon leaks or odours were noted in the vicinity of the fuel storage unit.

3. SITE HISTORY AND SEARCHES

3.1 Historical Aerial Imagery Review

The historical aerial imagery database, provided by NSW Search and Discovery Spatial Services⁵, ranges from as early as 1943 to the latest available in 2022 (accessed on 3 June 2024). A review of the historical aerial imagery was completed to identify the locations of any previous buildings and/or other infrastructures associated with activities that could present on/off-site sources of contamination, as summarised in **Table 3-1** below:

Table 3-1 Historical Aerial Imagery Review

Year	On-site Land Use	Adjacent Land Use
1943	The majority of the site was undeveloped with sparse vegetation, except for a building structure observed in the centre of the site. The use of the building was unknown due to the poor resolution of the aerial imagery.	Surrounding land was also undeveloped and vegetated, primarily covered with low-lying grass. The surrounding road (Deepwater Road) appeared in the imagery, indicating significant infrastructure development. Port Jackson, approximately 300 m to the north-east and Scotts Creek, approximately 150 m to the south-west were observed in the imagery.
1955	The majority of the site remains unchanged, except for a group of building structures appeared in the centre of the site.	Surrounding land within a 100 m radius largely remains unchanged. Residential housing appeared to undergo development approximately 370 m north-west of the site.
1965	The building structure and its associated aboveground carpark were appeared in the imagery, consistent with the current layout.	Greater development of residential areas in the surrounding lands, except for the golf course to the north. A square-shaped building structure was observed approximately 100 m north of the site, suspected to be the aboveground fuel tank storage.
1971	The site remained unchanged.	Surrounding lands remained unchanged.
1986	The site remained unchanged.	A tennis court appeared approximately 50 m to the north of the site.
2022	The site remained unchanged.	Largely remained unchanged, except for the construction of a building structure that appeared to be undergoing located immediately to the east of the site.

⁵ portal.spatial.nsw.gov.au/portal/apps/webappviewer

3.2 Land Titles

A historical land title search was conducted through InfoTrack Pty Ltd. Copies of relevant documents resulting from this search are presented in **Appendix E**. A summary of the previous and current registered proprietors is presented in **Table 3-2**.

Table 3-2 Land Titles

Years	Registered Proprietor(s)
1921-1959	Greater Sydney Development Association Limited
1959-1963	Headland Developments Pty Limited
1963-1963	Alexander Gamble (Engineer), Robert Standley Steel (Medical Practitioner), James Matthews (Overseer), (Trustee Castle Cove Country Club)
1963-1977	Alexander Gamble (Engineer), Malcolm John Amor Knocker (Accountant), Kenneth Claude Connop (Hire Car Proprietor), (Trustees Castle Cove Country Club)
1977-date	Castle Cove Country Club Limited

3.3 Database Searches (Lotsearch, 2024)

An environmental risk and planning report (Ref: Lotsearch LS056963 EL, dated 30 May 2024) was reviewed as part of this PSI, which included searches of various environmental resources and plans archived by statutory authorities. This full report is presented in **Appendix F**.

Relevant information is summarised as follows:

- No former gasworks or waste management were identified on the site or within a 1,000 m search buffer.
- The site was not part of the NSW EPA Per- and Poly- Fluoroalkyl Substances (PFAS) Investigation Program, Defence PFAS Investigation Program, Defence Management Program, or Air services Australia National PFAS Management Program.
- No Defence Controlled Areas (DCA) or National Unexploded Ordnance (UXO) was identified on the site or within a 1,000 m search buffer.
- The site was not recorded on the NSW EPA Other Sites with Contamination Issues Dataset.
- Five former licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within a 1,000 m search buffer, including three for application of herbicides, 173 m north-east, up-gradient and two for waste generation or storage, 883 and 976 m west, down-gradient of the site. The occurrence of off-site contamination migration for the three activities conducted up-gradient is considered to be low.
- No dry cleaners, motor garages or service stations were identified from the historical business directories between 1948 and 1993 within a 1,000 m search buffer.
- No dryland salinity area was identified on the site. No mining subsidence district was present within a 1,000m search buffer.
- No ecological (native vegetation, wetlands, groundwater / inflow dependent ecosystems) constraints applied to the site.
- There was no mining subsidence districts listed within a 1,000 m search buffer.

In summary, the database search indicated that no evidence of contaminative activities on site or in the near vicinity. In particular there was no evidence of heavy industry or major petrochemical storage on the site or in the near vicinity.

3.4 Council Searches

A request to access property files archived by Willoughby Council was submitted on 30 May 2024. At the time of writing this report, a response from Council was yet to be received. If records that relate to (possible) environmental / contaminating activities become available, an addendum to this report will be submitted.

3.5 Safework NSW Dangerous Goods Search (DGS)

A search of the *Stored Chemical Information Database* maintained by Safework NSW was requested by EI on 3 June 2024. This database contains information relating to the storage of dangerous goods, in particular the presence of (licensed) underground and aboveground storage tanks.

The Safework NSW database search did not identify any relevant information corresponding to the site (**Appendix G**).

One depot was identified in the Dangerous Goods Search database, located 100 m north-west, cross-gradient of the site (**Figure A.2, Appendix A**), as detailed in **Table 3-3**. This identified depot aligns with the observations made in **Section 2.4.2**.

Table 3-3 Details of Depot

Depot No.	Depot Type	Goods Stored in Depot	Class	Quantity (L)	Licensee	Licence Expiry Date
PET 1	Roofed Store	UN 1203 PETROL	Class 3	600	Castle Cove Country Club Ltd	12 March 2004

The depot is a storage area for keeping of small quantities of fuel in drums. The fuel is likely used for equipment to maintain the fairways of the golf course. The potential for significant hydrocarbon leakage from the depot is considered to be localised to near-surface.

3.6 On-site interview

EI conducted an interview with a representative of Castle Cove Golf Club on 30 May 2024, and noted the following:

- No aboveground fuel storage tank or underground petroleum storage system (UPSS) present on the site since at least 2006;
- An aboveground fuel storage unit (concrete) is located 100 m north-west, cross-gradient of the site, under the jurisdiction of the local council (See **Section 3.5**);
- An on-site grease trap was in use at the time of the inspection and it was associated with an operational club restaurant located within the Building A, Area 4.

3.7 Previous Investigation

A Preliminary In-situ Waste Classification was conducted by Douglas Partners Pty Ltd (DP) for the property at 74 Deepwater Road, Castle Cove. This assessment was documented under the following report:

- Douglas Partners, Preliminary In-situ Waste Classification Proposed Country Club and Seniors Living Building, 68 Deepwater Road¹, Castle Cove, reference: 218311.00.R.002.Rev0, dated 23 February 2023.

A summary of the key findings is provided in **Table 3-4**. The full report is attached in **Appendix H**.

Table 3-4 Summary of the Previous Investigation

Project Task	Findings
Objectives	The objective was to provide the information on the waste classification of the sub-surface soils.
Scope of Works	<p>The scope of works included:</p> <p>Review of aerial imagery and EPA notices;</p> <p>Inspection of the site to assess the potential for contamination;</p> <p>Sampling and analytical testing 15 samples from 10 boreholes, comprising heavy metals (cadmium, copper, lead, mercury, nickel, and zinc), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, and xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCP), organophosphorus pesticides (OPP), phenols, polychlorinated biphenyls (PCB), and asbestos;</p> <p>Interpreting the analytical results and reporting as per the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014).</p>
Soil descriptions	<p>Fill materials comprised fine to medium grained dark grey sand, with clay, angular to sub-angular gravel inclusions, and traces of rootlets, fill materials depths ranging from the site surface to 1.8 metre below ground level (mBGL). Deeper fill layer present along the building perimeter (BH7 and BH9).</p> <p>Natural materials comprised medium to coarse grained pale grey sandstone with some yellow-brown and red, moderately to slightly weathered, Hawkesbury Sandstone, natural materials depths starting from 0.1 (BH1) to 1.8 mBGL (BH7).</p> <p>Identified potential sources of contamination included imported fill materials used for levelling the site surface and hazardous materials (e.g. asbestos) used for the existing buildings.</p>
Analytical Results	All contaminant concentrations for the analysed fill samples were below the contaminant thresholds (CT1) for General Solid Waste (GSW, non-putrescible), except for chromium and in sample BH4_0.1-0.2, lead in sample BD01/13122022 and nickel in samples BD02/14122022 and BH4_0.1-0.2.

Project Task	Findings
	<p>BD01/11122022 and BD02/14122022 were the duplicate and triplicate samples of BH02_0.2-0.3.</p> <p>Further Toxicity Leaching Characteristics Procedure (TCLP) testing were conducted and indicated that the leachable concentration results were below the TCLP1 threshold for GSW (non-putrescible).</p>
Conclusion	<p>Fill: within the area subject to classification as shown on Drawing R.002.D.01, is classified as – General Solid Waste (non-putrescible).</p> <p>Natural: within the area subject to classification as shown on Drawing R.002.D.01, is classified as – Virgin Excavated Natural Material (VENM) underlying the fill above to the depth of proposed excavation.</p> <p>Three boreholes (BH1, BH7 and BH9) were converted to the groundwater monitoring wells for geotechnical investigation purpose. Two are located up-gradient and one is located down-gradient of the site. No groundwater samples were collected for environmental investigation purpose.</p> <p>Groundwater depth is inferred to range between 1.5 mBGL (BH1) and 10 mBGL (BH7).</p>
Conditions	<p>This preliminary classification was not to be used for waste disposal. Further work is required before a formal classification suitable for waste disposal can be provided.</p>

3.8 NSW EPA Online Records

As part of this PSI, EI conducted searches of public registers maintained by the NSW EPA for statutory notices and licensing agreements, issued under the Contaminated Land Management Act 1997 and the Protection of the Environment Operations Act 1997.

Record of Notices under Section 58 of CLM Act 1997

An online search of the contaminated land public record was conducted on 4 June 2024. This database is a searchable repository containing information on:

- Orders made under Part 3 of the CLM Act 1997;
- Notices available to the public under Section 58 of the CLM Act;
- Approved voluntary management proposals under the CLM Act 1997 that have not been fully carried out and where the approval of the NSW EPA has not been revoked;
- Site audit statements provided to the NSW EPA under Section 53B of the CLM Act 1997 that relate to significantly contaminated land;
- Where practicable, copies of anything formerly required to be part of the public record; and
- Actions taken by the NSW EPA under Section 35 or 36 of the *Environmentally Hazardous Chemicals Act 1985* (EHC Act 1985).

The search confirmed that neither the site nor surrounding lands within a 500 m radius were subject to any regulatory notices relevant to the aforementioned legislations.

List of NSW Contaminated Sites Notified to EPA

An online search was conducted through the *List of NSW Contaminated Sites Notified to the NSW EPA* under Section 60 of the CLM Act 1997 on 4 June 2024. This list is maintained by the NSW EPA and includes properties on which contamination has been identified, but not deemed to be impacted significantly enough to warrant regulation. The search confirmed that neither the site nor the surrounding lands within a 500 m radius were subject to any licensing agreements, notices, or programs relevant to the aforementioned legislation.

POEO Public Register

An online search was conducted of the *Protection of the Environment Operations Act 1997* public register on 4 June 2024. This register contains records pertaining to environmental protection licences, applications, notices, audits, pollution studies and reduction programs.

The search confirmed that neither the site nor the surrounding lands within a 500 m radius were subject to any licensing agreements, notices, or programs relevant to the aforementioned legislation.

3.9 Groundwater Bore Records and Local Groundwater Use

A review of Lotsearch report (2024) indicated 12 registered bores identified within a 2,000 m radius of the site. A summary of the registered bores is presented with selected details in **Table 3-5**.

Table 3-5 Registered Bores Summary

NSW Bore ID	Bore Type	Drill Date	Bore Depth (m)	SWL (mBGL)	Distance (m)	Direction
GW108481	Unknown	11/12/2007	216.0	-	815	South
GW111233	Monitoring	11/08/2010	4.3	1.8	1,367	South
GW111232	Monitoring	16/11/2010	4.5	2.4	1,378	South
GW111234	Monitoring	11/08/2010	4.5	2.4	1,393	South
GW026513	Irrigation	01/12/1966	64.0	-	1,427	South West
GW111007	Monitoring	19/04/2010	7.5	3.8	1,591	North West
GW111008	Monitoring	19/04/2010	7.5	3.8	1,599	North West
GW111006	Monitoring	19/04/2010	7.5	3.8	1,628	North West
GW114502	Monitoring	28/10/2010	8.0	2.5	1,631	South West
GW114503	Monitoring	28/10/2010	8.0	2.5	1,648	South West
GW114504	Monitoring	28/10/2010	8.0	2.5	1,654	South West
GW065075	Other	15/02/1994	150.0	44.0	1,950	North West

Note 1 SWL – Standing water level.

Note 2 Salinity and yield information were not available for any of the wells.

The records indicated that majority the registered water bores were installed for monitoring purposes, except for GW026513 and GW065075, located down-gradient and cross-gradient of the site. As such, they were not considered to be potential receptors to any site contamination.

4. CONCEPTUAL SITE MODEL

Following the guidelines outlined in NEPC (2013) *Schedule B2 – Guideline on Site Characterisation*, a Conceptual Site Model (CSM) was prepared, incorporating the findings obtained during this PSI. Potential contamination sources, exposure pathways, and receptors that were considered relevant for this assessment are summarised along with a qualitative assessment of the potential risks posed by compete exposure pathways.

4.1 Summary of Site History

Based on a review of historical information, the current buildings and their associated aboveground (on-grade) carparks on the site were first observed in the 1965 aerial imagery.

The surrounding road (Deepwater Road) appeared in the 1943 aerial imagery, indicating significant infrastructure development around the site. Port Jackson, approximately 300 m to the north-east and Scotts Creek, approximately 150 m to the south-west were observed in the imagery.

Residential housing appeared to undergo development approximately 370m north-west of the site in the 1955 aerial imagery.

The site and its surrounding lands have remained largely unchanged since at least 1965.

4.2 Sub-Surface Conditions

As per the waste classification report (DP, 2023), the fill materials consisted of fine to medium dark grey sand, with clay, trace rootlets, with angular to sub-angular gravel inclusions and medium to coarse grained pale grey sandstone boulders. Inclusions of foreign materials such as metal, glass and rubble were observed in fill from the boreholes (BH7, BH9) that were located around the building perimeter, indicating the imported fill materials of unknown origin and quality used for grading and levelling the site.

Natural materials comprised medium to coarse grained pale grey sandstone with some yellow-brown and red, moderately to slightly weathered, Hawkesbury Sandstone, natural materials depth started from 0.1 (BH1) to 1.8 mBGL (BH7). Sandstone outcropping was observed by DP (2023) at some locations

Groundwater depth is inferred to range between 1.5 mBGL (BH1) and 10 mBGL (BH7). It is anticipated to flow south-west, towards Scotts Creek and eventually the Pacific Ocean.

4.3 Potential Contamination Sources

The potential contamination sources are considered as follows:

- Potential imported fill materials of unknown origin and quality (used to grade the site);
- Deposition of hazardous building materials in near-surface soils (including asbestos containing materials (ACM), lead-based paints and other metals) due to weathering and uncontrolled demolition of former / existing building fabrics;
- Migration of mobile contaminants from adjacent properties (aboveground fuel storage unit, cross-gradient, low risk);
- Hydrocarbon leakage from vehicles; and
- Application of pesticides around building (footing) perimeter.

4.4 PFAS Assessment

NSW EPA (2017) requires that PFAS are considered when investigating land contamination. An assessment of the probability for PFAS occurrence is provided in **Table 4-1**. This was based on considerations outlined in the *PFAS National Environmental Management Plan* (HEPA, 2020) and the EnRisk (2016) decision tree. In this instance, the potential for PFAS to be present on-site was low and subsequently PFAS sampling / analysis of soil and groundwater was unwarranted.

Table 4-1 PFAS Decision Tree

Preliminary Screening	Probability	Justification
Is the past or present site activity listed in the HEPA (2020) ² as being an activity with risk of fire? If so list activity.	L	Site history does not indicate related activities occurred on-site.
Is the past or present off-site activity up-gradient or adjacent to the site listed in the HEPA (2020) ² as being an activity with risk of fire? If so list activity	L	Off-site (up-gradient or adjacent to the site) history does not indicate related activities occurred on-site.
Did fire training involving the use of suppressants occur on-site between 1970 and 2010?	L	Site history does not indicate fire-training activities occurred on-site.
Did fire training occur up-gradient of or adjacent to the site between 1970 and 2010?	L	Off-site (up-gradient or adjacent to the site) history does not indicate related activities occurred on-site or within a 500m radius.
Is an airport or fire station up gradient of or adjacent to the site? ¹	L	The closest fire station, Willoughby Fire Station, to the site is over 2 km, down-gradient, it is considered to have a low probability of occurrence on the site.
Have “fuel” fires ever occurred on-site? e.g. ignition of fuel (solvent, petrol, diesel, kerosene) tanks?	L	Above-ground fuel tank storage was observed during the site inspection, located approximately 100m north-west, and cross-gradient of the site. Therefore, the impact of contamination migration to the site is considered to be low.
Have PFAS been used in manufacturing or stored on-site? ²	L	Site history indicates the site has been used as a golf course since at least 1965.
Could PFAS have been imported to the site in fill materials from a site with activity listed in HEPA (2020)? Importation of fill materials of unknown chemical quality within the site.	L	N/A
Could PFAS-contaminated groundwater or run-off have migrated on to the site?	L	Site history indicates the site is located in a residential dominated area. Therefore, the potential for the contaminated groundwater migration to the site is considered to be low.
Is the site or adjacent sites listed in the NSW EPA PFAS Investigation Program? ⁵	L	No

Preliminary Screening	Probability	Justification
If the probability is medium or high in any of the rows, does the site analytical suite need to be optimised to include preliminary sampling and analysis for PFAS in soil (incl. ASLP testing) and waters? See explanation below.	-	No
<p>Note 1 Runoff from fire training areas may impact surface water, sediment and groundwater.</p> <p>Note 2 PFAS is used wide range of industrial processes and consumer products, including in the manufacture of non-stick cookware, specialised garments and textiles, Scotchguard™ and similar products (used to protect fabric, furniture, leather and carpets from oils and stains), metal plating and in some types of fire-fighting foam (https://www.nicnas.gov.au/chemical-information/factsheets/chemical-name/perfluorinated-chemicals-pfas)</p> <p>Note 3 If medium or high probability is applicable to any of the preliminary screening questions, the site analytical suite will be optimised to include preliminary sampling and analysis for PFAS in soil (ASLP Testing) and water.</p> <p>Note 4 L = Low, M = Medium, H = High</p> <p>Note 5 https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program</p>		

4.5 Emerging Chemicals

The NSW EPA uses Chemical Control Orders (CCOs), a primary legislative tool under the *Environmentally Hazardous Chemicals Act 1985*, to control chemicals of concern and limit their potential impact on the environment. Considerations for chemicals controlled by CCOs, and other potential emerging chemicals, are outlined in **Table 4-2**.

In this instance, the potential for an emerging chemical of concern to be present on-site was low, with the possible exceptions of polychlorinated biphenyls (PCB) and pesticides potentially present in fill of unknown quality potentially imported to the site.

Table 4-2 Emerging or Controlled Chemicals

Chemicals of Concern (CCO or emerging)	Decision
Were aluminium smelter wastes used or stored on site (CCO, 1986)?	No
Do dioxin contaminated wastes (CCO, 1986) have the potential to impact the site? ¹	No
Were organotin products (CCO, 1989) used or stored on site? ²	No
Were PCBs used or PCB wastes (CCO, 1997) stored on-site? ³	No
Were scheduled chemicals or wastes (CCO, 2004) used or stored? ⁴	Pesticides might have been potentially used historically around the building footings and/or present in imported fill. If present likely to be localised and near surface in the vicinity of building footings
Are other emerging chemicals suspected? ⁵	No
If Yes to any questions, has site sampling suite been optimised to include sampling for these chemicals of concern?	Yes. As per the report (DP, 2023), the analytical results of the samples were below OCPs and OPPs CT1 criteria of 0.05 mg/kg (NSW EPA, 2014).

- Note 1 From burning of certain chemicals, smelting or chemical manufacturing or fire on or near the Site.
- Note 2 From anti-fouling paints used or removed at boat & shipyards and marinas.
- Note 3 From older transformer oils & electrical capacitors
- Note 4 Twenty-four priority organochlorine pesticides and industrial by-products
- Note 5 Other chemicals considered as emerging e.g. 1,4 dioxane (associated with some VOCs).

4.6 Contaminants of Potential Concern (COPCs)

Based on the potential contamination sources described in **Section 4.3**, the COPCs at the site were considered to be:

- Heavy metals (HMs) – arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), lead (Pb), nickel (Ni) and zinc (Zn);
- Total recoverable hydrocarbons (TRHs);
- Benzene, toluene, ethylbenzene, xylene (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs);
- Organochlorine and organophosphate pesticides (OCPs and OPPs);
- Polychlorinated biphenyls (PCBs); and
- Asbestos.

4.7 Identified Receptors

The following potential receptors of site contamination are identified as follows:

- Current and future site users;
- Demolition and construction workers;
- Residents on the adjacent land during on-site demolition / construction works;
- Future intrusive workers; and
- Ecological receptors in areas of exposed soil / landscaping; and
- Down-gradient water body (Scotts Creek).

A qualitative assessment of the exposure pathways and associated risks to the identified human and environmental receptors relating to the potential sources of site contamination is summarised in **Table 4-3**.

Table 4-3 Potential Pollutant Linkages

Potential Source	Impacted Media	Contaminants of Potential Concern	Transport mechanism	Exposure pathway	Potential receptor	Source-Pathway-Receptor (SPR) Linkage
Imported fill of unknown origin and quality	Soil	HMs, TRHs, BTEX, PAHs, PCBs, OCPs, OPPs and asbestos	Disturbance of surface and subsurface soils during site redevelopment, future site maintenance and future use of the site post redevelopment	Ingestion Dermal contact Inhalation of particulates	Current and future site users Demolition / construction workers Adjacent site users Future intrusive workers	Potentially complete. Detailed Site Investigation (DSI) will be required, to address the identified data gaps in Section 4.8.
Hazardous building materials (e.g. asbestos, lead)			Atmospheric dispersion from soil to outdoor and indoor air spaces			
Application of pesticides						
Hydrocarbon leakage from cars in the car parking areas		TRHs, BTEX and PAHs	Volatilisation of contamination from soil and diffusion to indoor air spaces.	Inhalation of vapours		
	Groundwater	TRHs, BTEX and PAHs	Volatilisation of contamination from groundwater to indoor or outdoor air spaces (onsite and offsite)	Inhalation of vapours	Current and future site users Demolition / construction workers Adjacent site users Future intrusive workers	Potentially complete. Groundwater was not investigated for this PSI. Based on the potential contamination sources identified in Section 4.3 , along with the observation made in Area 2, Section 2.4.2 , groundwater investigation is recommended as part of the DSI.
			Disturbance of surface soils during site redevelopment, future site maintenance and future use of the site post redevelopment	Ingestion Dermal contact	Demolition / construction workers Future intrusive workers	
		HMs, TRHs, BTEX and PAHs	Migration of dissolved phase impacts in groundwater via diffusion and advection	Biota uptake	Scotts Creek Exposed soil and landscaping in the near vicinity	Potentially complete. Scotts Creek is less than 150m down-gradient of the site.

4.8 Data Gaps

As per NSW EPA (2022), an assessment of data gaps is provided in **Table 4-4**.

Table 4-4 Data Gap Assessment

Data Gap	Assessment
Soil sampling density below minimum guideline density.	<p>As per the report (DP, 2023), sampling was limited to 10 locations and was not designed to meet the minimum sampling density recommended in the Sampling Design Guideline (NSW EPA, 2022).</p> <p>A minimum of four additional sampling locations, targeting the existing carpark in the south-eastern portion and building perimeter in the north-eastern portion of the site, will be required to meet the minimum sampling density (NSW EPA, 2022).</p>
Groundwater	<p>As per the report (DP, 2023), three boreholes (BH1, BH7, and BH9) were converted to the groundwater monitoring wells for geotechnical investigation purposes, two are located up-gradient, and one is located down-gradient. However, DP (2023) did not provide analytical data for on-site groundwater quality, and also was not assessed in this PSI.</p> <p>Based on the potential contamination sources identified in Section 4.3, along with the observation made in Section 2.4.2, groundwater investigation is recommended as part of the DSI.</p>

5. CONCLUSIONS

A preliminary site investigation was conducted for the propriety located at 74 Deepwater Road, Castle Cove NS, also described as Lot 1 in Deposited Plan (DP) 610360 to assess the potential for contamination to exist on the land in support of RFI process following the submission of a DA for the Castle Cove Development works.

The key findings were as follows:

- The subject site had been used as a golf course country clubhouse since at least the 1960s. Surrounding lands are the golf course fairways and greens, and predominantly residential properties. No heavy industrial properties are present in the vicinity of the subject site.
- No evidence of gross contamination was noted during the inspection.
- No visual evidence of infrastructure associated with an underground storage tank (UST) was observed on the site.
- The site and surrounding lands within a 500m radius were found to be free of statutory notices and licensing agreements issued under the Contaminated Land Management Act 1997 and Protection of the Environment Operations Act 1997.
- The site was not included on the List of NSW Contaminated Sites Notified to the NSW EPA.
- The site is within an area of 'no known occurrence' for acid sulfate soil (ASS).
- The previous investigation for preliminary waste classification (DP 2023) described the subsurface lithology as fill materials consisting of fine to medium dark grey sand and pale grey sandstone boulders (to 1.8 mBGL) with foreign inclusions such as metal, glass, and rubble (at borehole BH7), overlying pale grey sandstone bedrock. Groundwater was observed between 1.5 mBGL (BH1) and 10 mBGL (BH7).

Based on the findings of this PSI, and with consideration of EI's *Statement of Limitations* (**Section 7**), there was a low potential for contamination to exist on the site. In accordance with *State Environmental Planning Policy (Resilience and Hazards) 2021*, the site is suitable for the proposed redevelopment works, subject to the implementation of the recommendations in **Section 6**.

6. RECOMMENDATION

EI provides the following recommendations in relation to the proposed development of the site:

- A complementary Hazardous Material Survey (HMS) should be conducted **prior** to the commencement of any demolition works. All identified hazardous materials must be appropriately managed to maintain workers health and safety during the demolition works and to prevent the spread of hazardous materials onto the site soil surfaces.
- The qualitative CSM established that potential SPR linkages existed on the site, as per **Table 4.3**. A Detailed Site Investigation (DSI) should be conducted following the demolition of the existing building structures. The scope of the DSI is to be appropriate for the proposed development and is to consider the data gaps presented in **Section 4.8**. A groundwater monitoring event (GME) should be conducted at existing monitoring wells.
- Following removal of the existing asphalt / bitumen layer and other aboveground structures, an inspection of the exposed soil surface should be performed by a suitably qualified environmental consultant, to check for any visible signs of contamination (in particular fragments of fibre cement sheeting or stained / odours soil).
- Any surplus soil materials that are designated for off-site disposal (e.g. excavation of basement carpark, foundations, drainage and service lines), must be classified in accordance with the NSW EPA (2014) Waste Classification Guidelines, with the analytical suite to include the identified potential contaminants (**Section 4.6**). Once appropriately classified, all waste materials are to be transported to EPA-licensed waste facilities by the appointed waste contractors. All tipping dockets supplied by the landfill companies are to be retained, to confirm the appropriate (lawful) disposal wastes.
- Outline the protocols for any importation of soil to the site (e.g. for filling / landscaping). Any soil materials that are imported to the site must be validated as suitable for the intended use or be classified as Virgin Excavated Natural Materials (VENM) in accordance with NSW EPA guidelines.

EI emphasise that these recommendations can be satisfied as conditions of consent.

7. STATEMENT OF LIMITATIONS

This report has been prepared for the exclusive use of Taylor Developments Group Pty Ltd, which is the only intended beneficiary of EI's work. The scope of the investigation carried out for the purpose of this report was limited to that agreed with Taylor Developments Group Pty Ltd.

No other party should rely on this document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

The findings presented in this report are the result of discrete and specific sampling methodologies used in accordance with best industry practices and standards. Due to the site-specific nature of soil sampling from point locations, it is considered likely that all variations in subsurface conditions across a site cannot be fully defined, no matter how comprehensive the field program.

While normal assessments of data reliability have been made, EI assumes no responsibility or liability for errors in any data obtained from previous assessments conducted on site, regulatory agencies (e.g. Council, NSW EPA), statements from sources outside of EI, or developments resulting from situations outside the scope of works of this project.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events (e.g. groundwater movement and or spillages of contaminating substances). These changes may occur subsequent to EI's investigation.

EI's assessment is necessarily based upon the results of the site investigation and the restricted program of surface and subsurface sampling, screening and chemical analysis, which was set out in the project proposal. Neither EI, nor any other reputable consultant, can provide unqualified warranties nor does EI assume any liability for site conditions not observed or accessible during the time of the investigations.

This report was prepared for Taylor Developments Group Pty Ltd and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

This report and associated documents remain the property of EI subject to payment of all fees due for this assessment. The report shall not be reproduced except in full and with prior written permission by EI.

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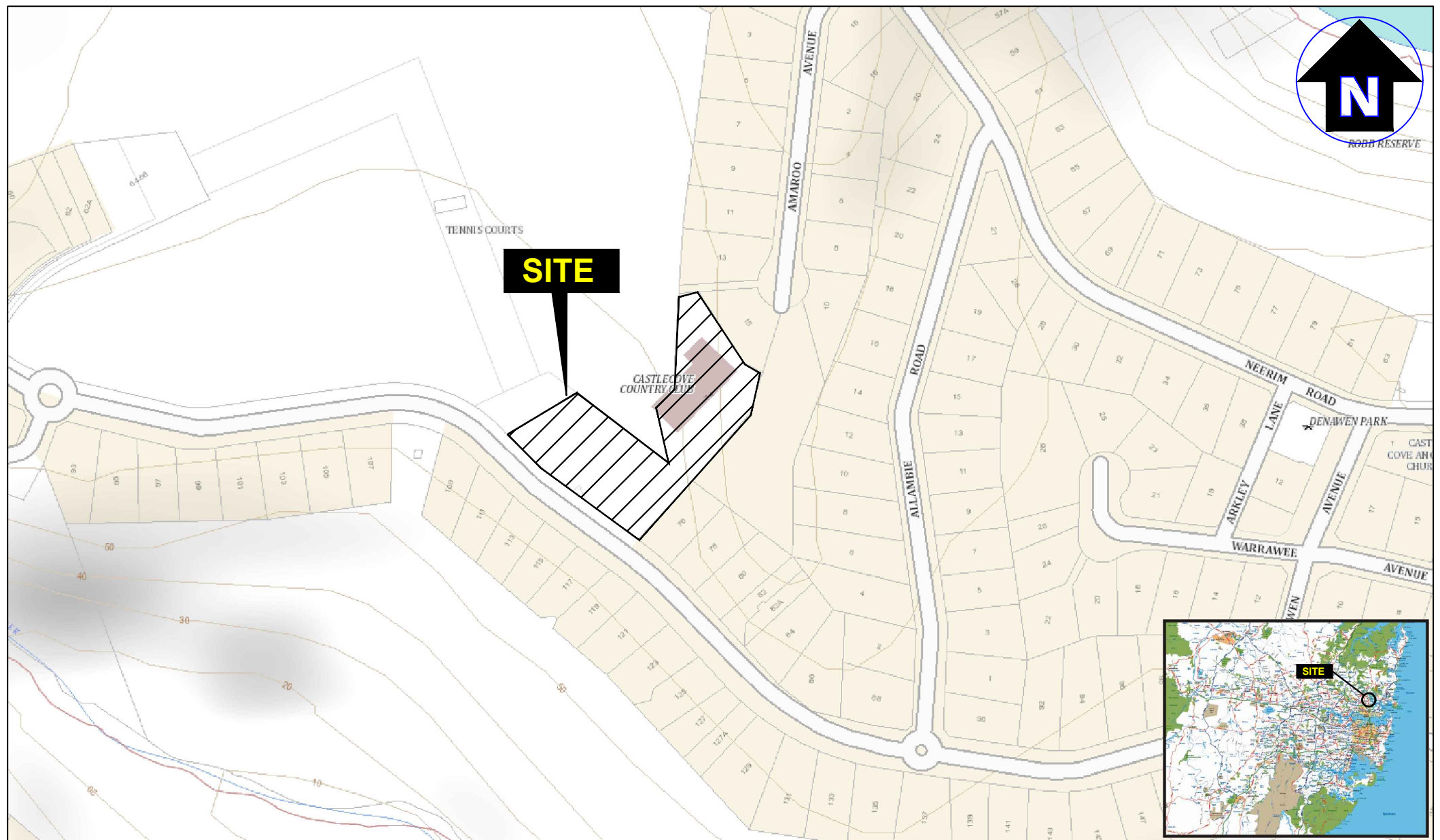
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ABBREVIATIONS

ACM	Asbestos-Containing Materials
ANZG	Australian and New Zealand and Australian State and Territory Governments
AS	Australian Standard
ASS	Acid Sulfate Soils
B(a)P	Benzo(a)Pyrene (a polycyclic aromatic hydrocarbon compound)
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CBD	Central Business District
CLM	Contaminated Land Management
COC	Chain of Custody
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DA	Development Application
BYDA	Before You Dig Australia
DP	Deposited Plan
DQI	Data Quality Indicators
DQO	Data Quality Objectives
NSW EPA	Environment Protection Authority (of New South Wales)
F1	C ₆ -C ₁₀ TRH less sum of BTEX concentrations
F2	>C ₁₀ -C ₁₆ TRH less naphthalene
F3	>C ₁₆ -C ₃₄ TRH
F4	>C ₃₄ -C ₄₀ TRH
FCS	Fibre Cement Sheeting
HIL	Health-based Investigation Level
HM	Heavy Metals
HMS	Hazardous Materials Survey
km	Kilometres
LGA	Local Government Area
m	Metres
mAHD	Metres Australian Height Datum
mBGL	Metres Below Ground Level
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OPP	Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PFAS	Per- or Poly- Fluoroalkyl Substances
SEPP	State Environmental Planning Policy
SIL	Soil Investigation Level
SRA	Sample Receipt Advice (document confirming laboratory receipt of samples)
SWL	Standing Water Level
TCLP	Toxicity Characteristics Leaching Procedure
TRH	Total Recoverable Hydrocarbons (non-specific analysis of organic compounds)
UPSS	Underground Petroleum Storage System
USEPA	United States Environmental Protection Agency

Appendix A – Figures





LEGEND Note: All locations are approximate

- Site boundary
- Inferred Groundwater flow



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Taylor Development Group Pty Ltd
Preliminary Site Investigation
74 Deepwater Road, Castle Cove, NSW
Site Location Plan

Figure:

2

Project: E26387.E01_Rev1

Appendix B – Architecture Plans

68-74 DEEPWATER ROAD CASTLE COVE

DEVELOPMENT APPLICATION FOR THE CASTLE COVE COUNTRY CLUB AND 17 INDEPENDENT LIVING UNITS

November 2023

CouncilWilloughby Council

Lot & DPLot 1 DP 610360

ZoningR2 - Low Density Residential

Site Area5723 m²

Drawing Schedule

Sheet Number	Sheet Name	Revision	Rev Date
DA 1.00	Cover Sheet	A	2023.12.14
DA 1.01	Site Context	A	2023.12.14
DA 1.02	Site Analysis	A	2023.12.14
DA 1.03	Site & Surroundings	A	2023.12.14
DA 1.04	Design Response	A	2023.12.14
DA 2.01	Existing/Demolition Plan	A	2023.12.14
DA 3.01	Site Plan	A	2023.12.14
DA 3.02	Club - Ground Level	A	2023.12.14
DA 3.03	Club - Top of Ground Level	A	2023.12.14
DA 3.04	Club - Level 1	A	2023.12.14
DA 3.05	Club - Roof Level	A	2023.12.14
DA 3.20	Club - Sections	A	2023.12.14
DA 4.01	Club - South & East Elevations	A	2023.12.14
DA 4.02	Club - North & West Elevations	A	2023.12.14
DA 4.51	ILU - Basement Level	A	2023.12.14
DA 4.52	ILU - Lower Ground Level	A	2023.12.14
DA 4.53	ILU - Ground Level	A	2023.12.14
DA 4.54	ILU - Level 01	A	2023.12.14
DA 4.55	ILU - Level 02	A	2023.12.14
DA 4.56	ILU - Roof Level	A	2023.12.14
DA 4.59	ILU - Bus Stop Footpath	A	2023.12.14
DA 5.01	ILU - Sections	A	2023.12.14
DA 5.03	Overall Section through Site	A	2023.12.14
DA 5.20	ILU - South & East Elevations	A	2023.12.14
DA 5.21	ILU - North & West Elevations	A	2023.12.14
DA 6.00	Project Data Schedule	A	2023.12.14
DA 6.01	Sun Eye Diagram	A	2023.12.14
DA 6.02	Shadow Diagrams Existing vs Proposed	A	2023.12.14
DA 6.03	Side Setback 45 degrees	A	2023.12.14
DA 6.04	Cross Ventilation & Solar Access Diagrams	A	2023.12.14
DA 6.05	Height Limit	A	2023.12.14
DA 6.30	GFA Club Calculations	A	2023.12.14
DA 6.31	GFA ILU Calculations	A	2023.12.14
DA 6.33	Deep Soil Calculations	A	2023.12.14
DA 7.01	Club CGI - View 1	A	2023.12.14
DA 7.02	Club CGI - View 2	A	2023.12.14
DA 7.03	Club CGI - View 3	A	2023.12.14
DA 7.04	Club CGI - View 4	A	2023.12.14
DA 7.05	Overall CGI - View 5	A	2023.12.14
Grand total: 39			



NOT FOR CONSTRUCTION

Legend:

- Property Boundary
Rear/Side Setbacks
Front Setback
Hidden
Level Marker (Plan)
Level Marker (Elevation)
Top of Wall Level

Material Tag
See Material Board for code reference

- BRC-XX Brick
CONC-XX Concrete Finish
GL-XX Glass
LV-XX Louvers
MET-XX Metal
EWS-XX External Wall System
PMB-XX Permeable Driveway
PNT-XX Paint Finish
RF-XX Roof Sheeting
TIL-XX Timber

- Finishes
Tile
Carpet
Timber Floors
Grass
Gravel/Stone
Brickwork
Metal Sheet

- Hatches
Existing
Proposed
Demolished

- Existing Tree to be retained
Existing Tree to be removed
Proposed Planting/Tree

NOT FOR CONSTRUCTION

NOTES:

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- All dimensions in millimeters unless otherwise shown.
- Use figured dimensions only.
- Do not scale from drawings.
- Check all dimensions on site prior to construction.
- To be read in conjunction with all other documents.
- Report any discrepancies to Antoniades Architects Pty Ltd.
- All boundary dimensions and bearings to be verified by licensed surveyor prior to proceeding with work.

REV A FOR DA SUBMISSION DESCRIPTION BY MS DATE 2023.12.14

ANTONIADES
ARCHITECTS

www.antoniades.com.au
ACN 129 731 559

Nominated Architect: Andreas Antoniades
NSW Registration 7954

PROJECT PHASE
DEVELOPMENT APPLICATION
STATUS
FOR SUBMISSION

PROJECT NO.
22015DA
PROJECT
CC Country Club
ADDRESS
Castle Cove Country Club
CLIENT
Taylor

DRAWING SERIES
Plans - Club
DRAWING TITLE
Site Plan

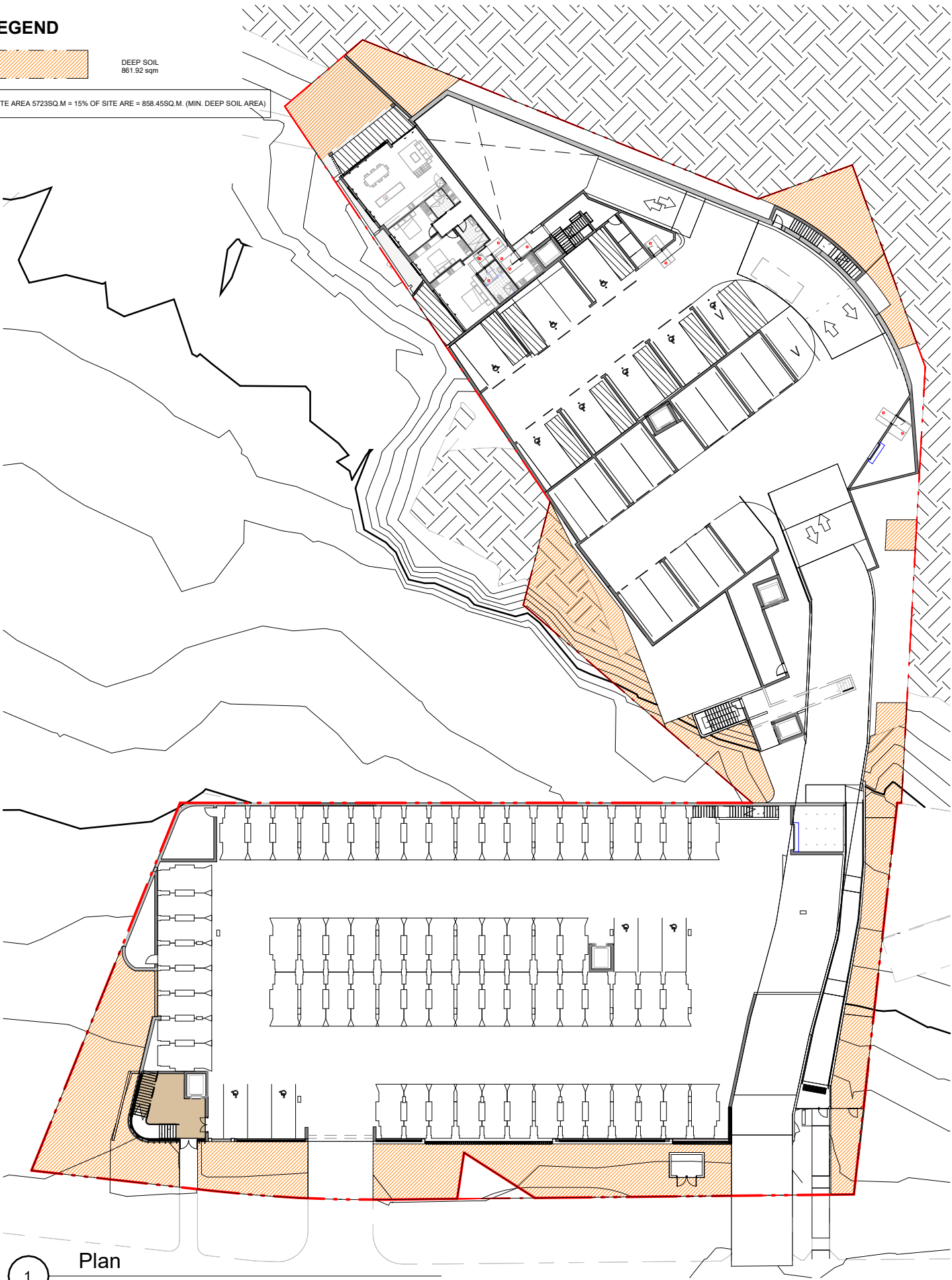
DRAWING NO.
DA 3.01
SCALE
As indicated
0m 4 8 10m
Scale 1:500

REVISION
A
DRAWN BY
MS
CHECKED BY
AA
NORTH

LEGEND

DEEP SOIL
861.92 sqm

SITE AREA 5723SQ.M = 15% OF SITE ARE = 858.45SQ.M. (MIN. DEEP SOIL AREA)



1

Plan
CARPARK LEVEL

1 : 500

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- Check all dimensions on site prior to construction.
- To be read in conjunction with all other documents.
- Report any discrepancies to Antoniades Architects Pty Ltd.
- All boundary dimensions and bearings to be verified by licensed surveyor prior to proceeding with work.

REV	DESCRIPTION	BY	DATE
A	FOR DA SUBMISSION	MS	2023.12.14

ANTONIADES
ARCHITECTS

www.antoniades.com.au
ACN 129 731 559

Nominated Architect: Andreas Antoniades
NSW Registration 7954

PROJECT PHASE
DEVELOPMENT APPLICATION

STATUS
FOR SUBMISSION

PROJECT NO.
22015DA

PROJECT
CC Country Club

ADDRESS
Castle Cove Country Club

CLIENT
Taylor

DRAWING SERIES
Design Analysis

DRAWING TITLE
Deep Soil Calculations

DRAWING NO.
DA 6.33

SCALE
1 : 500

0m 4 8 10m
Scale 1:500

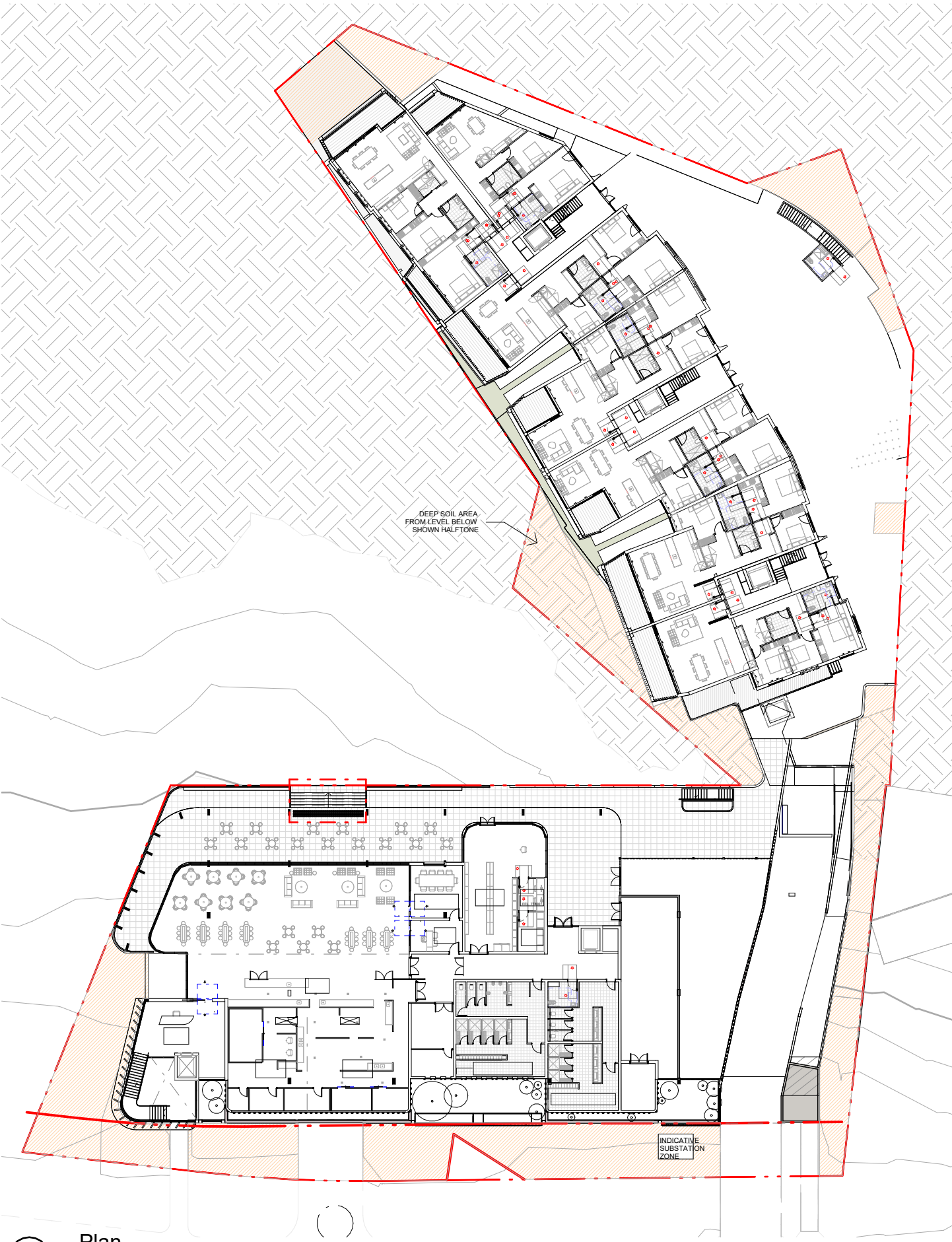
@A3

REVISION
A

DRAWN BY
LC

CHECKED BY
AA

NORTH



2

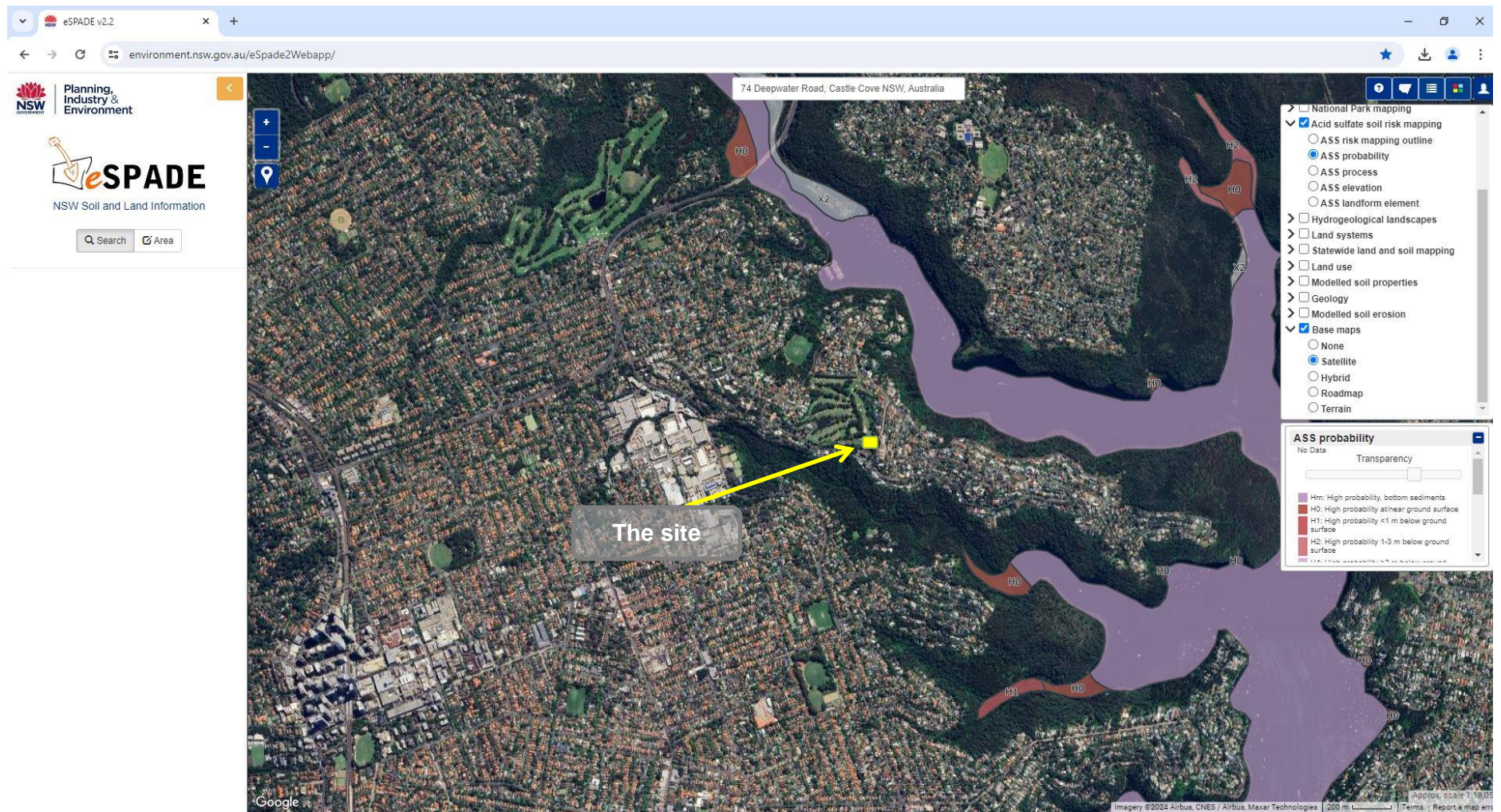
Plan
LEVEL 1 / GROUND LEVEL

1 : 500

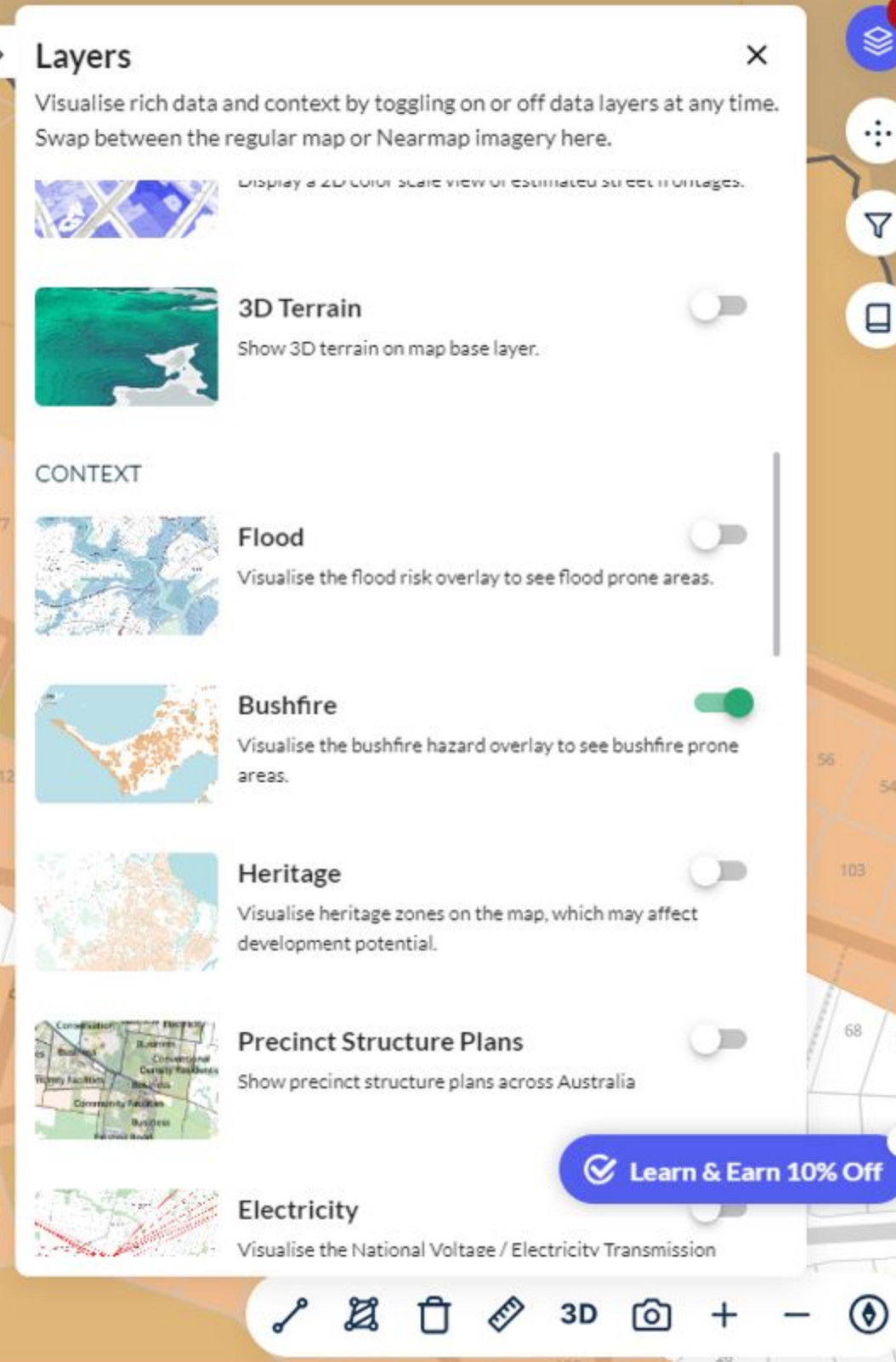
DEEP SOIL AREA
FROM LEVEL BELOW
SHOWN HALFTONE

INDICATIVE
SUBSTATION
ZONE

Appendix C – Bushfire Zone and ASS Map



Source: <https://www.environment.nsw.gov.au/eSpade2Webapp/>



Appendix D – Site Photographs



Photograph 1: Site frontage at 74 Deepwater Road, looking south, as observed on 30 May 2024.



Photograph 2: Bitumen hardstand surfaces (relatively poor condition) at the visitor carpark, looking east, as observed on 30 May 2024.



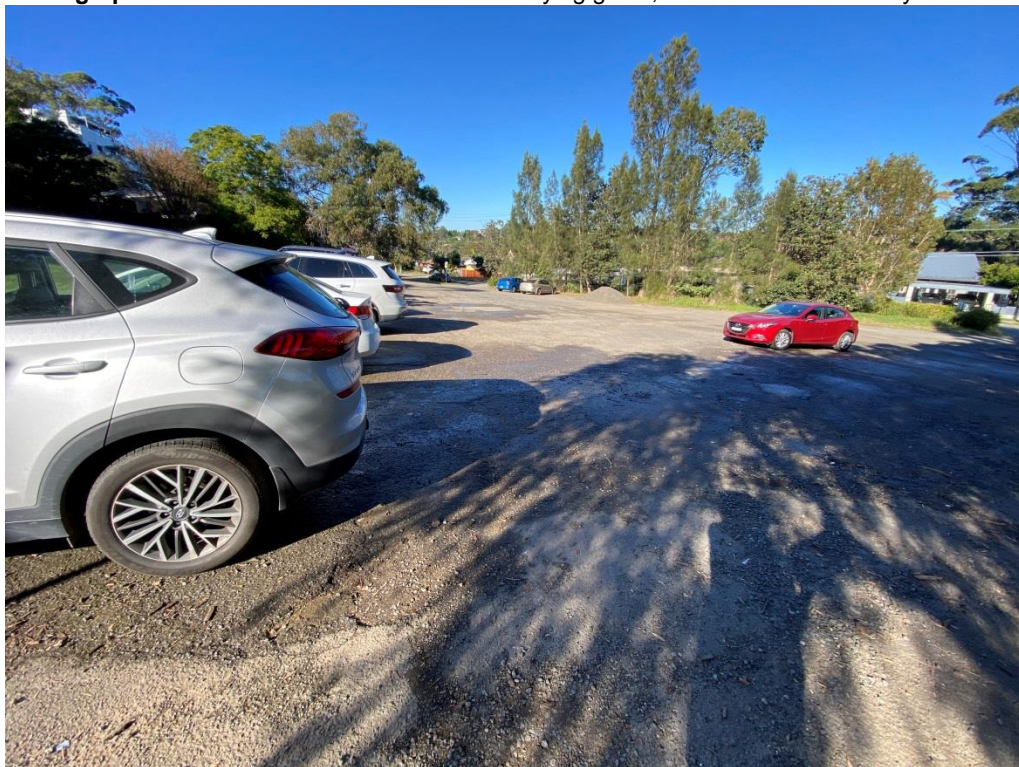
Photograph 3: One stockpile, 70m³, the soil materials consisted of sandy gravel, dark grey, fine to coarse grained sand, with 10-20 mm gravels in size, well graded, dry, as observed on 30 May 2024.



Photograph 4: One groundwater monitoring well near the site entrance, as observed on 30 May 2024.



Photograph 5: Area 2 surfaces covered with low-lying grass, as observed on 30 May 2024.



Photograph 6: Golf Course visitor carpark, as observed on 30 May 2024.



Photograph 7: One stockpile was observed at visitor carpark on 30 May 2024.



Photograph 8: Hillside to the east of the site, as observed on 30 May 2024.



Photograph 9: One storm water sump and a drainage sump were observed near the site exit on 30 May 2024.



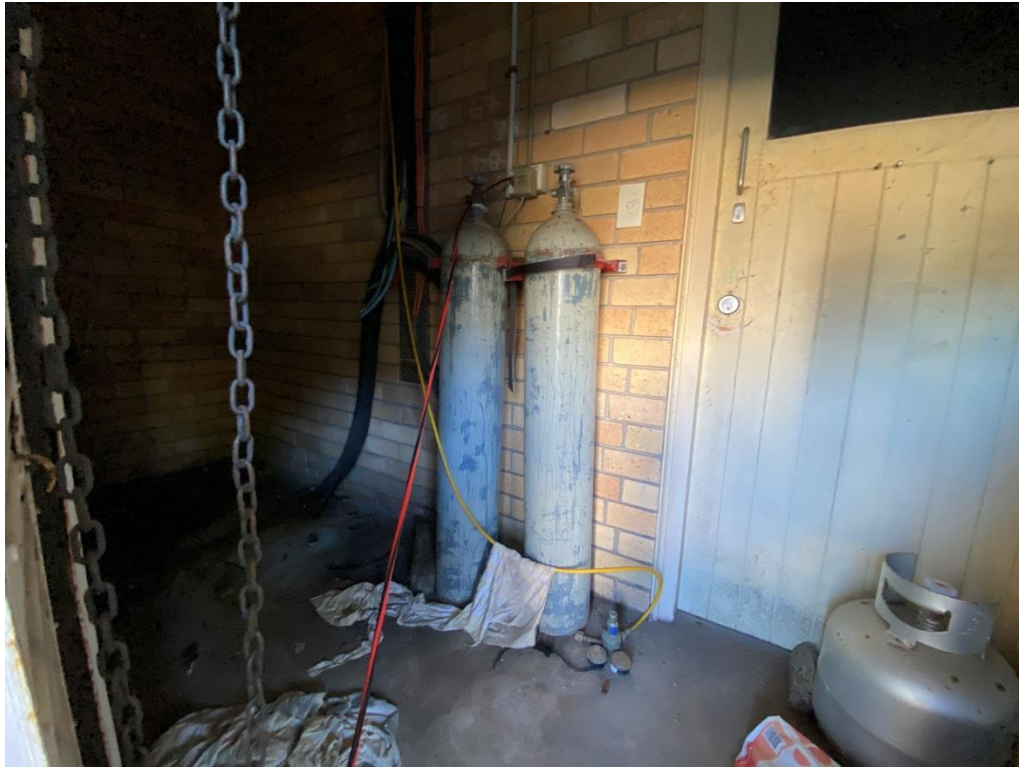
Photograph 10: Building A, brick construction, looking south, as observed on 30 May 2024.



Photograph 11: Under the veranda, along the western boundary of Building A, as observed on 30 May 2024.



Photograph 12: A grease trap unit, covered with blue plastic sheeting, as observed on 30 May 2024.



Photograph 13: Cylinders of carbon dioxide and LPG (RHS), as observed on 30 May 2024.



Photograph 14: A decommissioned electrical/gas generator unit, as observed on 30 May 2024.



Photograph 15: Building B, as observed on 30 May 2024.



Photograph 16:Two water tanks at the rear of Building B, as observed on 30 May.



Photograph 17: A groundwater monitoring well was observed on the driveway behind Building B, on 30 May 2024.



Photograph 18: Shells on the soil surface along Building B perimeter, was observed on 30 May 2024.



Photograph 19: An elevated area covered with dense vegetation, as observed on 30 May 2024.



Photograph 20: An aboveground, fuel storage unit (concrete) located in golf course area outside of subject site. Observed on 30 May 2024.

Appendix E – Land Title Search



ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Re: - 74 Deepwater Road, Castle Cove

Description: - Lot 1 D.P. 610360

As regards the parts tinted yellow and grey on the attached Cadastral Records Enquiry Report

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
	<u>As regards the parts tinted yellow</u>	
May 1921 (1921 to 1959)	Greater Sydney Development Association Limited	Volume 3184 Folio 143 Then Volume 5319 Folio 150 Now Volume 6529 Folio 233
02.11.1959 (1959 to 1963)	Headland Developments Pty Limited	Volume 6529 Folio 233 Now Volume 8223 Folio 180
	<u>As regards the part tinted grey</u>	
	This part was formerly a Crown Road now closed.	
03.02.1961 (1961 to 1963)	Headland Developments Pty Limited	Volume 8084 Folio 211 Now Volume 8223 Folio 180
	<u>Continued as regards both parts</u>	
04.09.1963 (1963 to 1963)	Alexander Gamble (Engineer) Robert Stanley Steel (Medical Practitioner) James Matthews (Overseer) (? Trustees Castle Cove Country Club)	Volume 8223 Folio 180
04.09.1963 (1963 to 1977)	Alexander Gamble (Engineer) Malcolm John Amor Knocker (Accountant) Kenneth Claude Connop (Hire Car Proprietor) (? Trustees Castle Cove Country Club)	Volume 8223 Folio 180
15.09.1977 (1977 to date)	Castle Cove Country Club Limited	Volume 8223 Folio 180 Then Volume 14210 Folio 43 Now 1/610360

Denotes current registered proprietor



ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards the parts tinted pink and blue on the attached Cadastral Records Enquiry Report

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
	<u>As regards the part tinted pink</u>	
May 1921 (1921 to 1959)	Greater Sydney Development Association Limited	Volume 3184 Folio 143 Then Volume 5319 Folio 150 Now Volume 6529 Folio 233
02.11.1959 (1959 to 1963)	Headland Developments Pty Limited	Volume 6529 Folio 233 Now Volume 8223 Folio 178
	<u>As regards the part tinted blue</u>	
	This part was formerly a Crown Road now closed.	
03.02.1961 (1961 to 1963)	Headland Developments Pty Limited	Volume 8084 Folio 211 Now Volume 8223 Folio 179
	<u>Continued as regards both parts</u>	
04.09.1963 (1963 to 1963)	Alexander Gamble (Engineer) Robert Stanley Steel (Medical Practitioner) James Matthews (Overseer) (? Trustees Castle Cove Country Club)	Volume 8223 Folio 179
04.09.1963 (1963 to 1977)	Alexander Gamble (Engineer) Malcolm John Amor Knocker (Accountant) Kenneth Claude Connop (Hire Car Proprietor) (? Trustees Castle Cove Country Club)	Volume 8223 Folio 179
15.09.1977 (1977 to date)	Castle Cove Country Club Limited	Volume 8223 Folio 179 Then Volume 14210 Folio 43 Now 1/610360

Denotes current registered proprietor

As regards the part tinted green on the attached Cadastral Records Enquiry Report

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
May 1921 (1921 to 1960)	Greater Sydney Development Association Limited	Volume 3184 Folio 143 Then Volume 5319 Folio 150 Volume 6529 Folio 233 Now Volume 7911 Folio 139
30.08.1960 (1960 to 1963)	Manufacturers' Mutual Insurance Custodian Trustees (Canberra) Limited	Volume 7911 Folio 139 Then Volume 7977 Folio 71 Now Volume 8363 Folio 115



ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Continued as regards the part tinted green on the attached Cadastral Records Enquiry Report

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
04.10.1963 (1963 to 1963)	Alexander Gamble (Engineer) Mervyn McGrath (Printer) Oswald D'Arcy Garrard (Company Director) (? Trustees Castle Cove Country Club)	Volume 8363 Folio 115 Now Volume 8476 Folio 86
04.09.1963 (1963 to 1977)	Alexander Gamble (Engineer) Malcolm John Amor Knockner (Accountant) Kenneth Claude Connop (Hire Car Proprietor) (? Trustees Castle Cove Country Club)	Volume 8476 Folio 86
15.09.1977 (1977 to date)	Castle Cove Country Club Limited	Volume 8476 Folio 86 Then Volume 14210 Folio 43 Now 1/610360

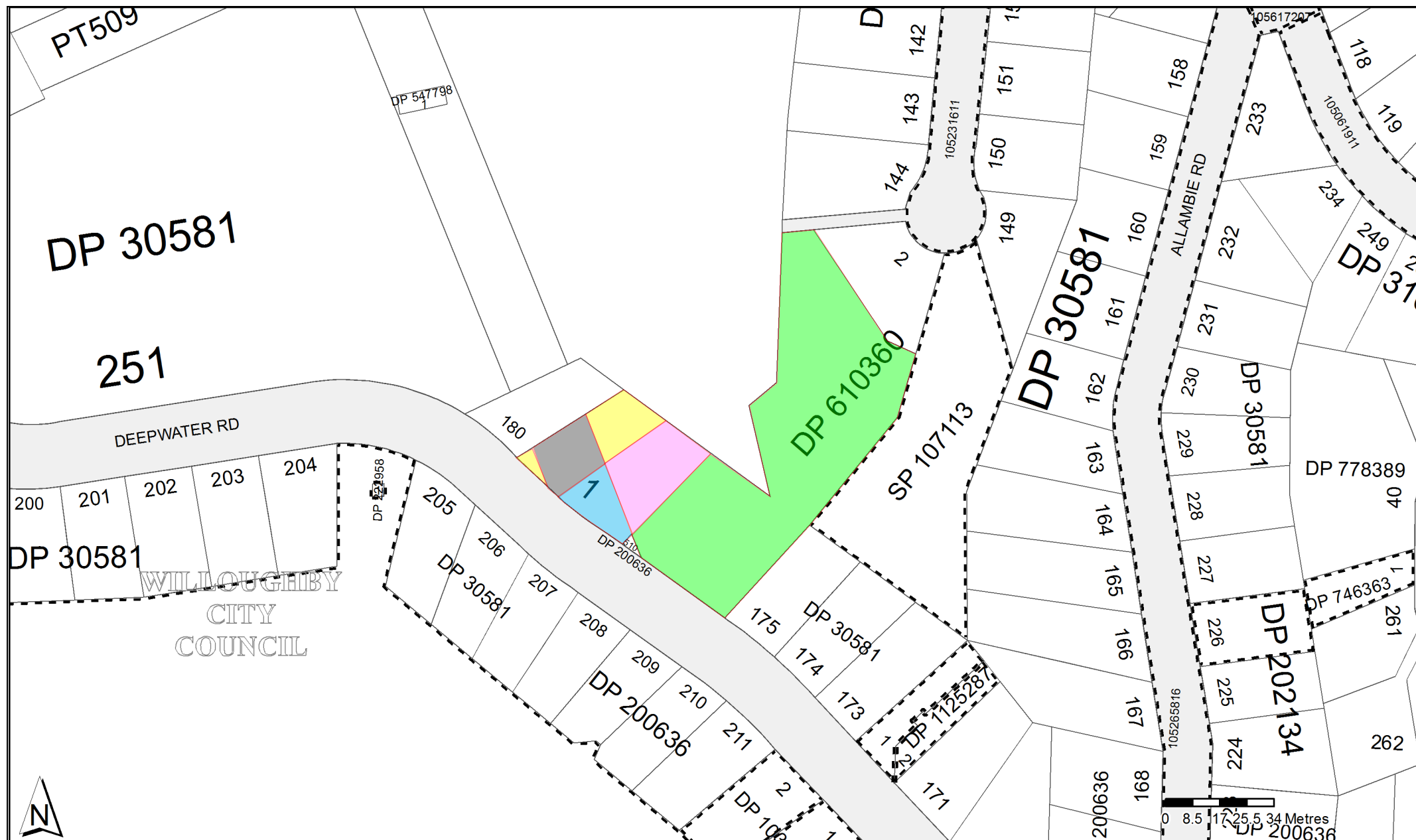
Denotes current registered proprietor

Easements: - NIL

Leases: -

- Various telecommunication leases found but not investigated.

Yours Sincerely
Mark Groll
31 May 2024





PLAN FORM 2

Plan Drawing only to appear in this space

DP 0610360

OFFICE USE ONLY

Signatures and seals only

THE COMMON SEAL OF CASTLE COVE COUNTRY CLUB LIMITED WAS AFFIXED HERETO BY AUTHORITY OF ITS BOARD OF DIRECTORS IN THE PRESENCE OF

SECRETARY

DIRECTORS



Edmund
Acting Assistant District Secretary
Officer

Council Clerk's Certificate

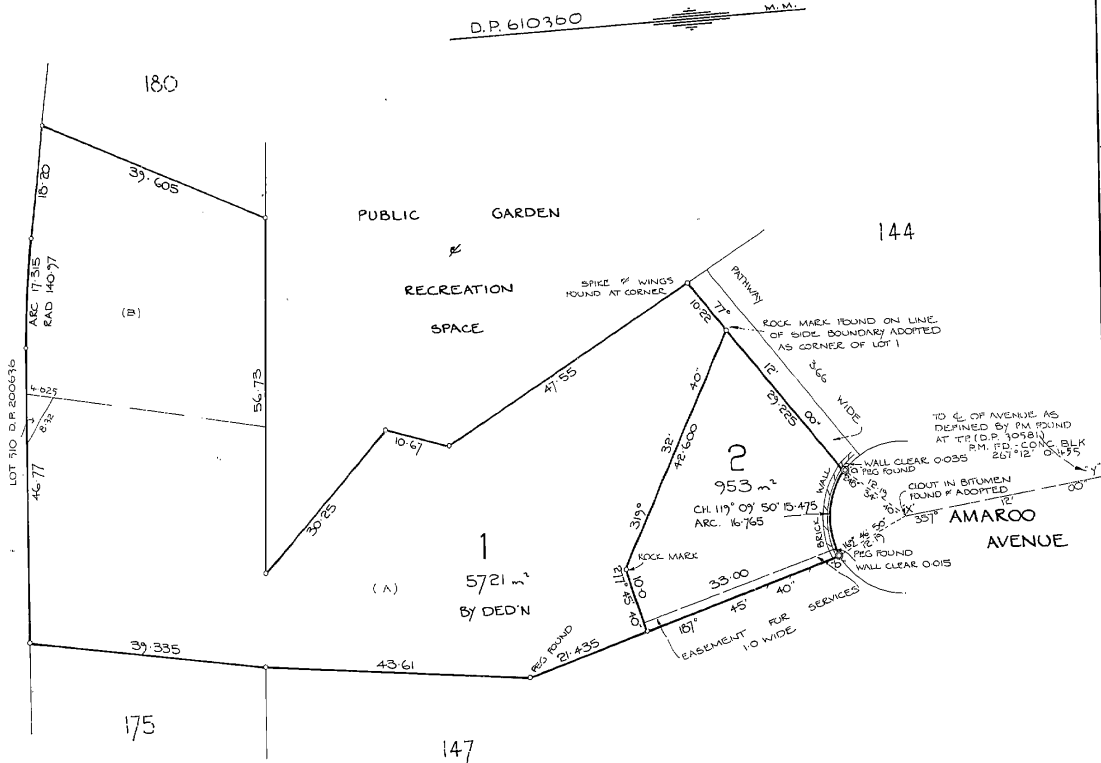
I hereby certify that:
(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and
(b) the requirements of section 34B of the Metropolitan Water, Sewerage and Drainage Act, 1924, as amended, (Metropolitan Water, Sewerage and Drainage Act, 1924, as amended, 1938, as amended)

have been complied with by the applicant in relation to the proposed Subdivision
"Insert 'new road' or 'consolidated lot' set out herein"
Subdivided No. 3361
Date 15.5.1980

Signature of Council Clerk

*This part of certificate to be deleted when the application is only for a consolidated lot or the opening of a new road or where the land is to be subdivided in whole, outside the area of operation of the Metropolitan Water, Sewerage and Drainage Board and the Hunter-Drainage Water Board.
(Delete if inapplicable)

ROAD
WATER
DEEP



a. 16° 46' 50"	371	CH # W IN VEHICLE CROSSING
b. 246° 34' 40"	4-145	CH # W IN GUTTER

D. P. 610360

Registered: 24.7.1980

C.A. No. 3361 of 15-5-1980

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: U 1860-73

Last Plan: D.P. 30581, D.P. 200636

PLAN OF SUBDIVISION OF LOTS 145 & 146 OF D.P. 30581 AND LOTS 147 & 148 OF D.P. 200636

Reduction Ratio: 1:500
Lengths are in metres.

Min./Municipality: WILLOUGHBY

Locality: CASTLE COVE

Parish: WILLOUGHBY

County: CUMBERLAND

This document is not a plan in itself.
(Delete if inapplicable)

EDWARD FRANCIS HUNTER
"FRANK" HUNTER, of 22 WINSLOW STREET, MILDURA, VIC., a surveyor registered under the Surveyors Act, 1920, as amended, hereby certifies that the survey represented in this plan was made by him or under his supervision, and that it is accurate and has been made in accordance with the Survey Practice Regulations, 1933, and was completed on 11th MARCH 1980.

Signature: *Edward Francis Hunter*
Surveyor registered under Surveyors Act, 1920, as amended.
District of Ashburton, "X" - "Y".
(Strike out either (1) or (2), if none date of survey)

Panel for use only for statements of intention to dedicate public roads or to create public reserves, drainage reserves, easements or restrictions as to user.

PURSUANT TO SEC. 80B OF THE CONVEYANCING ACT 1919-1964 AS AMENDED IT IS INTENDED TO CREATE:

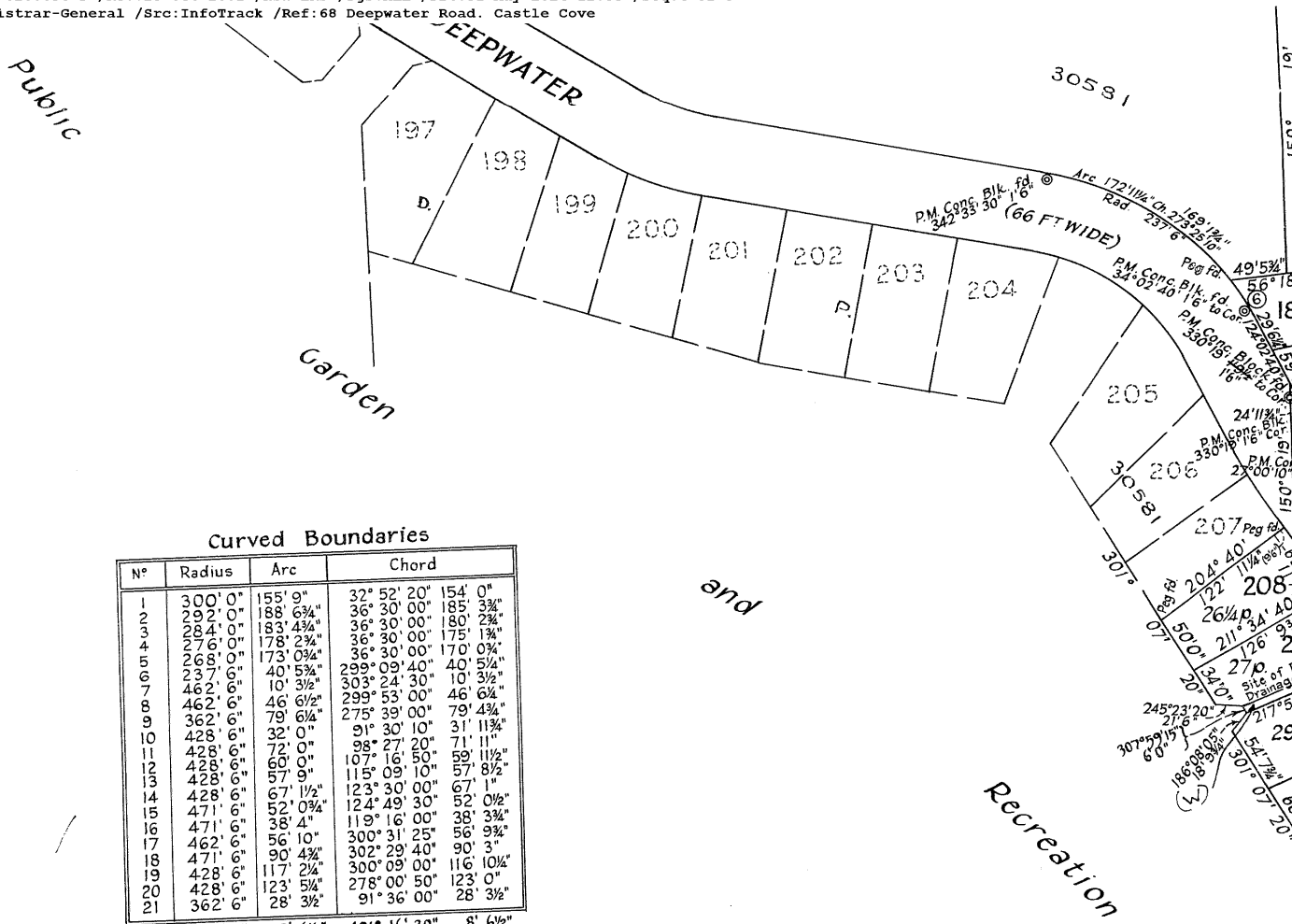
- EASEMENT FOR SERVICES
10 WIDE
- EASEMENT FOR USER
- RESTRICTION AS TO USER.

SURVEYOR'S REFERENCE: 23849

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

M.P.D.

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 25th day of July, 1980.



Curved Boundaries

N°	Radius	Arc	Chord
1	300' 0"	155' 9"	32° 52' 20" 154' 0"
2	292' 0"	188' 6 3/4"	36° 30' 00" 185' 3 3/4"
3	284' 0"	183' 4 3/4"	36° 30' 00" 180' 2 3/4"
4	276' 0"	178' 2 3/4"	36° 30' 00" 175' 1 3/4"
5	268' 0"	173' 0 3/4"	36° 30' 00" 170' 0 3/4"
6	237' 6"	40' 5 3/4"	299° 09' 40" 40' 5 3/4"
7	462' 6"	10' 3 1/2"	303° 24' 30" 10' 3 1/2"
8	462' 6"	46' 6 1/2"	299° 53' 00" 46' 6 1/2"
9	362' 6"	79' 6 1/4"	275° 39' 00" 79' 4 3/4"
10	428' 6"	32' 0"	91° 30' 10" 31' 11 3/4"
11	428' 6"	72' 0"	98° 27' 20" 71' 11"
12	428' 6"	60' 0"	107° 16' 50" 59' 11 1/2"
13	428' 6"	57' 9"	115° 09' 10" 57' 8 1/2"
14	428' 6"	67' 1 1/2"	123° 30' 00" 67' 1"
15	471' 6"	52' 0 3/4"	124° 49' 30" 52' 0 1/2"
16	471' 6"	38' 4"	119° 16' 00" 38' 3 3/4"
17	462' 6"	56' 10"	300° 31' 25" 56' 9 3/4"
18	471' 6"	90' 4 3/4"	300° 29' 40" 90' 3"
19	428' 6"	117' 2 1/4"	300° 09' 00" 116' 10 1/4"
20	428' 6"	123' 5 1/4"	278° 00' 50" 123' 0"
21	362' 6"	28' 3 3/4"	91° 36' 00" 28' 3 3/4"
22	362' 6"	8' 6 1/2"	101° 16' 30" 8' 6 1/2"

It is intended to create an Easement for Support of Variable Width in favour of the Willoughby Municipal Council over the parts of Lots 225 & 226 shown as Site of Prop'd Eas. for Support Var Width.

It is intended to dedicate the Extensions of Deepwater and Allambie Roads to the public for road purposes

The Proposed Drainage Easements 6Ft. Wide within Lots 209 & 213 are intended to be appurtenant to Deepwater Road.

It is intended to consolidate Lot A with Lot 177, adjoining on the north-east.

The Proposed Easement for Support of Variable Width within Lots 208 to 218 inclusive, is intended to be appurtenant to Deepwater Road, and within Lots 225 & 226 is intended to be appurtenant to Allambie Road Extension.

It is intended to create a Drainage Easement 6Ft. Wide in favour of the Willoughby Municipal Council over the part of Lot 189 shown as Site of Proposed Drainage Easement 6 Feet Wide.

NOTE:
 Lots 224, 225 & 226 have been deleted from this plan.

Deletion of the above lots from this plan is acceptable to The Council of the Municipality of Willoughby.
 Town Clerk.

The Council of the Municipality of Willoughby, New South Wales, do hereby certify that the requirements of the Local Government Act, 1919, (other than the requirements for the registration of plans), have been complied with by the applicant in relation to the proposed subdivision (insert "new road" or "subdivision" as the case may be) herein.

Approved by Council and covered by Council Clerk's Certificate No. 2603 Date 25/4/02

Town Clerk

Approved by the Council and Certified in accordance with the Provisions of Section 327 of the Local Government Act, 1919.

Subdivision No.

Council Clerk

Datum line of Azimuth: A-B

I hereby certify that the requirements of the Local Government Act, 1919, (other than the requirements for the registration of plans), have been complied with by the applicant in relation to the proposed subdivision (insert "new road" or "subdivision" as the case may be) herein.

Signature
 Council Clerk

DP200636 (E)

DP

Plan Form No. 1 (For Deposited Plan)

DP 200636 (E)

Municipality of Willoughby
Shire of

PLAN
of Subdivision of Lots R to Z incl. D.P. 30
the Land comprised in C.T. Vol. 65
and Crown Grant Vol. 8084
PARISH OF WILLOUGHBY COUNTY

Scale 100 Feet to an inch

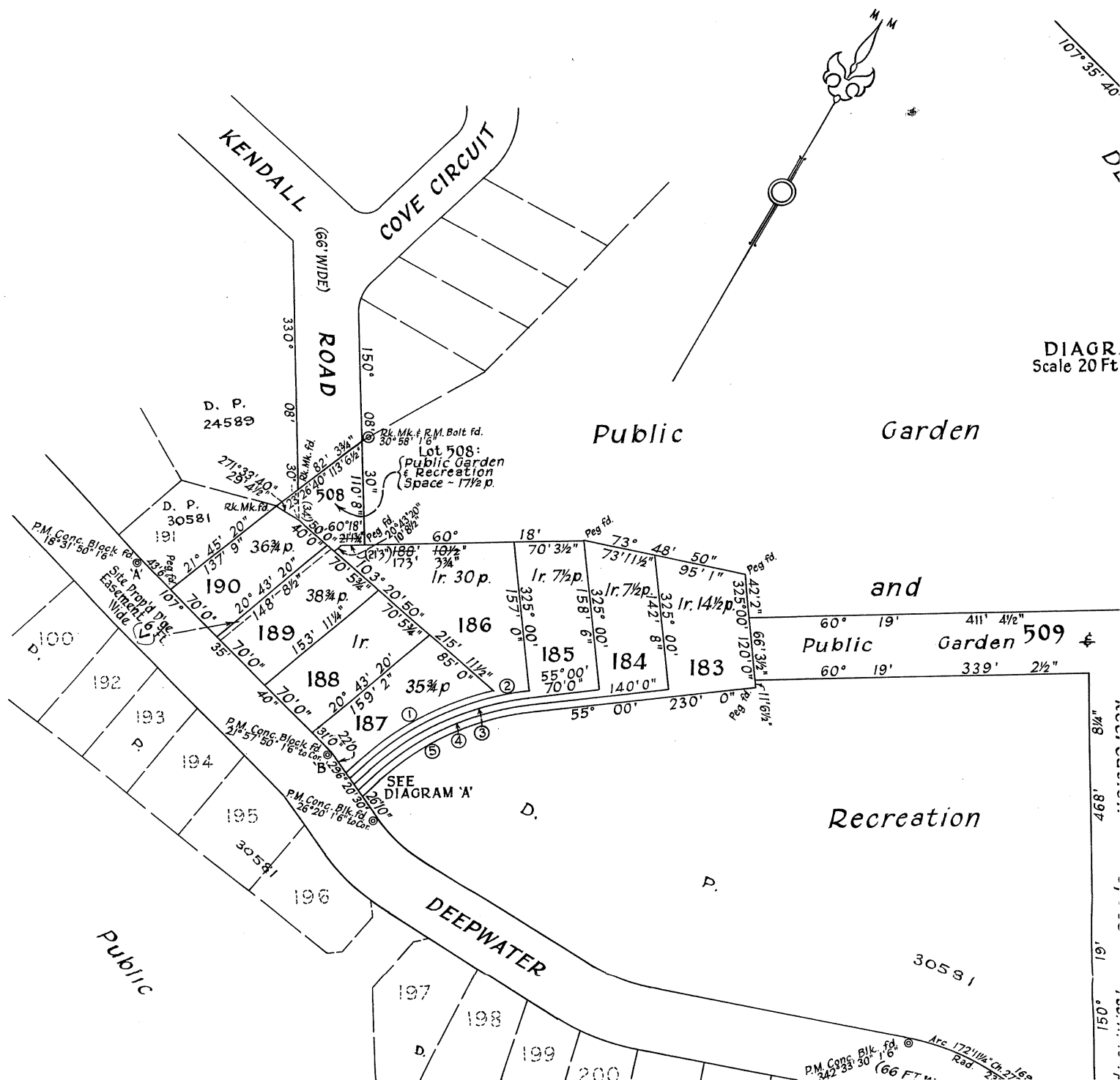
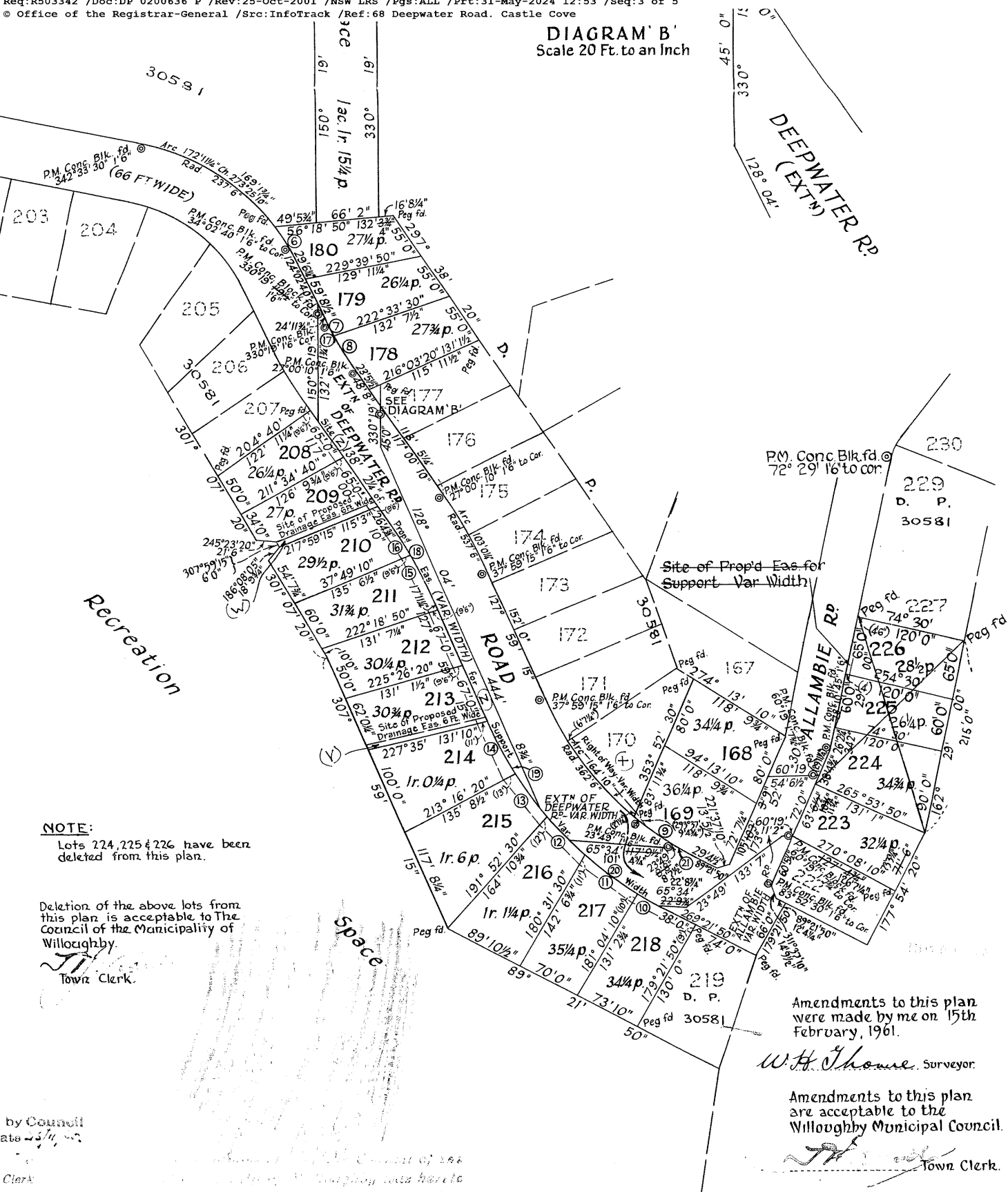


DIAGRAM 'B'
Scale 20 Ft. to an Inch



by Council
at 25/4 52.

ClerA

ments of the
er than the
n of plans),
e applicant
... ..
on) set out

2000

I, William Henry Thorne
of 149 Castlereagh St., Sydney

a surveyor registered under the Surveyors Act, 1929-1946, hereby certify that the survey represented in this plan is accurate and has been made * (1) by me (2) under my immediate supervision in accordance with the Survey Practice Regulations, 1933, and was completed on 13th Nov. 1959.

(Signature) *W. B. Thorne.*
Surveyor registered under the Surveyors Act, 1929-46.

DP 200636

PLAN

to Z incl. D.P. 30581 and part of
 in C.T. Vol. 6529 Fol. 233
 Grant Vol. 8084 Fol. 211
 SHBY COUNTY OF CUMBERLAND

le. 100 Feet to an inch

DP 200636 (E)	
2603 (25/11/1960)	
R.P.	
Subdivision	
Roll Plan	888
D.P.	30581

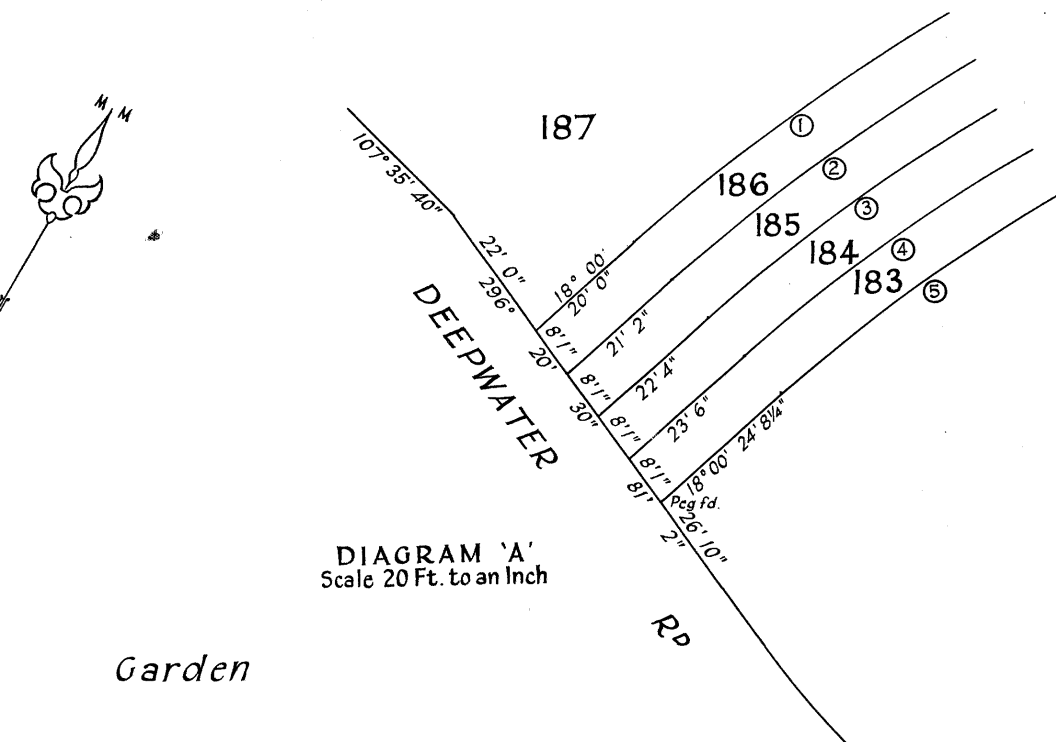
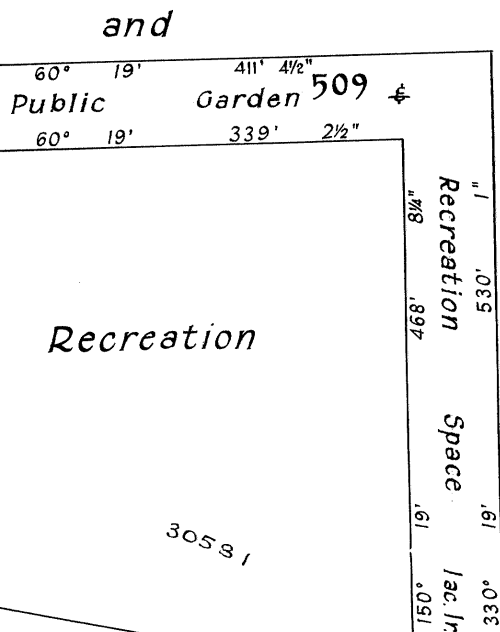


DIAGRAM 'A'
 Scale 20 Ft. to an Inch

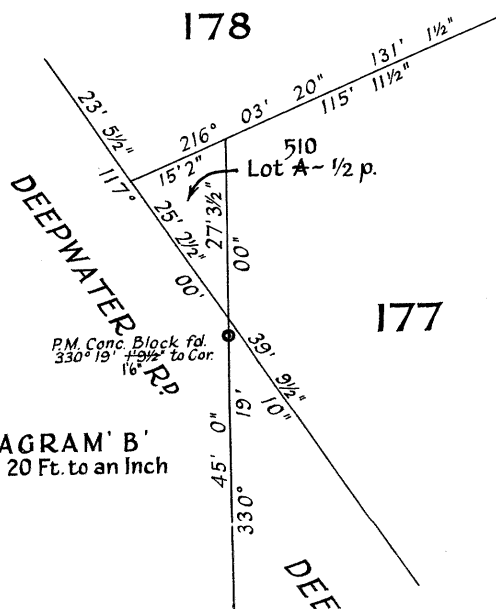
Garden



Recreation

Space

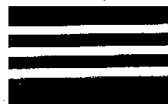
DIAGRAM 'B'
 Scale 20 Ft. to an Inch



178

177

NEW SOUTH WALES



CERTIFICATE OF TITLE

REAL PROPERTY ACT, 1900



14210043

Appln. No.16570 (part)

Prior Titles Vol.8223 Fol.179
Vol.8223 Fol.180
Vol.8476 Fol. 86



Vol. **14210** Fol. **43**
EDITION ISSUED
19 8 1980

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land with all described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

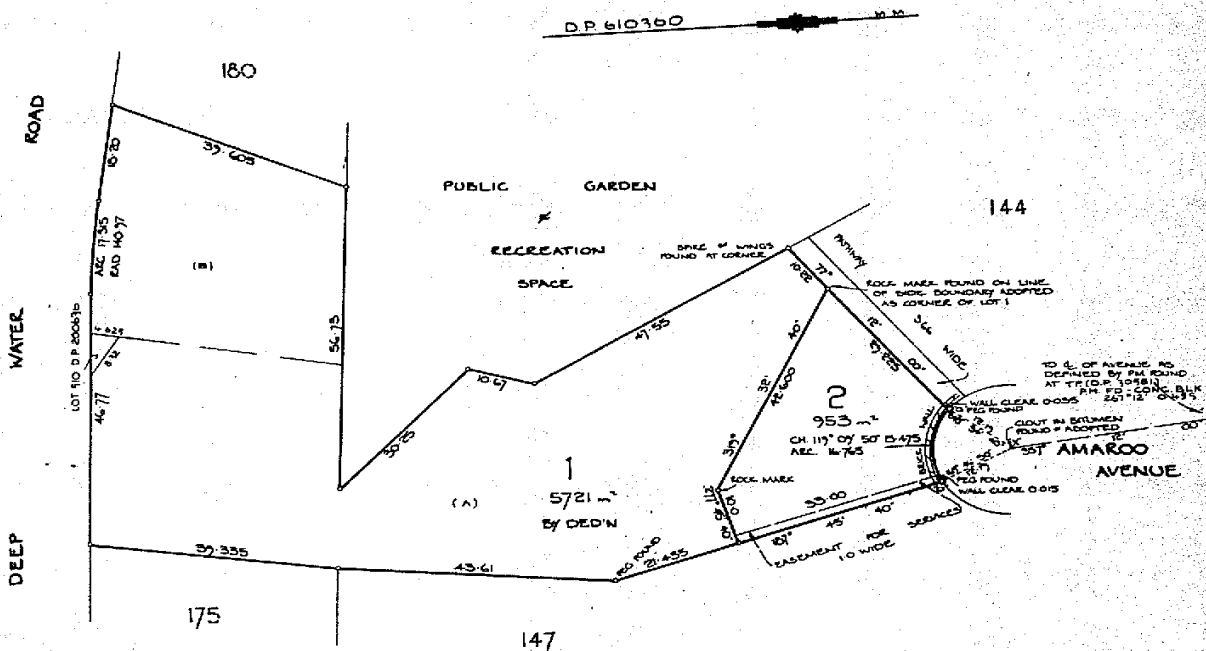
CANCELLED

Registrar General.



PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



(A) COVENANT J421647
(B) J421649

C.	17' 4" 50'	5-71	DN # W IN VEHICLE CROSSING
D.	24' 54' 40'	4-445	DN # W IN GUTTER

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 610360 in the Municipality of Willoughby Parish of Willoughby and County of Cumberland being part of Portion 36 granted to Haynes Gibbs Alleyne on 24-4-1858 and part of Portion 37 and 3.627 hectares granted by Crown Grants Volume 335 Folio 17 and Volume 8084 Folio 211 respectively. EXCEPTING THEREOUT all minerals reserved by the Crown Grant of 3.627 hectares.

FIRST SCHEDULE

CASTLECOVE COUNTRY CLUB LIMITED.

SECOND SCHEDULE

- GRY
1. Reservations and conditions, if any, contained in the Crown Grants above referred to.
CY2. J421647)P Covenants affecting the land shown so burdened in the plan hereon.
CY J421649)P
M3. Q334934P Mortgage to Bank of New South Wales.
EG24. DP610360P Easement for Services appurtenant to the land above described.
EAZ5. DP610360P Easement for user appurtenant to the land above described.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

SECOND SCHEDULE (continued)

[illegible][illegible]

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED



SEARCH DATE

29/5/2024 10:16PM

FOLIO: 1/610360

First Title(s): SEE PRIOR TITLE(S)

Prior Title(s): VOL 14210 FOL 43

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
7/9/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED

30/9/2005	AB776603	LEASE	
30/9/2005	AB776604	LEASE	
30/9/2005	AB776605	LEASE	
30/9/2005	AB776606	LEASE	EDITION 1

11/5/2006	AC299497	SUB-LEASE	
11/5/2006	AC299498	SUB-LEASE	
11/5/2006	AC299499	SUB-LEASE	
11/5/2006	AC299500	SUB-LEASE	

14/5/2012	AG935923	SURRENDER OF LEASE	
14/5/2012	AG935924	SURRENDER OF LEASE	
14/5/2012	AG935925	SURRENDER OF LEASE	
14/5/2012	AG935920	SURRENDER OF LEASE	
14/5/2012	AG935921	SURRENDER OF LEASE	
14/5/2012	AG935922	SURRENDER OF LEASE	
14/5/2012	AG935926	LEASE	
14/5/2012	AG935927	LEASE	
14/5/2012	AG935928	LEASE	EDITION 2

17/9/2014	AI737042	LEASE	EDITION 3
-----------	----------	-------	-----------

1/8/2015	AJ701432	DEPARTMENTAL DEALING	
----------	----------	----------------------	--

8/9/2018	AN695391	DEPARTMENTAL DEALING	EDITION 4 CORD ISSUED
----------	----------	----------------------	--------------------------

19/5/2021	AR61033	DISCHARGE OF MORTGAGE	EDITION 5
-----------	---------	-----------------------	-----------

*** END OF SEARCH ***



FOLIO: 1/610360

SEARCH DATE	TIME	EDITION NO	DATE
29/5/2024	10:16 PM	5	19/5/2021

LAND

LOT 1 IN DEPOSITED PLAN 610360
LOCAL GOVERNMENT AREA WILLOUGHBY
PARISH OF WILLOUGHBY COUNTY OF CUMBERLAND
TITLE DIAGRAM DP610360

FIRST SCHEDULE

CASTLECOVE COUNTRY CLUB LIMITED

SECOND SCHEDULE (8 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 LAND EXCLUDES MINERALS BY CROWN GRANT OF 3.627 HECTARES
- 3 J421647 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
- 4 J421649 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
- 5 DP610360 EASEMENT FOR SERVICES APPURTENANT TO THE LAND ABOVE DESCRIBED
- 6 DP610360 EASEMENT FOR USER APPURTENANT TO THE LAND ABOVE DESCRIBED
- 7 AG935928 LEASE TO TELSTRA CORPORATION LIMITED OF THE AREA SHOWN HATCHED IN PLAN WITH AB776605. COMMENCING 1/12/2018. EXPIRES: 30/11/2023.
AI737042 CONCURRENT LEASE AS TO THE PART SHOWN CROSS HATCHED IN PLAN WITH AI737042
- 8 AI737042 LEASE TO AP WIRELESS INVESTMENTS AUSTRALIA PTY LTD OF THE PREMISES HATCHED IN PLAN WITH AI737042. EXPIRES: 29/6/2039.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Appendix F – Lotsearch



LOTSEARCH

LOTSEARCH ENVIRO LITE

Date: 30 May 2024 14:19:06

Reference: LS056963 EL

Address: 74 Deepwater Road, Castle Cove, NSW 2069

Disclaimer:

The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.

You should obtain independent advice before you make any decision based on the information within the report.

The detailed terms applicable to use of this report are set out at the end of this report.

Dataset Listing

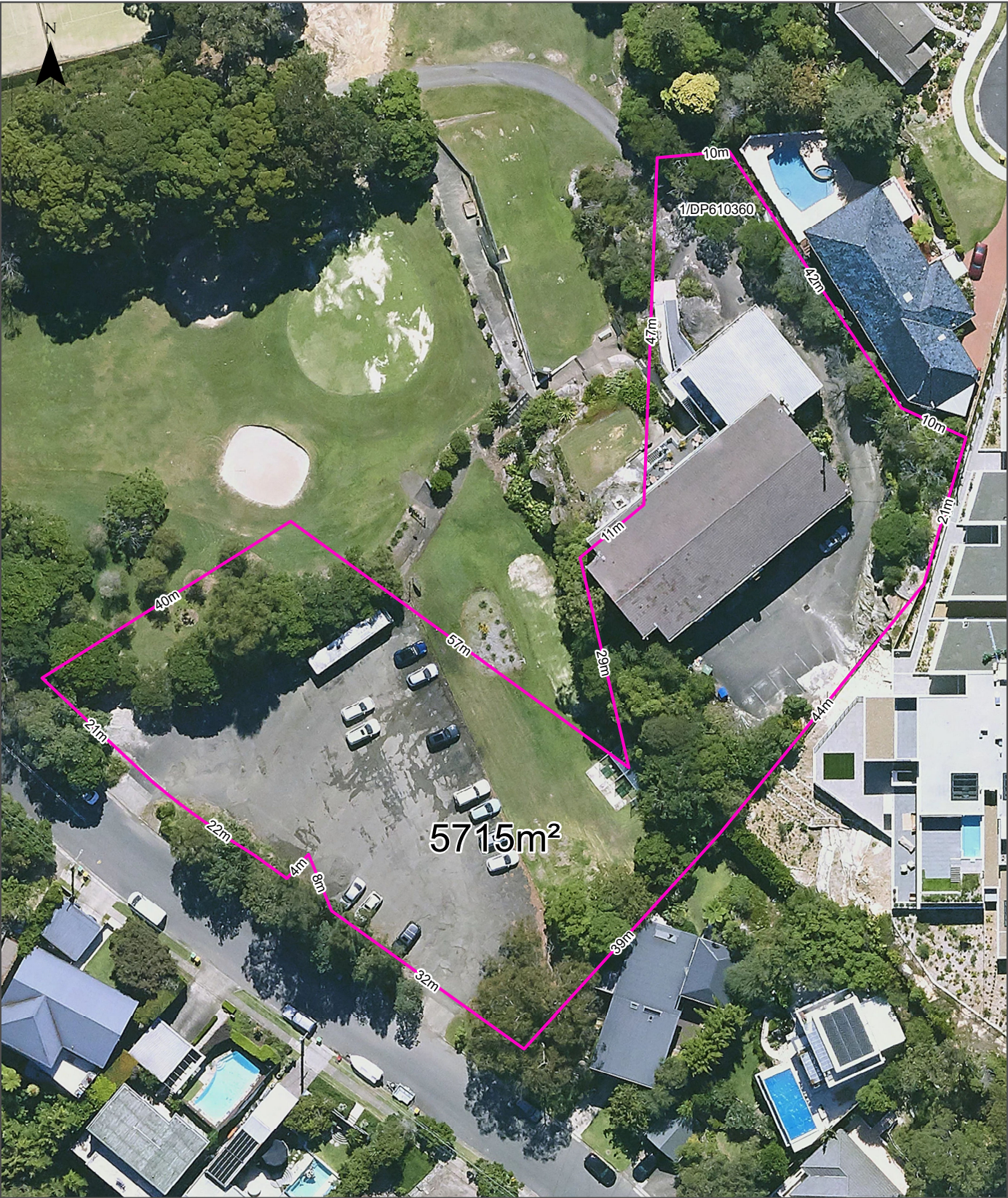
Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Customer Service - Spatial Services	17/04/2024	17/04/2024	Quarterly	-	-	-	-
Topographic Data	NSW Department of Customer Service - Spatial Services	21/05/2024	21/05/2024	Annually	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority NSW	15/05/2024	10/05/2024	Monthly	1000m	0	0	1
Contaminated Land Records of Notice	Environment Protection Authority NSW	15/05/2024	15/05/2024	Monthly	1000m	0	0	0
Former Gasworks	Environment Protection Authority NSW	28/04/2024	14/07/2021	Quarterly	1000m	0	0	0
Notices under the POEO Act 1997	Environment Protection Authority NSW	15/05/2024	15/05/2024	Monthly	1000m	0	0	0
National Waste Management Facilities Database	Geoscience Australia	26/05/2022	07/03/2017	Annually	1000m	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	20/09/2023	07/09/2020	Annually	1000m	0	0	4
EPA PFAS Investigation Program	Environment Protection Authority NSW	15/05/2024	21/11/2023	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Australian Department of Defence	16/05/2024	29/02/2024	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Australian Department of Defence	16/05/2024	29/02/2024	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	16/05/2024	16/05/2024	Monthly	2000m	0	0	0
Defence Controlled Areas	Australian Department of Defence	15/04/2024	15/04/2024	Quarterly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Australian Department of Defence	30/04/2024	02/09/2022	Quarterly	2000m	0	0	0
National Unexploded Ordnance (UXO)	Australian Department of Defence	15/04/2024	15/04/2024	Quarterly	2000m	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority NSW	13/11/2023	15/12/2022	Annually	1000m	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority NSW	15/05/2024	15/05/2024	Monthly	1000m	0	0	0
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority NSW	15/05/2024	15/05/2024	Monthly	1000m	0	0	0
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority NSW	15/05/2024	15/05/2024	Monthly	1000m	0	0	5
UBD Business Directories (Premise & Intersection Matches)	Hardie Grant			Not required	100m	0	0	0
UBD Business Directories (Road & Area Matches)	Hardie Grant			Not required	100m	-	9	9
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	250m	0	0	0
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	250m	-	0	0
Points of Interest	NSW Department of Customer Service - Spatial Services	16/04/2024	16/04/2024	Quarterly	1000m	1	2	37
Tanks (Areas)	NSW Department of Customer Service - Spatial Services	16/04/2024	16/04/2024	Quarterly	1000m	0	0	0
Tanks (Points)	NSW Department of Customer Service - Spatial Services	16/04/2024	16/04/2024	Quarterly	1000m	0	0	0
Major Easements	NSW Department of Customer Service - Spatial Services	06/05/2024	06/05/2024	Quarterly	1000m	0	2	14
State Forest	Forestry Corporation of NSW	12/12/2023	11/12/2023	Annually	1000m	0	0	0
Hydrogeology Map of Australia	Geoscience Australia	17/04/2024	19/08/2019	Annually	1000m	1	1	1

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018	NSW Department of Climate Change, Energy, the Environment and Water	28/05/2024	23/02/2018	Quarterly	1000m	0	0	0
National Groundwater Information System (NGIS) Boreholes	Bureau of Meteorology; Water NSW	28/05/2024	13/07/2022	Annually	2000m	0	0	12
NSW Seamless Geology Single Layer: Rock Units	NSW Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	1	1	7
NSW Seamless Geology Single Layer: Trendlines	NSW Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	0	0	0
NSW Seamless Geology Single Layer: Geological Boundaries and Faults	NSW Department of Regional NSW	06/12/2023	31/05/2023	Annually	1000m	0	0	0
Naturally Occurring Asbestos Potential	NSW Department of Regional NSW	26/04/2024	14/03/2024	Annually	1000m	0	0	0
Atlas of Australian Soils	Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES)	12/01/2024	17/02/2011	Annually	1000m	1	1	2
Soil Landscapes of Central and Eastern NSW	NSW Department of Climate Change, Energy, the Environment and Water	12/12/2023	27/07/2020	Annually	1000m	1	1	5
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning, Housing and Infrastructure	03/05/2024	15/03/2024	Monthly	500m	1	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	12/01/2024	21/02/2013	Annually	1000m	1	1	3
Dryland Salinity - National Assessment	Australian Bureau of Agricultural and Resource Economics and Sciences	18/07/2014	12/05/2013	Annually	1000m	0	0	0
Mining Subsidence Districts	NSW Department of Customer Service	03/05/2024	03/05/2024	Quarterly	1000m	0	0	0
Current Mining Titles	NSW Department of Regional NSW	17/05/2024	17/05/2024	Monthly	1000m	0	0	0
Mining Title Applications	NSW Department of Regional NSW	17/05/2024	17/05/2024	Monthly	1000m	0	0	0
Historic Mining Titles	NSW Department of Regional NSW	17/05/2024	17/05/2024	Monthly	1000m	10	10	10
Environmental Planning Instrument SEPP State Significant Precincts	NSW Department of Planning, Housing and Infrastructure	03/05/2024	08/09/2023	Monthly	1000m	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning, Housing and Infrastructure	03/05/2024	26/04/2024	Monthly	1000m	1	5	61
Commonwealth Heritage List	Australian Department of Climate Change, Energy, the Environment and Water	20/10/2023	13/04/2022	Annually	1000m	0	0	0
National Heritage List	Australian Department of Climate Change, Energy, the Environment and Water	20/10/2023	13/04/2022	Annually	1000m	0	0	1
State Heritage Register - Curtilages	NSW Department of Planning, Industry and Environment	26/04/2024	08/03/2024	Quarterly	1000m	0	0	0
Environmental Planning Instrument Local Heritage	NSW Department of Planning, Housing and Infrastructure	03/05/2024	05/04/2024	Monthly	1000m	0	0	9
Bush Fire Prone Land	NSW Rural Fire Service	16/05/2024	12/03/2024	Monthly	1000m	1	2	3
NSW Native Vegetation Type Map	NSW Department of Climate Change, Energy, the Environment and Water	26/05/2023	12/12/2022	Quarterly	1000m	1	3	10
Ramsar Wetlands of Australia	Australian Department of Climate Change, Energy, the Environment and Water	16/05/2024	11/04/2024	Annually	1000m	0	0	0
Collaborative Australian Protected Areas Database (CAPAD) 2022 - Terrestrial	Australian Department of Climate Change, Energy, The Environment and Water	04/03/2024	30/06/2022	Annually	1000m	0	0	1
Collaborative Australian Protected Areas Database (CAPAD) 2022 - Marine	Australian Department of Climate Change, Energy, The Environment and Water	04/03/2024	30/06/2022	Annually	1000m	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	28/10/2022	26/10/2022	Annually	1000m	0	0	3
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	28/10/2022	26/10/2022	Annually	1000m	0	0	5
NSW BioNet Species Sightings	NSW Department of Climate Change, Energy, the Environment and Water	29/11/2023	29/11/2023	Weekly	10000m	-	-	-

Site Diagram

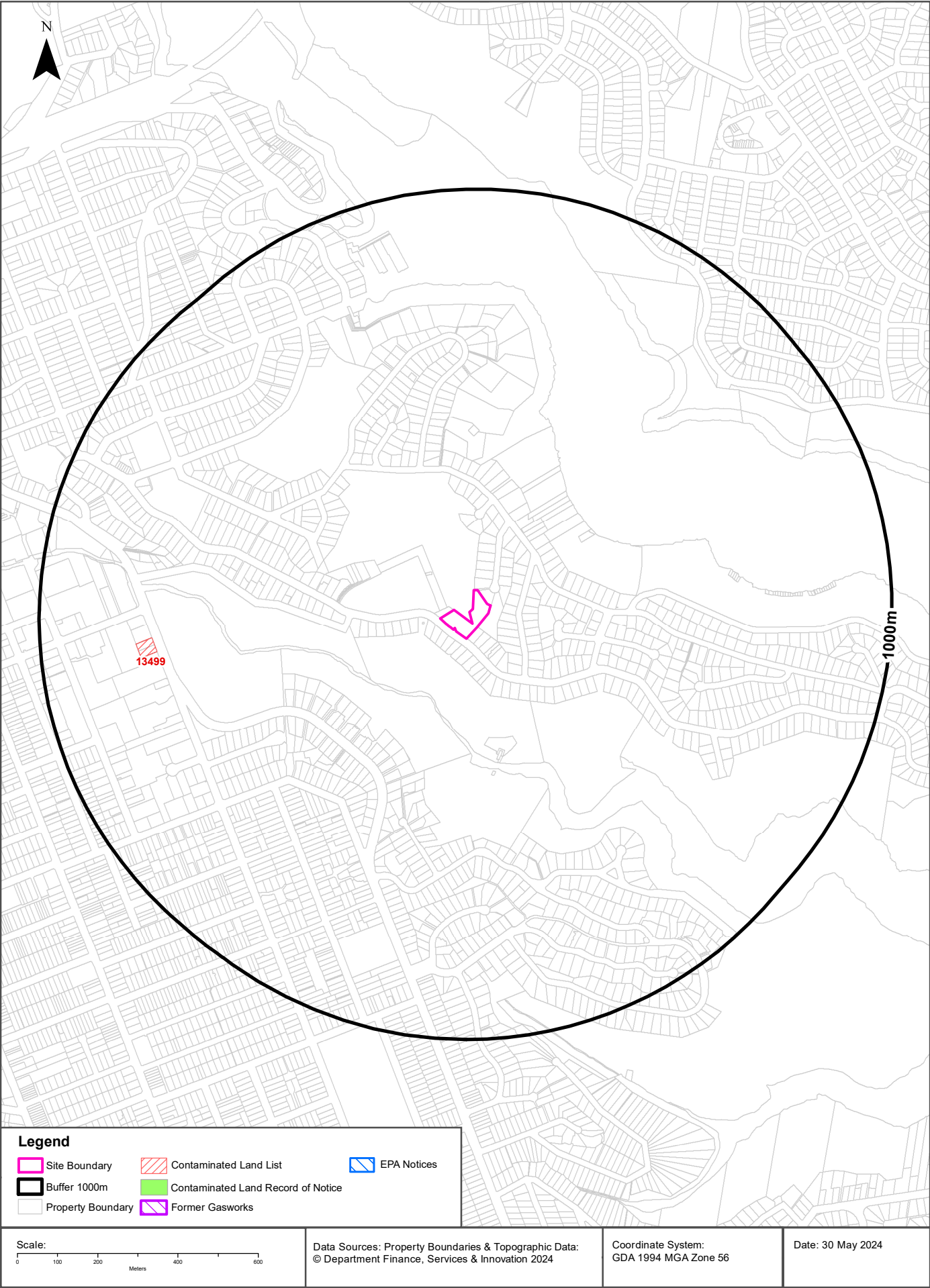
74 Deepwater Road, Castle Cove, NSW 2069



Legend <div><div></div> Site Boundary</div> <div><div></div> Internal Parcel Boundaries</div>	Total Area: 5715m ² Total Perimeter: 437m <small>Disclaimers:</small> Measurements are approximate only and may have been simplified or smaller lengths removed for readability. Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.	Scale: 0 20 40 Meters Data Source Aerial Imagery: © Aerometrex Pty Ltd Coordinate System: GDA 1994 MGA Zone 56 Date: 30 May 2024
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Contaminated Land

74 Deepwater Road, Castle Cove, NSW 2069



Contaminated Land

74 Deepwater Road, Castle Cove, NSW 2069

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist	Direction
13499	Woolworths Chatswood	364-366 Eastern Valley Way	CHATSWOOD	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	711m	West

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Contaminated Land

74 Deepwater Road, Castle Cove, NSW 2069

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority
Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit
<http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm>

Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Contaminated Land

74 Deepwater Road, Castle Cove, NSW 2069

EPA Notices

Penalty Notices, s.91 & s.92 Clean up Notices and s.96 Prevention Notices within the dataset buffer:

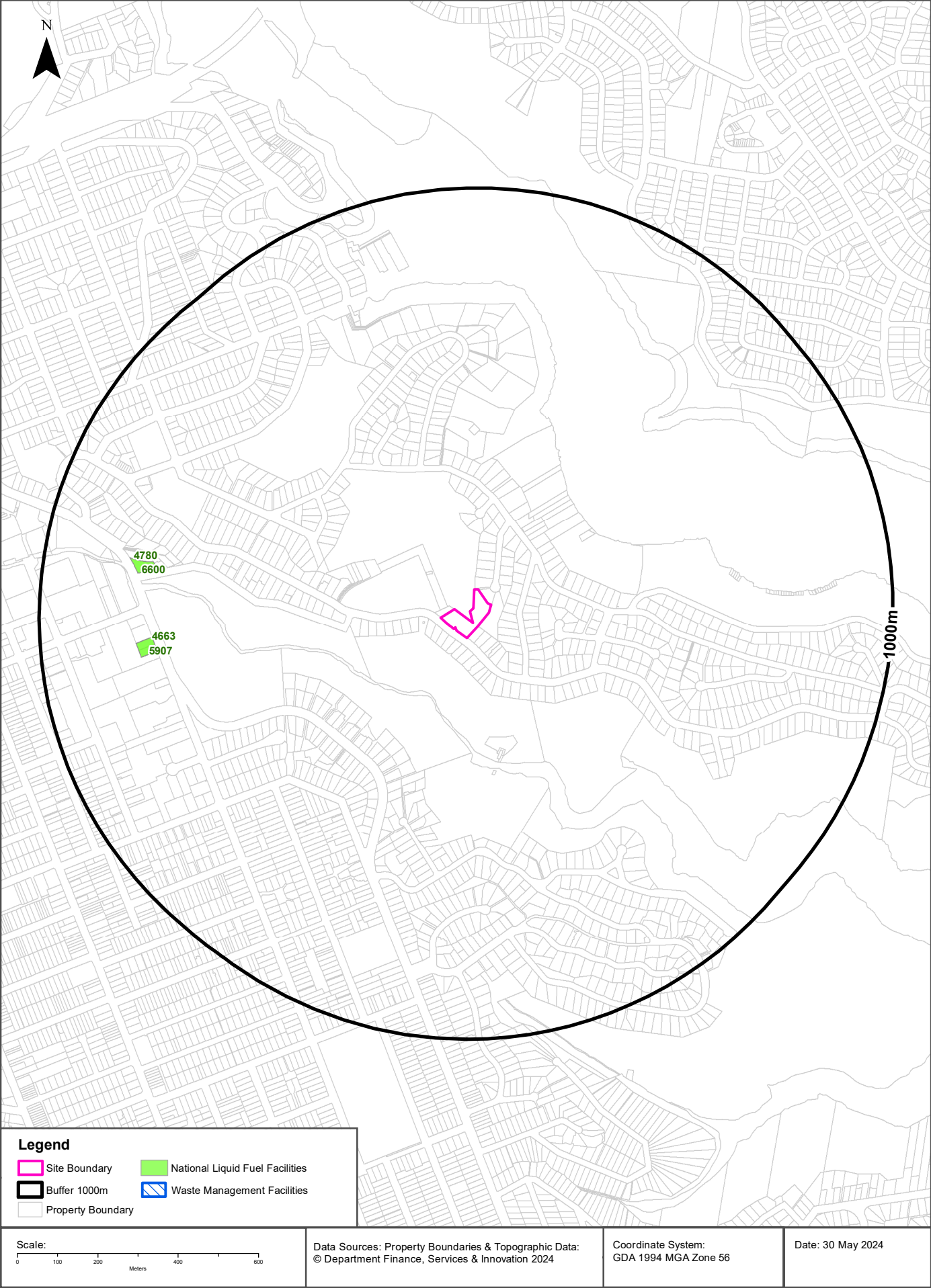
Map ID	Number	Type	Name	Address	Status	Issued Date	Act	Offence	Offence Date	Loc Conf	Dist	Dir
N/A												

NSW EPA Notice Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Waste Management & Liquid Fuel Facilities

74 Deepwater Road, Castle Cove, NSW 2069



Waste Management & Liquid Fuel Facilities

74 Deepwater Road, Castle Cove, NSW 2069

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

National Liquid Fuel Facilities

National Liquid Fuel Facilities within the dataset buffer:

Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist	Direction
4663	Caltex	Woolworths Caltex Chatswood East	362-366 Eastern Valley Way	Chatswood	Petrol Station	Operational		25/07/2011	Premise Match	711m	West
5907	CALTEX WOOLWORTHS	CALTEX WOOLWORTHS CHATSWOOD EAST	364-366 EASTERN VALLEY WAY	CHATSWOOD EAST	PETROL STATION	OPERATIONAL			Premise Match	711m	West
4780	BP	BP Castle Cove	327 Eastern Valley Way	Middle Cove	Petrol Station	Operational		25/07/2011	Premise Match	715m	West
6600	METRO FUEL	METRO CASTLE COVE	327 EASTERN VALLEY WAY	CASTLE COVE	PETROL STATION	OPERATIONAL			Premise Match	715m	West

National Liquid Fuel Facilities Data Source: Geoscience Australia
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

PFAS Investigation & Management Programs

74 Deepwater Road, Castle Cove, NSW 2069

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Map ID	Site	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Defence PFAS Investigation Program

Sites being investigated by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation Program Data Custodian: Department of Defence, Australian Government

Defence PFAS Management Program

Sites being managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites and Unexploded Ordnance

74 Deepwater Road, Castle Cove, NSW 2069

Defence Controlled Areas (DCA)

Defence Controlled Areas provided by the Department of Defence within the dataset buffer:

Site ID	Location Name	Loc Conf	Dist	Dir
N/A	No records in buffer			

Defence Controlled Areas, Data Custodian: Department of Defence, Australian Government

Defence 3 Year Regional Contamination Investigation Program (RCIP)

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
N/A	No records in buffer					

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

National Unexploded Ordnance (UXO)

Sites which have been assessed by the Department of Defence for the potential presence of unexploded ordnance within the dataset buffer:

Site ID	Location Name	Category	Area Description	Additional Information	Commonwealth	Loc Conf	Dist	Dir
N/A	No records in buffer							

National Unexploded Ordnance (UXO), Data Custodian: Department of Defence, Australian Government

EPA Other Sites with Contamination Issues

74 Deepwater Road, Castle Cove, NSW 2069

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasminco Lead Abatement Strategy Area

Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

EPA Activities

74 Deepwater Road, Castle Cove, NSW 2069

Licensed Activities under the POEO Act 1997

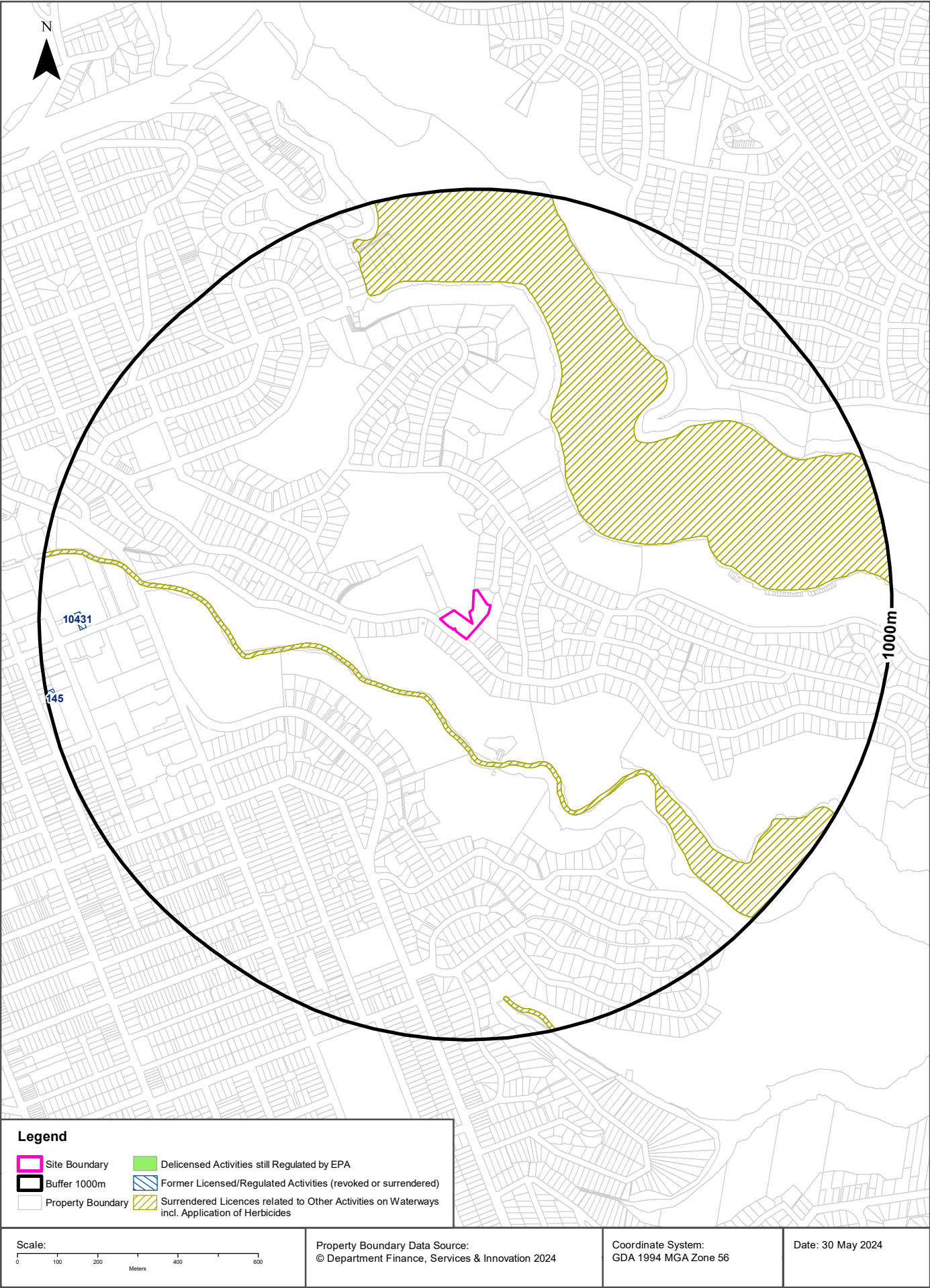
Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

POEO Licence Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Delicensed & Former Licensed EPA Activities
74 Deepwater Road, Castle Cove, NSW 2069



EPA Activities

74 Deepwater Road, Castle Cove, NSW 2069

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

Delicensed Activities Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

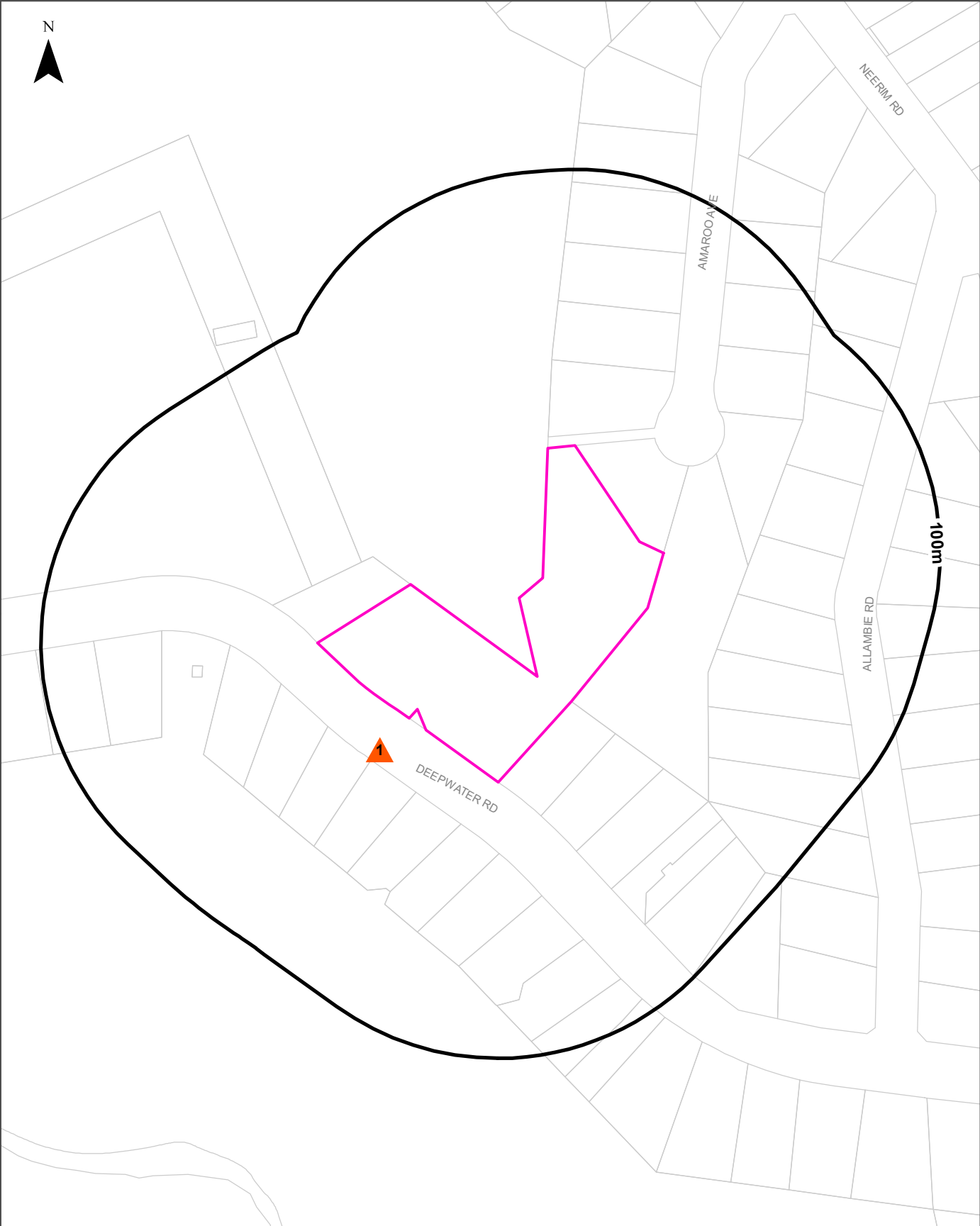
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	173m	North East
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered	07/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	173m	North East
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered	09/11/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	173m	North East
10431	INTEC LTD	21 Smith Street, CHATSWOOD, NSW 2067	Surrendered	16/02/2000	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	883m	West
145	GEORGE WESTON FOODS LIMITED	51 ALLEYNE STREET, CHATSWOOD, NSW 2067	Surrendered	17/01/2000	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	976m	West

Former Licensed Activities Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Historical Business Directories

74 Deepwater Road, Castle Cove, NSW 2069



Legend		Scale: 0 25 50 75 100 Meters	Coordinate System: GDA 1994 MGA Zone 56
Site Boundary	Business directory records mapped to a specific premise		Date: 30 May 2024
Buffer 100m	Business directory records mapped to a road intersection	Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018 Property Boundaries © NSW Department Finance, Services & Innovation 2024	
Property Boundary	Business directory records mapped to a road corridor		
Business directory records mapped to a general area			

Historical Business Directories

74 Deepwater Road, Castle Cove, NSW 2069

Business Directory Records 1950-1991 Premise or Road Intersection Matches

Potentially contaminative business activities extracted from Universal Business Directories from years 1991, 1986, 1982, 1978, 1975, 1970, 1965, 1961 & 1950, mapped to a premise or road intersection within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
N/A	No records in buffer						

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Business Directory Records 1950-1991

Road or Area Matches

Potentially contaminative business activities extracted from Universal Business Directories from years 1991, 1986, 1982, 1978, 1975, 1970, 1965, 1961 & 1950, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	SCHOOLS - SPECIAL.	Forbes Carlisles Swim Centre, Castlecove Shopping Centre, Deepwater Rd., Castlecove. 2069	85004	1986	Road Match	0m
	SCHOOLS - SPECIAL. (S1500)	Forbes Carlisles Swim Centre, Castlecove Shopping Centre, Deepwater Rd., Castle cove. 2069.	73575	1982	Road Match	0m
	SCHOOLS-SPECIAL.	Forbes Carlisles Swim Centre, Castlecove Shopping Centre, Deepwater Rd., Castlecove. 2069	65104	1978	Road Match	0m
	BUTCHERS-RETAIL	Castlecove Butchery, Castlecove Shopping Centre, Deepwater Rd., Castlecove. 2069	10179	1975	Road Match	0m
	DELICATESSENS.	Castlecove Delicatessen, Castlecove Shopping Centre, Deepwater Rd., Castlecove. 2069	19990	1975	Road Match	0m
	CHEMISTS-PHARMACEUTICAL	Castlecove Pharmacy, Castlecove Shopping Centre, Deepwater Rd., Castlecove. 2069	15081	1975	Road Match	0m
	DENTISTS.	Cohen, C., Castlecove Shopping Centre, Deepwater Rd., Castlecove. 2069	20847	1975	Road Match	0m
	DENTISTS.	Fletcher, J. V., Castlecove Shopping Centre, Deepwater Rd., Castlecove. 2069	20931	1975	Road Match	0m
	SCHOOLS-SPECIAL	Forbes Carlisle's Swim Centre, Castlecove Shopping Cent., Deepwater Rd., Castlecove 2069	76048	1975	Road Match	0m

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Historical Business Directories

74 Deepwater Road, Castle Cove, NSW 2069

Dry Cleaners, Motor Garages & Service Stations 1948-1993 Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer.

Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
N/A	No records in buffer						

Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018

Dry Cleaners, Motor Garages & Service Stations 1948-1993

Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

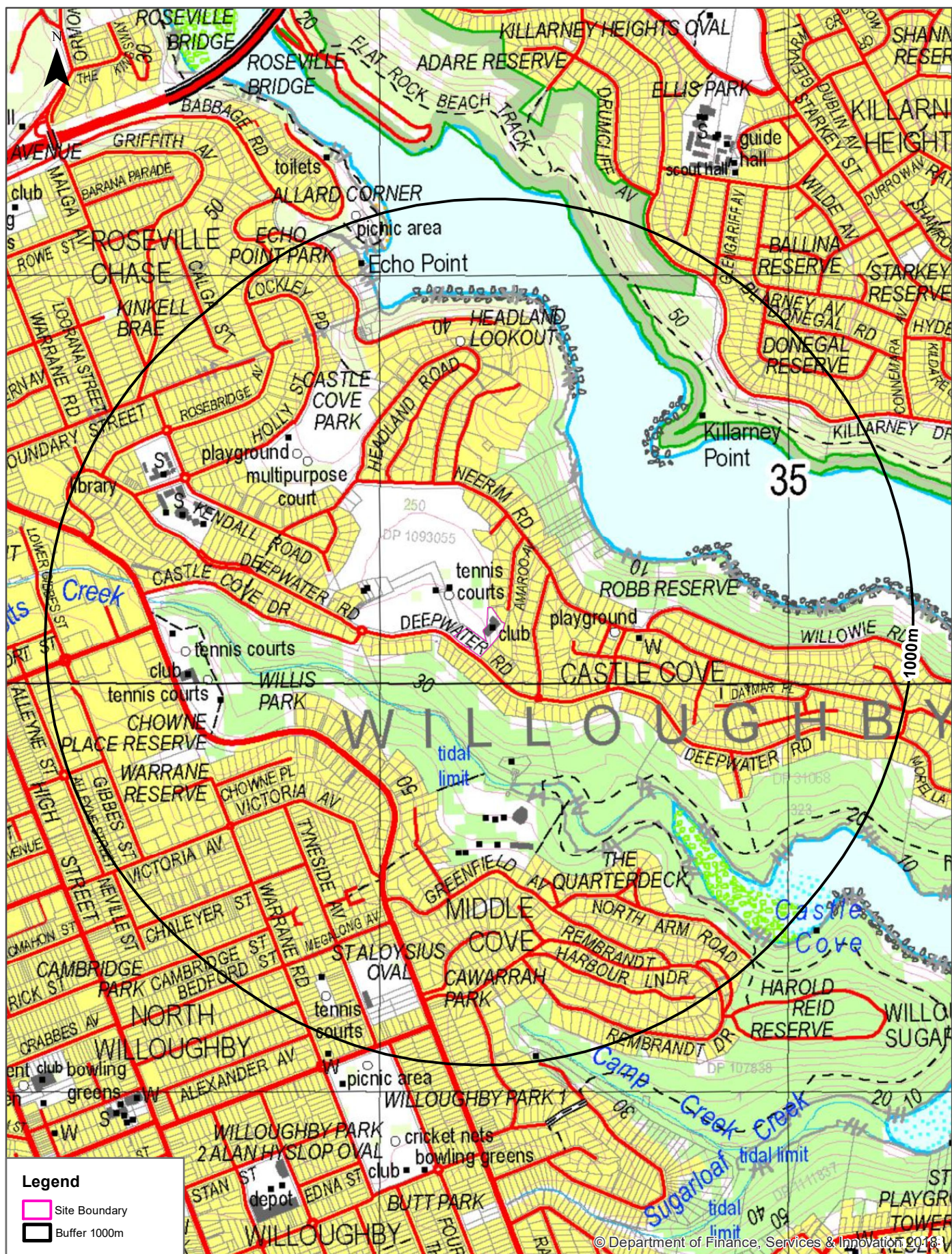
Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer					

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Topographic Map 2015

74 Deepwater Road, Castle Cove, NSW 2069



<p>Scale:</p>	<p>Data Sources: Topographic Map Data © NSW Land and Property Information</p>	<p>Coordinate System: GDA 1994 MGA Zone 56</p>	<p>Date: 30 May 2024</p>
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Historical Map 1975

74 Deepwater Road, Castle Cove, NSW 2069



Historical Map c.1936

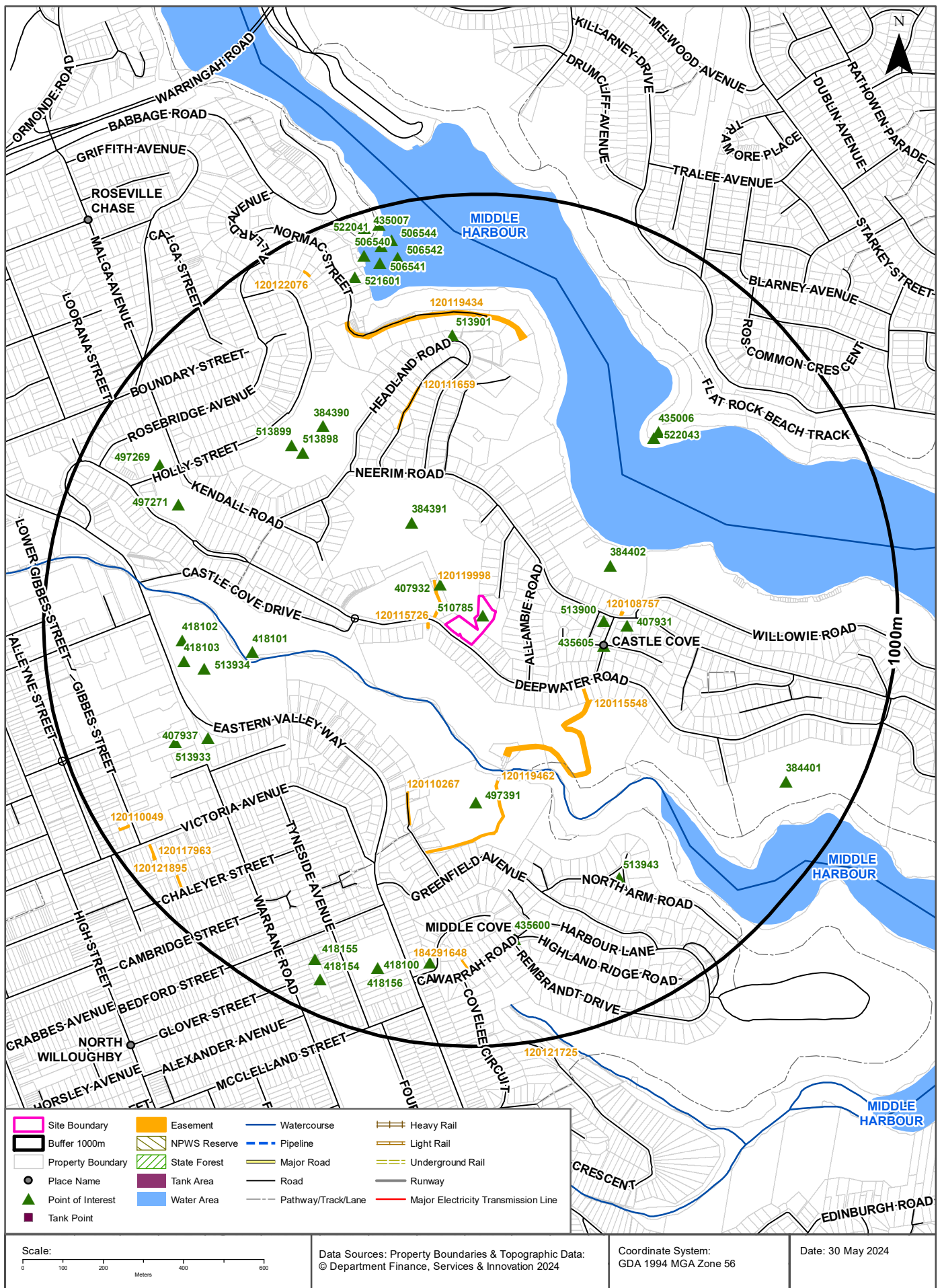
74 Deepwater Road, Castle Cove, NSW 2069





Topographic Features

74 Deepwater Road, Castle Cove, NSW 2069



Topographic Features

74 Deepwater Road, Castle Cove, NSW 2069

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
510785	Club	CASTLECOVE COUNTRY CLUB	0m	On-site
407932	Sports Court	TENNIS COURTS	92m	North West
384391	Golf Course	CASTLE COVE COUNTRY CLUB GOLF COURSE	248m	North West
513900	Picnic Area	DENAWEN PARK	270m	East
435605	Suburb	CASTLE COVE	282m	East
384402	Park	ROBB RESERVE	307m	North East
407931	Place Of Worship	CASTLE COVE ANGLICAN CHURCH	329m	East
497391	Combined Primary-Secondary School	GLENAEON RUDOLF STEINER SCHOOL	393m	South
418101	Park	WILLIS PARK	485m	West
513898	Sports Court	MULTIPURPOSE COURT	557m	North West
384390	Sports Field	CASTLE COVE PARK	574m	North West
522043	Historic Site	FORMER KILLARNEY PICNIC GROUND (INCLUDING WHARF)	579m	North East
513899	Picnic Area	PLAYGROUND	588m	North West
435006	Headland	KILLARNEY POINT	598m	North East
513934	Sports Court	TENNIS COURTS	610m	West
513901	Lookout	HEADLAND LOOKOUT	654m	North
407937	Park	CHOWNE PLACE RESERVE	655m	South West
418102	Sports Court	TENNIS COURTS	656m	West
418103	Club	THE COVE SPORTS CLUB	658m	West
513943	Park	THE QUARTERDECK	686m	South East
497271	Primary School	CASTLE COVE PUBLIC SCHOOL	728m	West
513933	Park	WARRANE RESERVE	733m	West
435600	Suburb	MIDDLE COVE	740m	South
418100	Park	CAWARRAH PARK	797m	South
497269	Primary School	CASTLE COVE PUBLIC SCHOOL	815m	North West
384401	Park	Park	833m	South East
418156	Sports Field	ST ALOYSIUS OVAL	839m	South
521601	Park	ECHO POINT PARK	852m	North
506541	Wharf	Wharf	864m	North
506542	Wharf	Wharf	867m	North
418155	Community Facility	WILLOUGHBY DISTRICT TENNIS CLUB	875m	South West

Map Id	Feature Type	Label	Distance	Direction
506540	Wharf	Wharf	895m	North
506543	Wharf	Wharf	905m	North
506544	Wharf	Wharf	912m	North
418154	Sports Court	TENNIS COURTS	914m	South West
522041	Historic Site	SITE OF ECHO POINT FARM INCLUDING SLIPWAY	957m	North
435007	Headland	ECHO POINT	960m	North

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Topographic Features

74 Deepwater Road, Castle Cove, NSW 2069

Tanks (Areas)

What are the Tank Areas located within the dataset buffer?

Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
N/A	No records in buffer					

Tanks (Points)

What are the Tank Points located within the dataset buffer?

Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
N/A	No records in buffer					

Tanks Data Source: © Land and Property Information (2015)

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Major Easements

What Major Easements exist within the dataset buffer?

Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120119998	Primary	Undefined		31m	North West
120115726	Primary	Undefined		41m	West
120115548	Primary	Undefined		271m	South East
120108757	Primary	Undefined		310m	East
120119462	Primary	Undefined		345m	South
120110267	Primary	Undefined		399m	South
120111659	Primary	Undefined		462m	North
120119434	Primary	Undefined		642m	North
184291648	Primary	Right of way		786m	South
120122076	Primary	Undefined		901m	North West
120121895	Primary	Undefined		914m	South West
120117963	Primary	Undefined		917m	South West
120110049	Primary	Undefined		933m	South West
120121725	Primary	Undefined		997m	South

Easements Data Source: © Land and Property Information (2015)

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Topographic Features

74 Deepwater Road, Castle Cove, NSW 2069

State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

State Forest Data Source: © NSW Department of Finance, Services & Innovation (2018)

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Hydrogeology & Groundwater

74 Deepwater Road, Castle Cove, NSW 2069

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Porous, extensive aquifers of low to moderate productivity	0m	On-site

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)

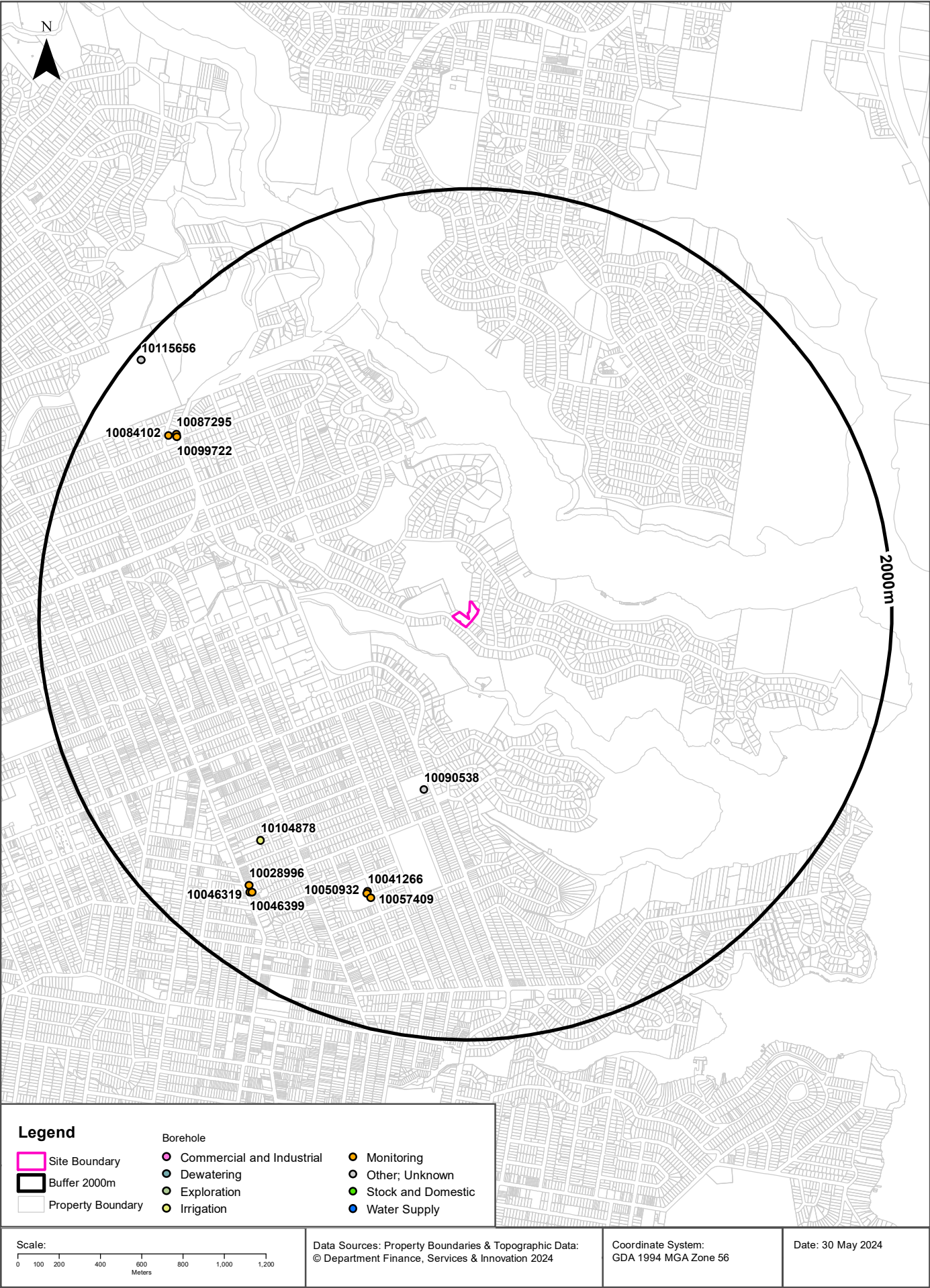
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Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018

Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

Prohibition Area No.	Prohibition	Distance	Direction
N/A	No records in buffer		

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 Data Source : NSW Department of Primary Industries



Hydrogeology & Groundwater

74 Deepwater Road, Castle Cove, NSW 2069

Groundwater Boreholes

Boreholes within the dataset buffer:

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Drill Date	Bore Depth (m)	Reference Elevation	Height Datum	Salinity (mg/L)	Yield (L/s)	SWL (mbgl)	Distance	Direction
10090538	GW108481	Unknown	Proposed	11/12/2007	216.00		AHD		0.050		815m	South
10041266	GW111233	Monitoring	Functional	11/08/2010	4.30		AHD			1.80	1367m	South
10050932	GW111232	Monitoring	Functional	16/11/2010	4.50		AHD			2.40	1378m	South
10057409	GW111234	Monitoring	Functional	11/08/2010	4.50		AHD			2.40	1393m	South
10104878	GW026513	Irrigation	Unknown	01/12/1966	64.00		AHD	Fresh			1427m	South West
10099722	GW111007	Monitoring	Functional	19/04/2010	7.50		AHD			3.80	1591m	North West
10087295	GW111008	Monitoring	Functional	19/04/2010	7.50		AHD			3.80	1599m	North West
10084102	GW111006	Monitoring	Functional	19/04/2010	7.50		AHD			3.80	1628m	North West
10028996	GW114502	Monitoring	Functional	28/10/2010	8.00		AHD			2.50	1631m	South West
10046399	GW114503	Monitoring	Functional	28/10/2010	8.00		AHD			2.50	1648m	South West
10046319	GW114504	Monitoring	Functional	28/10/2010	8.00		AHD			2.50	1654m	South West
10115656	GW065075	Other	Functioning	15/02/1994	150.00		AHD	Fresh	6.000	44.00	1950m	North West

Borehole Data Source: Bureau of Meteorology; Water NSW. Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Hydrogeology & Groundwater

74 Deepwater Road, Castle Cove, NSW 2069

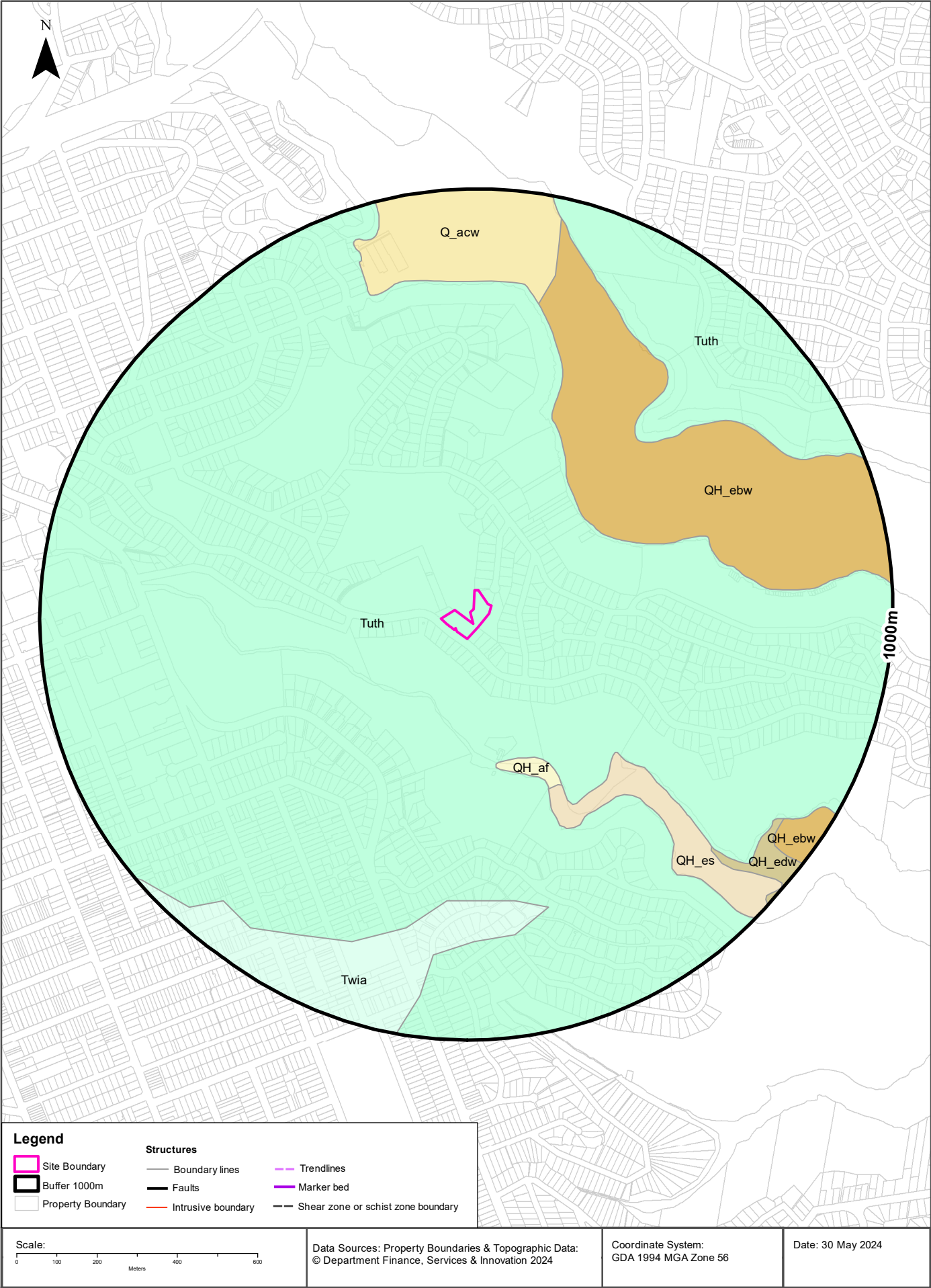
Driller's Logs

Drill log data relevant to the boreholes within the dataset buffer:

NGIS Bore ID	Drillers Log	Distance	Direction
10090538	0.00m-3.50m CLAY AND FILL 3.50m-25.00m SANDSTONE L/BROWN 25.00m-26.00m SHALE 26.00m-52.00m SANDSTONE GREY 52.00m-54.00m SANDSTONE AND SHALE,BEDD. S/SPOTS 54.00m-81.00m SANDSTONE GREY 81.00m-85.00m SANDSTONE,SHALE BEDDING 85.00m-115.00m SANDSTONE GREY 115.00m-116.50m SANDSTONE FINE QUARTZ 116.50m-121.00m SANDSTONE GREY 121.00m-122.00m SHALE,BLACK HARD 122.00m-145.00m SANDSTONE GREY 145.00m-145.50m SANDSTONE F/QUARTZ 145.50m-154.00m SANDSTONE GREY 154.00m-158.00m SANDSTONE,SHALE BEDDING 158.00m-158.50m SANDSTONE FINE QUARTZ 158.50m-172.00m SANDSTONE GREY 172.00m-173.00m SANDSTONE FINE QUARTZ 173.00m-216.00m SANDSTONE GREY	815m	South
10041266	0.00m-0.15m CONCRETE 0.15m-0.30m FILL,SAND,FINE TO MEDIUM GRAINED 0.30m-0.80m FILL,GRAVELLY SAND,FINE TO MEDIUM GRAINED 0.80m-1.60m FILL,SANDY CLAY,LOW PLASTICITY 1.60m-2.00m SILTY CLAY,MEDIUM PLASTICITY,BROWN 2.00m-2.15m SILTY CLAY,GREY TO BROWN 2.15m-4.30m SILTY CLAY,L/PLASTICITY,SOME WHITE TO YELLOW SANDS,IRONSTONE BANDING	1367m	South
10050932	0.00m-0.20m CONCRETE 0.20m-0.30m FILL,SANDY GRAVEL 0.30m-0.50m FILL CLAYEY SAND 0.50m-0.75m FILL SANDY CLAY 0.75m-1.40m FILL SANDY CLAY,L/PLASTICITY 1.40m-1.50m CLAYEY SAND 1.50m-2.20m SILTY CLAY M/PLASTICITY 2.20m-2.30m SILTY CLAY,TRACES OF GRAVEL 2.30m-4.50m SILTY CLAY,RED TO BROWN WITH GREY	1378m	South
10057409	0.00m-0.20m CONCRETE 0.20m-0.95m FILL, SANDY CLAY,SOME GRAVEL AND IRONSTONE 0.95m-1.10m FILL,SANDY CLAY,FINE SAND 1.10m-1.50m FILL,CLAYEY GRAVELLY SAND 1.50m-4.50m SILTY CLAY,LOW PLASTICITY,DARK GREY TO BROWN	1393m	South
10104878	0.00m-9.14m Clay Soil 9.14m-12.19m Sandstone White Soft 12.19m-13.71m Shale Water Supply 13.71m-22.86m Sandstone White Soft 22.86m-31.08m Sandstone 31.08m-35.05m Sandstone White 35.05m-36.57m Shale 36.57m-39.01m Sandstone White 39.01m-39.62m Shale 39.62m-57.91m Sandstone White 57.91m-59.43m Sandstone White Soft Water Supply 59.43m-60.35m Shale Sandy 60.35m-64.00m Driller	1427m	South West
10099722	0.00m-0.20m CONCRETE SLAB:0.2m 0.20m-0.60m FILL,SILTY SAND,FINE TO MED.GRAINED,YELLOW 0.60m-0.70m CONCRETE SLAB:0.1m 0.70m-1.60m FILL,SILTY SAND,CLAY,IRONSTONE,GRAVEL 1.60m-3.00m SHALE,GREY WITH CLAY BANDS,GREY AND ORANGE 3.00m-4.40m SANDSTONE FINE TO MED. GRAINED,GREY AND ORANGE 4.40m-5.40m SANDSTONE WITH SHALE BANDS 5.40m-7.50m SANDSTONE FINE TO MEDIUM GRAINED.ORANGE WITH CLAY BANDS	1591m	North West
10087295	0.00m-0.20m CONCRETE SLAB:0.15m 0.20m-1.80m FILL,AS ABOVE,TRACE OF IRONSTONE AND IGNEOUS GRAVEL 1.80m-4.20m SANDSTONE FINE TO MEDIUM GRAINED,RED WITH GREY CLAY BANDS. 4.20m-6.40m SANDSTONE,FINE TO MEDIUM GRAINED,LIGHT YELLOW 6.40m-7.50m SANDSTONE FINE TO MEDIUM GRAINED,DARK BROWN WITH CLAY BANDS.	1599m	North West

NGIS Bore ID	Drillers Log	Distance	Direction
10084102	0.00m-0.20m CONCRETE 0.20m-0.40m FILL,SILTY SANDY CLAY,TRACE OF IRONSTONE 0.40m-0.80m SILTY CLAY 0.80m-1.80m SHALE,/ QUARTZ 1.80m-3.50m SANDSTONE,FINE TO MEDIUM GRAINED RED. 3.50m-6.20m SANDSTONE YELLOW 6.20m-7.50m SANDSTONE,FINE TO MED.GRAINED,GREY	1628m	North West
10028996	0.00m-0.20m FILL GRAVEL,LOOSE DRY 0.20m-0.60m FILL, SILTY CLAY VERY SOFT 0.60m-1.60m FILL SILTY CLAY, SOFT, MOIST 1.60m-4.30m RESIDUAL CLAY STIFF 4.30m-5.00m RESIDUAL CLAY VERY STIFF 5.00m-7.00m RESIDUAL SANDY CLAY 7.00m-8.00m RESIDUAL CLAYEY SAND,DENSE,MOIST,SANDSTONE	1631m	South West
10046399	0.00m-0.20m FILL, GRAVEL 0.20m-0.40m FILL, SILTY CLAY 0.40m-1.60m FILL SILTY CLAY SOFT MOIST 1.60m-5.00m RESIDUAL CLAY VERY STIFF BELOW 2.5m 5.00m-6.00m RESIDUAL CLAY VERY STIFF MOIST,GREY RED 6.00m-7.00m SANDY CLAY BECOMING SOFT,BEC.MOIST 7.00m-8.00m RESIDUAL CLAYEY SAND,DENSE,MOIST,DARK GREY	1648m	South West
10046319	0.00m-0.20m FILL, GRAVEL,LOOSE,DRY,PURPLE , COARSE 0.20m-0.40m FILL.SILTY CLAY VERY SOFT,MOIST,LOW PLASTICITY 0.40m-1.40m FILL SILTY CLAY,SOFT,MOIST 1.40m-5.00m RESIDUAL CLAY STIFF BEC. VERY STIFF 5.00m-6.00m RESIDUAL CLAY VEY STIFF,MOIST 6.00m-8.00m RESIDUAL SANDY CLAY STIFF BEC.SOFT	1654m	South West
10115656	0.00m-137.00m 137.00m-147.00m SHALE DARK GREY 147.00m-150.00m SANDSTONE GREY DARK	1950m	North West

Drill Log Data Source: Bureau of Meteorology; Water NSW. Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>



Geology

74 Deepwater Road, Castle Cove, NSW 2069

Geological Units

What are the Geological Units within the dataset buffer?

Unit Code	Unit Name	Description	Unit Stratigraphy	Age	Dominant Lithology	Distance
Tuth	Hawkesbury Sandstone	Medium- to coarse-grained quartz sandstone with minor shale and laminite lenses.	\Ungrouped Triassic units\\Hawkesbury Sandstone\\	Anisian (base) to Anisian (top)	Sandstone	0m
QH_af	Alluvial floodplain deposits	Silt, very fine- to medium-grained lithic to quartz-rich sand, clay.	\Alluvium\\Alluvial floodplain deposits\\	Holocene (base) to Now (top)	Clastic sediment	318m
QH_ebw	Estuarine basin and bay (subaqueous)	Clay, silt, shell, very fine- to fine-grained lithic-quartz (\pm carbonate) sand (fluvially- and/or marine-deposited).	\Estuarine deposits\\Estuarine basin and bay\\Estuarine basin and bay (subaqueous)\\	Holocene (base) to Now (top)	Clastic sediment	318m
QH_es	Estuarine swamp	Organic-rich mud, peat, clay, silt, very fine- to fine-grained sand (marine-deposited), fine- to medium-grained sand (fluvially deposited).	\Estuarine deposits\\Estuarine swamp\\	Holocene (base) to Now (top)	Organic rich sediment	425m
Twia	Ashfield Shale	Black to light grey shale and laminite.	\Wianamatta Group\\Ashfield Shale\\	Middle Triassic (base) to Middle Triassic (top)	Shale	652m
Q_acw	Alluvial channel deposits - subaqueous	Fluvially deposited sand, gravel, silt, clay.	\Alluvium\\Alluvial channel deposits\\Alluvial channel deposits - subaqueous\\	Quaternary (base) to Now (top)	Clastic sediment	728m
QH_edw	Estuarine fluvial delta front (subaqueous)	Very fine- to fine-grained (sporadically medium-grained) lithic-quartz sand (fluvially-deposited), silt, clay, shell material.	\Estuarine deposits\\Estuarine fluvial delta front\\Estuarine fluvial delta front (subaqueous)\\	Holocene (base) to Now (top)	Clastic sediment	799m

Linear Geological Structures

What are the Dyke, Sill, Fracture, Lineament and Vein trendlines within the dataset buffer?

Map ID	Feature Description	Map Sheet Name	Distance
No Features			

What are the Faults, Shear zones or Schist zones, Intrusive boundaries & Marker beds within the dataset buffer?

Map ID	Boundary Type	Description	Map Sheet Name	Distance
No Features				

Geological Data Source: Statewide Seamless Geology v2.1, Department of Regional NSW

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Naturally Occurring Asbestos Potential

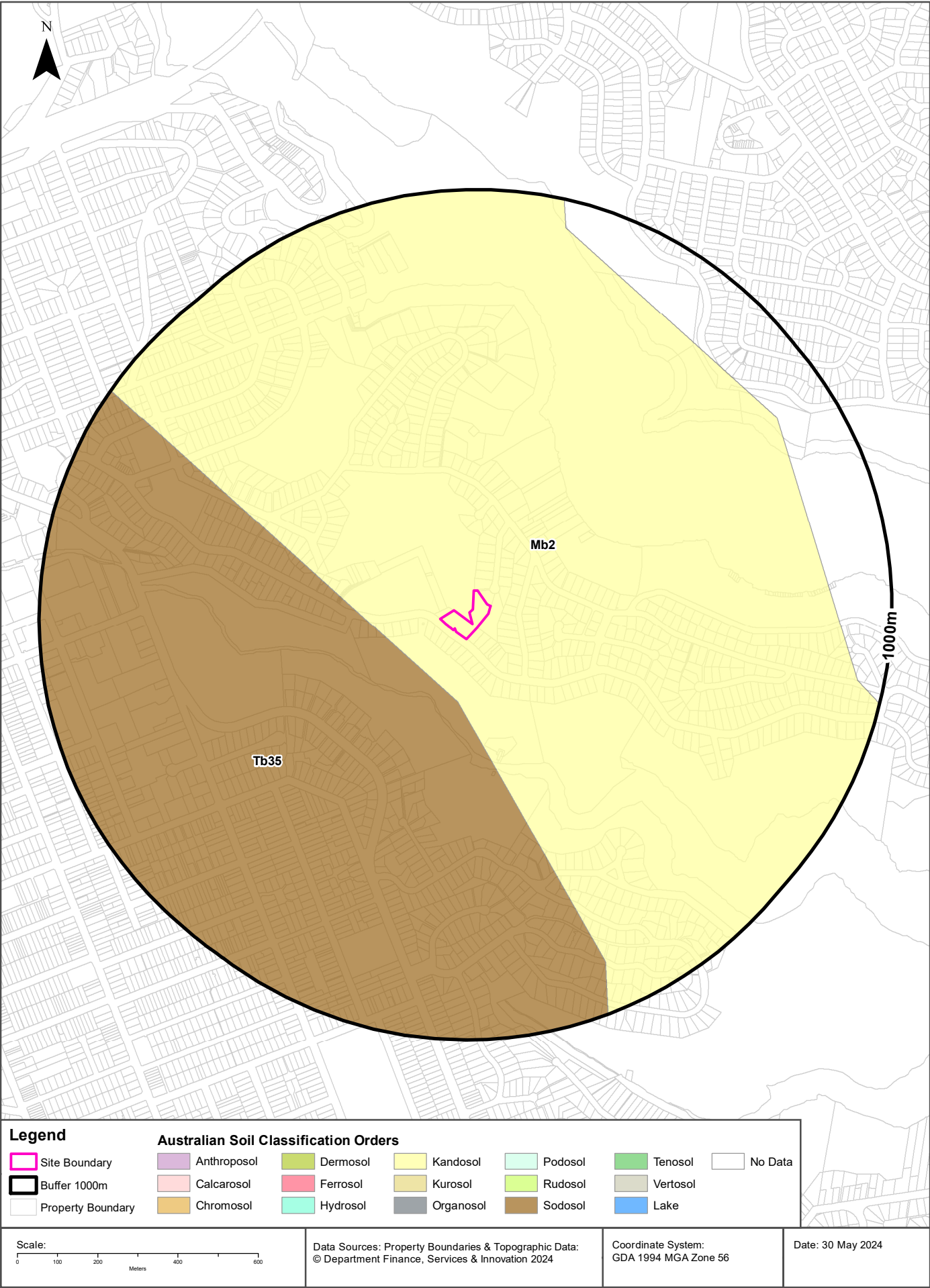
74 Deepwater Road, Castle Cove, NSW 2069

Naturally Occurring Asbestos Potential

Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Naturally Occurring Asbestos Potential Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy



Soils

74 Deepwater Road, Castle Cove, NSW 2069

Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

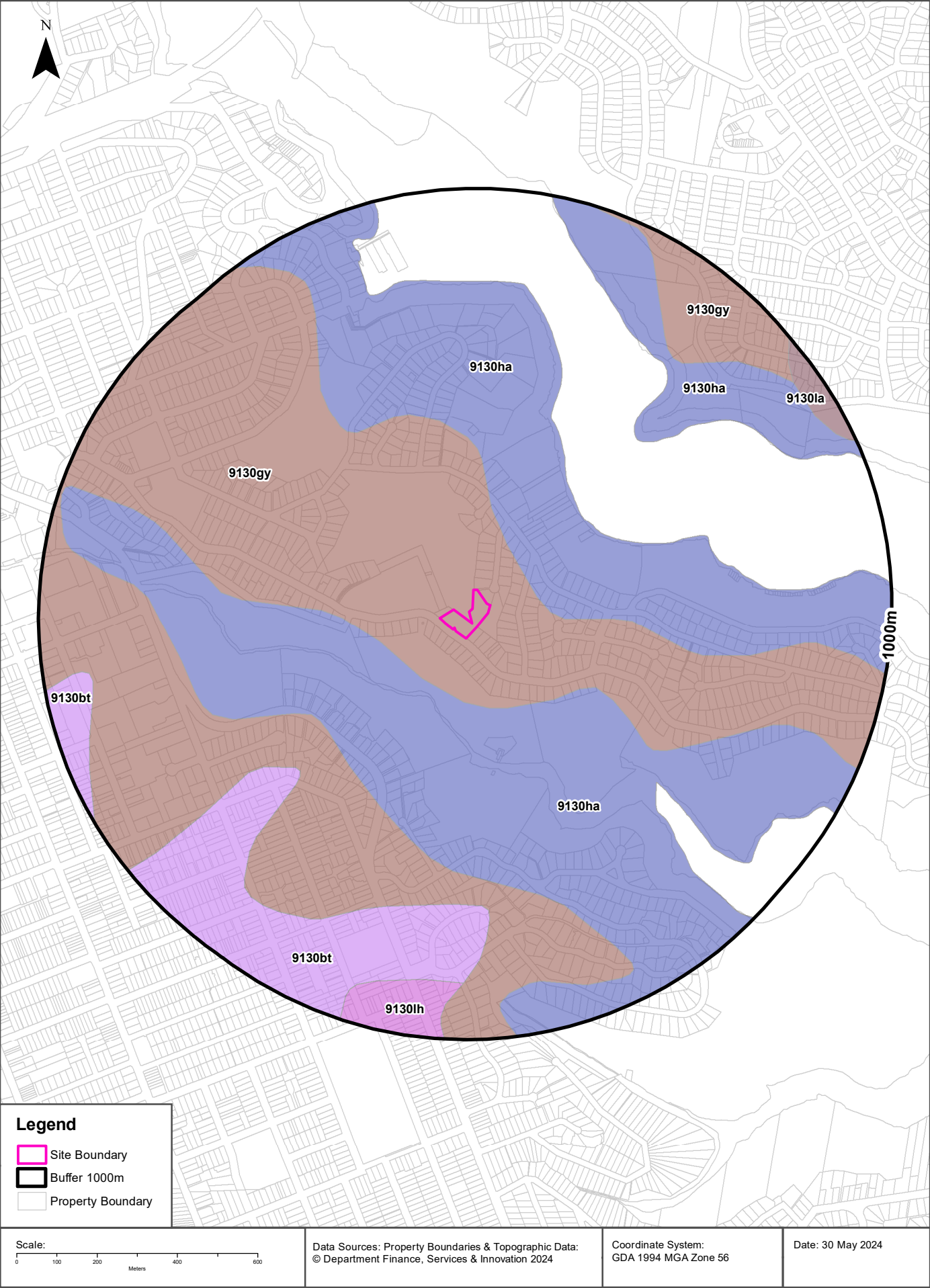
Map Unit Code	Soil Order	Map Unit Description	Distance	Direction
Mb2	Kandosol	Dissected sandstone plateau of moderate to strong relief with sandstone pillars, ledges, and slabs-- level to undulating ridges, irregularly benched slopes, steep ridges, cliffs, canyons, narrow sandy valleys: chief soils are (i) on areas of gentle to moderate relief, acid yellow leached earths (Gn2.74) and (Gn2.34) and acid leached yellow earths (Gn2.24)- sometimes these soils contain ironstone gravel; and (ii) on, or adjacent to, areas of strong relief, siliceous sands (Uc1.2), leached sands (Uc2.12) and (Uc2.2), and shallow forms of the above (Gn2) soils. Associated are: (i) on flat to gently undulating remnants of the original plateau surface, leached sands (Uc2.3), siliceous sands (Uc1.2), sandy earths (Uc5.22), and (Gn2) soils as for (i) above (these areas are in part comparable with unit Cb29); (ii) on flat ironstone gravelly remnants of the original plateau surface, (Gn2) soils as for unit Mb5(i); (iii) on gently undulating ridges where interbedded shales are exposed, shallow, often stony (Dy3.41), (Dr2.21), and related soils similar to unit Tb35; (iv) narrow valleys of (Uc2.3) soils flanked by moderate slopes of (Dy3.41) soils; (v) escarpments of steep hills with shallow (Dy) and (Dr) soils between sandstone pillars; and (vi) shallow (Um) soils, such as (Um6.21) on steep hills of basic rocks. As mapped, minor areas of units Mg20, Mm1, and Mw8 are included. Data are limited.	0m	On-site
Tb35	Sodosol	Dissected plateau remnants--flat to undulating ridge tops with moderate to steep side slopes: chief soils are hard acidic yellow and yellow mottled soils (Dy3.41), (Dy2.21), and (Dy2.41) and hard acidic red soils (Dr2.21); many shallow profiles occur and profile thickness varies considerably over short distances. Associated are: (Gn3.54), (Gn3.14), and possibly other (Gn3) soils; (Db1.2) soils on some ridges; (Dy5.81) soils in areas transitional to unit Mb2; soils common to unit Mb2; and eroded lateritic remnants. Small areas of other soils are likely. Flat ferruginous shale or sandstone fragments are common on and/or in and/or below the soils of this unit.	125m	South West

Atlas of Australian Soils Data Source: CSIRO

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Soil Landscapes of Central and Eastern NSW

74 Deepwater Road, Castle Cove, NSW 2069



Soils

74 Deepwater Road, Castle Cove, NSW 2069

Soil Landscapes of Central and Eastern NSW

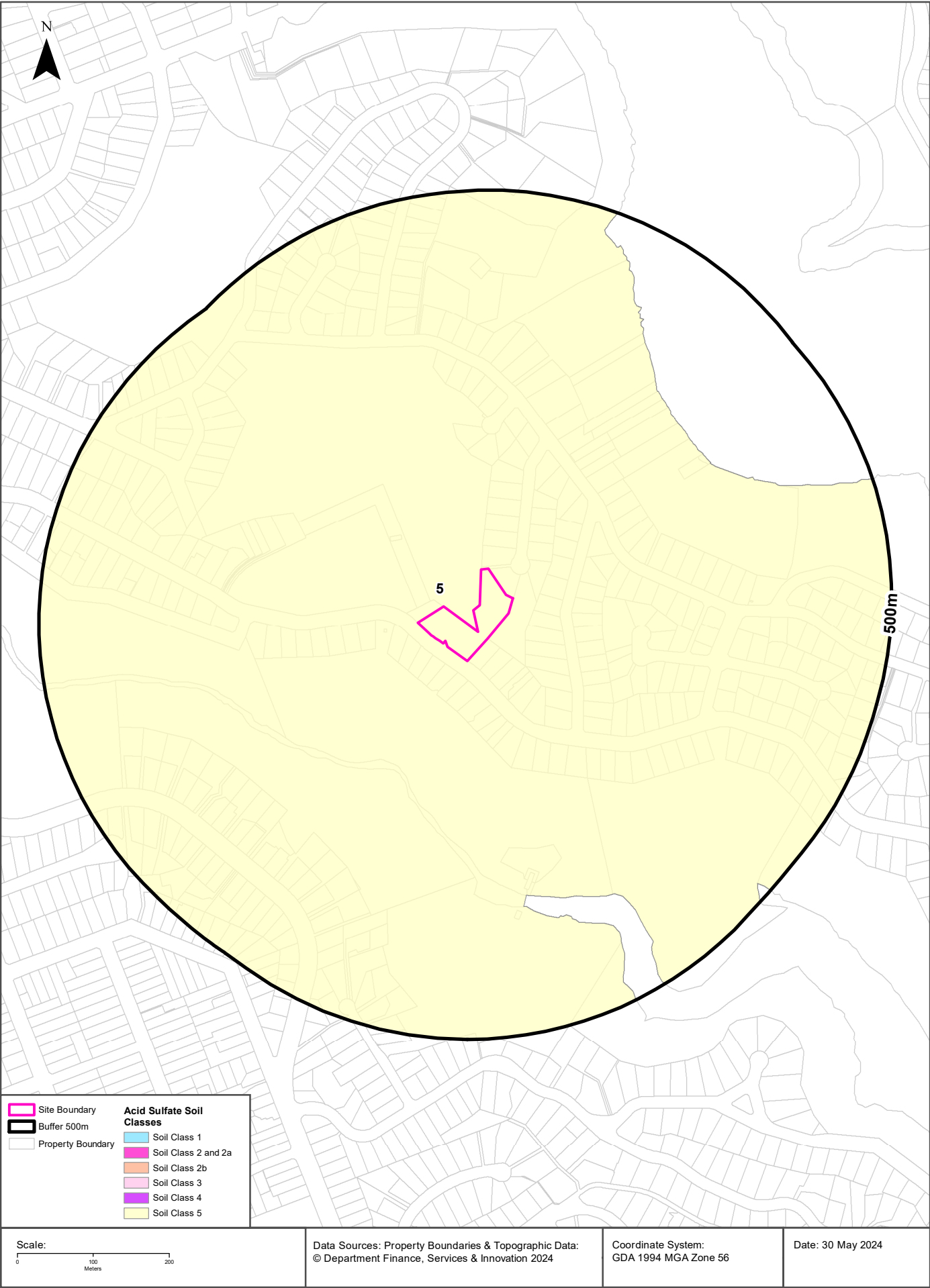
Soil Landscapes of Central and Eastern NSW within the dataset buffer:

Soil Code	Name	Distance	Direction
9130gy	Gymea	0m	On-site
9130ha	Hawkesbury	111m	East
9130bt	Blacktown	515m	South West
9130lh	Lucas Heights	855m	South
9130la	Lambert	935m	North East

Soil Landscapes of Central and Eastern NSW: NSW Department of Planning, Industry and Environment
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Acid Sulfate Soils

74 Deepwater Road, Castle Cove, NSW 2069



Acid Sulfate Soils

74 Deepwater Road, Castle Cove, NSW 2069

Environmental Planning Instrument - Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

Soil Class	Description	EPI Name
5	Works within 500 metres of adjacent Class 1, 2, 3, or 4 land that is below 5 metres AHD and by which the watertable is likely to be lowered below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land, present an environmental risk	Willoughby Local Environmental Plan 2012

If the on-site Soil Class is 5, what other soil classes exist within 500m?

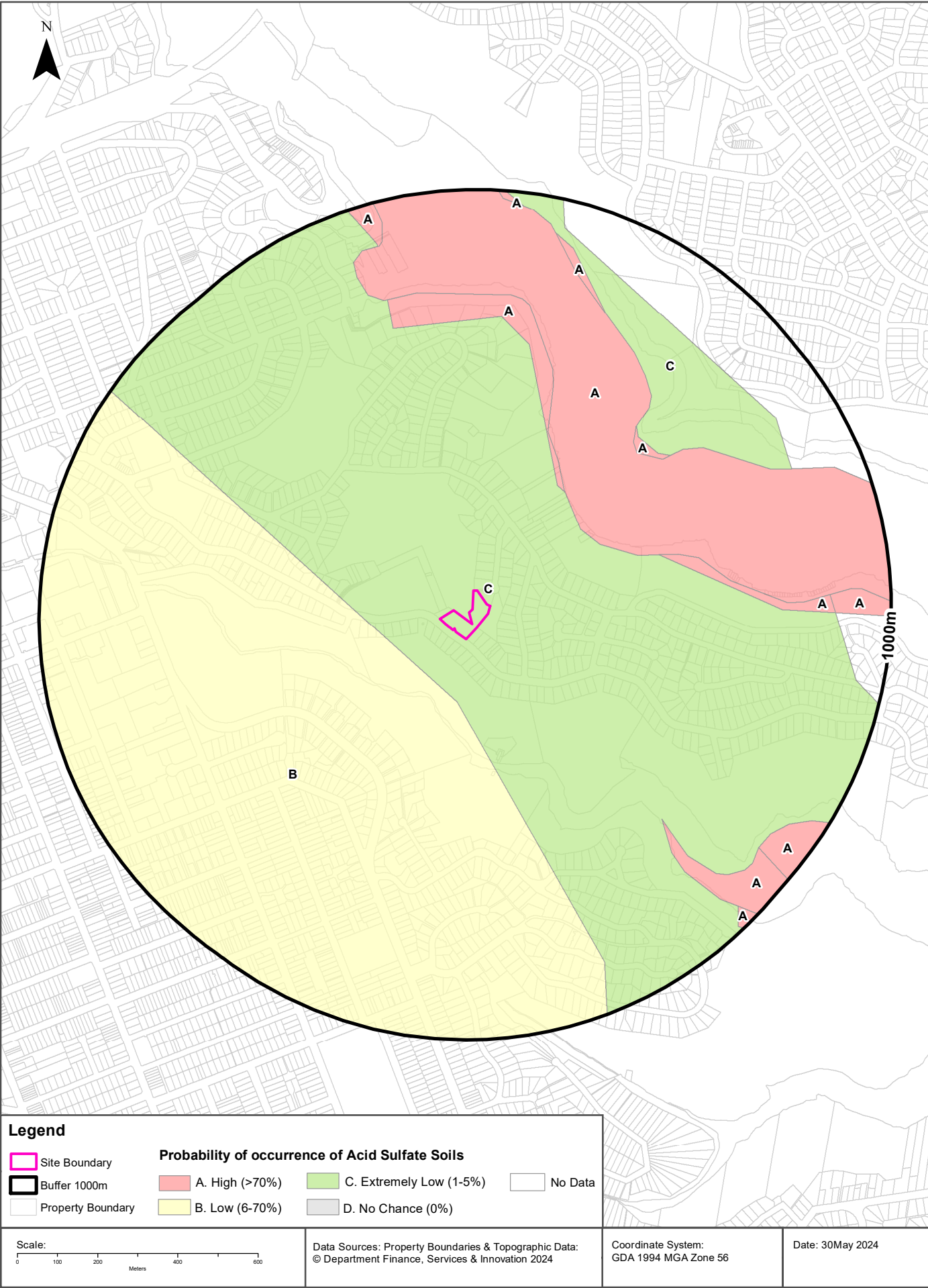
Soil Class	Description	EPI Name	Distance	Direction
None				

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Atlas of Australian Acid Sulfate Soils

74 Deepwater Road, Castle Cove, NSW 2069



Acid Sulfate Soils

74 Deepwater Road, Castle Cove, NSW 2069

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance	Direction
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m	On-site
B	Low Probability of occurrence. 6-70% chance of occurrence.	126m	South West
A	High Probability of occurrence. >70% chance of occurrence.	949m	South East

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Dryland Salinity

74 Deepwater Road, Castle Cove, NSW 2069

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

No

Is there Dryland Salinity - National Assessment data within the dataset buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A		

Dryland Salinity Data Source : National Land and Water Resources Audit

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Any persons using this information do so at their own risk.

In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Mining

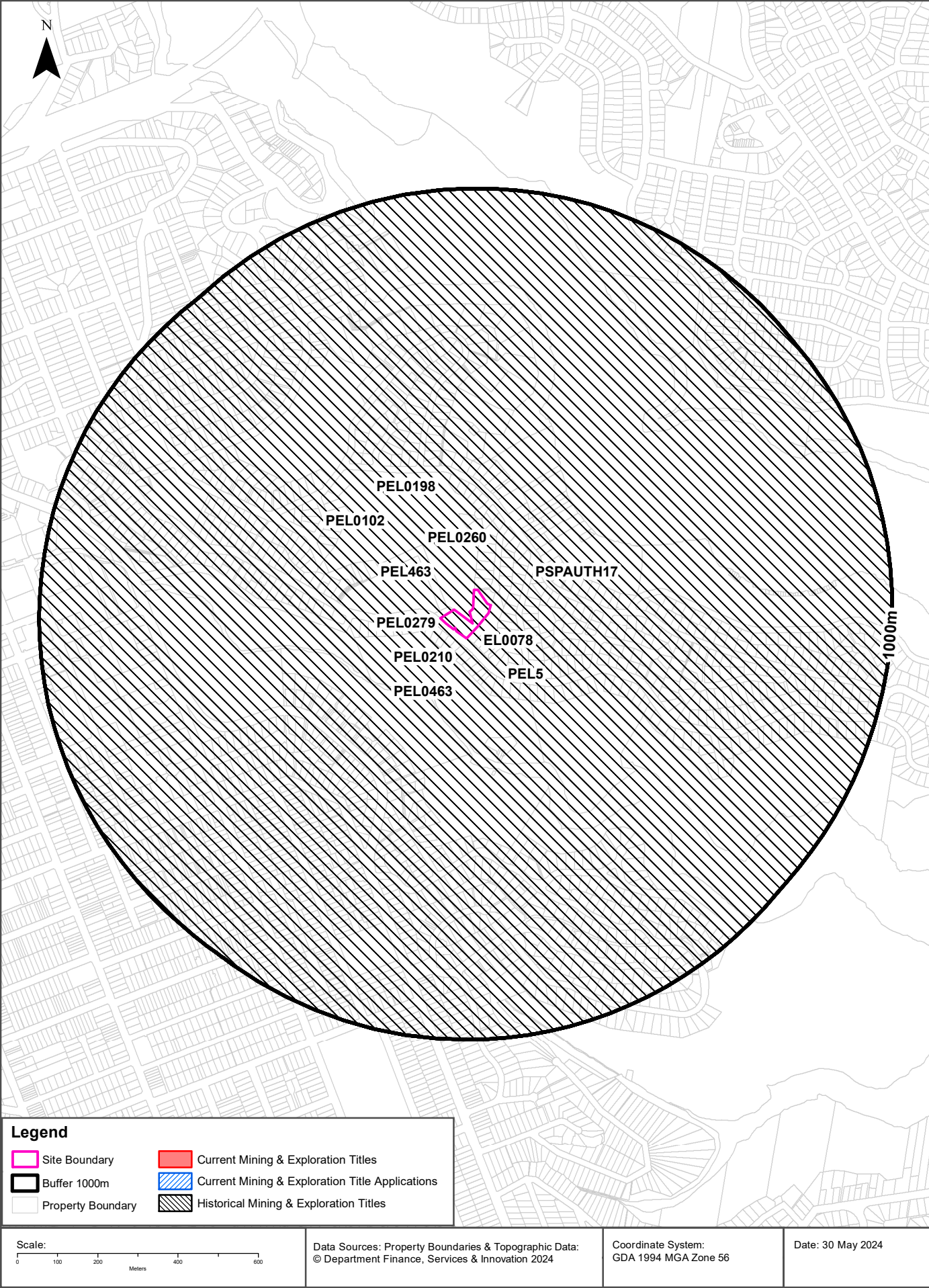
74 Deepwater Road, Castle Cove, NSW 2069

Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

Mining Subsidence District Data Source: © Land and Property Information (2016)
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Mining

74 Deepwater Road, Castle Cove, NSW 2069

Current Mining & Exploration Titles

Current Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Grant Date	Expiry Date	Last Renewed	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer								

Current Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

Current Mining & Exploration Title Applications

Current Mining & Exploration Title Applications within the dataset buffer:

Application Ref	Applicant	Application Date	Operation	Resource	Minerals	Dist	Dir
N/A	No records in buffer						

Current Mining & Exploration Title Applications Data Source: © State of New South Wales through NSW Department of Industry

Mining

74 Deepwater Road, Castle Cove, NSW 2069

Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Start Date	End Date	Resource	Minerals	Dist	Dir
PEL0463	DART ENERGY (APOLLO) PTY LTD	20091010	20150603	PETROLEUM	Petroleum	0m	On-site
PSPAUTH17	MACQUARIE ENERGY PTY LTD	20070803	20080703	PETROLEUM	Petroleum	0m	On-site
PEL0198	JOHN STREVS (TERRIGAL) NL			PETROLEUM	Petroleum	0m	On-site
EL0078	CONTINENTAL OIL CO OF AUSTRALIA LIMITED	19670201	19680201	MINERALS		0m	On-site
PEL463	DART ENERGY (APOLLO) PTY LTD	20081022	20130227	MINERALS		0m	On-site
PEL5	AGL UPSTREAM INVESTMENTS PTY LIMITED	19931111	20011210	MINERALS		0m	On-site
PEL0260	NORTH BULLI COLLIERIES PTY LTD, AGL PETROLEUM OPERATIONS PTY LTD, THE AUSTRALIAN GAS LIGHT CO.	19810909	19930803	PETROLEUM	Petroleum	0m	On-site
PEL0102	AUSTRALIAN OIL AND GAS CORPORATION LTD			PETROLEUM	Petroleum	0m	On-site
PEL0210	THE AUSTRALIAN GAS LIGHT COMPANY (AGL), NORTH BULLI COLLIERIES PTY LTD			PETROLEUM	Petroleum	0m	On-site
PEL0279	THE ELECTRICITY COMMISSION OF NSW (TRADING AS PACIFIC POWER)	19910504	19931111	PETROLEUM	Petroleum	0m	On-site

Historical Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

State Environmental Planning Policy

74 Deepwater Road, Castle Cove, NSW 2069

State Significant Precincts

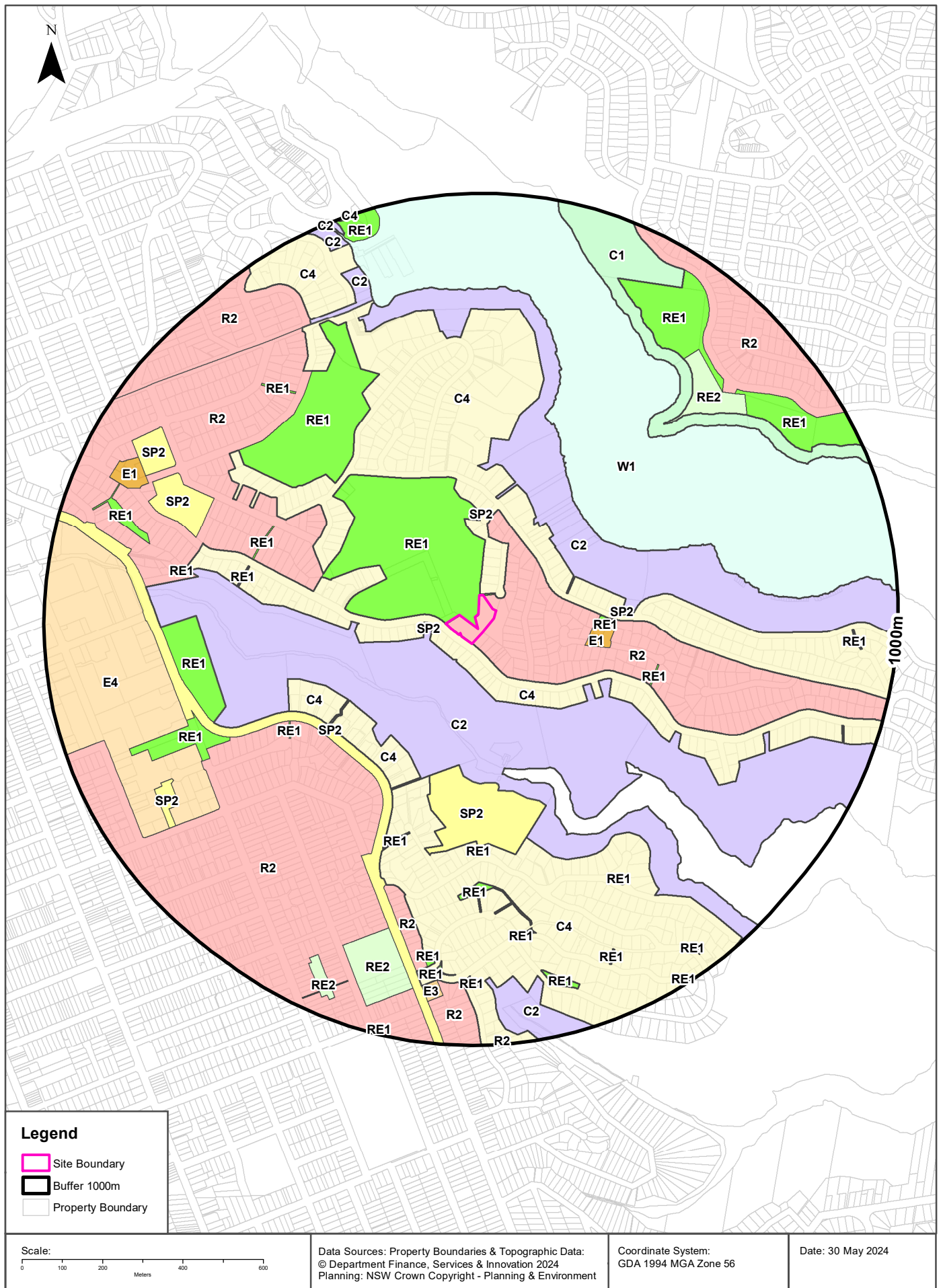
What SEPP State Significant Precincts exist within the dataset buffer?

Map Id	Precinct	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
N/A	No records in buffer							

State Environment Planning Policy Data Source: NSW Crown Copyright - Planning & Environment
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EPI Planning Zones

74 Deepwater Road, Castle Cove, NSW 2069



Environmental Planning Instrument

74 Deepwater Road, Castle Cove, NSW 2069

Land Zoning

What EPI Land Zones exist within the dataset buffer?

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
R2	Low Density Residential		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	0m	On-site
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	0m	North West
C4	Environmental Living		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	0m	North East
C2	Environmental Conservation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	32m	South East
SP2	Infrastructure	Electricity Transmission and Distribution	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	42m	West
SP2	Infrastructure	Electricity Transmission and Distribution	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	199m	North
E1	Local Centre		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	234m	East
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	250m	East
C4	Environmental Living		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	299m	South West
SP2	Infrastructure	Educational Establishment	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	303m	South
C4	Environmental Living		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	308m	South West
W1	Natural Waterways		Warringah Local Environmental Plan 2011	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 3	312m	North East
SP2	Infrastructure	Electricity Transmission and Distribution	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	312m	East
R2	Low Density Residential		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	330m	North West
C4	Environmental Living		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	345m	South
SP2	Infrastructure	Classified Road	Willoughby Local Environmental Plan 2012	08/03/2024	08/03/2024	08/03/2024	Amendment No 36	380m	South West
R2	Low Density Residential		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	404m	South West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	420m	East
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	446m	North West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	458m	South West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	491m	West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	493m	South
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	505m	South
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	510m	West
C1	National Parks and Nature Reserves		Warringah Local Environmental Plan 2011	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 3	569m	North East

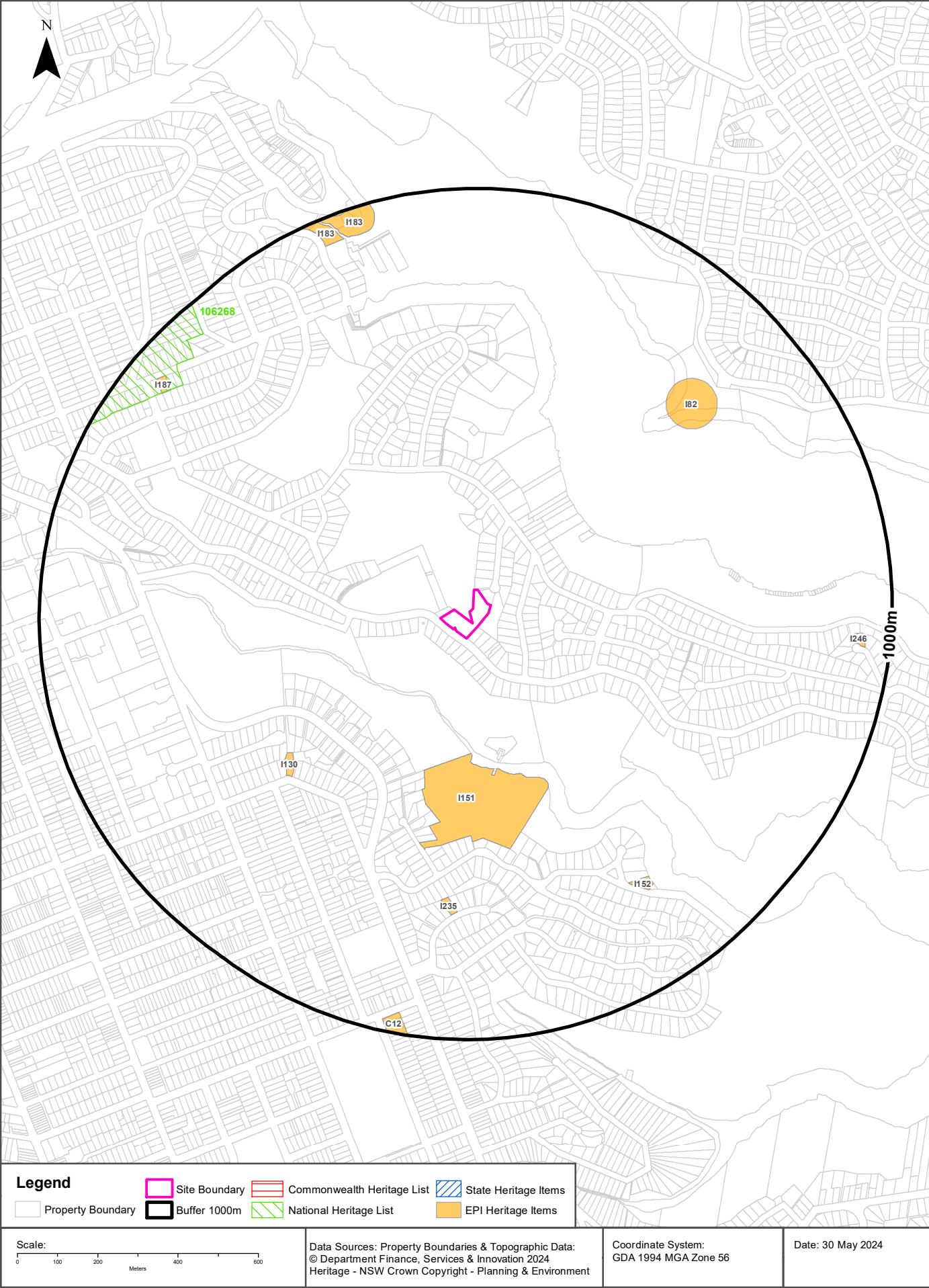
Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	585m	West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	592m	South
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	608m	West
RE2	Private Recreation		Warringah Local Environmental Plan 2011	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 3	617m	North East
R2	Low Density Residential		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	631m	South
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	655m	West
SP2	Infrastructure	Educational Establishment	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	655m	West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	679m	South East
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	681m	North West
E4	General Industrial		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	689m	West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	721m	South
RE2	Private Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	736m	South
RE1	Public Recreation		Warringah Local Environmental Plan 2011	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 3	758m	North East
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	763m	West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	777m	South
R2	Low Density Residential		Warringah Local Environmental Plan 2011	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 3	780m	North East
C2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 4	780m	North
SP2	Infrastructure	Educational Establishment	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	781m	North West
SP2	Infrastructure	Electricity Transmission and Distribution	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	782m	South West
RE1	Public Recreation		Warringah Local Environmental Plan 2011	21/04/2023	26/04/2023	26/04/2023	Map Amendment No 3	791m	North East
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 4	792m	North West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	793m	South
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 4	794m	North West
E1	Local Centre		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	819m	North West
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	826m	South
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	830m	South
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	835m	South
E3	Productivity Support		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	841m	South
R2	Low Density Residential		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	841m	South
RE2	Private Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	863m	South West

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	885m	East
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	920m	South East
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 4	930m	North
C2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	26/04/2023	Map Amendment No 4	933m	North
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	981m	South
RE1	Public Recreation		Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	08/03/2024	Amendment No 34	985m	South East

Environmental Planning Instrument Data Source: NSW Crown Copyright - Planning & Environment
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Heritage Items

74 Deepwater Road, Castle Cove, NSW 2069



Heritage

74 Deepwater Road, Castle Cove, NSW 2069

Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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National Heritage List

What are the National Heritage List Items located within the dataset buffer?

Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
106268	National Trust Urban Conservation Areas of Kur-ring-gai	Pacific Hwy Wahroonga NSW	1/13/020/0060	Historic	Nominated place		866m	North West

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: NSW Crown Copyright - Office of Environment & Heritage
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Environmental Planning Instrument - Heritage

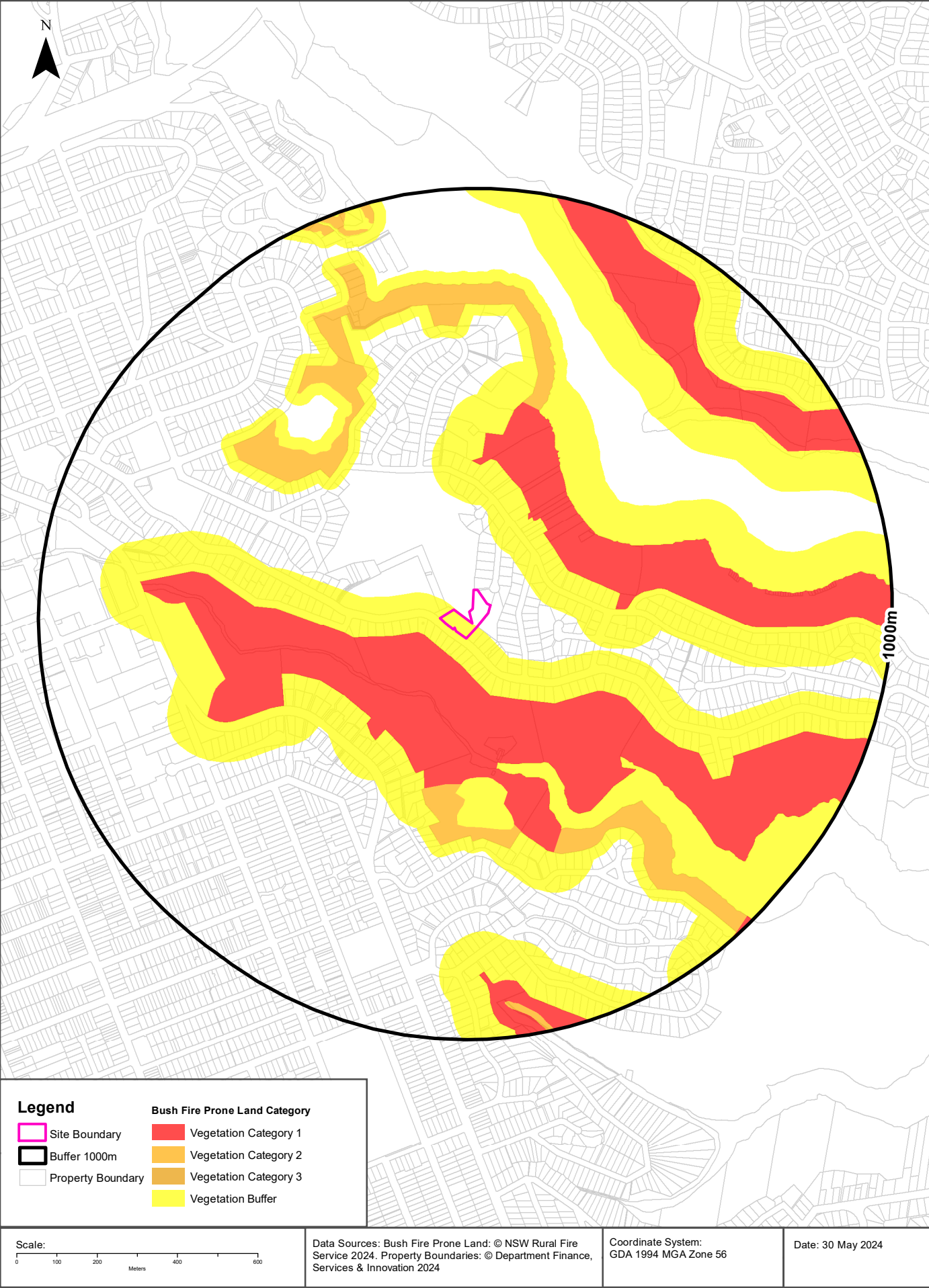
What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I151	Glenaeon School (including gateway)	Item - General	Local	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	30/06/2023	286m	South
I130	House (including original interiors)	Item - General	Local	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	30/06/2023	498m	South West
I82	Killarney Picnic Grounds	Item - Landscape	Local	Warringah Local Environmental Plan 2011	09/12/2011	09/12/2011	30/06/2017	641m	North East

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I235	House (including original interiors)	Item - General	Local	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	30/06/2023	646m	South
I152	House (including original interiors)	Item - General	Local	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	30/06/2023	729m	South East
I187	House (including original interiors)	Item - General	Local	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	30/06/2023	881m	North West
I246	House (including original interiors)	Item - General	Local	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	30/06/2023	898m	East
I183	Echo Point Park	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	03/03/2023	03/03/2023	18/08/2023	930m	North
C12	Willoughby Park	Conservation Area - General	Local	Willoughby Local Environmental Plan 2012	30/06/2023	30/06/2023	30/06/2023	946m	South

Heritage Data Source: NSW Crown Copyright - Planning & Environment

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Natural Hazards

74 Deepwater Road, Castle Cove, NSW 2069

Bush Fire Prone Land

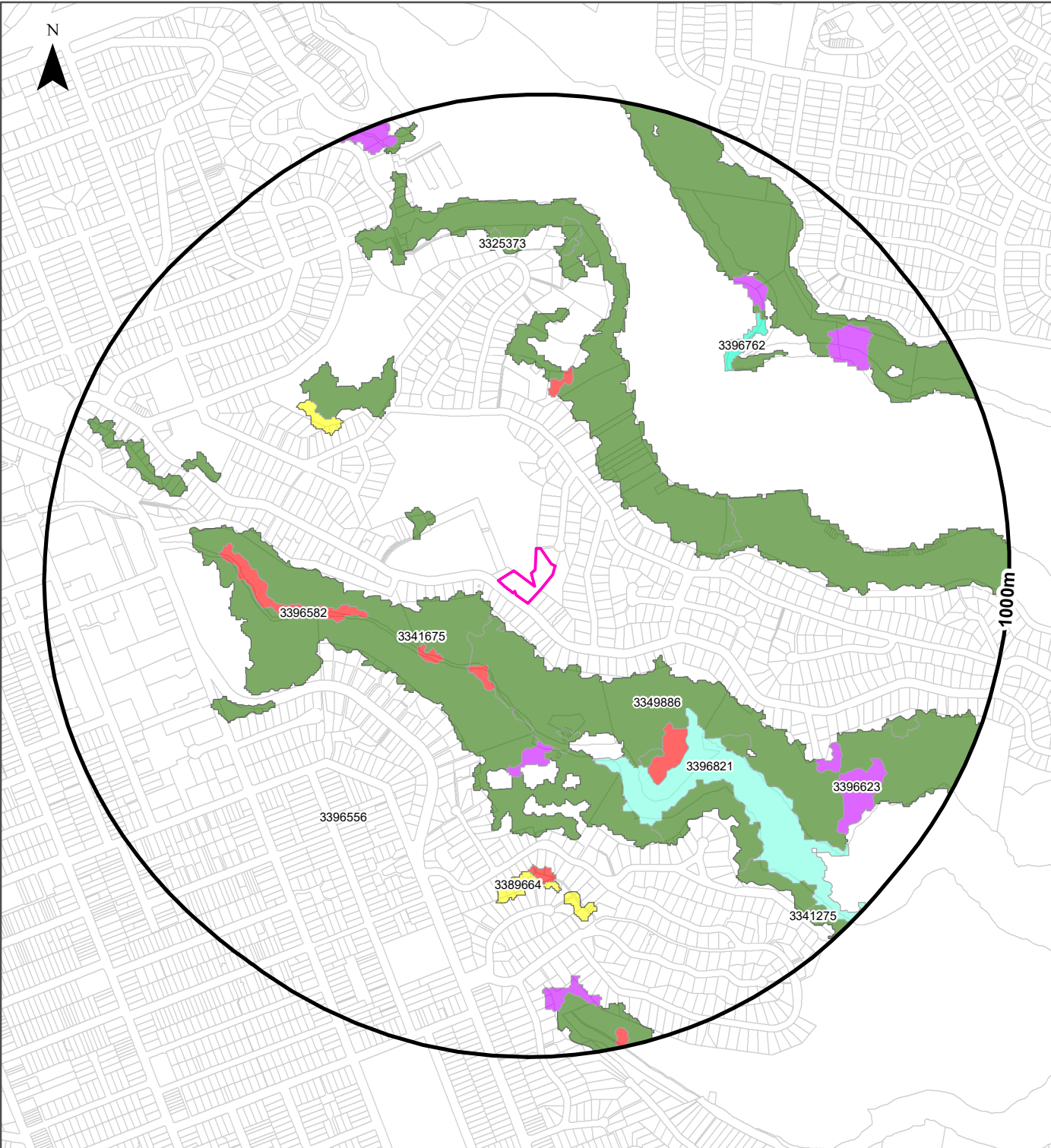
What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	0m	On-site
Vegetation Category 1	56m	South East
Vegetation Category 2	364m	South

NSW Bush Fire Prone Land - © NSW Rural Fire Service under Creative Commons 4.0 International Licence

Ecological Constraints - Vegetation & Ramsar Wetlands

74 Deepwater Road, Castle Cove, NSW 2069



Site Boundary	Dry Sclerophyll Forests (Shrub/grass sub-formation)	Semi-arid Woodlands (Grassy sub-formation)
ReportBuffer	Dry Sclerophyll Forests (Shrubby sub-formation)	Semi-arid Woodlands (Shrubby sub-formation)
Property Boundary	Forested Wetlands	Wet Sclerophyll Forests (Grassy sub-formation)
Ramsar Wetland	Freshwater Wetlands	Wet Sclerophyll Forests (Shrubby sub-formation)
Native Vegetation		
Alpine Complex	Grasslands	Non vegetated
Arid Shrublands (Acacia sub-formation)	Grassy Woodlands	Unattributed
Arid Shrublands (Chenopod sub-formation)	Heathlands	Not classified
	Rainforests	Other
	Saline Wetlands	

Scale:
0 100 200 400 600
Meters

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2024

Coordinate System:
GDA 1994 MGA Zone 56

Date: 30 May 2024

Ecological Constraints

74 Deepwater Road, Castle Cove, NSW 2069

Native Vegetation

What native vegetation exists within the dataset buffer?

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3396556	Not classified	(Not classified) Not classified	Not classified	0m	On-site
3341675	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Foreshores Forest	Sydney Coastal Dry Sclerophyll Forests	44m	West
3349886	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	64m	East
3396582	Rainforests	(Rainforests) Sydney Coastal Coachwood Gallery Rainforest	Northern Warm Temperate Rainforests	163m	South West
3396623	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	305m	South East
3396821	Saline Wetlands	(Saline Wetlands) Grey Mangrove-River Mangrove Forest	Mangrove Swamps	370m	South East
3389664	Heathlands	(Heathlands) Woronora Plateau Heath-Mallee	Sydney Coastal Heaths	484m	South
3396762	Forested Wetlands	(Forested Wetlands) Estuarine Swamp Oak Twig-rush Forest	Coastal Floodplain Wetlands	562m	North East
3325373	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	646m	North
3341275	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Bloodwood Shrub Forest	Sydney Coastal Dry Sclerophyll Forests	911m	South East

Native Vegetation Type Map : NSW Department of Planning and Environment 2022

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Ecological Constraints

74 Deepwater Road, Castle Cove, NSW 2069

Ramsar Wetlands

What Ramsar Wetland areas exist within the dataset buffer?

Map ID	Ramsar Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

Ramsar Wetlands Data Source: © Commonwealth of Australia - Department of Agriculture, Water and the Environment

Ecological Constraints - Protected Areas

74 Deepwater Road, Castle Cove, NSW 2069



Legend

	Site Boundary		Strict Nature Reserve		Natural Monument or Feature		Protected area sustainable use of natural resources
	Buffer 1000m		Wilderness Area		Habitat/Species Management Area		Uncategorised Protected Area
	Property Boundary		National Park		Protected Landscape/Seascape		

Scale:

0

100

200

400

600

Meters

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2024

Coordinate System:
GDA 1994 MGA Zone 56

Date: 30 May 2024

Ecological Constraints

74 Deepwater Road, Castle Cove, NSW 2069

Collaborative Australian Protected Areas Database - Terrestrial

Protected areas in terrestrial environments identified by the CAPAD within the dataset buffer:

Map ID	Area Name	Area Details	Management Category	Authority	Jurisdiction	Dist	Dir
1	Garigal	National Park	National Park	NSW Department of Planning and Environment	State	569m	North East

Collaborative Australian Protected Areas Database - Marine

Protected areas in marine environments identified by the CAPAD within the dataset buffer:

Map ID	Area Name	Area Details	Management Category	Authority	Jurisdiction	Dist	Dir
N/A	No records in buffer						

Source: Collaborative Australian Protected Areas Database (CAPAD) 2022
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Ecological Constraints - Groundwater Dependent Ecosystems Atlas

74 Deepwater Road, Castle Cove, NSW 2069



Ecological Constraints

74 Deepwater Road, Castle Cove, NSW 2069

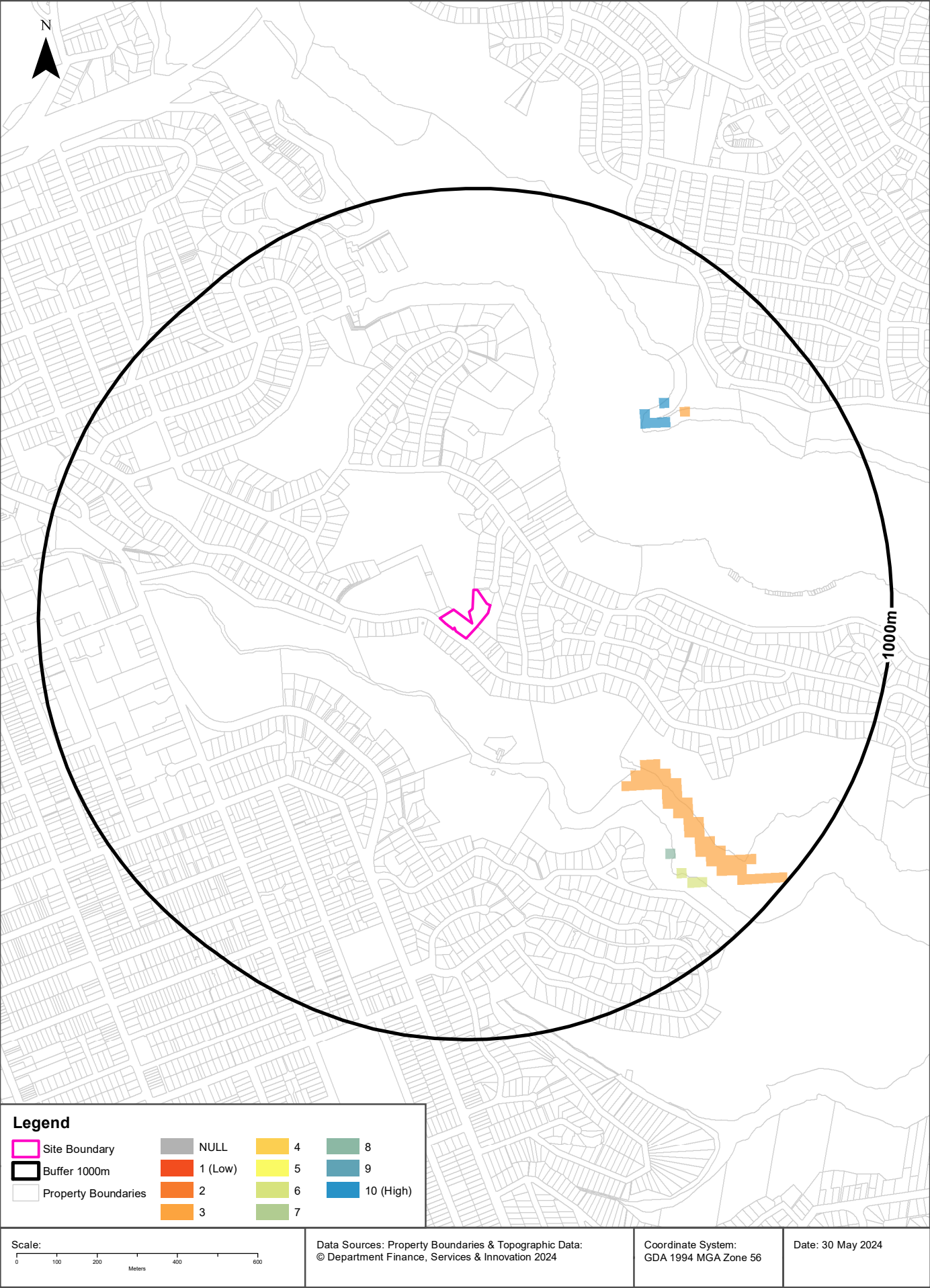
Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	High potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation		523m	South East
Terrestrial	High potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	570m	North East
Terrestrial	Moderate potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	720m	South East

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology
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Ecological Constraints - Inflow Dependent Ecosystems Likelihood

74 Deepwater Road, Castle Cove, NSW 2069



Ecological Constraints

74 Deepwater Road, Castle Cove, NSW 2069

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	3	Deeply dissected sandstone plateaus.	Vegetation		523m	South East
Terrestrial	10	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	570m	North East
Terrestrial	3	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	663m	North East
Terrestrial	8	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	720m	South East
Terrestrial	6	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	775m	South East

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology

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Ecological Constraints

74 Deepwater Road, Castle Cove, NSW 2069

NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Amphibia	Heleioporus australiacus	Giant Burrowing Frog	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Amphibia	Litoria aurea	Green and Golden Bell Frog	Endangered	Not Sensitive	Vulnerable	
Animalia	Amphibia	Pseudophryne australis	Red-crowned Toadlet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Actitis hypoleucos	Common Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Amauornis moluccana	Pale-vented Bush-hen	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Anous stolidus	Common Noddy	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Anseranas semipalmata	Magpie Goose	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Category 2	Critically Endangered	
Animalia	Aves	Apus pacificus	Fork-tailed Swift	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Ardenna carneipes	Flesh-footed Shearwater	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Ardenna grisea	Sooty Shearwater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ardenna pacifica	Wedge-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ardenna tenuirostris	Short-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Arenaria interpres	Ruddy Turnstone	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Botaurus poiciloptilus	Australasian Bittern	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Burhinus grallarius	Bush Stone-curlew	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Calidris acuminata	Sharp-tailed Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris alba	Sanderling	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris ferruginea	Curlew Sandpiper	Endangered	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris tenuirostris	Great Knot	Vulnerable	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	Category 3	Endangered	
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Endangered Population, Vulnerable	Category 3	Endangered	
Animalia	Aves	Calonectris leucomelas	Streaked Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calyptorhynchus banksii banksii	Red-tailed Black-Cockatoo (coastal subspecies)	Critically Endangered	Category 2	Not Listed	
Animalia	Aves	Calyptorhynchus banksii samueli	Red-tailed Black-Cockatoo (inland subspecies)	Vulnerable	Category 2	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Calyptorhynchus lathamii lathamii	South-eastern Glossy Black-Cockatoo	Vulnerable	Category 2	Vulnerable	
Animalia	Aves	Chthonicola sagittata	Speckled Warbler	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Cinclosoma castanotum	Chestnut Quail-thrush	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Cuculus optatus	Oriental Cuckoo	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Diomedea exulans	Wandering Albatross	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Erythrotriorchis radiatus	Red Goshawk	Endangered	Category 2	Endangered	
Animalia	Aves	Esacus magnirostris	Beach Stone-curlew	Critically Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Eudyptula minor	Little Penguin	Endangered Population	Not Sensitive	Not Listed	
Animalia	Aves	Falco subniger	Black Falcon	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Gallinago hardwickii	Latham's Snipe	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Grantiella picta	Painted Honeyeater	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus longirostris	Pied Oystercatcher	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needle-tail	Not Listed	Not Sensitive	Vulnerable	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Hydroprogne caspia	Caspian Tern	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ixobrychus flavicollis	Black Bittern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Lathamus discolor	Swift Parrot	Endangered	Not Sensitive	Critically Endangered	
Animalia	Aves	Limosa lapponica	Bar-tailed Godwit	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Macronectes giganteus	Southern Giant Petrel	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Menura alberti	Albert's Lyrebird	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Neophema pulchella	Turquoise Parrot	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Nettapus coromandelianus	Cotton Pygmy-Goose	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Ninox connivens	Barking Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox strenua	Powerful Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Numenius madagascariensis	Eastern Curlew	Not Listed	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Numenius minutus	Little Curlew	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Numenius phaeopus	Whimbrel	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Onychoprion fuscata	Sooty Tern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Oxyura australis	Blue-billed Duck	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pachycephala olivacea	Olive Whistler	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pandion cristatus	Eastern Osprey	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Petroica boodang	Scarlet Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Phaethon lepturus	White-tailed Tropicbird	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Phaethon rubricauda	Red-tailed Tropicbird	Vulnerable	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Philomachus pugnax	Ruff	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Pluvialis fulva	Pacific Golden Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Pluvialis squatarola	Grey Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies)	Endangered	Category 3	Vulnerable	
Animalia	Aves	Polytelis swainsonii	Superb Parrot	Vulnerable	Category 3	Vulnerable	
Animalia	Aves	Pterodroma leucoptera leucoptera	Gould's Petrel	Vulnerable	Not Sensitive	Endangered	
Animalia	Aves	Pterodroma nigripennis	Black-winged Petrel	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pterodroma solandri	Providence Petrel	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus magnificus	Wompoo Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Puffinus assimilis	Little Shearwater	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stercorarius longicaudus	Long-tailed Jaeger	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Stercorarius parasiticus	Arctic Jaeger	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Stercorarius pomarinus	Pomarine Jaeger	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sterna hirundo	Common Tern	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sternula albigrons	Little Tern	Endangered	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sula dactylatra	Masked Booby	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Thalassarche bulleri	Buller's Albatross	Not Listed	Not Sensitive	Vulnerable	
Animalia	Aves	Thalassarche cauta	Shy Albatross	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Thalassarche melanophris	Black-browed Albatross	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Thalasseus bergii	Crested Tern	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Thinornis cucullatus cucullatus	Eastern Hooded Dotterel	Critically Endangered	Not Sensitive	Vulnerable	
Animalia	Aves	Todiramphus chloris	Collared Kingfisher	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Tringa incana	Wandering Tattler	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Tringa nebularia	Common Greenshank	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa stagnatilis	Marsh Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tyto novaehollandiae	Masked Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Tyto tenebrosa	Sooty Owl	Vulnerable	Category 3	Not Listed	
Animalia	Gastropoda	Meridolum corneovirens	Cumberland Plain Land Snail	Endangered	Not Sensitive	Not Listed	
Animalia	Gastropoda	Pommerhelix duralensis	Dural Land Snail	Endangered	Not Sensitive	Endangered	
Animalia	Insecta	Petalura gigantea	Giant Dragonfly	Endangered	Not Sensitive	Not Listed	
Animalia	Mammalia	Arctocephalus forsteri	New Zealand Fur-seal	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Arctocephalus pusillus doriferus	Australian Fur-seal	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Balaenoptera musculus	Blue Whale	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Cercartetus nanus	Eastern Pygmy-possum	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	Dugong dugon	Dugong	Endangered	Not Sensitive	Not Listed	
Animalia	Mammalia	Eubalaena australis	Southern Right Whale	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Isodon obesulus obesulus	Southern Brown Bandicoot (eastern)	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Macrotis lagotis	Bilby	Extinct	Not Sensitive	Vulnerable	
Animalia	Mammalia	Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus australis	Little Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Notomys mitchellii	Mitchell's Hopping-mouse	Extinct	Not Sensitive	Not Listed	
Animalia	Mammalia	Perameles nasuta	Long-nosed Bandicoot	Endangered Population	Not Sensitive	Not Listed	
Animalia	Mammalia	Petauroides volans	Southern Greater Glider	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Petaurus australis	Yellow-bellied Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Petaurus norfolkensis	Squirrel Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Phoniscus papuensis	Golden-tipped Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Physeter macrocephalus	Sperm Whale	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Pseudomys gracilicaudatus	Eastern Chestnut Mouse	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Pseudomys hermannsburgensis	Sandy Inland Mouse	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	<i>Pseudomys novaehollandiae</i>	New Holland Mouse	Not Listed	Not Sensitive	Vulnerable	
Animalia	Mammalia	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	<i>Vespadelus trouhoni</i>	Eastern Cave Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	<i>Aspidites ramsayi</i>	Woma	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	<i>Caretta caretta</i>	Loggerhead Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	<i>Chelonia mydas</i>	Green Turtle	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	<i>Dermochelys coriacea</i>	Leatherback Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	<i>Diplodactylus platyurus</i>	Eastern Fat-tailed Gecko	Endangered	Not Sensitive	Not Listed	
Animalia	Reptilia	<i>Eretmochelys imbricata</i>	Hawksbill Turtle	Not Listed	Not Sensitive	Vulnerable	
Animalia	Reptilia	<i>Hemiaspis damelii</i>	Grey Snake	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	<i>Myuchelys bellii</i>	Western Sawshelled Turtle, Bell's Turtle	Endangered	Not Sensitive	Vulnerable	
Animalia	Reptilia	<i>Pseudonaja modesta</i>	Ringed Brown Snake	Endangered	Not Sensitive	Not Listed	
Animalia	Reptilia	<i>Tiliqua occipitalis</i>	Western Blue-tongued Lizard	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	<i>Uvidiculus sphyrurus</i>	Border Thick-tailed Gecko	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	<i>Varanus rosenbergi</i>	Rosenberg's Goanna	Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	<i>Camarophyllopsis kearneyi</i>		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	<i>Hygrocybe anomala</i> var. <i>ianthinomarginata</i>		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	<i>Hygrocybe aurantipes</i>		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	<i>Hygrocybe austropratensis</i>		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	<i>Hygrocybe collucera</i>		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	<i>Hygrocybe griseoramosa</i>		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	<i>Hygrocybe lanecovensensis</i>		Endangered	Not Sensitive	Not Listed	
Fungi	Flora	<i>Hygrocybe reesia</i>		Vulnerable	Not Sensitive	Not Listed	
Fungi	Flora	<i>Hygrocybe rubronivea</i>		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	<i>Acacia bynoeana</i>	Bynoe's Wattle	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	<i>Acacia gordonii</i>		Endangered	Not Sensitive	Endangered	
Plantae	Flora	<i>Acacia terminalis</i> subsp. <i>Eastern Sydney</i>	Sunshine wattle	Endangered	Not Sensitive	Endangered	
Plantae	Flora	<i>Allocasuarina portuensis</i>	Nielsen Park She-oak	Endangered	Category 3	Endangered	
Plantae	Flora	<i>Amperea xiphoclada</i> var. <i>pedicellata</i>		Extinct	Not Sensitive	Extinct	
Plantae	Flora	<i>Asterolasia buxifolia</i>		Endangered	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Baeckea kandos		Endangered	Category 3	Endangered	
Plantae	Flora	Caladenia tessellata	Thick Lip Spider Orchid	Endangered	Category 2	Vulnerable	
Plantae	Flora	Callistemon linearifolius	Netted Bottle Brush	Vulnerable	Category 3	Not Listed	
Plantae	Flora	Chamaesyce psammogeton	Sand Spurge	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Cryptostylis hunteriana	Leafless Tongue Orchid	Vulnerable	Category 2	Vulnerable	
Plantae	Flora	Darwinia biflora		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Davidsonia jerseyana	Davidson's Plum	Endangered	Category 2	Endangered	
Plantae	Flora	Deyeuxia appressa		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Epacris purpurascens var. purpurascens		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Epacris sparsa	Sparse Heath	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus camfieldii	Camfield's Stringybark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus leucoxylon subsp. pruinosa	Yellow Gum	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus pulverulenta	Silver-leaved Gum	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus scoparia	Wallangarra White Gum	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Euphrasia collina subsp. muelleri	Mueller's Eyebright	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Genoplesium baueri	Bauer's Midge Orchid	Endangered	Category 2	Endangered	
Plantae	Flora	Grammitis stenophylla	Narrow-leaf Finger Fern	Endangered	Category 3	Not Listed	
Plantae	Flora	Grevillea caleyi	Caley's Grevillea	Critically Endangered	Category 3	Critically Endangered	
Plantae	Flora	Grevillea hilliania	White Yiel Yiel	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Haloragodendron lucasii		Endangered	Not Sensitive	Endangered	
Plantae	Flora	Hibbertia puberula		Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Hibbertia spanantha	Julian's Hibbertia	Critically Endangered	Category 2	Critically Endangered	
Plantae	Flora	Hibbertia superans		Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Isotoma fluviatilis subsp. fluviatilis		Not Listed	Category 3	Extinct	
Plantae	Flora	Lasiopetalum joyceae		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Leptospermum deanei		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Macadamia integrifolia	Macadamia Nut	Not Listed	Not Sensitive	Vulnerable	
Plantae	Flora	Macadamia tetraphylla	Rough-shelled Bush Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Melaleuca biconvexa	Biconvex Paperbark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Melaleuca deanei	Deane's Paperbark	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Microtis angusii	Angus's Onion Orchid	Endangered	Category 2	Endangered	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Persoonia hirsuta	Hairy Geebung	Endangered	Category 3	Endangered	
Plantae	Flora	Persoonia laxa		Extinct	Not Sensitive	Extinct	
Plantae	Flora	Pimelea curviflora var. curviflora		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Prasophyllum fuscum	Slaty Leek Orchid	Critically Endangered	Category 2	Vulnerable	
Plantae	Flora	Prostanthera marifolia	Seaforth Mintbush	Critically Endangered	Category 3	Critically Endangered	
Plantae	Flora	Rhizanthella slateri	Eastern Australian Underground Orchid	Vulnerable	Category 2	Endangered	
Plantae	Flora	Rhodamnia rubescens	Scrub Turpentine	Critically Endangered	Not Sensitive	Critically Endangered	
Plantae	Flora	Sarcophilus hartmannii	Hartman's Sarcophilus	Vulnerable	Category 2	Vulnerable	
Plantae	Flora	Senecio spathulatus	Coast Groundsel	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Tetradlea glandulosa		Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Tetradlea juncea	Black-eyed Susan	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Thesium australe	Austral Toadflax	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Triplarina imbricata	Creek Triplarina	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Wilsonia backhousei	Narrow-leafed Wilsonia	Vulnerable	Not Sensitive	Not Listed	

Data does not include NSW category 1 sensitive species.

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LC Code	Location Confidence
Premise Match	Georeferenced to the site location / premise or part of site
Area Match	Georeferenced to an approximate or general area
Road Match	Georeferenced to a road or rail corridor
Road Intersection	Georeferenced to a road intersection
Buffered Point	A point feature buffered to x metres
Adjacent Match	Land adjacent to a georeferenced feature
Network of Features	Georeferenced to a network of features
Suburb Match	Georeferenced to a suburb boundary
As Supplied	Spatial data supplied by provider

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Appendix G – Dangerous Goods Search



Licence No. 35/011366



APPLICATION FOR RENEWAL OF LICENCE TO KEEP DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION
THEREUNDER

DECLARATION: Please renew licence number 35/011366 to 12/03/2005. I confirm that all the licence details shown below are correct (amend if necessary).


(Signature)

STUART KENCHINGTON
(Please print name)

3/2/2004
(Date signed)

for: CASTLECOVE COUNTRY CLUB LTD

THIS SIGNED DECLARATION SHOULD BE RETURNED TO:

WorkCover New South Wales
Dangerous Goods Licensing Section
LOCKED BAG 2906
LISAROW NSW 2252

Enquiries: ph. (02) 43215500
fax (02) 92875500

Details of licence on 29 January 2004:

Licence Number 35/011366 Expiry Date 12/03/2004

Licensee CASTLECOVE COUNTRY CLUB LTD ACN 001 039 318

Postal Address: DEEPWATER RD CASTLE COVE NSW 2069

Licence Contact ~~PAUL KELLY~~ STUART KENCHINGTON Ph. 02 9417 5444 Fax. 02 9417 3060

Premises Licensed to Keep Dangerous Goods
CASTLECOVE COUNTRY CLUB LTD
DEEPWATER RD CASTLE COVE 2069

Nature of Site GOLF CLUBS

Major Supplier of Dangerous Goods VARIOUS

Emergency Contact for this Site ~~PAUL KELLY~~ STUART KENCHINGTON Ph. 02 9417 5444

Site staffing 8 HRS 5 DAYS

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
PET 1	ROOFED STORE	Class 3	600 L
	UN 1203 PETROL		600 L

Application for Licence to Keep Dangerous Goods

WORKCOVER
NEW SOUTH WALES

Application for ☐ new licence ☐ amendment ☐ transfer ☒ renewal of expired licence 1993

PART A - Applicant and site information See page 2 of Guidance Notes.

1 Name of applicant

ACN

CASTLECOVE COUNTRY CLUB

2 Postal address of applicant

Suburb/Town

Postcode

PO Box 410 Forestville 2092

3 Trading name or site occupier's name

4 Contact for licence inquiries

Phone

Fax

Name

9477 5444 9477 3060

5 Previous licence number (if known)

35/

6 Previous occupier (if known)

7 Site to be licensed

No

Street

DEEPWATER ROAD

Suburb/Town

Postcode

CASTLECOVE

8 Main business of site

GOLF CLUB

9 Site staffing: Hours per day

8

Days per week

5

10 Site emergency contact

Phone

Name

11 Major supplier of dangerous goods

METROPOLITAN FUEL

12 If a new site or for amendments to depots - see page 4 of Guidance Notes

Plan stamped by

Name of Accredited Consultant

Date Stamped

I certify that the details in this application (including any accompanying computer disk) are correct and cover all licensable quantities of dangerous goods kept on the premises

13 Signature of applicant

Printed name

Date

PAUL KELLY 01/08/00

Please send your application, marked **CONFIDENTIAL**, to: **Dangerous Goods Licensing, WorkCover NSW, Level 3, GPO Box 5364, SYDNEY NSW 2001**

6855 L166M10101 WIR

Main Entrance

Deepwater Road

Car Park

Tennis

Access Road

Clubhouse

Main Car Park

Site Sketch Please carefully read the instructions on page 3 of the Guidance Notes before sketching the site.

Pit A
Road Stone
Churn

461

461

Tennis

Baller Area

Fire Road
EXTENSION

HOUSES

DEEPWATER ROAD.

Main
Car Park.

MAIN
ENTRANCE TO
SITE

Tennis
Car Park

GOLF COURSE

Clubhouse.

Access to
SITE

GOLF COURSE

TENNIS
COURTS.

Office

Roller
Door

48 mtrs

19 mtrs

Fire
Door

PET 1
Roofed Store.

Class

40 GALLON
FUEL DRUMS

Fire
Exit

Roller
Door

Fire
Exit
passage

GOLF COURSE

HOUSES

35/011366.

MEERIM ROAD.

NO ACCESS.

HOUSES.

What is a depot? See page 5 of the Guidance Notes.

PART C - Dangerous Goods Storage Complete one section per depot.

If you have more depots than the space provided, photocopy sufficient sheets first.

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
PET 1	ROOFED STORE 200lt drums.	3	400 lts

UN Number	Proper Shipping Name	PG Class (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m ³
1203	Petrol	3 II	Unleaded	400	L

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
PET 1	Roofed Store	3	200 lts

UN Number	Proper Shipping Name	PG Class (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m ³
1203	Petrol	3 II	Supers	200	L

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity

UN Number	Proper Shipping Name	PG Class (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m ³

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity

UN Number	Proper Shipping Name	PG Class (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m ³

Appendix H – Previous Investigation Report

Taylor Construction Group Pty Ltd
Level 13, 157 Walker Street
North Sydney, NSW 2060

Project 218311.00
23 February 2023
218311.00.R.002.Rev0
SF:jl

Attention: Maureece Xuereb

Email: MaureeceX@taylorau.com.au

Preliminary *In-Situ* Waste Classification
Proposed Country Club and Seniors Living Building
68 Deepwater Road, Castle Cove

1. Executive Summary

This report describes the methodology and results of a waste classification undertaken by Douglas Partners Pty Ltd (DP) on *in-situ* fill and natural soils located at 68 Deepwater Road, Castle Cove (refer to Section 2 for further details). The results are summarised in the following Table 1.

Table 1: Summary of Waste Classification

Material Identification	<i>In-situ</i> fill and natural soils
Approximate Area	5735 m ² as shown on the attached Drawing R.002.D.01
Material Description	Fill: fine to medium dark grey sand, with clay, trace rootlets, with angular to sub-angular gravel inclusions and medium to coarse grained pale grey sandstone boulders to depths of between 0.1 m to 1.8 m. Natural: medium to coarse grained pale grey sandstone with some yellow-brown and red, moderately to slightly weathered, very low and low strength, slightly fractured, Hawkesbury Sandstone
Classification	Fill: General Solid Waste (non-putrescible) to depths of between 0.1 m and 1.8 m Natural: Virgin Excavated Natural Material (VENM) underlying the fill above to the depth of proposed excavation
Conditions Specific to this Classification	This preliminary classification is not to be used for waste disposal. Further work is required before a formal classification suitable for waste disposal can be provided. DP notes that fill is underlying asphaltic concrete in some areas of the site and the asphaltic surface (with an approximate thickness of 0.02 m to 0.04 m) is not included in this preliminary waste classification Refer to Section 7 for general conditions

2. Introduction

This waste classification was commissioned by Taylor Construction Pty Ltd and was undertaken with reference to DP Proposal 218311.00.P.001.Rev1 dated 4 October 2022.

It is understood that the site at 68 Deepwater Road, Castle Cove involves the construction of a two-storey Country Club with on-ground parking on the lower portion of the site (nearest to Deepwater Road) and a Seniors Living Building with a single level basement on the upper portion of the site. It is understood that the proposed Country Club car park is to be connected to the senior living car park via an accessway that is to be constructed by cutting into the existing hillside.

This waste classification assessment provides information on the waste classification of the sub surface soils. A geotechnical investigation was carried out concurrently to provide information on the subsurface conditions for design and planning purposes and is reported separately.

The investigation included using a drill rig to drill 10 boreholes, laboratory testing and preparation of a preliminary waste classification report.

3. Scope of Works

The scope of works was as follows:

- Review of aerial photographs and EPA notices;
- Inspection of the site to assess the potential for contamination;
- Sampling from 10 geotechnical boreholes;
- Laboratory testing of 15 samples for a range of common contaminants. A preliminary allowance has been made for completion of TCLP testing on one soil sample. Additional TCLP testing may be warranted depending on the level of contamination on the tested soil samples;
- Collection of samples and dispatch to a NATA accredited laboratory for analysis for the identified contaminants of concern;
- Preparation of this in situ waste classification report; and
- The waste classification was conducted with reference to the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (NSW EPA, 2014). In assessing soils as virgin excavated natural materials (VENM) the POEO Act and NSW EPA website were also referenced.

4. Analytical and Sampling Rationale

The basis for the analytical rationale is provided in Table 2.

Table 2: Site Information

Item	Description
Site Description	As observed at the time of conducting the field work for the waste classification (16 December 2022) the site slopes towards the southwest from 74 m RL to 67 m RL relative to the Australian Height Datum. The assessment area included a single storey brick golf club building surrounded by concrete pathways and an asphalt pavement (car park) in reasonable condition with minor cracks.
Site History	<p>Historical aerial photographs were reviewed as part of this assessment and relevant observations of the site and the surrounding area is summarised below:</p> <p>1943: The site consists of uncleared, high-density vegetation. Deepwater Road is present to the south but appears narrower than the present alignment and unpaved, followed by more uncleared land with high-density vegetation. East and west of the site consist of uncleared high-density vegetation. The golf course is present to the north of the site with a layout very similar to the current layout.</p> <p>1955: The site south-west site area has been cleared of high-density vegetation and now comprises a vacant dirt area with a few trees remaining. A few small buildings are present along the south-eastern boundary. The surrounding area remains relatively unchanged.</p> <p>1965: The golf club building is present on site in the same layout as present day. The south-west site area is still an exposed soil area but is now being used for carparking. Deepwater Road is present to the east and south of site and has been paved with residential buildings on its south followed by high-density vegetation. Residential buildings are present to the east. To the north the golf course layout remains relatively unchanged.</p> <p>1971: The carpark on site is now in its current layout. The overall site is now in the layout seen in present day. The surroundings remain relatively unchanged.</p> <p>1986 to Present: The site remains relatively unchanged. The surrounding area remains relatively unchanged.</p> <p>A search of the EPA contaminated land record indicates that no contaminated land sites are present within 1 km.</p> <p>A search of publicly available data bases also indicates that the site is not listed as a contaminated site on the NSW EPA notified and regulated sites.</p>
Geology and Soil Landscapes	Reference to the Sydney 1:100,000 Series Geological Sheet indicates that the site is underlain by Hawkesbury Sandstone which typically comprises medium to coarse grained quartz sandstone with some shale bands or lenses. The results of the investigation on the site confirmed the regional mapping, with sandstone bedrock intersected at shallow depth.
Acid Sulfate Soils	Reference to the 1:25,000 Acid Sulfate Soils (ASS) Risk map indicates that the site is within an area of no known acid sulphate soils. The nearest mapped occurrence of ASS is within Middle Harbour approximately 340m northeast of site. Given the elevation and known geology of the site, acid sulphate soils are not expected to be present on the site.

Item	Description
Identified Potential Sources of Contamination	<ul style="list-style-type: none"> Imported fill; Existing buildings (potential hazardous materials such as asbestos).

On this basis the contaminants of concern are considered to comprise the following (analytical rationale):

- Eight metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Total recoverable hydrocarbons (TRH);
- Benzene, toluene, ethylbenzene, and xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAH);
- Organochlorine pesticides (OCP);
- Organophosphorus pesticides (OPP);
- Total phenols;
- Polychlorinated biphenyls (PCB); and
- Asbestos.

The sampling rationale is provided in Table 3.

Table 3: Sampling Rationale

Assessment Area	Approximately 5735 m ² as shown on the attached Drawing R.002.D.01.
Depth of Assessment	Boreholes were drilled to depths between 5 m and 14.45 m.
Number of Sampling Locations	Ten boreholes were drilled using a drill rig for geotechnical purposes. Locations were selected to provide general coverage of the assessment area i.e., the proposed construction development footprint.
Number of Samples	<ul style="list-style-type: none"> Laboratory soil testing of the following: <ul style="list-style-type: none"> ○ 15 samples for a range of common contaminants. ○ Completion of TCLP analysis on one soil sample. ○ One QA / QC test including trip spike, trip blank and interlaboratory replicate.

It is noted that dimensions and / or tonnage approximations have been estimated to inform the sampling rationale. DP recommends that if accurate volumes and / or tonnages are required surveys and weighbridge measurements are undertaken.

5. Field Work Observations

The logs are attached which should be read in conjunction with the attached explanatory notes that define geotechnical classification methods and terms used to describe the soils and rocks. In summary, the subsurface profile encountered comprised the following:

- Asphaltic concrete was encountered at most test locations with varying thickness between 0.02m to 0.04m; underlain by
- Fill: fine to medium grained dark grey sand, with clay, angular to sub-angular gravel inclusions, and traces of rootlets to depths of about 0.1 m to 0.8 m;
- Fill in boreholes BH7 to BH9: medium to coarse grained pale grey sandstone boulders, gravelly sand and clayey sand from depths of between 0.03 m to 0.7 m to depths of between 1.2 m - 1.8 m with anthropogenic inclusions such as metal, lead, glass and rubble in borehole BH7; underlain by
- Natural: medium to coarse grained pale grey sandstone with some yellow-brown and red, moderately to slightly weathered, very low and low strength, slightly fractured, Hawkesbury Sandstone, natural started between 0.3 m and 1.8 m and was drilled to final depths between 5.0 m and 14.45 m;
- At the location of BH1 only, natural clayey sand was observed at a depth of 0.1 m, which was observed to grade into very low strength, low strength and medium strength sandstone at depth of about 0.8 m, 2 m and 2.4 m, respectively.

A site walkover was undertaken by an environmental scientist, Srikanth Raghuraman, on 13 December 2022. The general site topography was observed to be consistent with that described in Section 4. The site photographs are included in Appendix B.

The following key site features were observed:

- A single storey brick golf club building with tiled roof, balconies, café, and golf shop at the northern portion of the site (photograph 1)'
- Concrete pathways around the buildings and asphalt car park at the rear end of the building. No staining was observed on the concrete and in the slab appeared to be in fair condition, exhibiting minor cracks (photograph 2, 3 & 4)'
- Gas cylinders and generators were observed in the cage room at the rear end of the golf club building (photograph 5)'
- A water storage tank and an exposed sandstone wall at the northern boundary of the site (photograph 6);
- Coarse gravel and mulch stockpile in the asphalt car park in the southern portion of the site fronting Deepwater Road (photograph 7 & 8);
- Abandoned office rooms on the first floor of the golf club building (photograph 9); and
- Rubbish storage at the rear end of property.

6. Waste Classification

The following Table 4 presents the results of the six-step procedure outlined in NSW EPA (2014) for determining the type of waste and the waste classification. This process applies to the fill at the site, which do not meet the definition of VENM.

Table 4: Six Step Classification Procedure

Step	Comments	Rationale
1. Is the waste special waste?	No	No asbestos-containing materials (ACM), clinical or related waste, or waste tyres were observed in the test pits; Asbestos was not detected by the analytical laboratory.
2. Is the waste liquid waste?	No	The fill comprised a soil matrix.
3. Is the waste "pre-classified"?	No	The fill is not pre-classified with reference to NSW EPA (2014). The natural soil, if classified as VENM, is pre-classified as general solid waste (non-putrescible).
4. Does the waste possess hazardous waste characteristics?	No	The fill was not observed to contain or considered at risk to contain explosives, gases, flammable solids, oxidising agents, organic peroxides, toxic substances, corrosive substances, coal tar, batteries, lead paint or dangerous goods containers.
5. Determining a wastes classification using chemical assessment	Conducted	Refer to Table A1 (attached).
6. Is the waste putrescible or non-putrescible?	Putrescible / Non-putrescible	The fill does not contain materials considered to be putrescible ^a .

Note: a wastes that are generally not classified as putrescible include soils, timber, garden trimmings, agricultural, forestry and crop materials, and natural fibrous organic and vegetative materials (NSW EPA, 2014).

The field and laboratory data quality assurance and quality control results for the samples have been reviewed and are considered to be acceptable. The laboratory certificates are attached.

As shown in the attached Table A1, all contaminant concentrations for the analysed fill samples were below the contaminant thresholds (CT1s) for General Solid Waste (non-putrescible) with the exception of chromium in sample BH4/0.1-0, Lead in sample BD01/13122022 and Nickel in samples BD02/14122022 and BH4/0.1-0.2. Additional TCLP tests were conducted for the analytes exceeding the CT1 thresholds on representative "worst case" samples. The SCC and TCLP concentrations for those samples were below the contaminant thresholds SCC1 and TCLP1 for General Solid Waste (non-putrescible), respectively.

Table 5: Waste Classification Summary

Item	Description
Based on the observations at the time of sampling and the reported analytical results, the fill described as:	FILL: fine to medium dark grey sand, with clay, trace rootlets, with angular to sub-angular gravel inclusions and medium to coarse grained pale grey sandstone boulders
Within the area subject to classification as shown on Drawing R.002.D.01, is classified as:	General Solid Waste (non-putrescible)

The following Table 6 presents the results of the assessment of natural soil and rock at the site with reference to the VENM definition in the POEO Act and the EPA¹ website.

<https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material>

Table 6: VENM Classification Procedure

Item	Comments	Rationale
1. Is the material natural?	Yes	Natural soil and rock logged in the test pits as per Section 5. These materials underlie the fill at the site.
2. Are manufactured chemicals or process residues present?	No	There were no visual or olfactory indicators of chemical contamination of the materials in the test pits. Concentrations of contaminants were considered to be typical of background concentrations (Table A1).
3. Are sulfidic ores or soils present?	No	Refer to Table 2.
4. Are there current or previous land uses that have (or may have) contaminated the materials?	No	Previous land uses may have impacted on surface soils overlying the materials. Low chemical concentrations indicate no likely impact on the natural materials.

Table 7: VENM Classification Summary

Item	Description
Based on the outcomes presented in Table 6, the natural soils and rock described as:	yellow-brown clayey sand and medium to coarse grained pale grey sandstone with some yellow-brown and red, moderately to slightly weathered, very low and low strength, slightly fractured, Hawkesbury Sandstone
Within the area subject to classification as shown on Drawing R.002.D.01, is classified as:	VENM

¹ <https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material>

7. Conditions

This preliminary classification is not to be used for waste disposal. Further work is required before a formal classification suitable for waste disposal can be provided. The final waste classification is to be confirmed by a qualified environmental consultant including visual and analytical assessments.

If any fill / soil / rock is encountered that is different to those sampled and tested or exhibit signs of potential contamination (e.g., anthropogenic inclusions, staining or odours) this waste classification does not apply and the advice of a qualified environmental consultant should be sought.

If during excavation the natural *in situ* soil / rock is found to contain possible signs of contamination or is cross contaminated with any non-VENM soil or rock the excavated natural soil / rock cannot be classified as VENM. In this regard, it is also recommended that care should be taken during the bulk excavation of the VENM to prevent cross contamination between the VENM and non-VENM materials.

Both the receiving site and the site disposing of the fill / soil / rock should satisfy the requirements of the licence before disposal of the fill / soil / rock is undertaken. Note that appropriate prior arrangement with the receiving site / relevant authorities should be obtained prior to the disposal of any fill / soil / rock off site. The receiving site should check to ensure that the fill / soil / rock received matches the description provided in this report and contains no cross contamination. The handling, transport and disposal of the waste should be conducted in accordance with regulatory and statutory requirements. DP does not accept liability for the unlawful disposal of waste materials from any site. DP accepts no responsibility for the material tracking, loading, management, transport, or disposal of waste from the site.

8. References

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

9. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 68 Deepwater Road, Castle Cove in accordance with DP's proposal 218311.00.P.001.Rev1 dated 4 October 2022 and acceptance received from Taylor Construction Group Pty Ltd via an email dated 2 October 2022. The work was carried out in accordance with a Consultancy Agreement executed on 18 January 2023. This report is provided for the exclusive use of Taylor Construction Group 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.

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

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.

DP personnel are not licenced or accredited surveyors. Any quantities quoted in this report are provided for general guidance only and should not be relied upon. The services of a licenced / accredited surveyor should be engaged if reliable quantities are required.

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.

The results provided in the report are indicative of the surface and sub-surface conditions only at the specific sampling locations, and then only to the depths investigated and at the time the work was carried out. Surface and sub-surface conditions can change as a result of human influences, and such changes may occur after DP's field testing has been completed.


Although the sampling plan adopted for this waste classification 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 conditions, budget constraints, parts of the site being inaccessible and not available for inspection / sampling, or due to vegetation preventing visual inspection and reasonable access. It is therefore considered possible that hazardous building materials, 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 hazardous building materials are not present in the fill or surface soils at the site.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Reviewed by

pp 
Sam Ferguson
Environmental Scientist

p.p. 
Mike Nash
Principal

Attachments: Notes About This Report
Drawing R.002.D.01
Photographs
Historical Aerials
Borehole Logs and Explanatory Notes
Summary of Laboratory Results
Laboratory Certificates of Analysis, Chain of Custody Documentation and Sample Receipt
Advice

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.

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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

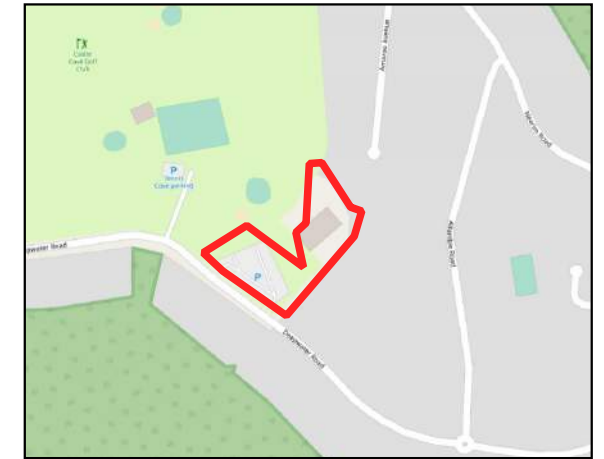
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later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



Locality Plan

LEGEND

- Site Boundary
- ⊕ Borehole Test Location

NOTE:
 1: Basemap from MetroMap[(Dated 13.06.2022)
 2: Site Boundary and Test Locations shown are approximate only

0 5 10 15 20 25 30 35 40 45 50 m
 1:600 @ A3





Photo 1: Main brick building with café and golf shop



Photo 2: Asphalt carpark next to building



Photo 3: Concrete paths around exterior of building



Photo 4: Cracks throughout asphalt carpark



Photo 5: Gas canisters within cage room



Photo 6: Water storage tank near northern boundary




Photo 7: Gravel stockpile in carpark

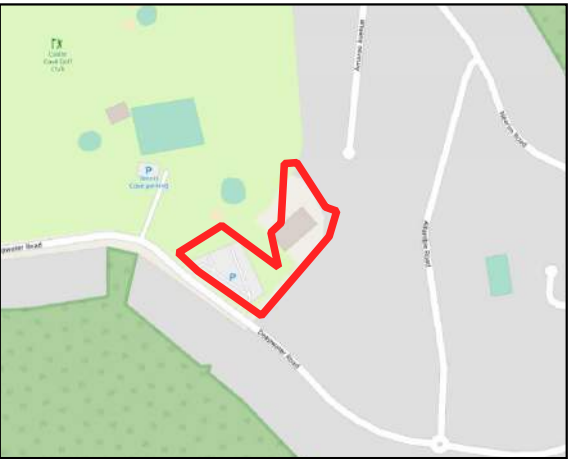


Photo 8: Mulch stockpiles in carpark



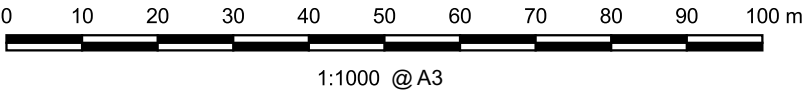
Photo 9: Abandoned office rooms on first floor

 Douglas Partners Geotechnics Environment Groundwater	Site Photographs		PROJECT:	218311.00
	Preliminary In Situ Waste Classification		PLATE No:	5
	68 Deepwater Road, Castle Cove		REV:	0
	CLIENT	Taylor Construction Group Pty Ltd	DATE	February 2023



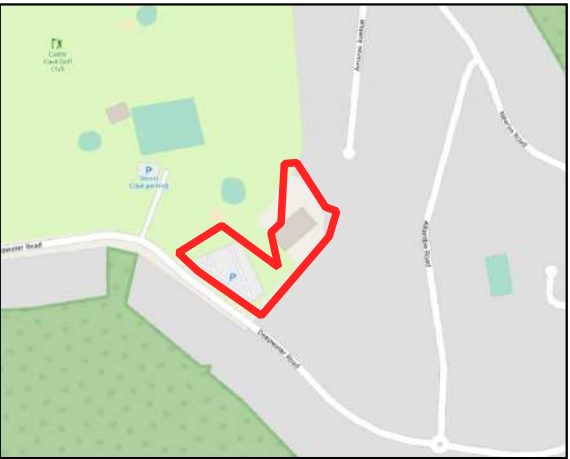
Locality Plan

NOTE:
1: Basemap from Spatial Services NSW
2: Site Boundary and Test Locations shown are approximate only



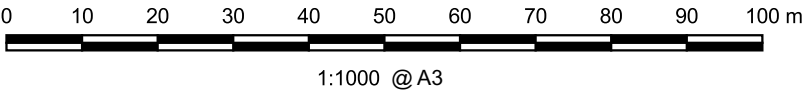
LEGEND
 Site Boundary





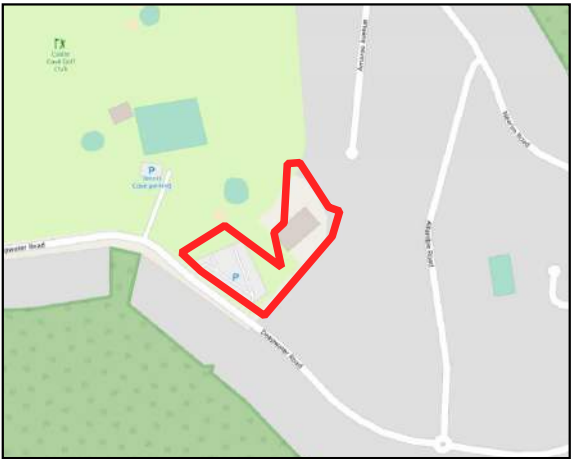
Locality Plan

NOTE:
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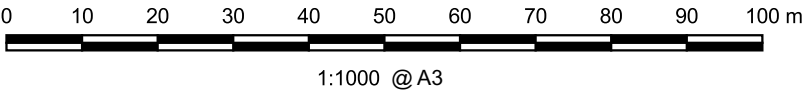
LEGEND
 Site Boundary





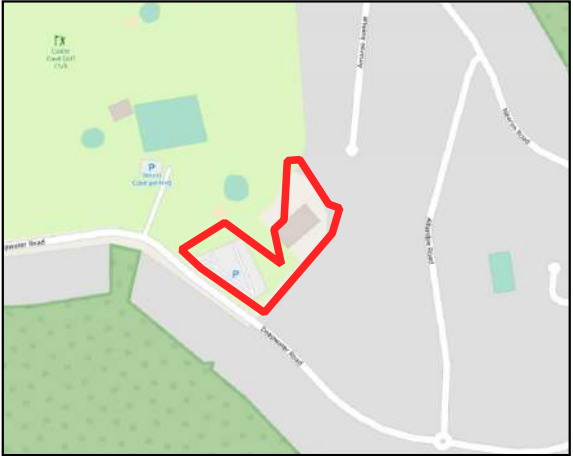
Locality Plan

NOTE:
1: Basemap from Spatial Services NSW
2: Site Boundary and Test Locations shown are approximate only



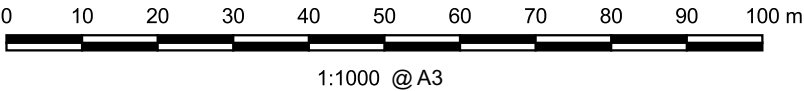
LEGEND
 Site Boundary





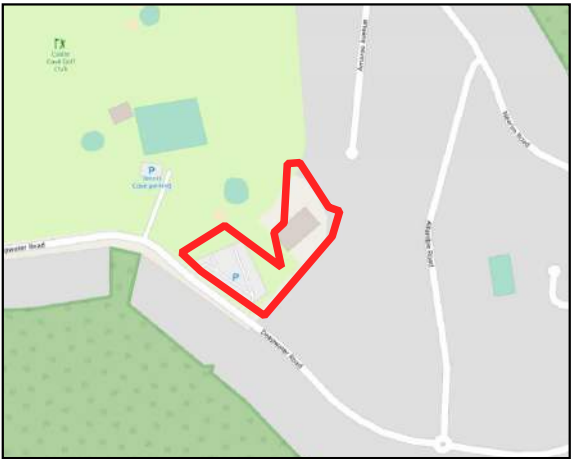
Locality Plan

NOTE:
1: Basemap from Spatial Services NSW
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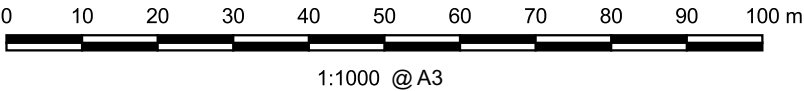
LEGEND
 Site Boundary





Locality Plan

NOTE:
1: Basemap from Spatial Services NSW
2: Site Boundary and Test Locations shown are approximate only



LEGEND
 Site Boundary

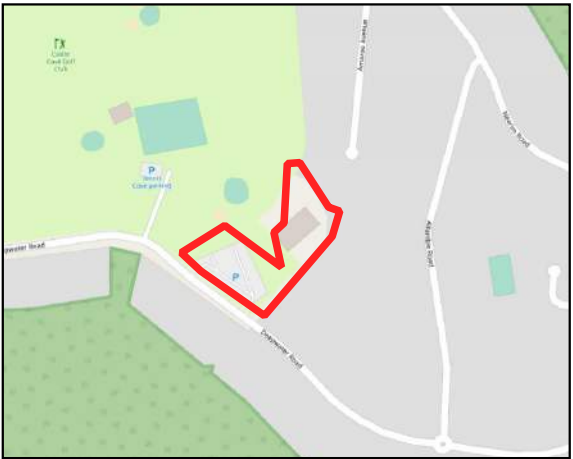
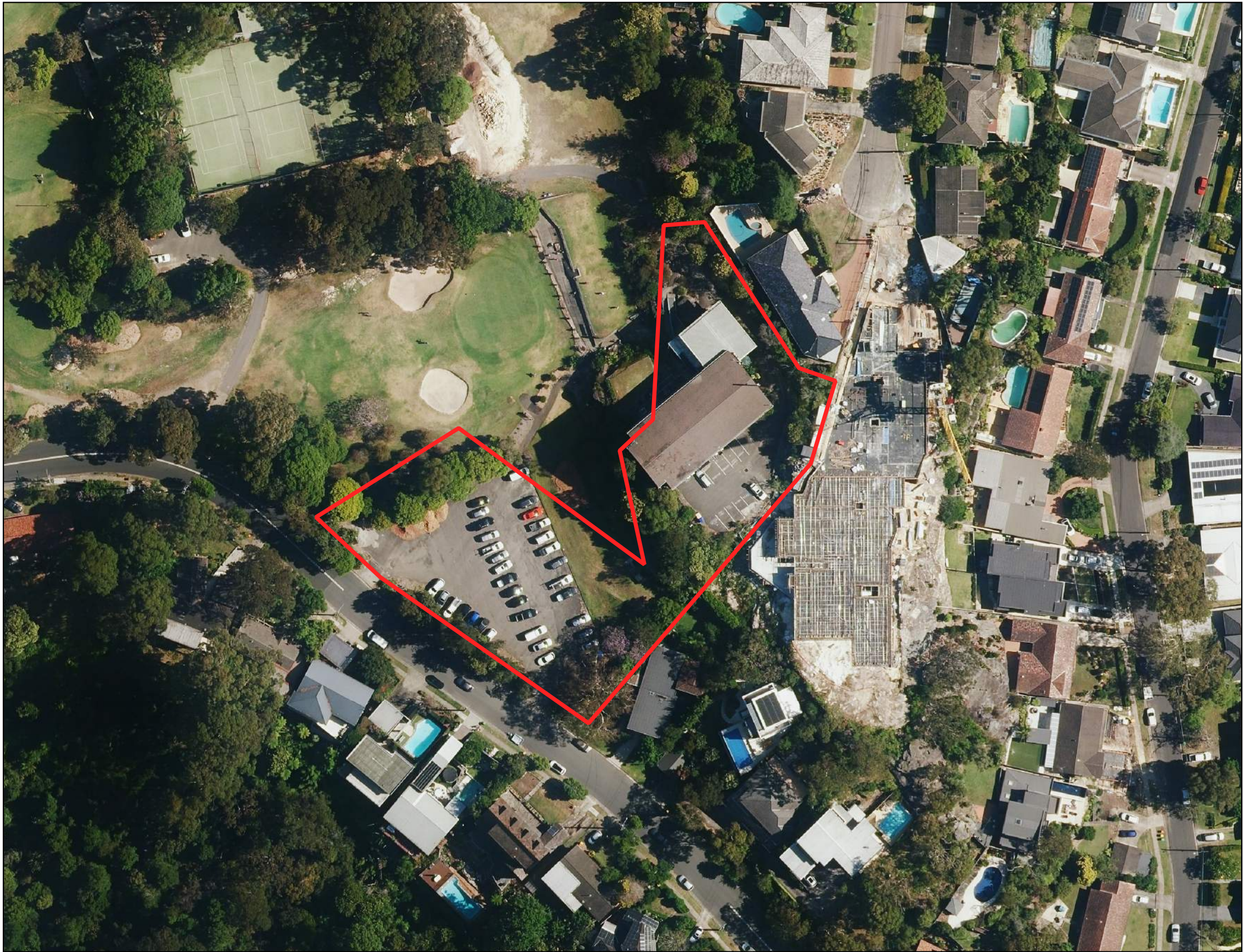


CLIENT: Taylor Construction Group Pty Ltd	
OFFICE: Sydney	DRAWN BY: LT
SCALE: 1:1000 @ A3	DATE: 23.02.2023

TITLE: **Historical Aerial Photograph - 1986**
Proposed Country Club and Seniors Living Building
68 Deepwater Road, Castle Cove

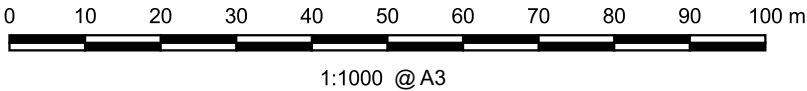


PROJECT No: 218311.00	
DRAWING No: R.002.D.06	
REVISION:	0



Locality Plan

NOTE:
1: Basemap from Spatial Services NSW
2: Site Boundary and Test Locations shown are approximate only



LEGEND
 Site Boundary





Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low

reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:
4,6,7
N=13
- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:
15, 30/40 mm

Sampling Methods

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.



Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 - 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 - 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)

- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)

- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;

- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
Soil tends to stick together.
Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w < PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL' (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w > PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈ LL' (i.e. near the liquid limit).
- 'Wet' or 'w > LL' (i.e. wet of the liquid limit).



Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $Is_{(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Abbreviation	Unconfined Compressive Strength MPa	Point Load Index * $Is_{(50)}$ MPa
Very low	VL	0.6 - 2	0.03 - 0.1
Low	L	2 - 6	0.1 - 0.3
Medium	M	6 - 20	0.3 - 1.0
High	H	20 - 60	1 - 3
Very high	VH	60 - 200	3 - 10
Extremely high	EH	>200	>10

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Residual Soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	No signs of decomposition or staining.
<i>Note: If HW and MW cannot be differentiated use DW (see below)</i>		
Distinctly weathered	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.

Rock Descriptions

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} > 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

Douglas Partners



Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U ₅₀	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

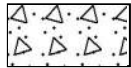
General



Asphalt



Road base



Concrete



Filling

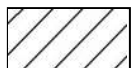
Soils



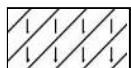
Topsoil



Peat



Clay



Silty clay



Sandy clay



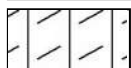
Gravelly clay



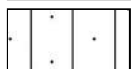
Shaly clay



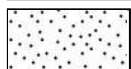
Silt



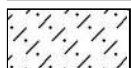
Clayey silt



Sandy silt



Sand



Clayey sand



Silty sand



Gravel



Sandy gravel



Cobbles, boulders



Talus

Sedimentary Rocks



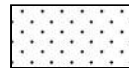
Boulder conglomerate



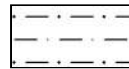
Conglomerate



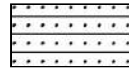
Conglomeratic sandstone



Sandstone



Siltstone



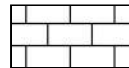
Laminite



Mudstone, claystone, shale



Coal

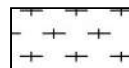


Limestone

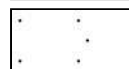
Metamorphic Rocks



Slate, phyllite, schist

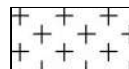


Gneiss

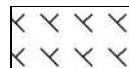


Quartzite

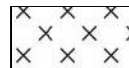
Igneous Rocks



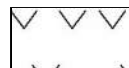
Granite



Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry

BOREHOLE LOG

CLIENT: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 67.2 AHD
EASTING: 334198
NORTHING: 6260110
DIP/AZIMUTH: 90°/-

BORE No: BH1
PROJECT No: 218311.00
DATE: 14/12/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing				
			EW	HW	MW	SW		FS	FR	Ex Low	Very Low	Low			Medium	High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
67	0.02	ASPHALTIC CONCRETE																E			
	0.1	FILL/ Sandy GRAVEL: fine to medium, angular to sub-angular, dark grey, fine to coarse sand, wet from diatube																B			
1	0.8	Clayey SAND SC: medium to coarse, yellow-brown, low plasticity clay, moist, extremely weathered sandstone																			
66		SANDSTONE: medium to coarse grained, pale grey yellow-brown and red, highly weathered, very low and low strength, fractured, Hawkesbury Sandstone																C	100	40	PL(A) = 0.07
2																					
65	2.4	SANDSTONE: medium to coarse, pale grey and yellow-brown, moderately weathered to fresh, medium strength, slightly fractured to unbroken, Hawkesbury Sandstone																			PL(A) = 0.99
3																		C	100	100	PL(A) = 0.74
4																					
63																		C	100	100	PL(A) = 0.59
5																					PL(A) = 0.71
5.5		Bore discontinued at 5.5m Target depth reached																			
6																					
61																					
7																					
60																					
8																					
59																					
9																					
58																					

RIG: MultiDrill 300

DRILLER: Tracess Drilling

LOGGED: TM

CASING: HQ to 1.0m

TYPE OF BORING: Diatube to 0.02m, Solid flight auger (TC-bit) to 1.0m, NMLC-Coring to 5.5m

WATER OBSERVATIONS: Groundwater observed at 1.72m

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well installed to 5.5m (screen 5.5-3.0m; blank 3.0-0.0m; gravel 5.5-2.0; bentonite 2.0-0.1m; gatic at surface)

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)

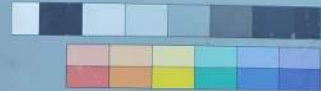
BORE: BH1

PROJECT: 218311.00

DECEMBER 2022



Project No: 218311.00
BH ID: 1
Depth: 1.0 - 5.5
Core Box No.: 1



1.00 - 5.50m

BOREHOLE LOG

CLIENT: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 67.2 AHD
EASTING: 334198
NORTHING: 6260110
DIP/AZIMUTH: 90°/-

BORE No: BH1
PROJECT No: 218311.00
DATE: 14/12/2022
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			
67.2	0.02	ASPHALTIC CONCRETE		E	0.1				Gatic cover	
	0.1	FILL/ Sandy GRAVEL: fine to medium, angular to sub-angular, dark grey, fine to coarse sand, wet from diatube		B	0.2					
	0.8	Clayey SAND SC: medium to coarse, yellow-brown, low plasticity clay, moist, extremely weathered sandstone			0.8					
	1.0	SANDSTONE: medium to coarse grained, pale grey yellow-brown and red, highly weathered, very low and low strength, fractured, Hawkesbury Sandstone			1.0					
	1.9			C	1.9		PL(A) = 0.07			
	2.45				2.45					
	2.9			C	2.9		PL(A) = 0.99			
	3.9				3.9					
	3.96				3.96		PL(A) = 0.74			
	4.9			C	4.9		PL(A) = 0.59			
	5.4				5.4		PL(A) = 0.71			
	5.5	Bore discontinued at 5.5m Target depth reached			5.5					
	6									
	7									
	8									
	9									

RIG: MultiDrill 300

DRILLER: Tracess Drilling

LOGGED: TM

CASING: HQ to 1.0m

TYPE OF BORING: Diatube to 0.02m, Solid flight auger (TC-bit) to 1.0m, NMLC-Coring to 5.5m

WATER OBSERVATIONS: Groundwater observed at 1.72m

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well installed to 5.5m (screen 5.5-3.0m; blank 3.0-0.0m; gravel 5.5-2.0; bentonite 2.0-0.1m; gatic at surface)

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: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 66.9 AHD
EASTING: 334214
NORTHING: 6260091
DIP/AZIMUTH: 90°/-

BORE No: BH2
PROJECT No: 218311.00
DATE: 14/12/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities	Sampling & In Situ Testing				
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium			High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
	0.8	FILL/ Clayey SAND: fine to medium, dark grey, trace fine to medium igneous gravel, moist																E*			
	1	SANDSTONE: medium to coarse grained, pale grey with some yellow-brown, slightly weathered then fresh, medium strength with a very low strength band, slightly fractured to unbroken, Hawkesbury Sandstone																E			PL(A) = 0.48
	2																	C	100	95	PL(A) = 0.51
	3																	C	100	0	PL(A) = 0.64
	4																	C	100	95	PL(A) = 0.47
	5																	C	100	95	PL(A) = 0.53
	5.57	Bore discontinued at 5.57m Target depth reached																			PL(A) = 0.57
	6																				
	7																				
	8																				
	9																				

RIG: MultiDrill 300 **DRILLER:** Tracess Drilling **LOGGED:** TM **CASING:** HQ to 0.8m
TYPE OF BORING: Solid flight auger (TC-bit) to 0.8m, NMLC-Coring to 5.57m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS: Location coordinates are in MGA94 Zone 56. *BD02/14122022 taken from 0.2-0.3m

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)	

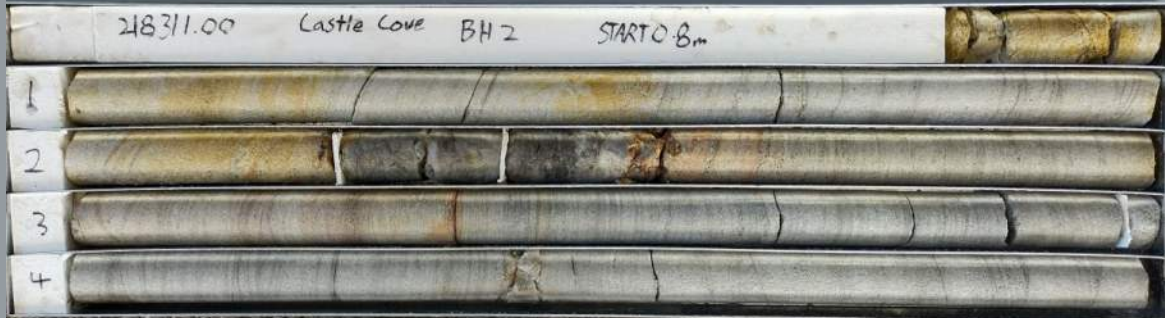
BORE: BH2

PROJECT: 218311.00

DECEMBER 2022



Project No: 218311.00
BH ID: 2
Depth: 0.6 - 5.0
Core Box No.: 1



0.80 – 5.00m

BORE: BH2

PROJECT: 218311.00

DECEMBER 2022



Project No: 218311.00
BH ID: 2
Depth: 5.0 - 5.57m
Core Box No.: 2



5.00 – 5.57m

BOREHOLE LOG

CLIENT: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 67.8 AHD
EASTING: 334250
NORTHING: 6260078
DIP/AZIMUTH: 90°/-

BORE No: BH3
PROJECT No: 218311.00
DATE: 14/12/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing				
			EW	HW	MW	SW		FS	FR	Ex Low	Very Low	Low			Medium	High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
	0.03	ASPHALTIC CONCRETE																			
	0.5	FILL/ SAND: fine to medium, dark grey, with clay, trace rootlets, wet from diatube,																E			
67	1	SANDSTONE: medium to coarse grained, pale grey and yellow-brown, moderately weathered to fresh, low to medium then medium strength, slightly fractured to unbroken, Hawkesbury Sandstone																			PL(A) = 0.47
66	2																C	100	100		PL(A) = 0.59
65	3																				PL(A) = 0.46
64	4	Below 3.5m: medium to high strength															C	100	80		PL(A) = 1
63	5	Below 4.2m: high strength																			PL(A) = 1
5.0	5.0	Bore discontinued at 5.0m Target depth reached																			PL(A) = 1.7
62	6																				
61	7																				
60	8																				
59	9																				
58																					

RIG: MultiDrill 300 **DRILLER:** Tracess Drilling **LOGGED:** TM **CASING:** HQ to 1.1m
TYPE OF BORING: Diatube to 0.04m, Solid flight auger (TC-bit) to 1.1m, NMLC-Coring to 5.0m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS: Location coordinates are in MGA94 Zone 56.

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)

BORE: BH3

PROJECT: 218311.00

DECEMBER 2022



Project No: 218311.00
BH ID: 3
Depth: 1.1 - 5.0
Core Box No.: 1



1.10 - 5.00m

BOREHOLE LOG

CLIENT: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 69.8 AHD
EASTING: 334230
NORTHING: 6260124
DIP/AZIMUTH: 90°/-

BORE No: BH4
PROJECT No: 218311.00
DATE: 14/12/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing			
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium			High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
	0.03	ASPHALTIC CONCRETE																			
	0.3	FILL/ Sandy CLAY: low plasticity, dark grey, with fine to medium sub-angular igneous gravel, w<PL																			
	0.69	SANDSTONE: medium to coarse grained, pale grey slightly weathered then fresh, low to medium then medium strength, slightly fractured to unbroken, Hawkesbury Sandstone																			
	1																				
	1.68																				
	2																				
	2.67	Below 2.4m: medium to high strength																			
	3																				
	3.67	Below 3.2m: medium strength																			
	4																				
	4.66																				
	5																				
	5.65																				
	6	Below 5.6m: high strength																			
	6.64																				
	7	Bore discontinued at 7.0m Target depth reached																			
	7.63																				
	8																				
	8.61																				
	9																				
	9.60																				

RIG: MultiDrill 300

DRILLER: Tracess Drilling

LOGGED: TM

CASING: HQ to 1.0m

TYPE OF BORING: Diatube to 0.34m, Solid flight auger (TC-bit) to 1.0m, NMLC-Coring to 7.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

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)

BORE: BH4

PROJECT: 218311.00

DECEMBER 2022



Douglas Partners
Geotechnics | Environment | Groundwater

Project No: 218311.00
BH ID: 4
Depth: 10-60
Core Box No.: 1



1.00 – 6.00m

BORE: BH4

PROJECT: 218311.00

DECEMBER 2022



Douglas Partners
Geotechnics | Environment | Groundwater

Project No: 218311.00
BH ID: 4
Depth: 60-70
Core Box No.: 2



6.00 – 7.00m

BOREHOLE LOG

CLIENT: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 69.8 AHD
EASTING: 334230
NORTHING: 6260124
DIP/AZIMUTH: 90°/--

BORE No: BH4
PROJECT No: 218311.00
DATE: 14/12/2022
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			
	0.03	ASPHALTIC CONCRETE		E	0.1					
	0.3	FILL/ Sandy CLAY: low plasticity, dark grey, with fine to medium sub-angular igneous gravel, w<PL			0.2					
		SANDSTONE: medium to coarse grained, pale grey slightly weathered then fresh, low to medium then medium strength, slightly fractured to unbroken, Hawkesbury Sandstone			1.0					
	1									
				C	1.9		PL(A) = 0.87			
	2									
		Below 2.4m: medium to high strength			2.52					
					2.9		PL(A) = 1.1			
	3									
		Below 3.2m: medium strength		C						
					3.9		PL(A) = 0.7			
	4									
					4.37					
					4.9		PL(A) = 0.56			
	5									
		Below 5.6m: high strength		C						
					5.9		PL(A) = 1.1			
	6									
					6.9					
	7	Bore discontinued at 7.0m Target depth reached			7.0					
	8									
	9									

RIG: MultiDrill 300

DRILLER: Tracess Drilling

LOGGED: TM

CASING: HQ to 1.0m

TYPE OF BORING: Diatube to 0.34m, Solid flight auger (TC-bit) to 1.0m, NMLC-Coring to 7.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

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: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 72.5 AHD
EASTING: 334256
NORTHING: 6260104
DIP/AZIMUTH: 90°/-

BORE No: BH5
PROJECT No: 218311.00
DATE: 15/12/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing				
			EW	HW	MW	SW		FS	FR	Ex Low	Very Low	Low			Medium	High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
	0.4	FILL/ Silty SAND: fine to medium, brown, trace rootlets, dry																E			
	72	SANDSTONE: medium to coarse, pale grey with some yellow-brown, moderately to slightly weathered, low to medium strength, slightly fractured, Hawkesbury Sandstone																E			
	1																				
	71																				
	2	Below 2.2m: medium strength																C	100	90	PL(A) = 0.37 PL(A) = 0.1
	70																				
	3																				PL(A) = 0.66
	69																	C	100	99	PL(A) = 0.81
	4	Below 4.5m: high strength																			
	68																				
	5																				PL(A) = 1.4
	67																				
	6																	C	100	100	PL(A) = 1.6
	66																				
	7																				PL(A) = 1.5
	65																				
	8																				PL(A) = 1.1
	64																	C	100	95	
	9																				PL(A) = 1.4
	63	Bore discontinued at 9.5m Target depth reached																			

RIG: MultiDrill 300 **DRILLER:** Tracess Drilling **LOGGED:** TM **CASING:** HQ to 1.1m
TYPE OF BORING: Solid flight auger (TC-bit) to 1.1m, NMLC-Coring to 9.5m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS: Location coordinates are in MGA94 Zone 56.

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)	

BORE: BH5

PROJECT: 218311.00

DECEMBER 2022



1.10 – 6.00m

BORE: BH5

PROJECT: 218311.00

DECEMBER 2022



6.00 – 9.50m

BOREHOLE LOG

CLIENT: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 72.7 AHD
EASTING: 334262
NORTHING: 6260096
DIP/AZIMUTH: 90°/-

BORE No: BH6
PROJECT No: 218311.00
DATE: 15/12/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing				
			EW	HW	MW	SW		FS	FR	Ex Low	Very Low	Low			Medium	High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
	0.4	FILL/ Silty SAND: fine to medium, brown, trace rootlets, dry																E			
	72	SANDSTONE: medium to coarse, pale grey with some yellow-brown, moderately to slightly weathered, low strength, slightly fractured, Hawkesbury Sandstone																			
	1																				
	71																				
	2																	C	100	90	PL(A) = 0.13
																					PL(A) = 0.16
	70	Below 2.2m: medium strength																			
	3																	C	100	100	PL(A) = 0.7
	69																				
	4	Below 4.5m: medium to high strength																			
	68																				
	5																	C	95	60	PL(A) = 0.92
	5.06	Below 5.1m: high strength																			
	5.1																				
	67																				
	6																				
	66																	C	100	100	PL(A) = 1.3
	7																				
	65																				
	8																				
	64																	C	100	100	PL(A) = 1.6
	9																				
	63																				
	9.5	Bore discontinued at 9.5m Target depth reached																			
	63																				

RIG: MultiDrill 300 **DRILLER:** Tracess Drilling **LOGGED:** TM **CASING:** HQ to 1.1m
TYPE OF BORING: Solid flight auger (TC-bit) to 1.1m, NMLC-Coring to 9.5m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS: Location coordinates are in MGA94 Zone 56.

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)	

BORE: BH6

PROJECT: 218311.00

DECEMBER 2022



1.20 – 6.00m

BORE: BH6

PROJECT: 218311.00

DECEMBER 2022



6.00 – 9.50m

BOREHOLE LOG

CLIENT: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 82.1 AHD
EASTING: 334278
NORTHING: 6260113
DIP/AZIMUTH: 90°/-

BORE No: BH7
PROJECT No: 218311.00
DATE: 13/12/2022
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering					Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing			
			EW	HW	MW	SW	FS		FR	Ex Low	Very Low	Low	Medium			High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
82.04	0.04	ASPHALTIC CONCRETE																E			
	0.2	FILL/ GRAVEL: medium to coarse, dark grey igneous gravel																			
		FILL/ SANDSTONE BOULDERS: medium to coarse grained, pale grey, boulders in a sandy gravel matrix																			
81.0	1.0																				
	1.8	1.6-1.8m: with lead flashing, glass, steel nails																			
80.0	2.0	SANDSTONE: medium to coarse grained, pale grey with some yellow-brown and red, moderately to slightly weathered, very low and low strength, slightly fractured, Hawkesbury Sandstone																C	100	60	PL(A) = 0.08
79.0	3.0																				PL(A) = 0.16
																		C	100	85	3.23m: Cs 10mm
78.0	4.0																				PL(A) = 0.07
		Below 4.2m: medium strength																			
77.0	5.0																				PL(A) = 0.98
																		C	100	90	4.34m: Ds 40mm 4.5m: J30-60 (x7), pl, ro, fe st
76.0	6.0																				PL(A) = 0.65
75.0	7.0																				PL(A) = 0.55
74.0	8.0																	C	100	95	6.1m: J40-70 (x6), pl, ro, cln 7.1m: J60-80 (x2), pl, ro, cln 7.54m: B20, pl, ro, fe st
																					PL(A) = 0.72
83.0	8.3	SANDSTONE: medium to coarse grained, pale grey, fresh, medium and high strength, slightly fractured, Hawkesbury Sandstone																			
																					PL(A) = 0.68
73.0	9.0																	C	100	95	8.05m: J60, pl, ro, cln 8.12m: B0, pl, ro, cly vn 8.6m: B0, pl, ro cly co
																					PL(A) = 0.66
												</									

RIG: MultiDrill 300

DRILLER: Tracess Drilling

LOGGED: TM

CASING: HQ to 1.4m

TYPE OF BORING: Diatube to 0.04m, Solid flight auger (TC-bit) to 1.4m, NMLC-Coring to 14.45m

WATER OBSERVATIONS: Groundwater observed at 9.98m

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well installed to 14.45m (screen 14.45-8.4m; blank 8.4-0.0m; gravel 14.45-3.0m; bentonite 3.0-0.1m; gatic at surface), Environmental sample taken from 1.6-1.8m

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: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 82.1 AHD
EASTING: 334278
NORTHING: 6260113
DIP/AZIMUTH: 90°/-

BORE No: BH7
PROJECT No: 218311.00
DATE: 13/12/2022
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing				
			EW	HW	MW	SW		FS	FR	Ex Low	Very Low	Low			Medium	High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
72		SANDSTONE: medium to coarse grained, pale grey, fresh, medium and high strength, slightly fractured, Hawkesbury Sandstone <i>(continued)</i>																			
71	11																	C	100	95	PL(A) = 0.9
70	12																				PL(A) = 1.5
69	13	At 13.25m: silstone clast																			PL(A) = 0.65
68	14																	C	100	98	PL(A) = 1.4
14.45		Bore discontinued at 14.45m Target depth reached																			PL(A) = 1
67	15																				
66	16																				
65	17																				
64	18																				
63	19																				

RIG: MultiDrill 300

DRILLER: Tracess Drilling

LOGGED: TM

CASING: HQ to 1.4m

TYPE OF BORING: Diatube to 0.04m, Solid flight auger (TC-bit) to 1.4m, NMLC-Coring to 14.45m

WATER OBSERVATIONS: Groundwater observed at 9.98m

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well installed to 14.45m (screen 14.45-8.4m; blank 8.4-0.0m; gravel 14.45-3.0m; bentonite 3.0-0.1m; gatic at surface), Environmental sample taken from 1.6-1.8m

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)

BORE: BH7

PROJECT: 218311.00

DECEMBER 2022



Douglas Partners
Geotechnics | Environment | Groundwater

Project No: 218311.00
BH ID: 7
Depth: 1.4 - 6.0
Core Box No.: 1



218311.00 Castle Lake BH 7 START 1.4m



1.40 – 6.00m

BORE: BH7

PROJECT: 218311.00

DECEMBER 2022



Douglas Partners
Geotechnics | Environment | Groundwater

Project No: 218311.00
BH ID: 7
Depth: 6.0 - 11.0
Core Box No.: 2



6.00 – 11.00m

BORE: BH7

PROJECT: 218311.00

DECEMBER 2022



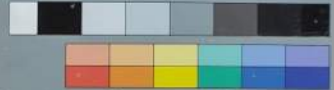
Douglas Partners
Geotechnics | Environment | Groundwater

Project No: 218311.00

BH ID: 7

Depth: 11.0 - 14.45

Core Box No.: 3



11.00 – 14.45m

BOREHOLE LOG

CLIENT: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 83.3 AHD
EASTING: 334293
NORTHING: 6260149
DIP/AZIMUTH: 90°/--

BORE No: BH9
PROJECT No: 218311.00
DATE: 12/12/2022
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		
83.03	0.03	ASPHALTIC CONCRETE							Gatic cover
		FILL/ SANDSTONE BOULDERS: medium to coarse grained, pale grey and yellow-brown, boulders in a sandy gravel matrix							
82.0	1.3				1.3				Blank pipe 0.0-3.0m Bentonite 0.1-2.0m
81.6	1.6	SANDSTONE: medium to coarse grained, pale grey with some yellow-brown and red, moderately to slightly weathered, low and medium strength, slightly fractured to unbroken, Hawkesbury Sandstone		C	1.9		PL(A) = 0.13		
					2.5				
					2.9		PL(A) = 0.28		
				C					
					3.9		PL(A) = 0.73		
					4.08				
					4.9		PL(A) = 0.24	14-12.22	
		Below 5.1m: medium strength with a high strength band		C					
					5.9		PL(A) = 1.4		Gravel 2.0-9.0m
					6.1				Machine slotted PVC screen 3.0-9.0m
					6.9		PL(A) = 0.42		
				C					
					7.9		PL(A) = 0.55		
					8.9		PL(A) = 0.56		
74.0	9.12	Bore discontinued at 9.12m Target depth reached			9.12				End cap Cave in 9.0-9.12m

RIG: MultiDrill 300

DRILLER: Tracess Drilling

LOGGED: TM

CASING: HQ to 1.3m

TYPE OF BORING: Diatube to 0.03m, Solid flight auger (TC-bit) to 1.3m, NMLC-Coring to 9.12m

WATER OBSERVATIONS: Groundwater observed at 4.68m

REMARKS: Location coordinates are in MGA94 Zone 56. Groundwater well installed to 9.0 (screen 9.0-3.0m; blank 3.0-0.0m; gravel 9.0-2.0m; bentonite 2.0-0.1m; gatic at surface), 100% drilling flush loss below 1.2m

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: Taylor Construction Group Pty Ltd
PROJECT: Proposed Country Club & Seniors Living Building
LOCATION: 68 Deepwater Road, Castle Cove

SURFACE LEVEL: 79.6 AHD
EASTING: 334276
NORTHING: 6260179
DIP/AZIMUTH: 90°/--

BORE No: BH10
PROJECT No: 218311.00
DATE: 12/12/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering				Graphic Log	Rock Strength					Water	Fracture Spacing (m)	Discontinuities		Sampling & In Situ Testing				
			EW	HW	MW	SW		FS	FR	Ex Low	Very Low	Low			Medium	High	Very High	Ex High	B - Bedding S - Shear	J - Joint F - Fault	Type
	0.03	ASPHALTIC CONCRETE																E			
	0.3	FILL/ Gravelly SAND: medium to coarse, grey and brown, fine to medium sub-rounded to sub-angular sandstone gravel, wet from diatube																E			
79																					
1		SANDSTONE: medium to coarse grained, pale grey with some yellow-brown, slightly to moderately weathered, low to medium strength, slightly fractured to unbroken, Hawkesbury Sandstone																			
78																					
2																		C	100	99	PL(A) = 0.27
77																					
3																					PL(A) = 0.14
76		Below 3.3m: medium strength																C	100	100	PL(A) = 0.46
4																					
75																					PL(A) = 0.37
5																					
74																					
6																		C	100	95	PL(A) = 0.36
73																					
7																					PL(A) = 0.52
7.17		Bore discontinued at 7.17m Target depth reached																			
72																					
8																					
71																					
9																					
70																					

RIG: MultiDrill 300

DRILLER: Tracess Drilling

LOGGED: TM

CASING: HQ to 1.1m

TYPE OF BORING: Diatube to 0.03m, Solid flight auger (TC-bit) to 1.1m, NMLC-Coring to 7.17m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

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)

BORE: BH10

PROJECT: 218311.00

DECEMBER 2022



Douglas Partners
Geotechnics | Environment | Groundwater

Project No: 218311.00

BH ID: 10

Depth: 1.1 - 6.0

Core Box No.: 1



218311.00
Castle Cove
BH 10 Start 1.10m

2

3

4

5

1.10 – 6.00m

BORE: BH10

PROJECT: 218311.00

DECEMBER 2022



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Project No: 218311.00

BH ID: 10

Depth: 6.0 - 7.17

Core Box No.: 2



6

7

EOH 7.17m

6.00 – 7.17m

Table A1 : Summary of Laboratory Results – Waste Classification Assessment

				Metals																TRH				
				Arsenic	Arsenic in TCLP	Cadmium	Cadmium in TCLP	Total Chromium	Total Chromium in TCLP	Copper	Copper in TCLP	Lead	Lead TCLP	Mercury (inorganic)	Mercury (inorganic) in TCLP	Nickel	Nickel in TCLP	Zinc	Zinc in TCLP	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons
			PQL	5	0.05	1	0.01	2	0.01	5	0.01	5	0.03	0.1	0.0005	2	0.02	5	0.02	10	50	100	100	50
Waste Classification Criteria																								
NSW EPA (2014) General Solid Waste (CT1)				100	-	20	-	100	-	-	-	100	-	4	-	40	-	-	-	650	10,000	10,000	10,000	10,000
NSW EPA (2014) General Solid Waste (SCC1, TCLP1)				500	5	100	1	1900	5	-	-	1500	5	50	0.2	1050	2	-	-	650	10000	10000	10000	10000
Published Background Concentrations																								
NEPC (1999)				1-50	-	1	-	5-1000	-	2-100	-	2-200	-	0.03	-	5-500	-	10-300	-	-	-	-	-	-
ANZECC (1992)				0.2-30	-	0.04-2	-	0.5-110	-	1-190	-	<2-200	-	0.001-0.1	-	2-400	-	2-180	-	-	-	-	-	-
ANZECC (2000)				1-53	-	0.016-0.78	-	2.5-673	-	0.4-412	-	2-81	-	-	-	1-517	-	1-263	-	-	-	-	-	-
Laboratory Results																								
Sample ID	Depth	Sample Matrix	Sample Date	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/l	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH1	0.1 - 0.2 m	Clayey SAND	14/12/2022	<4	-	<0.4	-	5	-	<1	-	1	-	<0.1	-	1	-	1	-	<25	<50	<100	<100	<50
BH2	0.2 - 0.3 m	FILL	14/12/2022	<4	-	<0.4	-	10	-	5	-	7	-	<0.1	-	9	-	10	-	<25	<50	<100	<100	<50
BD02/14122022*	0.2 - 0.3 m	FILL	14/12/2022	<5	-	<1	-	34	-	10	-	7	-	<0.1	-	42	-	27	-	<10	<50	<100	<100	<50
BH2	0.7 - 0.8 m	FILL	14/12/2022	<4	-	<0.4	-	7	-	2	-	4	-	<0.1	-	4	-	6	-	<25	<50	<100	<100	<50
BH3	0.2 - 0.3 m	FILL	14/12/2022	<4	-	<0.4	-	20	-	8	-	6	-	<0.1	-	18	-	16	-	<25	<50	<100	<100	<50
BH4	0.1 - 0.2 m	FILL	14/12/2022	<4	<0.05	<0.4	<0.01	260	<0.01	29	0.02	16	<0.03	<0.1	<0.0005	56	0.02	32	0.1	<25	<50	<100	<100	<50
BH5	0.1 - 0.2 m	FILL	15/12/2022	13	-	1	-	9	-	6	-	28	-	0.2	-	4	-	170	-	<25	<50	<100	<100	<50
BH5	0.5 - 0.6 m	SANDSTONE	15/12/2022	<4	-	<0.4	-	23	-	6	-	12	-	<0.1	-	2	-	19	-	<25	<50	<100	<100	<50
BH6	0.1 - 0.2 m	FILL	15/12/2022	<4	-	<0.4	-	4	-	4	-	9	-	<0.1	-	3	-	16	-	<25	<50	<100	<100	<50
BH7	0.04 - 0.1 m	FILL	13/12/2022	<4	-	<0.4	-	7	-	59	-	5	-	<0.1	-	23	-	19	-	<25	<50	<100	<100	<50
BH7	1.6 - 1.8 m	FILL	13/12/2022	<4	-	<0.4	-	6	-	61	-	47	-	<0.1	-	3	-	170	-	<25	<50	<100	<100	<50
BH8	0.02 - 0.1 m	FILL	13/12/2022	<4	-	<0.4	-	8	-	26	-	8	-	<0.1	-	6	-	22	-	<25	<50	<100	<100	<50
BH8	0.4 - 0.5 m	FILL	13/12/2022	<4	-	<0.4	-	6	-	7	-	30	-	<0.1	-	2	-	36	-	<25	<50	<100	<100	<50
BD01/13122022	0.4 - 0.5 m	FILL	13/12/2022	<4	-	<0.4	-	11	-	17	-	290	0.35	<0.1	-	4	-	65	-	<25	<50	<100	<100	<50
BH9	0.03 - 0.1 m	FILL	12/12/2022	<4	-	<0.4	-	9	-	76	-	2	-	<0.1	-	33	-	18	-	<25	<50	<100	<100	<50
BH10	0.04 - 0.1 m	FILL	12/12/2022	<4	-	<0.4	-	11	-	21	-	20	-	<0.1	-	7	-	27	-	<25	<50	<100	<100	<50
BH10	0.4 - 0.5 m	SANDSTONE	12/12/2022	<4	-	<0.4	-	27	-	23	-	7	-	<0.1	-	1	-	8	-	<25	<50	<100	<100	<50
Notes:																								
■ CT1 exceedance ■ TCLP1 and/or SCC1 exceedance ■ Asbestos detection																								
NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable																								
a QA/QC replicate of sample listed directly below the primary sample																								
b Total chromium used as initial screen for chromium(VI).																								
c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)																								
d Criteria for scheduled chemicals used as an initial screen																								
e Criteria for Chlorpyrifos used as initial screen																								
f All criteria are in the same units as the reported results																								
* *Interlab replicate sample is shown on laboratory reports incorrectly as "BH02/14122022" and is actually associated with sample "BD02/14122022"																								
PQL Practical quantitation limit																								
CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste																								
SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste																								
TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste																								

Table A1 : Summary of Laboratory Results – Waste Classification Assessment

				Phenol					OCP		OPP	Total PCB	Asbestos		
				2-Methylphenol (0-Cresol)	Phenol	2,4,5-trichlorophenol	2,4,6-trichlorophenol	Phenol (non-halogenated)	Total Endosulfan	Total Analysed OCP	Total Analysed OPP		Asbestos ID in soil >0.1g/kg	Trace Analysis	Total Asbestos
			PQL	0.5	5	0.5	0.5	0.5	0.05	0.05	0.05	0.1			
Waste Classification Criteria															
NSW EPA (2014) General Solid Waste (CT1)				4000	288	8000	40	288	60	<50	4	<50			
NSW EPA (2014) General Solid Waste (SCC1, TCLP1)				7200	518	14400	72	518	108	<50	7.5	<50			
Published Background Concentrations															
NEPC (1999)				-	-	-	-	-	-	-	-	-	-	-	NA
ANZECC (1992)				-	0.03 – 0.5	-	0.05 - 1	0.1 - 1	<0.001 - <0.97	-	-	0.02-0.1	-	-	-
ANZECC (2000)				-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Results															
Sample ID	Depth	Sample Matrix	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-
BH1	0.1 - 0.2 m	Clayey SAND	14/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH2	0.2 - 0.3 m	FILL	14/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BD02/14122022*	0.2 - 0.3 m	FILL	14/12/2022	<0.5	-	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.1	NAD	NAD	NAD
BH2	0.7 - 0.8 m	FILL	14/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH3	0.2 - 0.3 m	FILL	14/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH4	0.1 - 0.2 m	FILL	14/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH5	0.1 - 0.2 m	FILL	15/12/2022	-	<5	-	-	-	-	0.3	<0.1	<0.1	NAD	NAD	NAD
BH5	0.5 - 0.6 m	SANDSTONE	15/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH6	0.1 - 0.2 m	FILL	15/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH7	0.04 - 0.1 m	FILL	13/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH7	1.6 - 1.8 m	FILL	13/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH8	0.02 - 0.1 m	FILL	13/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH8	0.4 - 0.5 m	FILL	13/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BD01/13122022	0.4 - 0.5 m	FILL	13/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	-	-	-
BH9	0.03 - 0.1 m	FILL	12/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH10	0.04 - 0.1 m	FILL	12/12/2022	-	<5	-	-	-	-	<0.1	<0.1	<0.1	NAD	NAD	NAD
BH10	0.4 - 0.5 m	SANDSTONE	12/12/2022	-	-	-	-	-	-	-	-	-	-	-	-
Notes:															
■ CT1 exceedance ■ TCLP1 and/or SCC1 exceedance ■ Asbestos detection															
NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable															
a	QA/QC replicate of sample listed directly below the primary sample														
b	Total chromium used as initial screen for chromium(VI).														
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)														
d	Criteria for scheduled chemicals used as an initial screen														
e	Criteria for Chlorpyrifos used as initial screen														
f	All criteria are in the same units as the reported results														
*	*Interlab replicate sample is shown on laboratory reports incorrectly as "BH02/14122022" and is actually associated with sample "BD02/14122022"														
PQL	Practical quantitation limit														
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification wi														
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste														
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste														

CERTIFICATE OF ANALYSIS 313388

Client Details

Client	Douglas Partners Pty Ltd
Attention	Shahin Falahati, Lisa Teng
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>218311.0, Castle Cove</u>
Number of Samples	18 Soil
Date samples received	16/12/2022
Date completed instructions received	16/12/2022

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	03/01/2023
Date of Issue	03/01/2023
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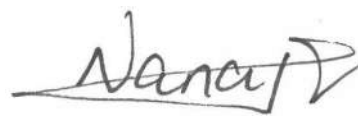
Asbestos Approved By

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

Results Approved By

Diego Bigolin, Inorganics Supervisor
 Hannah Nguyen, Metals Supervisor
 Josh Williams, Organics and LC Supervisor
 Kyle Gavril, Senior Chemist
 Nyovan Moonean, Asbestos Approved Identifier/Counter

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference	UNITS	BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022	22/12/2022
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	75	85	86	76

vTRH(C6-C10)/BTEXN in Soil

Our Reference		313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference	UNITS	BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022	22/12/2022
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	86	84	85	91	83

vTRH(C6-C10)/BTEXN in Soil

Our Reference		313388-11	313388-12	313388-13	313388-14	313388-15
Your Reference	UNITS	BH8	BH8	BH9	BH10	BH10
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	0.4-0.5
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	12/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022	22/12/2022
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	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	86	80	84	87

vTRH(C6-C10)/BTEXN in Soil

Our Reference		313388-16	313388-17	313388-18
Your Reference	UNITS	BD01/13122022	TS01/15122022	TB01/15122022
Depth		-	-	-
Date Sampled		13/12/2022	15/12/2022	15/12/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	22/12/2022	21/12/2022	21/12/2022
TRH C ₆ - C ₉	mg/kg	<25	[NA]	<25
TRH C ₆ - C ₁₀	mg/kg	<25	[NA]	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	[NA]	<25
Benzene	mg/kg	<0.2	113%	<0.2
Toluene	mg/kg	<0.5	114%	<0.5
Ethylbenzene	mg/kg	<1	113%	<1
m+p-xylene	mg/kg	<2	115%	<2
o-Xylene	mg/kg	<1	115%	<1
Naphthalene	mg/kg	<1	[NA]	<1
Total +ve Xylenes	mg/kg	<1	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	76	115	66

svTRH (C10-C40) in Soil						
Our Reference	UNITS	313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference		BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	28/12/2022	29/12/2022	28/12/2022	28/12/2022	28/12/2022
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	110	<100	120	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	110	<50	120	<50
Surrogate o-Terphenyl	%	115	122	84	116	122

svTRH (C10-C40) in Soil						
Our Reference	UNITS	313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference		BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	29/12/2022	28/12/2022	29/12/2022	29/12/2022	29/12/2022
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	%	113	132	120	120	102

svTRH (C10-C40) in Soil

Our Reference		313388-11	313388-12	313388-13	313388-14	313388-15
Your Reference	UNITS	BH8	BH8	BH9	BH10	BH10
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	0.4-0.5
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	12/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	29/12/2022	29/12/2022	29/12/2022	29/12/2022	28/12/2022
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	%	111	100	128	94	104

svTRH (C10-C40) in Soil

Our Reference		313388-16
Your Reference	UNITS	BD01/13122022
Depth		-
Date Sampled		13/12/2022
Type of sample		Soil
Date extracted	-	20/12/2022
Date analysed	-	29/12/2022
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	126

PAHs in Soil						
Our Reference		313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference	UNITS	BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	0.8
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Fluoranthene	mg/kg	<0.1	0.1	<0.1	<0.1	0.7
Pyrene	mg/kg	<0.1	0.1	<0.1	<0.1	0.7
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	0.5
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	0.6
Benzo(a)pyrene	mg/kg	<0.05	0.2	<0.05	<0.05	0.55
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
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	0.2
Total +ve PAH's	mg/kg	<0.05	0.53	<0.05	<0.05	5.0
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.8
Surrogate <i>p</i> -Terphenyl-d14	%	63	62	64	64	62

PAHs in Soil						
Our Reference		313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference	UNITS	BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	0.09	<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	0.09	<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	%	64	67	67	60	63

PAHs in Soil						
Our Reference		313388-11	313388-12	313388-13	313388-14	313388-15
Your Reference	UNITS	BH8	BH8	BH9	BH10	BH10
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	0.4-0.5
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	12/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	0.2	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.2	<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	0.3	<0.2
Benzo(a)pyrene	mg/kg	0.1	0.1	<0.05	0.3	<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	0.2	<0.1
Total +ve PAH's	mg/kg	0.1	0.1	<0.05	1.5	<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	%	63	62	62	63	64

PAHs in Soil		
Our Reference		313388-16
Your Reference	UNITS	BD01/13122022
Depth		-
Date Sampled		13/12/2022
Type of sample		Soil
Date extracted	-	20/12/2022
Date analysed	-	20/12/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	64

Organochlorine Pesticides in soil						
Our Reference		313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference	UNITS	BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	%	76	77	80	79	77

Organochlorine Pesticides in soil						
Our Reference		313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference	UNITS	BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	0.3	<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	%	81	84	87	80	84

Organochlorine Pesticides in soil						
Our Reference		313388-11	313388-12	313388-13	313388-14	313388-16
Your Reference	UNITS	BH8	BH8	BH9	BH10	BD01/13122022
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	-
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	%	82	84	83	83	86

Organophosphorus Pesticides in Soil						
Our Reference		313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference	UNITS	BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	%	76	77	80	79	77

Organophosphorus Pesticides in Soil

Our Reference		313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference	UNITS	BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	%	81	84	87	80	84

Organophosphorus Pesticides in Soil

Our Reference		313388-11	313388-12	313388-13	313388-14	313388-16
Your Reference	UNITS	BH8	BH8	BH9	BH10	BD01/13122022
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	-
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	%	82	84	83	83	86

PCBs in Soil						
Our Reference	UNITS	313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference		BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	%	76	77	80	79	77

PCBs in Soil						
Our Reference	UNITS	313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference		BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	%	81	84	87	80	84

PCBs in Soil						
Our Reference		313388-11	313388-12	313388-13	313388-14	313388-16
Your Reference	UNITS	BH8	BH8	BH9	BH10	BD01/13122022
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	-
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
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	%	82	84	83	83	86

Acid Extractable metals in soil

Our Reference		313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference	UNITS	BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022	22/12/2022
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	10	7	20	260
Copper	mg/kg	<1	5	2	8	29
Lead	mg/kg	1	7	4	6	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	9	4	18	56
Zinc	mg/kg	1	10	6	16	32

Acid Extractable metals in soil

Our Reference		313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference	UNITS	BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022	22/12/2022
Arsenic	mg/kg	13	<4	<4	<4	<4
Cadmium	mg/kg	1	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	23	4	7	6
Copper	mg/kg	6	6	4	59	61
Lead	mg/kg	28	12	9	5	47
Mercury	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	2	3	23	3
Zinc	mg/kg	170	19	16	19	170

Acid Extractable metals in soil

Our Reference		313388-11	313388-12	313388-13	313388-14	313388-15
Your Reference	UNITS	BH8	BH8	BH9	BH10	BH10
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	0.4-0.5
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	12/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022	22/12/2022
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	6	9	11	27
Copper	mg/kg	26	7	76	21	23
Lead	mg/kg	8	30	2	20	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	2	33	7	1
Zinc	mg/kg	22	36	18	27	8

Acid Extractable metals in soil

Our Reference		313388-16
Your Reference	UNITS	BD01/13122022
Depth		-
Date Sampled		13/12/2022
Type of sample		Soil
Date prepared	-	20/12/2022
Date analysed	-	22/12/2022
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	11
Copper	mg/kg	17
Lead	mg/kg	290
Mercury	mg/kg	<0.1
Nickel	mg/kg	4
Zinc	mg/kg	65

Misc Soil - Inorg

Our Reference		313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference	UNITS	BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg

Our Reference		313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference	UNITS	BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg

Our Reference		313388-11	313388-12	313388-13	313388-14	313388-16
Your Reference	UNITS	BH8	BH8	BH9	BH10	BD01/13122022
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	-
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Moisture						
Our Reference	UNITS	313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference		BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/12/2022	19/12/2022	19/12/2022	19/12/2022	19/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Moisture	%	1.5	2.3	2.7	0.7	2.0

Moisture						
Our Reference	UNITS	313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference		BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/12/2022	19/12/2022	19/12/2022	19/12/2022	19/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Moisture	%	2.7	1.8	1.1	2.2	2.9

Moisture						
Our Reference	UNITS	313388-11	313388-12	313388-13	313388-14	313388-15
Your Reference		BH8	BH8	BH9	BH10	BH10
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1	0.4-0.5
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022	12/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	19/12/2022	19/12/2022	19/12/2022	19/12/2022	19/12/2022
Date analysed	-	20/12/2022	20/12/2022	20/12/2022	20/12/2022	20/12/2022
Moisture	%	2.8	1.4	1.3	2.1	1.1

Moisture		
Our Reference	UNITS	313388-16
Your Reference		BD01/13122022
Depth		-
Date Sampled		13/12/2022
Type of sample		Soil
Date prepared	-	19/12/2022
Date analysed	-	20/12/2022
Moisture	%	1.5

Asbestos ID - soils						
Our Reference	UNITS	313388-1	313388-2	313388-3	313388-4	313388-5
Your Reference		BH1	BH2	BH2	BH3	BH4
Depth		0.1-0.2	0.2-0.3	0.7-0.8	0.2-0.3	0.1-0.2
Date Sampled		14/12/2022	14/12/2022	14/12/2022	14/12/2022	14/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022	22/12/2022
Sample mass tested	g	Approx. 65g	Approx. 65g	Approx. 45g	Approx. 45g	Approx. 55g
Sample Description	-	Tan coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey 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	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	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference	UNITS	313388-6	313388-7	313388-8	313388-9	313388-10
Your Reference		BH5	BH5	BH6	BH7	BH7
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.04-0.1	1.6-18
Date Sampled		15/12/2022	15/12/2022	15/12/2022	13/12/2022	13/12/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022	22/12/2022
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 60g	Approx. 80g	Approx. 55g
Sample Description	-	Brown coarse-grained soil & rocks	White fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Grey 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	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	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference		313388-11	313388-12	313388-13	313388-14
Your Reference	UNITS	BH8	BH8	BH9	BH10
Depth		0.02-0.1	0.4-0.5	0.03-0.1	0.04-0.1
Date Sampled		13/12/2022	13/12/2022	12/12/2022	12/12/2022
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	22/12/2022	22/12/2022	22/12/2022	22/12/2022
Sample mass tested	g	Approx. 65g	Approx. 40g	Approx. 75g	Approx. 55g
Sample Description	-	Pink coarse-grained soil & rocks	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	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

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-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
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.
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	<p>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.</p> <p>For soil results:-</p> <ol style="list-style-type: none"> 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. <p>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.</p>
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	<p>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.</p> <p>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.</p>

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	313388-2
Date extracted	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Date analysed	-			22/12/2022	1	22/12/2022	22/12/2022		22/12/2022	22/12/2022
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	1	<25	<25	0	126	125
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	1	<25	<25	0	126	125
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	124	120
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	118	116
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	126	127
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	132	132
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	127	127
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	82	1	85	81	5	95	87

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]	11	20/12/2022	20/12/2022		[NT]	[NT]
Date analysed	-			[NT]	11	22/12/2022	22/12/2022		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	91	87	4	[NT]	[NT]

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	313388-2
Date extracted	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Date analysed	-			28/12/2022	1	28/12/2022	28/12/2022		28/12/2022	29/12/2022
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	1	<50	<50	0	138	124
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	1	<100	<100	0	132	121
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	1	<100	<100	0	71	129
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	1	<50	<50	0	138	124
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	1	<100	<100	0	132	121
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	1	<100	<100	0	71	129
Surrogate o-Terphenyl	%		Org-020	78	1	115	86	29	97	122

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Date analysed	-			[NT]	11	29/12/2022	29/12/2022		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	11	111	123	10	[NT]	[NT]

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	313388-2
Date extracted	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Date analysed	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	85
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	83	83
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	84
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	85
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	96	84
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	87
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	73	63
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	126	139
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	64	1	63	67	6	71	67

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Date analysed	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	0.1	0.1	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	63	63	0	[NT]	[NT]

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	313388-2
Date extracted	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Date analysed	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	90
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	106	97
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	121	115
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	105	99
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	104
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	98	94
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	110	105
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	115
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	94	94
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	112	106
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	79	1	76	85	11	83	82

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Date analysed	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	82	84	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	313388-2
Date extracted	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Date analysed	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	138	136
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	93	89
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	99
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	132	140
Chlorpyrifos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	110
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	60	60
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	102	111
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	79	1	76	85	11	83	82

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Date analysed	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	82	84	2	[NT]	[NT]

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	313388-2
Date extracted	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Date analysed	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
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	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	79	1	76	85	11	83	82

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Date analysed	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	11	82	84	2	[NT]	[NT]

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	313388-2
Date prepared	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Date analysed	-			22/12/2022	1	22/12/2022	22/12/2022		22/12/2022	22/12/2022
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	107	111
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	102	92
Chromium	mg/kg	1	Metals-020	<1	1	5	5	0	108	#
Copper	mg/kg	1	Metals-020	<1	1	<1	<1	0	106	129
Lead	mg/kg	1	Metals-020	<1	1	1	1	0	103	105
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	89	88
Nickel	mg/kg	1	Metals-020	<1	1	1	<1	0	105	129
Zinc	mg/kg	1	Metals-020	<1	1	1	1	0	105	112

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Date analysed	-			[NT]	11	22/12/2022	22/12/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	11	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	11	8	8	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	11	26	29	11	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	11	8	11	32	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	11	6	8	29	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	11	22	19	15	[NT]	[NT]

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: Misc Soil - Inorg					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	313388-2
Date prepared	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Date analysed	-			20/12/2022	1	20/12/2022	20/12/2022		20/12/2022	20/12/2022
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	101	101

QUALITY CONTROL: Misc Soil - Inorg					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Date analysed	-			[NT]	11	20/12/2022	20/12/2022		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	11	<5	<5	0	[NT]	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

8 metals in soil - # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.

Note: Samples 313388-1-14 were sub-sampled from bags provided by the client.

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Lisa Teng

Sample Login Details

Your reference	218311.0, Castle Cove
Envirolab Reference	313388-C
Date Sample Received	16/12/2022
Date Instructions Received	13/01/2023
Date Results Expected to be Reported	20/01/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:

Sample ID	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	On Hold
BH1-0.1-0.2													✓
BH2-0.2-0.3													✓
BH2-0.7-0.8													✓
BH3-0.2-0.3													✓
BH4-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH5-0.1-0.2													✓
BH5-0.5-0.6													✓
BH6-0.1-0.2													✓
BH7-0.04-0.1													✓
BH7-1.6-18													✓
BH8-0.02-0.1													✓
BH8-0.4-0.5													✓
BH9-0.03-0.1													✓
BH10-0.04-0.1													✓
BH10-0.4-0.5													✓
BD01/13122022													✓
TS01/15122022													✓
TB01/15122022													✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Project No: 218311.00				Suburb: Castle Cove				To: Envirolab Services			
Project Manager: Lisa Teng / Shahin Falahati				Order Number: -				Sampler: TM			
Email: lisa.teng@douglaspartners.com.au shahin.falahati@douglaspartners.com.au				Attn: Sample Receipt							
Turnaround time: <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 72 hour <input type="checkbox"/> 48 hour <input type="checkbox"/> 24 hour <input type="checkbox"/> Same day								(02) 9910 6200 samplereceipt@envirolab.com.au			
Prior Storage: <input checked="" type="checkbox"/> Fridge <input type="checkbox"/> Freezer <input type="checkbox"/> Esky <input type="checkbox"/> Shelf				Do samples contain 'potential' HBM? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If YES, then handle, transport and store in accordance with FPM HAZID)							

Lab ID	Sample ID			Date Sampled	Sample Type S - soil W - water M - Material	Container Type G - glass P - plastic	Analytes										Notes/ Preservation/ Additional Requirements
	Location / Other ID	Depth From	Depth To				Hold	aggressivity suite	Combo 8a	Combo 3a	TRH/BTEX						
1	BH1	0.1	0.2	14/12/22	S	G/P		x	x								Can we please have the Aggressivity results reported as an A report
2	BH2	0.2	0.3	14/12/22	S	G/P		x	x								
3	BH2	0.7	0.8	14/12/22	S	G/P			x								
4	BH3	0.2	0.3	14/12/22	S	G/P			x								
5	BH4	0.1	0.2	14/12/22	S	G/P			x								
6	BH5	0.1	0.2	15/12/22	S	G/P			x								
7	BH5	0.5	0.6	15/12/22	S	G/P			x								
8	BH6	0.1	0.2	15/12/22	S	G/P		x	x								
9	BH7	0.04	0.1	13/12/22	S	G/P			x								
10	BH7	1.6	1.8	13/12/22	S	G/P			x								
11	BH8	0.02	0.1	13/12/22	S	G/P			x								
12	BH8	0.4	0.5	13/12/22	S	G/P			x								
13	BH9	0.03	0.1	12/12/22	S	G/P			x								
14	BH10	0.04	0.1	12/12/22	S	G/P			x								

Metals to analyse:				LAB RECEIPT 313388			
Number of samples in container:				Transported to laboratory by: Courier			
Send results to: Douglas Partners Pty Ltd				Lab Ref. No:			
Address: 96 Hermitage Road, West Ryde NSW 211				Received by: <i>muem</i>			
Phone: (02) 9809 0666				Date & Time: 16/12/22 1730			
Relinquished by: HD				Signed: <i>om</i>			

[illegible]

CERTIFICATE OF ANALYSIS 313388-B

Client Details

Client	Douglas Partners Pty Ltd
Attention	Lisa Teng
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>218311.0, Castle Cove</u>
Number of Samples	Additional Testing on 1 Soil
Date samples received	16/12/2022
Date completed instructions received	06/01/2023

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.

Report Details

Date results requested by	13/01/2023
Date of Issue	30/01/2023
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

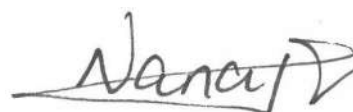
Asbestos Approved By

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

Results Approved By

Hannah Nguyen, Metals Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		313388-B-16
Your Reference	UNITS	BD01/13122022
Depth		-
Date Sampled		13/12/2022
Type of sample		Soil
Date extracted	-	10/01/2023
Date analysed	-	10/01/2023
pH of soil for fluid# determ.	pH units	8.6
pH of soil TCLP (after HCl)	pH units	1.7
Extraction fluid used		1
pH of final Leachate	pH units	4.9
Lead	mg/L	0.35

Client Reference: 218311.0, Castle Cove

Method ID	Methodology Summary
Inorg-004	<p>Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311.</p> <p>Please note that the mass used may be scaled down from default based on sample mass available.</p> <p>Samples are stored at 2-6oC before and after leachate preparation.</p>
Metals-020	<p>Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3.</p> <p>Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.</p>

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			10/01/2023	[NT]	[NT]	[NT]	[NT]	10/01/2023	[NT]
Date analysed	-			10/01/2023	[NT]	[NT]	[NT]	[NT]	10/01/2023	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	91	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Lisa Teng

Sample Login Details

Your reference	218311.0, Castle Cove
Envirolab Reference	313388-B
Date Sample Received	16/12/2022
Date Instructions Received	06/01/2023
Date Results Expected to be Reported	13/01/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	Additional Testing on 1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	Metals from Leaching Fluid pH 2.9 or 5	On Hold
BH1-0.1-0.2		✓
BH2-0.2-0.3		✓
BH2-0.7-0.8		✓
BH3-0.2-0.3		✓
BH4-0.1-0.2		✓
BH5-0.1-0.2		✓
BH5-0.5-0.6		✓
BH6-0.1-0.2		✓
BH7-0.04-0.1		✓
BH7-1.6-18		✓
BH8-0.02-0.1		✓
BH8-0.4-0.5		✓
BH9-0.03-0.1		✓
BH10-0.04-0.1		✓
BH10-0.4-0.5		✓
BD01/13122022	✓	
TS01/15122022		✓
TB01/15122022		✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Aileen Hie

From: Nick Sarlamis
Sent: Friday, 6 January 2023 10:20 AM
To: Aileen Hie; Customer Service
Cc: Joshua Williams; Hannah Nguyen
Subject: FW: Results for Registration 313388 218311.0, Castle Cove

Envirolab Ref: 313388B

A job request please

DJE: 13/1/23

std TIA.

From: Lisa Teng <Lisa.Teng@douglaspartners.com.au>
Sent: Friday, 6 January 2023 9:31 AM
To: Nick Sarlamis <NSarlamis@envirolab.com.au>; Shahin Falahati <shahin.falahati@douglaspartners.com.au>
Subject: Re: Results for Registration 313388 218311.0, Castle Cove

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Nick

Could we please order lead TCLP on sample BD01/13122022 please?

Thank you,

Get Outlook for iOS

Lisa Teng | Environmental Engineer

Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 437 976 196 | E: Lisa.Teng@douglaspartners.com.au

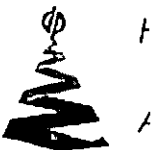


To find information on our COVID-19 measures, please visit douglaspartners.com.au/news/covid-19



END OF YEAR CLOSURE

Douglas Partners' offices will be closed over the Christmas / New Year season. To find out when your local Douglas Partners branch will be reopening, please go to www.douglaspartners.com.au/contact



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From: Nick Sarlamis <NSarlamis@envirolab.com.au>
Sent: Tuesday, January 3, 2023 2:05:34 PM
To: Shahin Falahati <shahin.falahati@douglaspartners.com.au>; Lisa Teng <lisa.teng@douglaspartners.com.au>
Subject: Results for Registration 313388 218311.0, Castle Cove

CERTIFICATE OF ANALYSIS 313388-C

Client Details

Client	Douglas Partners Pty Ltd
Attention	Lisa Teng
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	<u>218311.0, Castle Cove</u>
Number of Samples	additional analysis
Date samples received	16/12/2022
Date completed instructions received	13/01/2023

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.

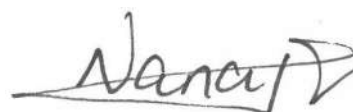
Report Details

Date results requested by	20/01/2023
Date of Issue	18/01/2023
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Loren Bardwell, Development Chemist

Authorised By



Nancy Zhang, Laboratory Manager

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		313388-C-5
Your Reference	UNITS	BH4
Depth		0.1-0.2
Date Sampled		14/12/2022
Type of sample		Soil
Date extracted	-	17/01/2023
Date analysed	-	17/01/2023
pH of soil for fluid# determ.	pH units	8.9
pH of soil TCLP (after HCl)	pH units	1.7
Extraction fluid used		1
pH of final Leachate	pH units	5.1
Arsenic	mg/L	<0.05
Cadmium	mg/L	<0.01
Chromium	mg/L	<0.01
Copper	mg/L	0.02
Lead	mg/L	<0.03
Mercury	mg/L	<0.0005
Nickel	mg/L	0.02
Zinc	mg/L	0.1

Method ID	Methodology Summary
Inorg-004	<p>Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311.</p> <p>Please note that the mass used may be scaled down from default based on sample mass available.</p> <p>Samples are stored at 2-6oC before and after leachate preparation.</p>
Metals-020	<p>Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.</p>
Metals-021	<p>Determination of Mercury by Cold Vapour AAS following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.</p>

Client Reference: 218311.0, Castle Cove

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			17/01/2023	[NT]	[NT]	[NT]	[NT]	17/01/2023	[NT]
Date analysed	-			17/01/2023	[NT]	[NT]	[NT]	[NT]	17/01/2023	[NT]
Arsenic	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	92	[NT]
Cadmium	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	80	[NT]
Chromium	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	83	[NT]
Copper	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	101	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	86	[NT]
Mercury	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	82	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	86	[NT]
Zinc	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	92	[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.

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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.

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Measurement Uncertainty estimates are available for most tests upon request.

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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.

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Lisa Teng

Sample Login Details

Your reference	218311.0, Castle Cove
Envirolab Reference	313388-C
Date Sample Received	16/12/2022
Date Instructions Received	13/01/2023
Date Results Expected to be Reported	20/01/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:

Sample ID	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	On Hold
BH1-0.1-0.2													✓
BH2-0.2-0.3													✓
BH2-0.7-0.8													✓
BH3-0.2-0.3													✓
BH4-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH5-0.1-0.2													✓
BH5-0.5-0.6													✓
BH6-0.1-0.2													✓
BH7-0.04-0.1													✓
BH7-1.6-18													✓
BH8-0.02-0.1													✓
BH8-0.4-0.5													✓
BH9-0.03-0.1													✓
BH10-0.04-0.1													✓
BH10-0.4-0.5													✓
BD01/13122022													✓
TS01/15122022													✓
TB01/15122022													✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

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Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Ming To

From: Aileen Hie
Sent: Friday, 13 January 2023 11:51 AM
To: Lisa Teng
Cc: Ming To
Subject: RE: Sample Receipt for 313388-B 218311.0, Castle Cove

Hi Lisa

No problem, we'll log this in.

Ref: 313388-C
TAT: Standard.
Due: 20/01/2023
M7.

Kind Regards,

Aileen Hie | Customer Service Supervisor | Envirolab Services
(Monday to Friday 10am to 6pm)

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
T 612 9910 6200
E AHie@envirolab.com.au | W www.envirolab.com.au

Follow us on: [LinkedIn](#) | [Facebook](#) | [Twitter](#)

Samples will be analysed per our T&C's.

From: Lisa Teng <lisa.teng@douglaspartners.com.au>
Sent: Friday, 13 January 2023 10:42 AM
To: Aileen Hie <AHie@envirolab.com.au>
Subject: RE: Sample Receipt for 313388-B 218311.0, Castle Cove

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Hi Aileen,

Could we also add another metals TCLP on sample 313388-5 please?

5	BH4	0.1 - 0.2 m
---	-----	-------------

Thank you,

Lisa Teng | Environmental Engineer
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 437 976 196 | E: Lisa.Teng@douglaspartners.com.au



To find information on our COVID-19 measures, please visit douglaspartners.com.au/news/covid-19



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CERTIFICATE OF ANALYSIS

Work Order : **ES2245953**
Client : **DOUGLAS PARTNERS PTY LTD**
Contact : LISA TENG
Address : 96 HERMITAGE ROAD
 WEST RYDE NSW, AUSTRALIA 2114
Telephone : ----
Project : 218311.00
Order number : ----
C-O-C number : ----
Sampler : TM
Site : Castle Cove
Quote number : EN/222
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 8
Laboratory : Environmental Division Sydney
Contact : Cez Bautista
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 19-Dec-2022 16:30
Date Analysis Commenced : 22-Dec-2022
Issue Date : 04-Jan-2023 10:16



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
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	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 Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH02/14122022	----	----	----	----
			Sampling date / time	14-Dec-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2245953-001	-----	-----	-----	-----
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	10.1	----	----	----	----
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	34	----	----	----	----
Copper	7440-50-8	5	mg/kg	10	----	----	----	----
Lead	7439-92-1	5	mg/kg	7	----	----	----	----
Nickel	7440-02-0	2	mg/kg	42	----	----	----	----
Zinc	7440-66-6	5	mg/kg	27	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH02/14122022	----	----	----	----
			Sampling date / time	14-Dec-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2245953-001	-----	-----	-----	-----
				Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH02/14122022	----	----	----	----
				Sampling date / time	14-Dec-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2245953-001	-----	-----	-----	-----
				Result	----	----	----	----	----
EP075(SIM)A: Phenolic Compounds - Continued									
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	----	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH02/14122022	----	----	----	----
Sampling date / time					14-Dec-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2245953-001	-----	-----	-----	-----
Result						----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		77.1	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		76.7	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		71.8	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		76.2	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		80.2	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		64.4	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		88.4	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		93.0	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		87.2	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		107	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		106	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH02/14122022	----	----	----	----
				Sampling date / time	14-Dec-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2245953-001	-----	-----	-----	-----
				Result		----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		106	----	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QUALITY CONTROL REPORT

Work Order	: ES2245953	Page	: 1 of 12
Client	: DOUGLAS PARTNERS PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: LISA TENG	Contact	: Cez Bautista
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 218311.00	Date Samples Received	: 19-Dec-2022
Order number	: ----	Date Analysis Commenced	: 22-Dec-2022
C-O-C number	: ----	Issue Date	: 04-Jan-2023
Sampler	: TM		
Site	: Castle Cove		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	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				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: 4787067)									
ES2245835-039	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	8	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	6	6	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	6	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	30	26	15.5	No Limit
ES2245835-054	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	118	140	17.3	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	107	118	9.9	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	36	37	3.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	67	70	4.5	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4787070)									
ES2245835-043	Anonymous	EA055: Moisture Content	----	0.1	%	13.2	10.0	27.2	0% - 50%
ES2245835-061	Anonymous	EA055: Moisture Content	----	0.1	%	10.2	9.1	11.2	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4787066)									
ES2245835-039	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2245835-054	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 4791504)									
ES2245899-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2245998-003	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit



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 (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4791501)									
ES2245899-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES2245998-003	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



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 (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4791501) - continued									
ES2245998-003	Anonymous	EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 4791501)									
ES2245899-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES2245998-003	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit



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 (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 4791501) - continued									
ES2245998-003	Anonymous	EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 4791503)									
ES2245899-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES2245998-003	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4791503)									
ES2245899-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



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 (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4791503) - continued									
ES2245899-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES2245998-003	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4790828)							
ES2245953-001	BH02/14122022	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2245859-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4791502)									
ES2245899-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2245998-003	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4790828)									
ES2245953-001	BH02/14122022	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2245859-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit

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 Work Order : ES2245953
 Client : DOUGLAS PARTNERS PTY LTD
 Project : 218311.00



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 (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4791502)									
ES2245899-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES2245998-003	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 4790828)									
ES2245953-001	BH02/14122022	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2245859-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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.

Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
	Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) LowHigh	
Result				
<5	121.1 mg/kg	98.8	88.0	113
<1	0.74 mg/kg	130	70.0	130
<2	19.6 mg/kg	120	68.0	132
<5	52.9 mg/kg	110	89.0	111
<5	60.8 mg/kg	103	82.0	119
<2	15.3 mg/kg	109	80.0	120
<5	139.3 mg/kg	100	66.0	133
<0.1	0.087 mg/kg	99.4	70.0	125
<0.1	1 mg/kg	84.1	62.0	126
<0.05	0.5 mg/kg	80.4	69.0	113
<0.05	0.5 mg/kg	82.8	65.0	117
<0.05	0.5 mg/kg	84.1	67.0	119
<0.05	0.5 mg/kg	84.3	68.0	116
<0.05	0.5 mg/kg	77.4	65.0	117
<0.05	0.5 mg/kg	70.6	67.0	115
<0.05	0.5 mg/kg	88.5	69.0	115
<0.05	0.5 mg/kg	80.3	62.0	118
<0.05	0.5 mg/kg	78.9	63.0	117
<0.05	0.5 mg/kg	103	66.0	116
<0.05	0.5 mg/kg	79.8	64.0	116
<0.05	0.5 mg/kg	75.4	66.0	116
<0.05	0.5 mg/kg	74.2	67.0	115
<0.05	0.5 mg/kg	74.0	67.0	123
<0.05	0.5 mg/kg	77.0	69.0	115
<0.05	0.5 mg/kg	80.4	69.0	121
<0.05	0.5 mg/kg	82.8	56.0	120
<0.05	0.5 mg/kg	83.0	62.0	124
<0.2	0.5 mg/kg	85.8	66.0	120
<0.05	0.5 mg/kg	97.2	64.0	122
<0.2	0.5 mg/kg	69.1	54.0	130



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				
EP068B: Organophosphorus Pesticides (OP) (QCLot: 4791501) - continued								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	89.4	59.0	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.3	62.0	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	54.4	54.0	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	71.2	67.0	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	70.0	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	76.3	72.0	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	99.6	68.0	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	80.2	68.0	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	77.7	69.0	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	89.9	76.0	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	97.4	64.0	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	87.2	70.0	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	80.0	69.0	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	76.9	66.0	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	80.4	68.0	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	76.8	62.0	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	75.2	68.0	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	78.1	65.0	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	80.8	41.0	123
EP075(SIM)A: Phenolic Compounds (QCLot: 4791503)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	98.2	71.0	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	96.7	72.0	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	95.1	71.0	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	95.3	67.0	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	70.9	54.0	114
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	91.8	68.0	126
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	83.5	66.0	120
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	83.7	70.0	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	82.8	70.0	116
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	86.6	54.0	114
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	86.0	60.0	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	50.6	10.0	80.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4791503)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	90.3	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	95.4	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	92.0	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	96.1	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	91.5	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	85.5	77.0	127



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				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4791503) - continued								
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	92.5	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	91.0	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	92.6	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	93.2	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	93.0	68.0	116
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	92.9	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	82.4	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	81.8	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	79.4	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	84.0	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4790828)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	94.0	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4791502)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	98.8	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	101	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	102	71.0	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4790828)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	96.5	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4791502)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	99.4	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	101	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	102	63.0	131
EP080: BTEXN (QCLot: 4790828)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	100	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	103	65.0	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	102	66.0	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	103	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	103	63.0	119

Matrix Spike (MS) Report

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

Sub-Matrix: SOIL			Matrix Spike (MS) Report		
			Spike	SpikeRecovery(%)	Acceptable Limits (%)

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: 4787067)							
ES2245835-039	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	93.1	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	101	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	104	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	102	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	104	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4787066)							
ES2245835-039	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	97.0	70.0	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 4791504)							
ES2245899-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	94.0	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 4791501)							
ES2245899-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	105	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	84.9	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	81.6	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	81.7	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	111	70.0	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	74.4	70.0	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 4791501)							
ES2245899-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	85.5	70.0	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	82.0	70.0	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	81.9	70.0	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	80.5	70.0	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	81.7	70.0	130
EP075(SIM)A: Phenolic Compounds (QCLot: 4791503)							
ES2245899-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	91.5	70.0	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	92.3	70.0	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	60.8	60.0	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	88.2	70.0	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	52.5	20.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4791503)							
ES2245899-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	98.7	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	97.1	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4790828)							
ES2245953-001	BH02/14122022	EP080: C6 - C9 Fraction	----	32.5 mg/kg	93.8	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4791502)							

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 Work Order : ES2245953
 Client : DOUGLAS PARTNERS PTY LTD
 Project : 218311.00



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4791502) - continued							
ES2245899-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	94.3	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	109	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	116	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4790828)							
ES2245953-001	BH02/14122022	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	95.7	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4791502)							
ES2245899-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	96.6	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	114	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	108	52.0	132
EP080: BTEXN (QCLot: 4790828)							
ES2245953-001	BH02/14122022	EP080: Benzene	71-43-2	2.5 mg/kg	92.5	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.6	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	94.0	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	93.3	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	96.7	70.0	130
	EP080: Naphthalene	91-20-3	2.5 mg/kg	95.0	70.0	130	

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2245953	Page	: 1 of 5
Client	: DOUGLAS PARTNERS PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: LISA TENG	Telephone	: +61-2-8784 8555
Project	: 218311.00	Date Samples Received	: 19-Dec-2022
Site	: Castle Cove	Issue Date	: 04-Jan-2023
Sampler	: TM	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			Evaluation	Analysis	
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation		Date analysed	Due for analysis
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) BH02/14122022	14-Dec-2022	----	----	----	22-Dec-2022	28-Dec-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) BH02/14122022	14-Dec-2022	22-Dec-2022	12-Jun-2023	✓	28-Dec-2022	12-Jun-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) BH02/14122022	14-Dec-2022	22-Dec-2022	11-Jan-2023	✓	28-Dec-2022	11-Jan-2023	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) BH02/14122022	14-Dec-2022	28-Dec-2022	28-Dec-2022	✓	03-Jan-2023	06-Feb-2023	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) BH02/14122022	14-Dec-2022	28-Dec-2022	28-Dec-2022	✓	04-Jan-2023	06-Feb-2023	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) BH02/14122022	14-Dec-2022	28-Dec-2022	28-Dec-2022	✓	04-Jan-2023	06-Feb-2023	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH02/14122022	14-Dec-2022	28-Dec-2022	28-Dec-2022	✓	03-Jan-2023	06-Feb-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH02/14122022	14-Dec-2022	28-Dec-2022	28-Dec-2022	✓	03-Jan-2023	06-Feb-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) BH02/14122022	14-Dec-2022	23-Dec-2022	28-Dec-2022	✓	24-Dec-2022	28-Dec-2022	✓
Soil Glass Jar - Unpreserved (EP071) BH02/14122022	14-Dec-2022	28-Dec-2022	28-Dec-2022	✓	30-Dec-2022	06-Feb-2023	✓

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 Work Order : ES2245953
 Client : DOUGLAS PARTNERS PTY LTD
 Project : 218311.00



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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) BH02/14122022	14-Dec-2022	23-Dec-2022	28-Dec-2022	✓	24-Dec-2022	28-Dec-2022	✓
Soil Glass Jar - Unpreserved (EP071) BH02/14122022	14-Dec-2022	28-Dec-2022	28-Dec-2022	✓	30-Dec-2022	06-Feb-2023	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) BH02/14122022	14-Dec-2022	23-Dec-2022	28-Dec-2022	✓	24-Dec-2022	28-Dec-2022	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Regular	Actual	Expected		Evaluation
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.67	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
TRH - Semivolatile Fraction	EP071	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	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 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)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3).
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
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).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES2245953

<p>Client : DOUGLAS PARTNERS PTY LTD</p> <p>Contact : LISA TENG</p> <p>Address : 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114</p> <p>E-mail : lisa.teng@douglaspartners.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : 218311.00</p> <p>Order number : ----</p> <p>C-O-C number : ----</p> <p>Site : Castle Cove</p> <p>Sampler : TM</p>	<p>Laboratory : Environmental Division Sydney</p> <p>Contact : Cez Bautista</p> <p>Address : 277-289 Woodpark Road Smithfield NSW Australia 2164</p> <p>E-mail : cez.bautista@alsglobal.com</p> <p>Telephone : +61-2-8784 8555</p> <p>Facsimile : +61-2-8784 8500</p> <p>Page : 1 of 2</p> <p>Quote number : EM2017DOUPAR0002 (EN/222)</p> <p>QC Level : NEPM 2013 B3 & ALS QC Standard</p>
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Dates

Date Samples Received : 19-Dec-2022 16:30	Issue Date : 21-Dec-2022
Client Requested Due : 03-Jan-2023	Scheduled Reporting Date : 03-Jan-2023
Date	

Delivery Details

Mode of Delivery : Carrier	Security Seal : Intact.
No. of coolers/boxes : 1	Temperature : 6.0°C - Ice Bricks present
Receipt Detail :	No. of samples received / analysed : 1 / 1

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- 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.

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- ### Summary of Sample(s) and Requested Analysis


Laboratory sample ID	Sampling date / time	Sample ID	SOIL - E Moisture	SOIL - S TRH/BT
ES2245953-001	14-Dec-2022 00:00	BH02/14122022	✓	✓

- *AU Certificate of Analysis - NATA (COA)	Email	shahin.falahati@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	shahin.falahati@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	shahin.falahati@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	shahin.falahati@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	shahin.falahati@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	shahin.falahati@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	shahin.falahati@douglaspartners.com.au

Project No: 218311.00		Suburb: Castle Cove		To: Envirolab Services	
Project Manager: Lisa Teng / Shahin Falahati		Order Number: -		Sampler: TM	
Email: lisa.teng@douglaspartners.com.au shahin.falahati@douglaspartners.com.au		Attn: Sample Receipt		Attn: Sample Receipt	
Turnaround time: <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 72 hour <input type="checkbox"/> 48 hour <input type="checkbox"/> 24 hour <input type="checkbox"/> Same day		Do samples contain 'potential' HBM? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes		(If YES, then handle, transport and store in accordance with FPM HAZID)	
Prior Storage: <input checked="" type="checkbox"/> Fridge <input type="checkbox"/> Freezer <input type="checkbox"/> Esky <input type="checkbox"/> Shelf					

Lab ID	Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type S - soil W - water M - Material	Container Type G - glass P - plastic	Hold	aggressivity suite	Combo 8a	Combo 3a	TRH/BTEX	Analytes						Notes/ Preservation/ Additional Requirements	
1	BH1	0.1	0.2	14/12/22	S	G/P		x	x										
2	BH2	0.2	0.3	14/12/22	S	G/P		x	x										
3	BH2	0.7	0.8	14/12/22	S	G/P			x										
4	BH3	0.2	0.3	14/12/22	S	G/P			x										
5	BH4	0.1	0.2	14/12/22	S	G/P			x										
6	BH5	0.1	0.2	15/12/22	S	G/P			x										
7	BH5	0.5	0.6	15/12/22	S	G/P			x										
8	BH6	0.1	0.2	15/12/22	S	G/P		x	x										
9	BH7	0.04	0.1	13/12/22	S	G/P			x										
10	BH7	1.6	1.8	13/12/22	S	G/P			x										
11	BH8	0.02	0.1	13/12/22	S	G/P			x										
12	BH8	0.4	0.5	13/12/22	S	G/P			x										
13	BH9	0.03	0.1	12/12/22	S	G/P			x										
14	BH10	0.04	0.1	12/12/22	S	G/P			x										

Environmental Division
Sydney
Work Order Reference
ES2245953



Telephone : + 61-2-8784 8565

Metals to analyse:		Transported to laboratory by: Courier	
Number of samples in container:			
Send results to: Douglas Partners Pty Ltd			
Address: 96 Hermitage Road, West Ryde NSW 2114		Phone: (02) 9809 0666	
Relinquished by: HD/CHRYSTIE GUSHP/204		Date: 16/12/2022	
		Signed:	

LAB RECEIPT	
Lab Ref. No:	3123588
Received by:	CHRYSTIE GUSHP
Date & Time:	16/12/2022 17:30
Signed:	

16/12/22 11:55

Rec'd 16/12/22

16:30

213388.
CMLCMA

Appendix I – Owner’s Consent

TO WHOM IT MAY CONCERN

CONSENT TO VIEW AND CARRY OUT INFORMATION SEARCHES,
TO MAKE RELEVANT APPLICATIONS FOR INFORMATION SEARCHES, MONITORING BORE
LICENCES (IF REQUIRED) AND OTHER REGULATORY PERMITS

Advice is hereby given to confirm that Maureece Xuereb is the registered owner or authorised representative of the Property identified as 74 Deepwater Road, Castle Cove NSW 2069, Lot 1 in DP 610360 ("the property") as shown on the attached plan.

As the owner / authorised signatory of the owner (delete that which is not applicable), I advise that ***E/ Australia*** is authorised to access any information and/or files held by any State or Local Government department and/or regulatory authorities, and/or to make application(s) for relevant licenses or permits relating to the Property, if required.

SIGNED on the 3 day of June, 2024.



Signature of Owner / Authorised Signatory

Maureece Xuereb

Name of ~~Owner~~ Authorised Signatory