

1 Overall Elevation - West 1:200

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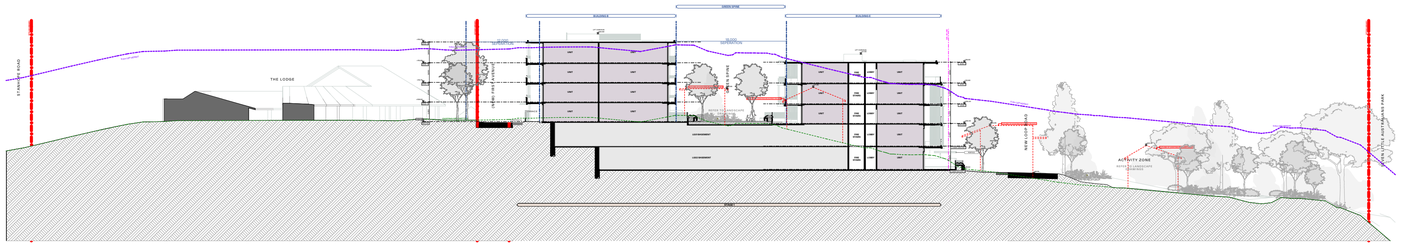
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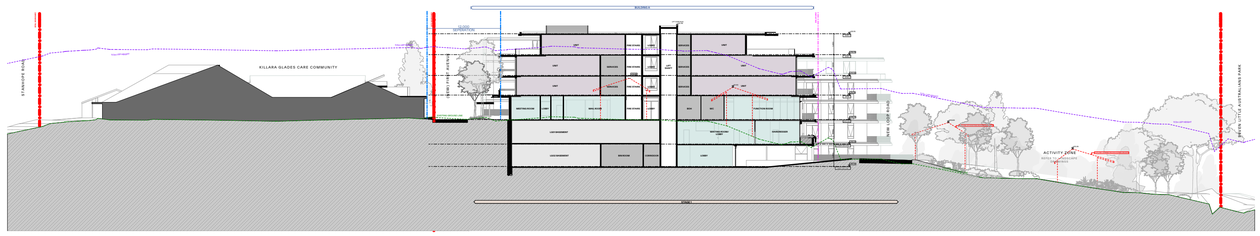
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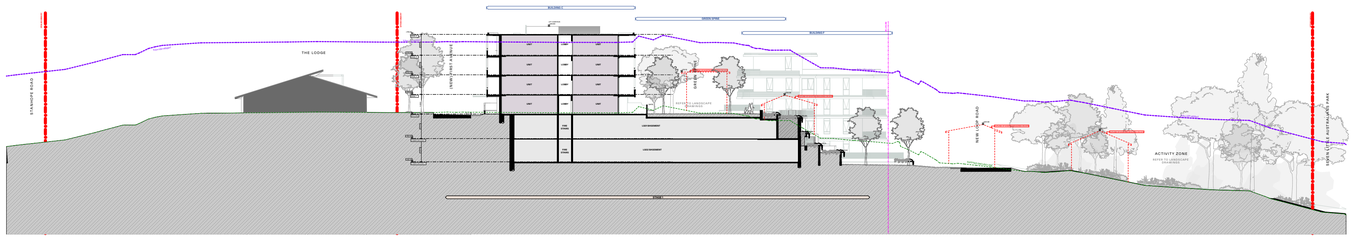
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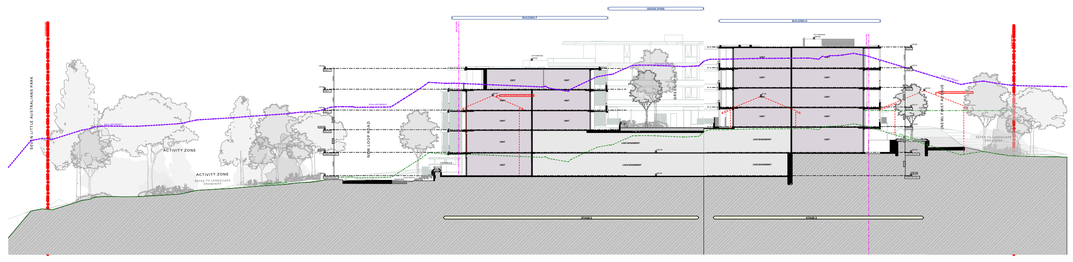
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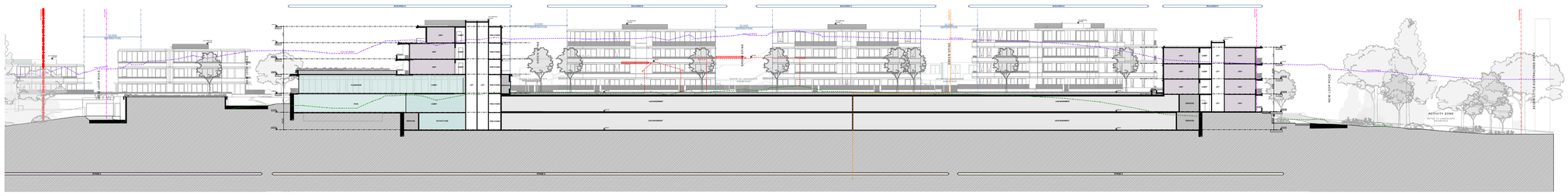
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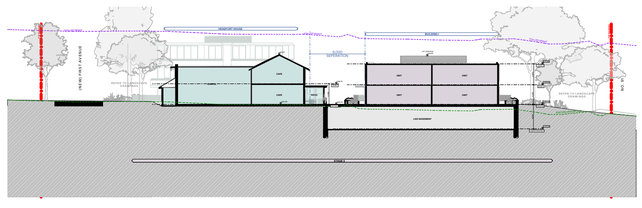
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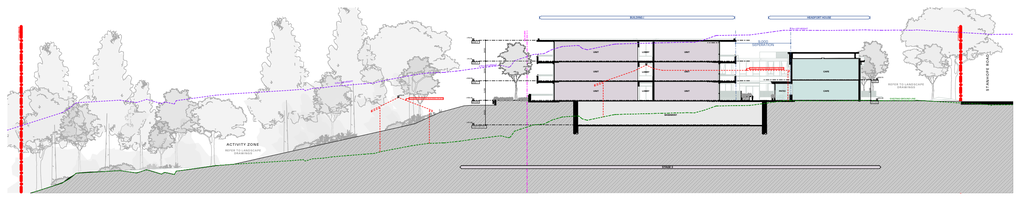
4 Section 4 - Building D and Building F 1:500



5 Section 5 - Building A, Green spine and Building H 1:500



6 Section 6 - Building I and Heritage 1:500



7 Section 7 - Building J and Heritage 1:500

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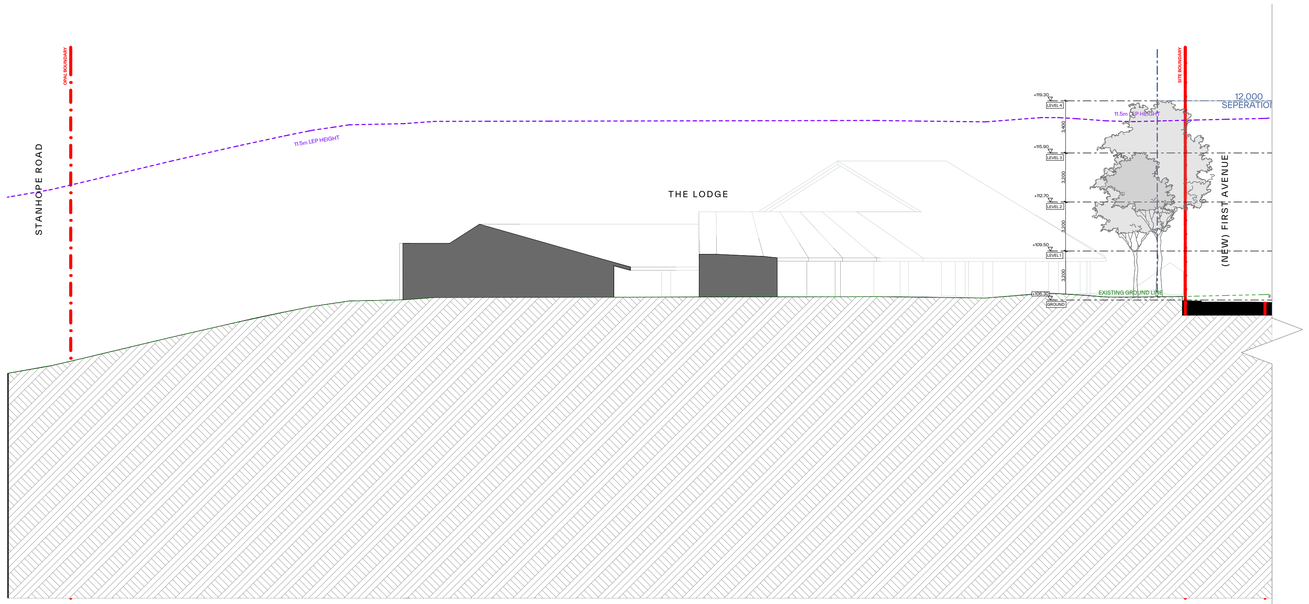
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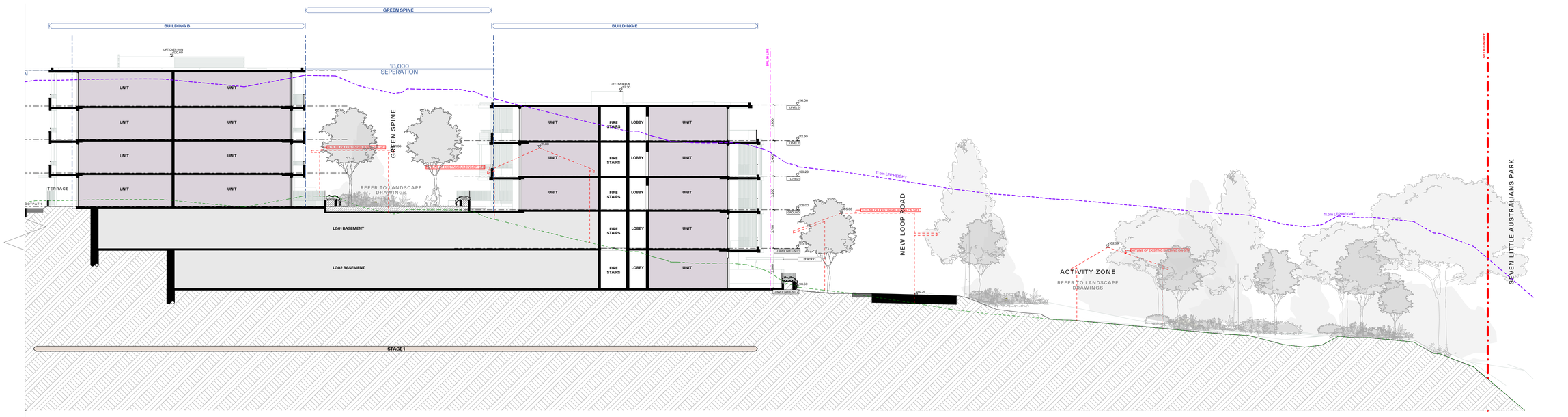
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1 Section 1 - Building B and Building E 1:200



2 Section 1 - Building B and Building E 1:200

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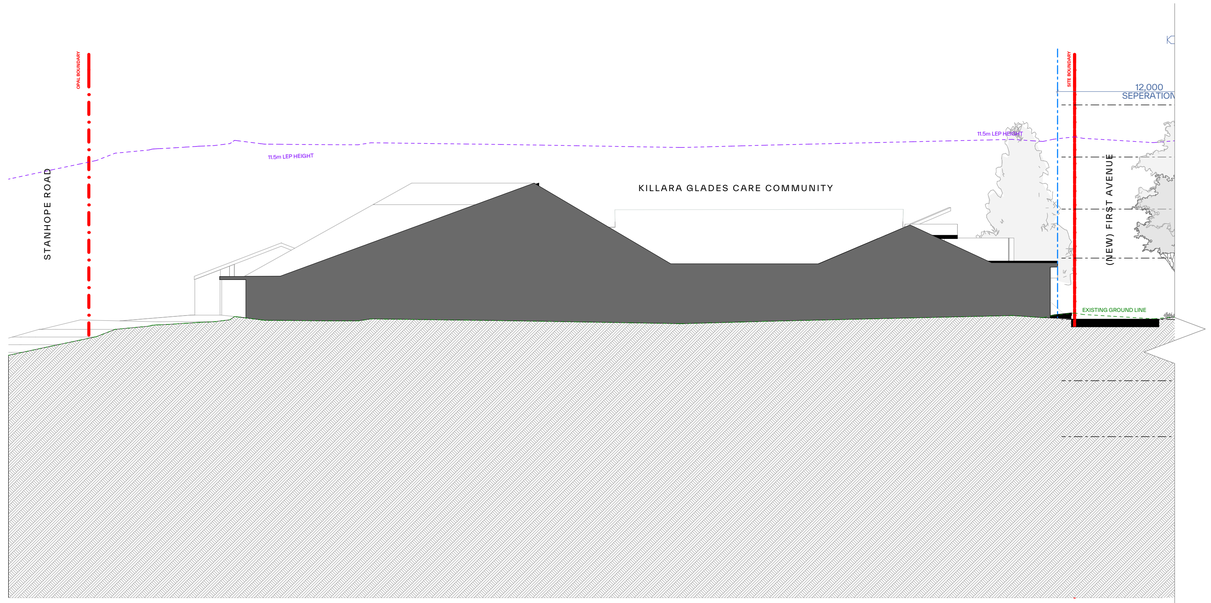
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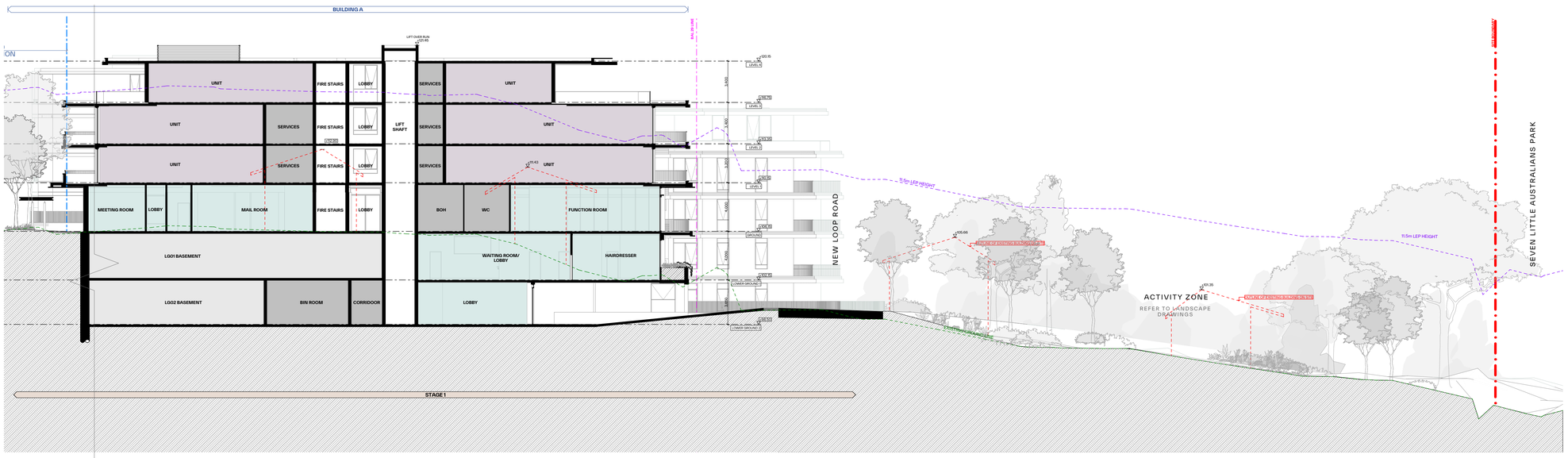
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1 Section 2 - Building A 1:200



2 Section 2 - Building A 1:200

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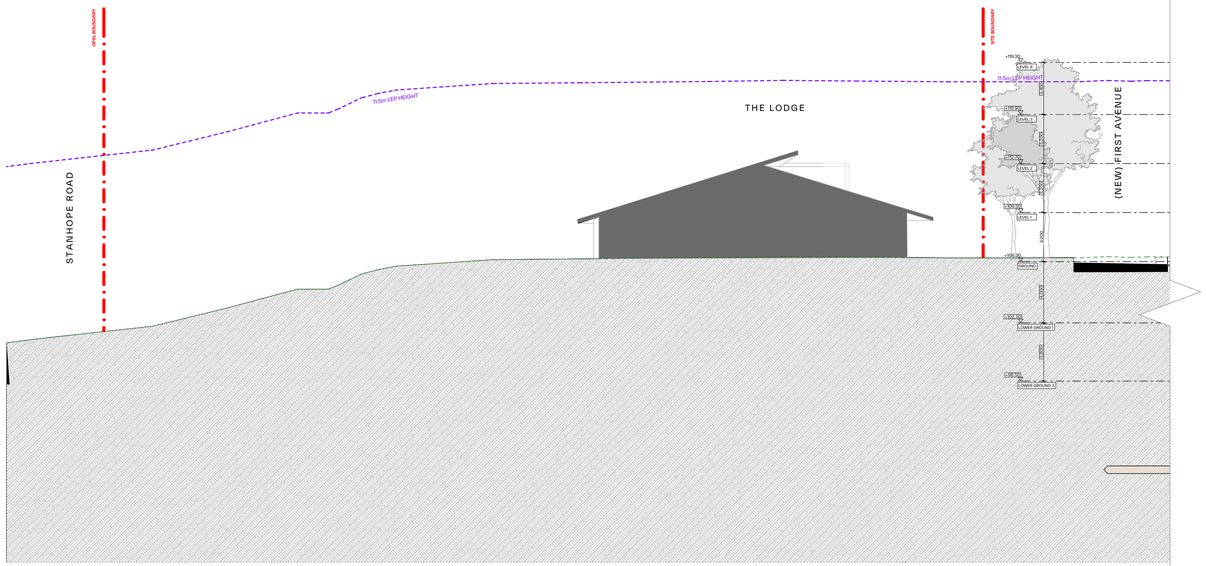
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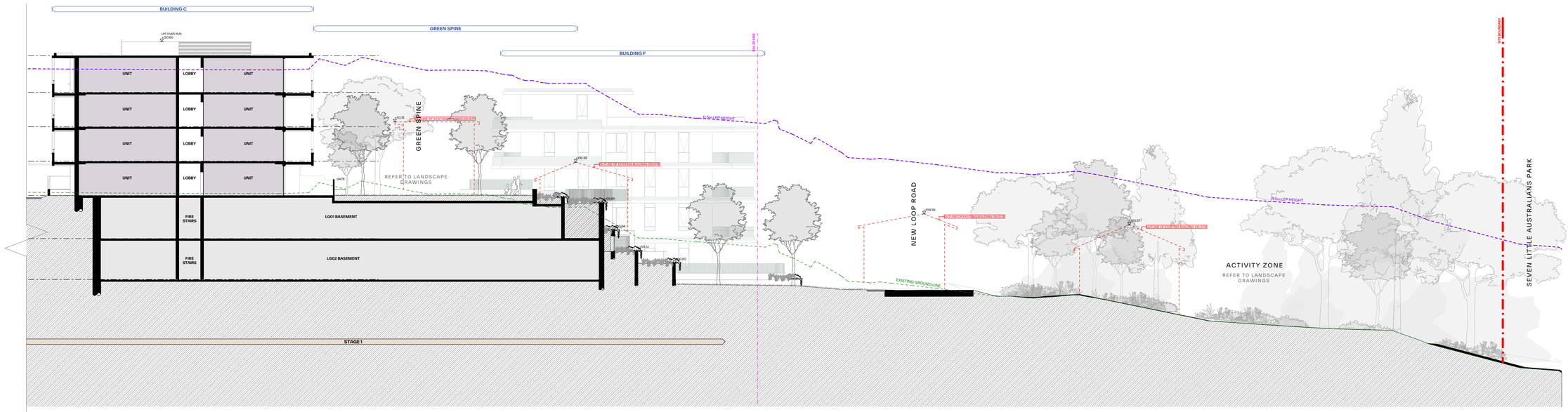
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1 Section 3 - Building C and tiered landscape 1:200



2 Section 3 - Building C and tiered landscape 1:200

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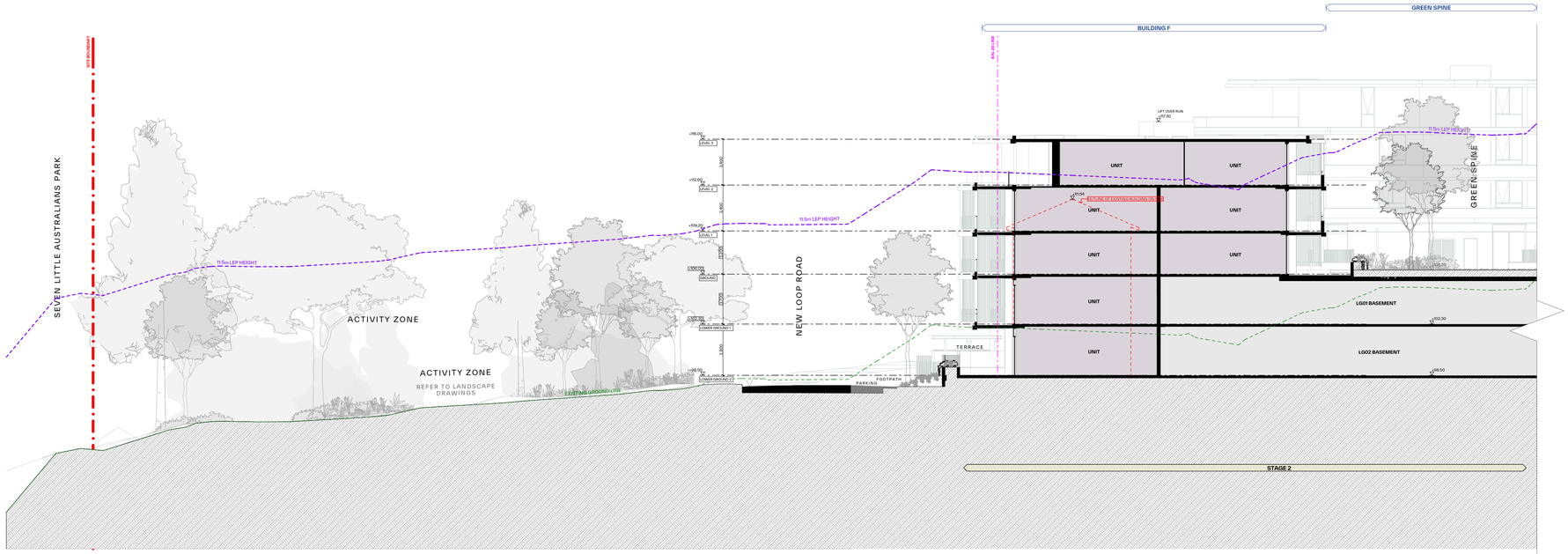
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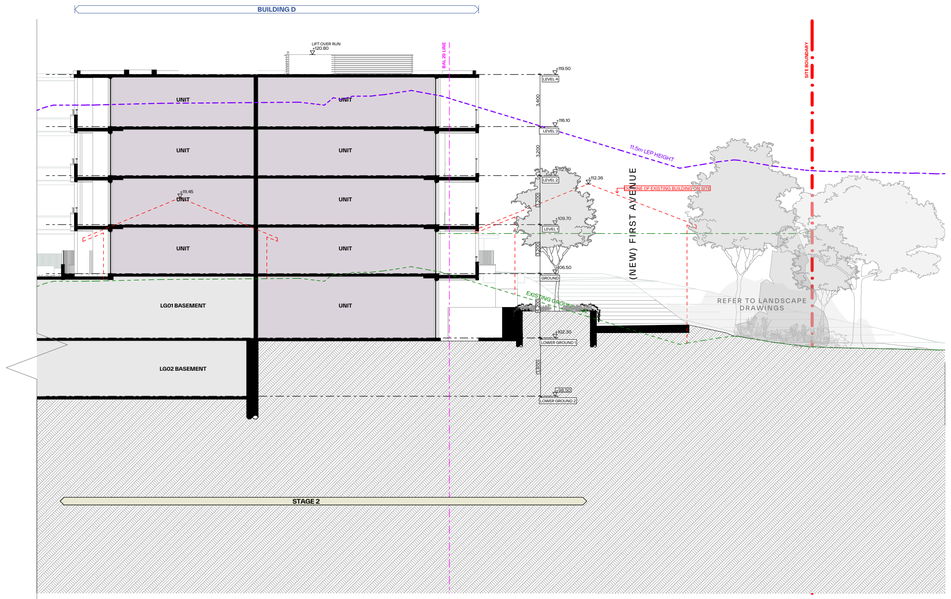
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1 Section 4 - Building D and Building F 1:200



2 Section 4 - Building D and Building F 1:200

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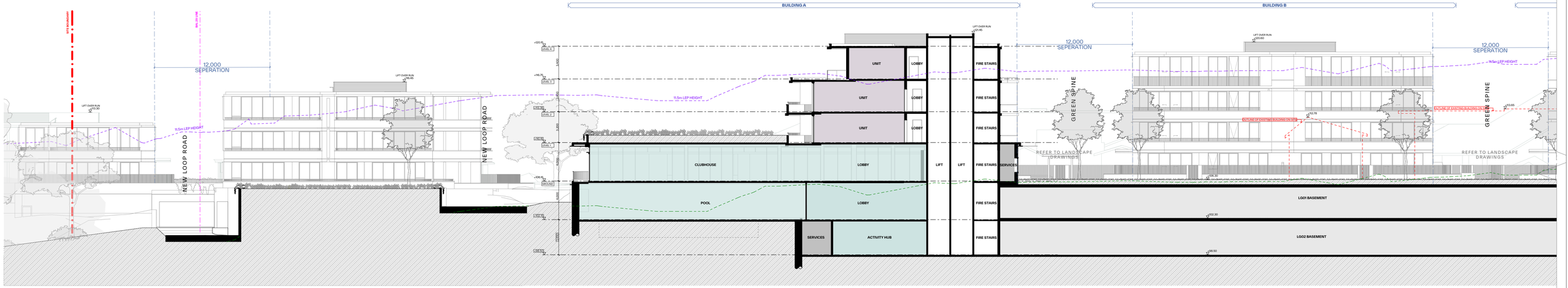
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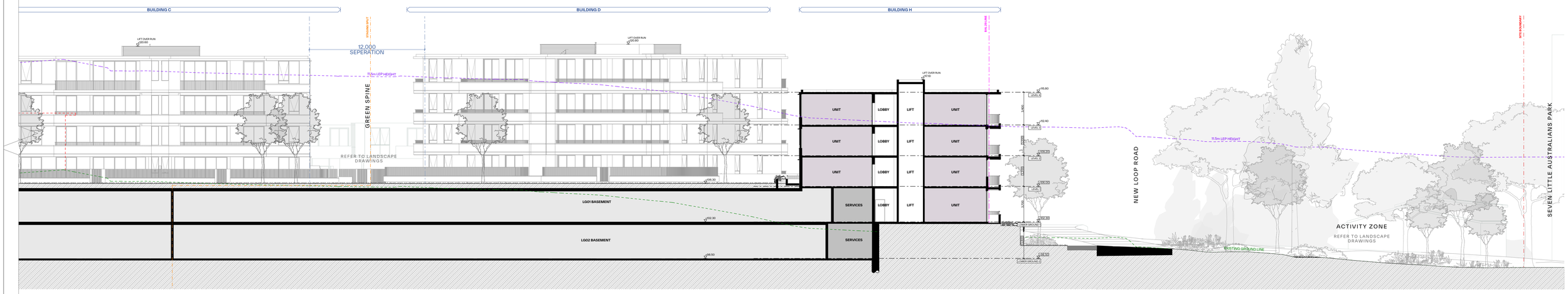
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1 Section 5 - Building A, Green spine and Building H 1:200



2 Section 5 - Building A, Green spine and Building H 1:200

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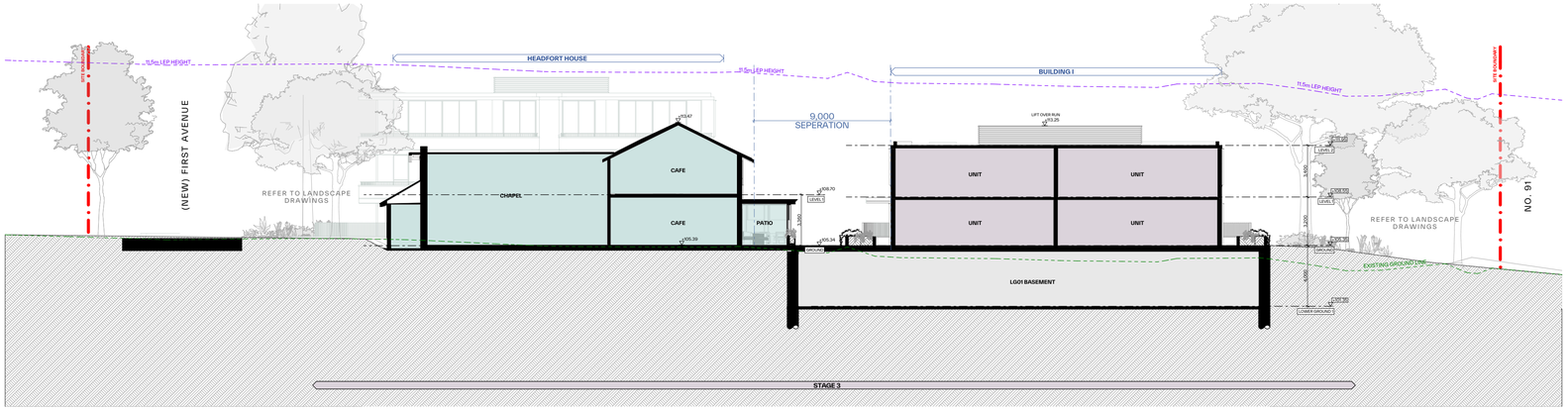
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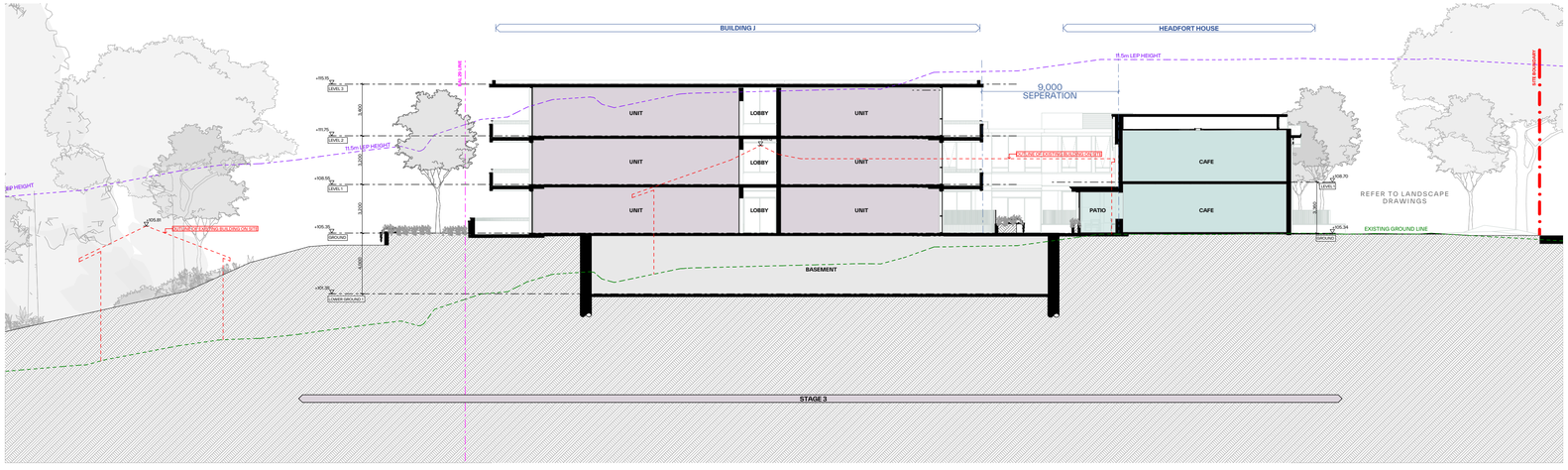
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1 Section 6 - Building I and Heritage 1:200



2 Section 7 - Building J and Heritage 1:200

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APPENDIX B

‘Additional Geotechnical and Hydrogeological Investigation’ Report prepared by JK Geotechnics (Ref. 34446A3rptRev2 dated 21 May 2026)

SPECIALIST ADVICE TO

LEVANDE PTY LTD

ON

ADDITIONAL GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION

FOR

PROPOSED REDEVELOPMENT

AT

LOURDES RETIREMENT VILLAGE,
95-97 STANHOPE ROAD, KILLARA, NSW

Date: 21 May 2026
Ref: 34446A3rptRev2

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Borehole Logs 101 to 109 (With Rock Core Photographs)
Figure 1: Site Location Plan
Figure 2: Borehole Location Plan
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1 INTRODUCTION

This specialist advice report presents the results of an additional geotechnical and hydrogeological investigation for the proposed redevelopment at Lourdes Retirement Village, 95-97 Stanhope Road, Killara, NSW. The location of the site is shown in Figure 1. The investigation was commissioned by Oliver McGeachie of Sinclair Brook, on behalf of Levande Pty Ltd, in an email dated 2 December 2025. The commission was based on our fee proposal, Ref. P73152A dated 6 November 2025.

This report must be read in conjunction with our previous 'Preliminary Geotechnical Investigation' report, Ref. 34446Arpt dated 29 September 2022 [JKG 2022], and supports a State Significant Development Application (SSDA) for a seniors housing development, comprising subdivision, key infrastructure, alterations/upgrades and refurbishment works to a residential care facility, and the redevelopment of independent living units (ILU's) and community amenities and facilities at the existing retirement village.

1.1 Overview

As an overview, based on an email prepared by Oliver McGeachie on 17 April 2026, we understand that the proposed redevelopment will comprise:

- Staged demolition of the existing 172 seniors housing dwellings which is highly considered on existing residents and includes site preparation works, including removal of the ILU's and serviced retirement apartments within the highest bushfire risk areas;
- Significant bushfire safety measures including creation of an Asset Protection Zone (APZ) for the site, reduced dwellings to the existing retirement village, upgrades to infrastructure to support bushfire protection, improved construction materials and standards and evacuation planning to increase resident and visitor safety;
- Torrens subdivision of land to completely separate the existing partly subdivided residential aged care facility from the remainder of the retirement living site;
- Alterations to the existing residential aged care facility, including:
    - demolition of the existing connection with the hostel building and associated internal and external alterations and additions;
    - ember protection upgrades to the facades of the building to comply with relevant Rural Fire Services (RFS) requirements;
    - demolition of the buildings connecting the residential aged care to the retirement serviced apartments, including new aged care facade and service, and internal alterations;
    - relocation and upgraded water tanks and sprinkler system; and
    - provision of new services infrastructure to support the subdivision;

- Construction of a new seniors housing development comprising:
    - nine boutique seniors housing blocks with a total of 145 ILU's varying between two and four storeys in height; and
    - Provision of a new community facility to support a range of social and recreational uses;
- High quality landscape works that appropriately respond to and embrace the bushland setting, enabling significant tree and biodiversity retention and avoiding impacts on remnant and contiguous bushland vegetation along the boundary adjoining Seven Little Australians Park;
- Adaptive re-use of the heritage listed Headfort House, including conservation works, curtilage improvements and sympathetic surrounding built form to improve the streetscape and allow for improved appreciation of the heritage item;
- Two consolidated one to two storey basements, providing car parking and associated services;
- Public domain works, including new roads and on-grade parking, and extensive landscaping within the APZ and throughout the site; and
- Extension and augmentation of physical infrastructure and utilities as required.

For a detailed project description, refer to the 'Environmental Impact Statement' prepared by Beam Planning and the architectural drawings prepared by PBD Architects.

1.2 Investigation Specific

We have been provided with the following updated information:

- Architectural drawings prepared by PBD Architects (Project No. 2539, Drawing Nos. DA100 to DA106, DA200 to DA209, and DA300 to DA306, Revision A, dated 15 May 2026);
- Topographic survey plans prepared by Norton Survey Partners (Ref. 21388, Sheets S1 to S10, dated 22 April 2015). The survey datum is the Australian Height Datum (AHD).

Based on the supplied information, and from a geotechnical perspective, we understand that the proposed redevelopment will include the following:

- Demolition of all existing buildings, except for Headfort House located towards the north-western corner of the site, and the existing Residential Aged Care Facility (RACF) at the northern end;
- Demolition of all existing pavements and retaining walls;
- Construction of seven, three or four storey buildings (Buildings A, B, C, D, E, F & H) overlying one or two common basement levels (Lower Ground 1 & Lower Ground 2) over the central portion of the site. Residential units will be located along the southern and eastern sides of proposed Lower Ground 1 and Lower Ground 2. Proposed Lower Ground 1 and Lower Ground 2 (basement) will be constructed at RL102.3m and RL98.5m, respectively. We have assumed that the bulk excavation levels (BEL) for proposed Lower Ground 1 and Lower Ground 2 will be at about RL102.0m and RL98.2m, respectively.

Due to the sloping nature of the site, the proposed basement will require excavation to a maximum depth of about 8.5m. Structural loads typical of this type of development have been assumed;

- Construction of two, two or three storey buildings (Buildings I & J) overlying one common basement level (Lower Ground 1) towards the western end of the site, on the western and southern sides of Headfort House. Proposed Lower Ground 1 (basement) will be constructed at RL101.35m, and we have assumed that BEL will be at about RL101.05m. Due to the sloping nature of the site, the proposed basement will require excavation to a maximum depth of about 4.2m. Structural loads typical of this type of development have been assumed; and
- Construction of an internal road network, for which we have assumed some cut and fill earthworks will be required.

The purpose of the additional investigation was to obtain further geotechnical and hydrogeological information in the vicinity of the proposed redevelopment area, carry out groundwater level monitoring for at least 3 months duration, carry out basement seepage analyses, and to use this information for the provision of updated comments and recommendations on site preparation, excavation conditions, drainage, retention systems, permanent batter slopes, footings, earthquake design parameters, exposure classification, bulk earthworks, basement on-grade floor slabs, and the internal road pavements.

This report provides specialist advice for use by the structural and civil designers in preparing their designs and no part of this report is considered a regulated design in accordance with the Design and Building Practitioners Act 2020.

Our environmental consulting division, JK Environments, has completed a preliminary groundwater quality screening in conjunction with our investigation. Reference should be made to the JK Environments report, Ref. E38092Brpt.

We understand that Prensa has been engaged to carry out a contamination investigation for the proposed redevelopment.

1.3 Relevant SEARs

The following summarises the Planning Secretary's Environmental Assessment Requirements (SEARs) that have been addressed by this report

Item	SEARs Requirement	Relevant Section of Report
12	***Ground and Groundwater Conditions***	
	• *Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site and including soil erosion.*	See Section 4 for groundwater monitoring and seepage analysis results.
	• *Where required provide a Groundwater Impact Assessment in accordance with relevant Groundwater Guidelines. If the proposed development is on land identified as having high salinity or acid sulfate soil potential in an EPI provide a Salinity Management Plan or Acid Sulfate Soil Management Plan that includes appropriate management measures and strategies.*	Outside the scope of this investigation.

2 INVESTIGATION PROCEDURE

The fieldwork for the investigation was carried out between 15 & 19 December 2025 and comprised the drilling and testing of nine boreholes (BH101 to BH109), at the locations shown on the attached Figure 2, to depths between 4.10m (BH101) and 15.19m (BH109) below existing surface levels. The boreholes were completed using our track mounted JK310 drill rig, which is equipped for site investigation purposes.

Prior to the commencement of the fieldwork, a specialist sub-consultant reviewed available 'Before You Dig Australia' information and electro-magnetically scanned the borehole locations for buried services.

The borehole locations were set out by tape measurements from existing surface features. The surface RL's indicated on the attached borehole logs were interpolated between spot level heights and ground contour lines shown on the supplied survey plans, and are therefore approximate. The supplied survey plans form the basis of Figure 2. The outlines of the proposed Lower Ground 1 and Lower Ground 2 levels have been plotted onto Figure 2. The locations of our previous boreholes, as detailed in JKG 2022, have also been plotted onto Figure 2.

The soil and upper weathered bedrock profiles were spiral auger drilled. The relative compaction and strength of the soil profile were assessed from the Standard Penetration Test (SPT) 'N' values, together with hand penetrometer readings on clayey soils recovered in the SPT split-spoon sampler, and by tactile examination. The strength of the underlying bedrock was initially assessed by observation of auger penetration resistance when using a twin-pronged tungsten carbide (TC) drill bit, together with examination of recovered cuttings.

At depths between 1.15m (BH105) and 2.60m (BH102 & BH103), the boreholes were extended into the bedrock to their final depths by rotary diamond coring techniques, using an NMLC triple tube core barrel with water flush. The strength of the cored bedrock was assessed by examination of the recovered rock cores, together with correlations with subsequent Point Load Strength Index ($I_{S(50)}$) test results.

Groundwater observations were made in the boreholes during and on completion of drilling. Groundwater monitoring wells were installed in all boreholes, in accordance with DPE (2022) [Reference 1]. Prior to the installation of the monitoring wells, the introduced drill flush water associated with rock coring was pumped out from the boreholes. The groundwater monitoring wells comprised 50mm diameter Class 18 PVC standpipes. The machine slotted length of each standpipe (i.e. the 'response zone') was installed and sealed within the bedrock profile. Here, the annulus between the borehole and the slotted length was backfilled with 2mm filter sand. Above the sand backfill, each borehole was sealed with bentonite. Cast-iron 'Gatic' covers were concreted flush with the ground surface to protect the top of the groundwater monitoring wells. The installation details are presented on the borehole logs.

Adjacent to BH101, BH107 and BH108, a second borehole was auger drilled to depths of 2.5m, 1.2m and 1.2m below existing surface levels, respectively, for the purpose of installing shallower groundwater monitoring wells within the upper soil and weathered rock profiles. The groundwater monitoring wells comprised 50mm diameter Class 18 PVC standpipes. The annulus between the borehole and the slotted length was backfilled with 2mm filter sand. Above the sand backfill, each borehole was sealed with bentonite. Cast-iron 'Gatic' covers were concreted flush with the ground surface to protect the top of the groundwater monitoring wells. The installation details are presented on the logs for BH101, BH107 and BH108.

Further details of the methods and procedures employed in the investigation are presented in the attached Report Explanation Notes.

Our geotechnical engineer (Anh Tu Luong) was present full-time during the fieldwork to set out the borehole locations, direct the borehole scanning, nominate testing and sampling, prepare the attached borehole logs, and to direct the groundwater monitoring well installations. The Report Explanation Notes define the logging terms and symbols used.

The recovered rock cores from BH101 to BH109 were photographed and Point Load Strength Index tested. The rock core photographs are enclosed with the borehole logs. The Point Load Strength Index test results are plotted on the borehole logs and summarised in the attached Table A. The unconfined compressive strengths (UCS), as estimated from the Point Load Strength Index test results, are also summarised in Table A and in Section 3.3.

Selected soil and extremely weathered rock samples were returned to a NATA registered analytical laboratory, Envirolab Services Pty Ltd, for pH and sulphate content testing. The results are summarised in the attached Envirolab Services 'Certificate of Analysis 400214' and in Section 3.3.

On 22 December 2025, we returned to site to measure the groundwater level in each well, and to install water level data loggers in the BH102 to BH106 wells, and BH109 well, and in the deeper wells in BH101, BH107 and BH108. The shallower wells in BH101, BH107 and BH108 were 'dry'. The water level data loggers were programmed to take readings at 10 minute intervals.

On 6 January 2026, we returned to site to measure the groundwater level in each well and then pump out the groundwater for the purpose of undertaking rising head infiltration tests to assess the permeability of the soil and upper weathered rock profile (i.e. shallower wells in BH101, BH107 and BH108) and of the deeper bedrock profile (i.e. wells in BH102 to BH106, and BH109 and in the deeper wells in BH101, BH107 and BH108). The shallower wells in BH101, BH107 and BH108 remained 'dry'. In the remaining wells, the groundwater level recharge rate during testing was measured using the water level data loggers, which were reprogrammed to take readings at 10 second intervals. Using established seepage formulae (and their assumptions), an approximate insitu horizontal coefficient of permeability (k_h) for the bedrock profile in each borehole has been calculated. The results are presented in Section 3.4. Following completion of the rising head infiltration tests, the water level data loggers were reprogrammed to take readings at 10 minute intervals.

On 7 January 2026, 19 February 2026 and 7 April 2026, we returned to site to measure the groundwater level in each well. During the final visit, which was 106 days (i.e. 3½ months) following their installation, the water level data loggers were retrieved and downloaded. The monitoring results are plotted as groundwater level (mAHD) and daily rainfall (mm) versus time, and are presented as Figures 3 to 11. The plotted rainfall data was obtained from the Bureau of Meteorology's rainfall records for their monitoring station at Chatswood Bowling Club (Station No. 66011).

3 RESULTS OF THE CURRENT INVESTIGATION

3.1 Site Description

The site (Lourdes Retirement Village) is located over the crest of a relatively wide ridge, which runs in a north-west to south-east direction. Stanhope Road bounds the northern site boundary. Within the site itself, the topography varies from relatively level to slopes, which grade to a maximum of 20° down towards the south. Based on the supplied survey plans, the maximum elevation relief across the site, between the northern relatively level portion and the lower lying southernmost internal road is about 14m. Beyond the southern and eastern site boundaries, the steep bushland covered hillsides grade between 15° and 45°.

At the time of our fieldwork, the site comprised the existing 172 dwelling Lourdes Retirement Village, including 108 ILU's and 64 serviced retirement apartments, as well as an RACF (known as 'Killara Glades Care Community' operated by Opal), administrative buildings and additional resident community facilities. The existing brick buildings varied in scale from one to three storeys (some with a single basement car parking level), and included the locally listed heritage item 'Headfort House', as shown on Figure 2. The site also contained garages and carports, suspended concrete footbridges and ramps, concrete and brick paved footpaths, and an internal road network with adjoining car parking areas, which were surfaced with asphaltic

concrete (AC) or concrete. The internal roads and footpaths longitudinally graded to a maximum of about 12°. Lawns, garden beds and trees were scattered across the site.

Along the northern and north eastern site boundaries, batter slopes grading between 26° and 35° and up to 3m high were present. Beyond the toes of the batter slopes, the ground surface gently graded between 2° and 3° towards Stanhope Road. These portions of the site were covered by trees, shrubs and leaf litter.

To the south and east of the northern relatively level portion of the site, surface levels typically fell at grades between 2° and 12°. This portion of the site was terraced by numerous retaining walls, which were up to 3m high. The retaining walls were of either concrete block, brick, dry stacked sandstone block, dry stacked sandstone boulder, or timber construction, and generally appeared to be in good condition. Batter slopes generally between 10° and 25° and up to approximately 2.5m high were also present across the lower sloping portion of the site.

Sandstone rock outcrops and exposed sandstone cut faces between 1.2m and 1.6m high were exposed across the site. The exposed sandstone was assessed to be of at least medium strength when struck with a geological hammer. Rock defects including extremely weathered bands and clay bands up to 130mm thick were also observed.

The neighbouring property to the west of the site (91 Stanhope Road) contained a two-storey brick residence and a separate single storey building, which were set back approximately 1m from the common boundary. The neighbouring surface level was about 0.4m lower in elevation than the subject site.

3.2 Subsurface Conditions

The 1:100,000 geological map of Sydney (Geological Survey of NSW, Geological Series Sheet 9130) indicates the site to be underlain by Hawkesbury Sandstone. Generally, the boreholes encountered pavements and/or fill, overlying residual clays, then sandstone bedrock at relatively shallow depths. Reference should be made to the attached borehole logs for specific details at each location. A summary of the encountered subsurface characteristics is provided below:

3.2.1 Pavements

AC surfacing was encountered in all current boreholes and ranged in thicknesses between 30mm and 90mm. A granular unbound roadbase layer was encountered below the AC surfacing in BH102, BH104, BH105 and BH109 and was either 50mm or 110mm thick. A roadbase layer was not found below the AC surfacing in the remaining five boreholes.

3.2.2 Fill

Fill, comprising clayey and/or sandy soils, was encountered below the AC surfacing in all boreholes, except BH104 and BH105, to depths between 0.4m (BH108) and 1.0m (BH103). Inclusions of igneous and sandstone gravel, ash, and concrete fragments were found in the fill. Based on the SPT result, the deeper fill in BH103, BH106, BH107 and BH109 was qualitatively assessed to be poorly compacted.

3.2.3 Residual Clays

Residual silty sandy clays of predominantly low or medium plasticity and of very stiff or hard strength were encountered below the AC pavement in BH104 and BH105, and below the fill in BH101, BH102, BH106 and BH108 to depths between 0.5m (BH105) and 1.6m (BH102).

3.2.4 Extremely Weathered Sandstone

Extremely weathered sandstone of hard (soil) strength was encountered below the fill in BH103 and BH107 and below the residual clays in BH101 and BH105. The thickness of this 'weak' layer ranged from 0.15m (BH105) to 0.9m (BH101).

3.2.5 Sandstone Bedrock

Sandstone bedrock was encountered in the previous and current boreholes at the depths and levels tabulated below:

Investigation ID	Borehole	Approximate Surface RL (mAHD)	Depth to Sandstone Bedrock below Original Surface Level (m)	Approximate Sandstone Bedrock Surface Level (mAHD)
Current	BH101	104.5	2.4	102.1
	BH102	105.2	1.6	103.6
	BH103	98.8	2.0	96.8
	BH104	106.2	0.75	105.5
	BH105	106.6	0.65	106.0
	BH106	101.6	1.0	100.6
	BH107	99.4	0.95	98.5
	BH108	102.2	1.2	101.0
	BH109	99.0	1.1	97.9
JKG 2022	BH1	105.5	2.0	103.5
	BH2	103.0	0.6	102.4
	BH3	103.8	0.2	103.6
	BH4	99.0	0.9	98.1
	BH5	106.6	0.8	105.8
	BH6	102.3	1.7	100.6
	BH7	98.8	0.9	97.9
	BH8	95.3	0.3	95.0
	BH9	95.2	1.3	93.9
JKG 1981	BH1	-	1.4	-
	BH2	-	1.2	-
	BH3	-	0.8	-
	BH4	-	1.0	-
	BH5	-	0.9	-
	BH6	-	0.6	-
	BH7	-	0.4	-
JKG 1989	BH1	-	1.8	-
	BH2	-	0.3	-
	BH3	-	0.4	-
JKG 2001	BH1	105.5	1.0	104.5
	BH2	105.8	0.5	105.3
	BH3	106.5	1.0	105.5
	BH4	106.2	0.5	105.7
JKG 2010A	BH1	-	1.1	-
	BH2	-	1.1	-
	BH8[1]	-	≥1.4	-
JKG 2010B	BH1	104.2	2.0	102.2
	BH2	104.6	1.4	103.2
	BH3	99.5	1.3	98.2
JKG 2014	BH2[1]	100.9	≥1.6	≤99.3
	BH4[1]	100.4	≥2.2	≤98.2

Note 1: These boreholes were completed using portable hand operated equipment. Based on the inherent limitations of the hand auger and DCP, the stratum on which refusal occurred cannot be confirmed.

Based on the investigation results, it appears that bedrock surface levels deepen radially in all directions from the centre of the site (i.e. from BH105). Based on the known weathering pattern of Hawkesbury Sandstone, the change in bedrock levels occurs across a number of 'steps', which create buried cliff lines.

In the current boreholes, the sandstone bedrock on first contact was generally moderately to slightly weathered and of low, medium or high strength. In BH107, the bedrock was capped with a 250mm thick layer of highly weathered sandstone of very low or low strength. Minor rock defects (i.e. joints, clay seams, extremely weathered seams and clay coated bedding parting) were encountered. In BH103, BH105 and BH109, 'no core' (core loss) zones were encountered within this upper sandstone profile and were 100mm, 80mm and 60mm thick, respectively; presumably a 'weaker' layer washed out by the introduced drill flush water. BH101 and BH102 were terminated within the moderately to slightly weathered sandstone profile at depths of 4.10m and 4.82m, respectively.

In BH103 to BH109, fresh sandstone of medium or high strength was encountered below depths between 2.28m (BH104) and 6.70m (BH107). The frequency of rock defects reduced within this basal profile. BH103 to BH109 were terminated within this basal fresh sandstone profile at depths between 4.46m (BH106) and 15.19m (BH109).

An indicative engineering classification of the sandstone bedrock has been carried out for the current boreholes, BH1 to BH6 from JKG 2022, and for the four cored boreholes from JKG 2001, at the locations shown on Figure 2. The rock classification has been carried out in accordance with Pells et al. (2019) [Reference 2] and is tabulated below:

Borehole	Approx. Surface RL (mAHD)	Indicative Engineering Classification of Sandstone Bedrock Depths (m) [RL at top of Unit (mAHD)]			
		Class V	Class IV	Class III	Class II/I
BH101	104.5	-	2.4-4.1 [102.1]	-	-
BH102	105.2	-	1.6-4.8 [103.6]	-	-
BH103	98.8	-	2.0-6.3 [96.8]	6.3-7.8 [92.5]	7.8-10.0 [91.0]
BH104	106.2	-	-	0.75-2.3 [105.5]	2.3-10.1 [103.9]
BH105	106.6	-	0.65-3.6 [106.0]	3.6-4.8 [103.0]	4.8-10.5 [101.8]
BH106[2]	101.6	-	1.0-2.7 [100.6]	2.7-4.5 [98.9]	-
BH107	99.4	0.95-1.2 [98.5]	1.2-1.9 [98.2]	1.9-3.8 [97.5]	3.8-8.5 [95.6]
BH108	102.2	-	1.2-1.7 [101.0]	1.7-5.0 [100.5]	-
BH109	99.0	-	1.1-3.2 [97.9]	-	3.2-15.2 [95.8]
JKG 2022 BH1	105.5	2.0-3.4 [103.5]	-	3.4-7.0 [102.1]	7.0-8.6 [98.5]
JKG 2022 BH2	103.0	0.6-2.2 [102.4]	2.2-5.6 [100.8]	-	5.6-8.9 [97.4]
JKG 2022 BH3	103.8	-	0.2-7.2 [103.6]	-	7.2-9.1 [96.6]
JKG 2022 BH4[2]	99.0	0.9-3.1 [98.1]	-	3.1-4.4 [95.9]	4.4-8.6 [94.6]
JKG 2022 BH5	106.6	-	0.8-3.5 [105.8]	3.5-6.5 [103.1]	6.5-8.4 [100.1]
JKG 2022 BH6	102.3	-	1.7-4.1 [100.6]	4.1-5.0 [98.2]	5.0-8.3 [97.3]
JKG 2001 BH1	105.5	-	-	1.1-3.9 [104.4]	-
JKG 2001 BH2	105.8	-	0.5-2.3 [105.3]	2.3-2.9 [103.5]	2.9-4.0 [102.9]
JKG 2001 BH3	106.5	-	1.0-3.4 [105.5]	-	3.4-4.3 [103.1]
JKG 2001 BH4	106.2	-	-	0.5-2.9 [105.7]	2.9-3.9 [103.3]

Note 2: The Class IV profile in BH106 and the Class V profile in BH4 (JKG 2022) contained medium and high strength sandstone.

3.2.6 Groundwater

All boreholes were 'dry' during and on completion of auger drilling. During rock core drilling, 100% drill flush water return was recorded in BH101, BH102, BH104, BH105, BH106, BH107 and BH108. However, in BH103, an estimated 90% drill flush water return was recorded, indicating some losses through open joints and bedding partings (i.e. a relatively permeable rock mass). In BH109, 50% drill flush water return was recorded from 1.23m to 3.25m depth, then 0% (no) drill flush water return down to borehole termination at 15.19m depth, indicating a highly permeable rock mass.

Groundwater monitoring wells were installed in the twin wells of BH101, BH107 and BH108 and in the single wells of the remaining boreholes. Water level data loggers were installed into the deeper wells of BH101, BH107 and BH108 and into the single wells of the remaining boreholes. Our groundwater level monitoring results for these wells, for the 3½ month period between 22 December 2025 and 7 April 2026, are presented as Figures 3 to 11. The effects of the rising head infiltration (pump out) tests and the groundwater sampling undertaken by JK Environments can be seen on some of these figures. From the available Bureau of Meteorology rainfall records, the following significant (heavy and/or prolonged) rainfall events occurred during the 3½ month groundwater level monitoring period:

- 18 & 19 January 2026: 119mm total rainfall (over 2 days)
- 27 & 28 February 2026: 77mm total rainfall (over 2 days)
- 8 to 11 March 2026: 56mm total rainfall (over 4 days)
- 18 March 2026: 31mm rainfall
- 27 March 2026: 18mm rainfall
- 4 & 5 April 2026: 26mm total rainfall (over 2 days)

As can be seen in Figures 3 to 11, and for a response zone within the bedrock profile, there was little groundwater level response to the rainfall events in the deeper wells of BH101, BH107 and BH108 and in the single wells of BH102 to BH106. However, in the BH109 well, there were noticeable responses to rainfall, where the groundwater level would 'spike' by up to 4.2m in elevation following each rainfall event. The monitoring results for the 3½ month period are summarised in the table below:

Groundwater Monitoring Well	Surface RL (mAHD)	Groundwater Level Monitoring Results between 22/12/2025 and 7/04/2026		
		Lowest Recorded Groundwater Level (mAHD)	Highest Recorded Groundwater Level (mAHD)	Maximum Level Variation (m)
BH101 (Deep)	104.5	101.4	101.8	0.4
BH102	105.2	102.0	102.6	0.6
BH103	98.8	94.5	94.9	0.4
BH104	106.2	99.4	101.2	1.8
BH105	106.6	97.8	98.7	0.8
BH106	101.6	99.2	99.5	0.3
BH107 (Deep)	99.4	95.4	96.5	1.1
BH108 (Deep)	102.2	99.0	99.2	0.2
BH109	99.0	93.6	97.8	4.2

Based on the groundwater level monitoring results, the hydraulic gradient appears to dip down to the south and south-west.

During our return visits on 7 January 2026, 19 February 2026 and 7 April 2026, we attempted to measure the groundwater levels in the shallow wells of BH101, BH107 and BH108, which were installed to depths of 2.5m, 1.2m and 1.2m, respectively. All three shallow wells were 'dry' during each visit.

3.3 Laboratory Test Results

The results of the Point Load Strength Index tests carried out on the recovered rock cores from BH101 to BH109 correlated well with our field assessment of bedrock strength. The estimated UCS's, based on the correlation provided in AS1726:2017 'Geotechnical Site Investigations' (i.e. UCS = 20 x $I_{S(50)}$), ranged up to 46MPa.

The soil and extremely weathered rock aggression tests results are tabulated below:

Borehole	Sample Depth (m)	Material	pH	Sulphate Content (mg/kg)
101	0.5-0.95	Residual Clay	7.2	20
	1.5-1.95	Extremely Weathered Sandstone	4.5	150
102	0.5-0.8	Residual Clay	4.5	180
103	0.5-0.8	Sandy Fill	7.0	<10
	1.5-1.65	Extremely Weathered Sandstone	5.3	10
104	0.2-0.4	Residual Clay	5.7	73
105	0.5-0.65	Extremely Weathered Sandstone	5.6	48
106	0.5-0.8	Sandy Fill	8.7	22
	0.8-1.0	Residual Clay	9.3	100
107	0.5-0.8	Clayey Fill	6.1	35
108	0.5-0.95	Residual Clay	6.0	20
109	0.5-0.95	Clayey Fill	7.7	20

3.4 Rising Head Infiltration Tests

Borehole rising head (i.e. pump out) infiltration tests were carried out in the deeper wells of BH101, BH107 and BH108 and in the single wells of BH102 to BH106. The groundwater level was purged/drawn down using a pump, and the rate of recharge was measured using the water level data logger. From the monitored groundwater level recharge rate, and by using established seepage formulae (i.e. Hvorslev's time lag and variable head methods) and their assumptions, the calculated horizontal coefficient of permeability (k_h) values of the sandstone bedrock within the response zone of each standpipe are tabulated below:

Borehole	Groundwater Depth Range within Sandstone Bedrock Response Zone (m) [Level Range (mAHD)]	Horizontal Coefficient of Permeability, k_h (m/sec)
BH101 (Deep)	2.6 – 4.1 [100.4 – 101.9]	3.5×10^{-7}
BH102	1.7 – 4.8 [100.4 – 103.5]	2.7×10^{-7}
BH103	2.6 – 10.0 [88.8 – 96.2]	4.4×10^{-8}
BH104	4.1 – 10.1 [96.1 – 102.1]	1.8×10^{-8}
BH105	4.5 – 10.5 [96.1 – 102.1]	4.6×10^{-9}
BH106	1.45 – 4.45 [97.2 – 100.2]	6.7×10^{-7}
BH107 (Deep)	1.7 – 8.5 [90.9 – 97.7]	5.8×10^{-8}
BH108 (Deep)	2.0 – 5.0 [97.2 – 100.2]	6.0×10^{-7}
BH109	1.7 – 15.2 [83.8 – 97.3	1.1×10^{-7}

The measured values generally indicate a low permeability for the sandstone bedrock.

4 GROUNDWATER SEEPAGE ANALYSIS

The purpose of the groundwater seepage analysis was to assess:

- The steady-state dewatering volume during construction to collect and control the seepage that occurs into the proposed basement excavations; and,
- The estimated groundwater drawdown outside the proposed excavations and the effects on the neighbouring properties.

The geotechnical and hydrogeological investigation, including the groundwater seepage analysis, has been completed generally in accordance with DPE 2022.

4.1 Methodology

3D steady-state analyses have been carried out for the proposed basement excavations. The seepage analyses were carried out using 3D finite element computer programs, including PLAXIS 3D by Bentley and SEEP 3D by GeoStudio. The seepage analysis methodology comprised the following:

- A subsurface model, including the proposed bulk excavation geometries, were developed in PLAXIS 3D using the information obtained from our investigations, and the supplied architectural drawings and topographic survey plans;
- Once the subsurface model was generated, they were then exported into SEEP 3D. The coordinate system of the geometries created in PLAXIS 3D was amended such that it matched the coordinate system of SEEP 3D to ensure that the exported geometries were unaltered;
- The calculated k_h values from the borehole rising head infiltration tests, as discussed in Section 3.7, were considered for the sandstone bedrock. The adopted k_h values used in the analyses for the sandstone bedrock were the highest calculated value of 6.7×10^{-7} m/sec (Case 1) and the median value of 1.1×10^{-7} m/sec (Case 2) from the results of the borehole rising head infiltration tests. The permeability value for the soil and extremely weathered rock profiles above the groundwater table were assumed based on our experience with similar materials;
- The highest recorded groundwater levels were analysed (in accordance with DPE 2022) based on the monitoring data to date;
- Groundwater total head boundary conditions were assigned to the sides of the models to simulate the initial groundwater levels;
- A steady-state seepage analysis was carried out on completion of bulk excavation for the proposed basements, assuming drainage down to the assumed BEL's; and
- Sensitivity analyses were carried out for both cases by increasing the vertical to horizontal permeability ratio of sandstone bedrock from 0.1 (Condition A) to 0.5 (Condition B).

4.2 Hydraulic Model and Boundary Conditions

Boundary total groundwater head conditions have been applied along the sides of the model to simulate the highest recorded groundwater levels mentioned in Section 3.2.6. The extent of the hydrogeological model is presented in Plate 1 below. For the purpose of our analyses, we have referred to the larger excavation as Block A, and the smaller, as Block B. The existing groundwater levels are presented in Plate 2 below.

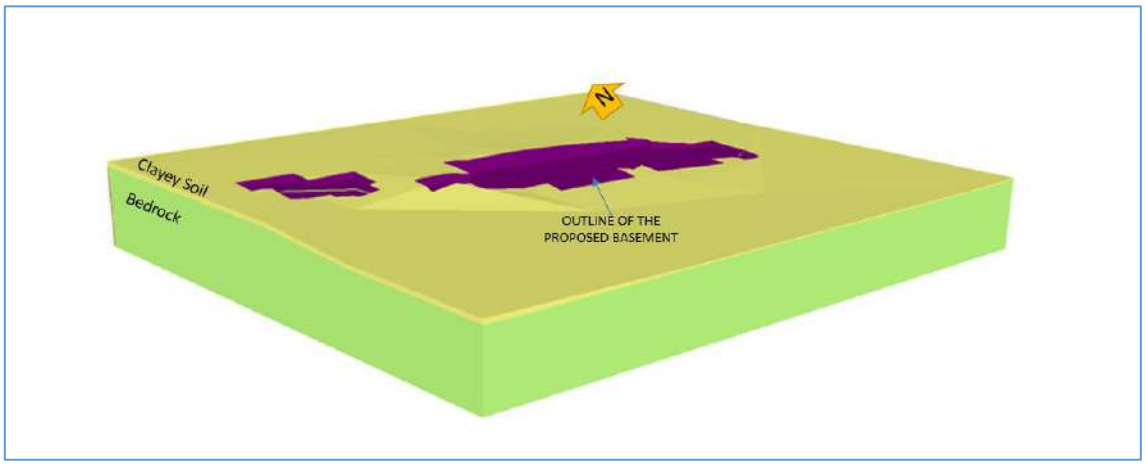


Plate 1: 3D Hydrogeological Model

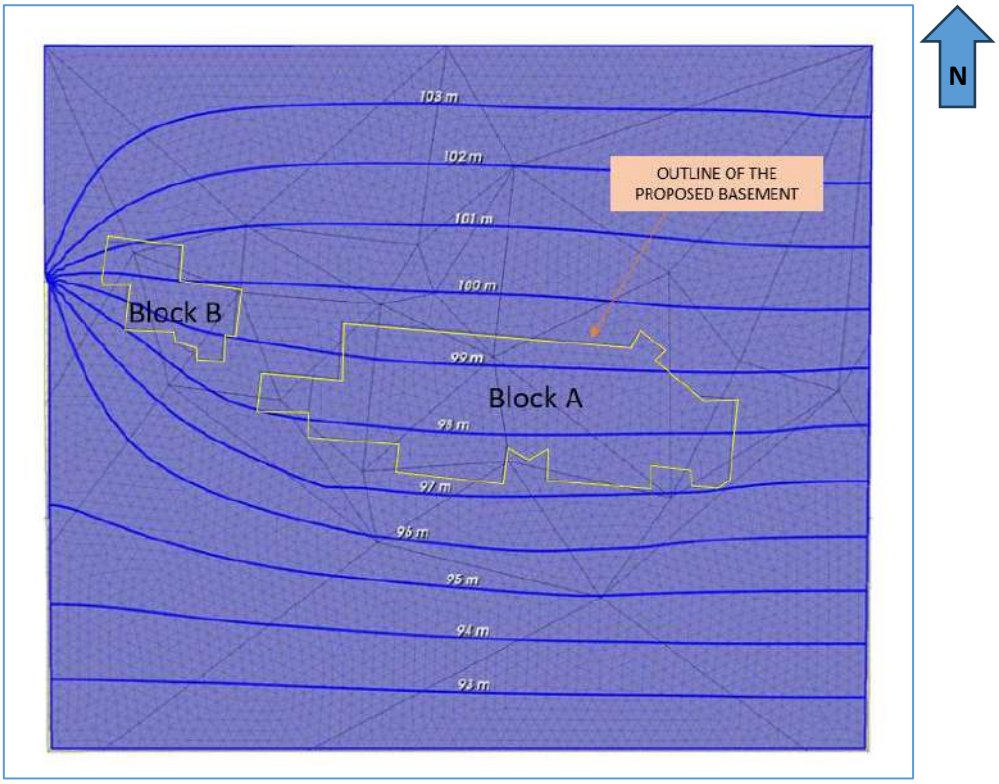


Plate 2: Plan View of Hydrogeological Model Showing Existing Groundwater Level Contours

For simplicity of analysis, the subsurface model comprised an upper material layer of soil and extremely weathered rock, underlain by sandstone bedrock. For the model, the bases and the sides of the propose

excavations were modelled as 'drained' such that the water flow at the bedrock/excavation interface had a zero-flow boundary to simulate drainage.

Based on our experience and available literature for the Sydney region, seepage through the rock mass will predominately occur within the defects. The most common continuous defect within the encountered bedrock is sub-horizontal bedding partings. Therefore, it is reasonable to apply a lower vertical permeability than that of the horizontal permeability. For the sandstone bedrock, we have adopted anisotropic conditions with a ratio of the vertical coefficient of permeability (k_v) to k_h of 0.1 (Condition A) based on preferential seepage paths along the bedding partings, and our experience. We have also completed a sensitivity analysis with a k_v/k_h ratio of 0.5 (Condition B). However, for the soil and extremely weathered rock, equal permeability in the vertical and horizontal directions (i.e. a k_v/k_h ratio of 1.0) is usually adopted.

The following scenarios were analysed based on the borehole logs, borehole rising head infiltration testing, well established correlations and our experience with similar materials:

Scenario		Material	Case	Horizontal Coefficient of Permeability (k_h) (m/sec)	k_v/k_h Ratio Condition
1	Block A	Soil & Extremely Weathered Sandstone	NA	1×10^{-7}	1
		Sandstone Bedrock	1	6.7×10^{-7}	0.1
	Block B	Soil & Extremely Weathered Sandstone	NA	1×10^{-7}	1
		Sandstone Bedrock	1	6.7×10^{-7}	0.1
2	Block A	Soil & Extremely Weathered Sandstone	NA	1×10^{-7}	1
		Sandstone Bedrock	1	6.7×10^{-7}	0.5
	Block B	Soil & Extremely Weathered Sandstone	NA	1×10^{-7}	1
		Sandstone Bedrock	1	6.7×10^{-7}	0.5
3	Block A	Soil & Extremely Weathered Sandstone	NA	1×10^{-7}	1
		Sandstone Bedrock	2	1.1×10^{-7}	0.1
	Block B	Soil & Extremely Weathered Sandstone	NA	1×10^{-7}	1
		Sandstone Bedrock	2	1.1×10^{-7}	0.1
4	Block A	Soil & Extremely Weathered Sandstone	NA	1×10^{-7}	1
		Sandstone Bedrock	2	1.1×10^{-7}	0.5
	Block B	Soil & Extremely Weathered Sandstone	NA	1×10^{-7}	1
		Sandstone Bedrock	2	1.1×10^{-7}	0.5

4.3 Analysis Results

The groundwater level contours after basement excavation and during dewatering are presented in Plate 3 below:

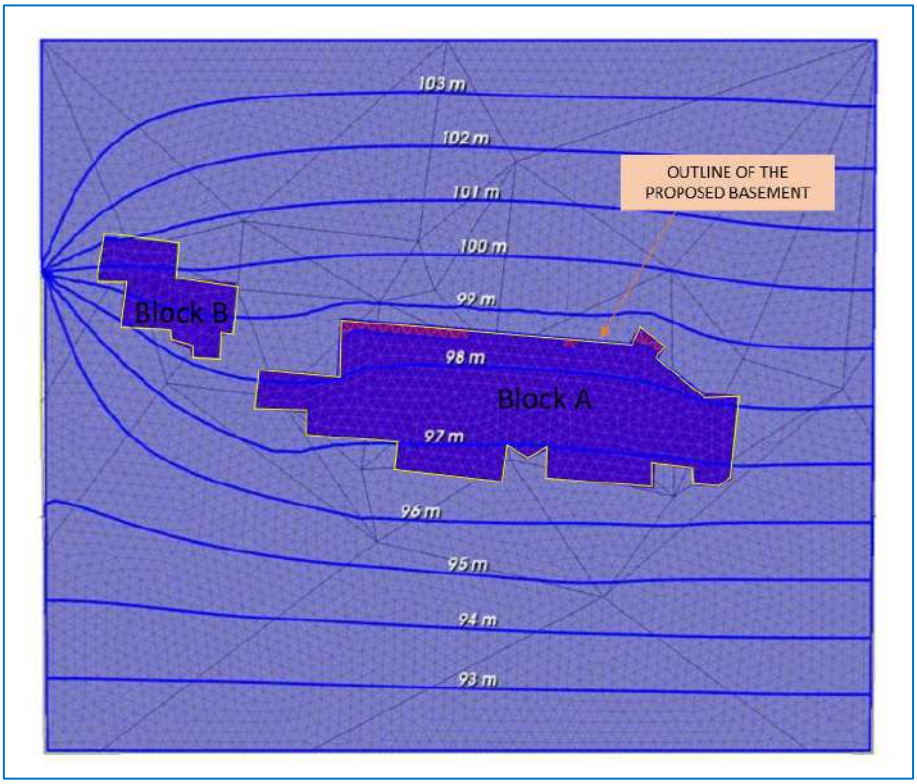


Plate 3: Plan View of Hydrogeological Model Showing Groundwater Level Contours Following excavation and During Dewatering

The table below summarises the estimated total groundwater inflow rates on completion of bulk excavation for each scenario analysed:

Scenario		Material	k_h Value Case	k_v/k_h Ratio Condition	Estimated Total Groundwater Inflow Rates		
					L/day	ML/year	Total for Blocks A & B ML/year
1	Block A	Soil & Extremely Weathered Sandstone	NA	1	4,682	1.71	
		Sandstone Bedrock	1 - Highest	A - 0.1			
	Block B	Soil & Extremely Weathered Sandstone	NA	1	109	0.04	
		Sandstone Bedrock	1 - Highest	A - 0.1			1.75
2	Block A	Soil & Extremely Weathered Sandstone	NA	1	6,040	2.20	
		Sandstone Bedrock	1 - Highest	B - 0.5			
	Block B	Soil & Extremely Weathered Sandstone	NA	1	98	0.04	
		Sandstone Bedrock	1 - Highest	B - 0.5			2.24
3	Block A	Soil & Extremely Weathered Sandstone	NA	1	785	0.29	
		Sandstone Bedrock	2 - Median	A - 0.1			
	Block B	Soil & Extremely Weathered Sandstone	NA	1	31	0.01	
		Sandstone Bedrock	2 - Median	A - 0.1			0.30
4	Block A	Soil & Extremely Weathered Sandstone	NA	1	1,013	0.37	
		Sandstone Bedrock	2 - Median	B - 0.5			
	Block B	Soil & Extremely Weathered Sandstone	NA	1	28	0.01	
		Sandstone Bedrock	2 - Median	B - 0.5			0.38

To put the above inflow rates into perspective, the flow rate from a single garden tap is between about 10L and 20L per minute. This equates to about 5ML/year to 10ML/year.

4.4 Overview

The seepage analysis presented above has been based on our assessment of likely permeability values within the soil and extremely weathered rock, and sandstone bedrock, as well as a 3½ month groundwater level monitoring period, which generally indicated that the groundwater levels in the sandstone bedrock typically varied in elevation between 0.2m (BH108) and 1.8m (BH104) due to heavy and/or prolonged rainfall events. The exception was in BH109 where the groundwater level 'spiked' to every rainfall event to a maximum of 4.2m in elevation. Notwithstanding, the maximum groundwater level encountered in BH109 at RL97.8m is below the BEL for proposed Lower Ground 2 which we have assumed to be at about RL98.2m. From the results of our analyses, the long-term total groundwater inflows into the proposed basement excavations are expected to be in the order of 0.30ML/year to 2.24ML/year.

Based on the estimated long-term groundwater inflow rates, we consider that drained basement excavations are feasible. Gravity discharge systems and/or appropriately sized sumps with automatic level control pumps will be required to intermittently discharge the seepage water to the stormwater system. Discharge will require approval from the appropriate authority.

On completion of bulk excavation, we strongly recommend that an inspection of the exposed bedrock be carried out by both JK Geotechnics and the hydraulic engineer to measure the actual inflow rates and confirm that the actual groundwater inflow rates are similar to that predicted.

The results of the seepage analysis may be used for the design of the basement drainage system. If so, then we recommend that a suitable factor of safety (not less than 2) be applied to the seepage volumes, and that the drainage system should have some redundancy for the potential for some siltation (or clogging) of drainage layers with time. As such, we recommend that the drainage system include flushing points. Furthermore, the subsoil drains should be backfilled with an appropriately graded filter material to prevent migration of fines, and to obviate the need for geofabrics (where possible), which may degrade or clog with time.

In addition to considering the inflow into the excavation, the drawdown of the groundwater levels outside of the basement excavations has also been considered when adopting drained basement walls. Some drawdown of groundwater will occur immediately adjacent to the basement excavations, however, this drawdown will be within the sandstone bedrock profile. As such, we consider that such drawdown will have negligible adverse geotechnical effects on the surrounding properties.

Notwithstanding, prior to the commencement of excavation, we recommend that continuous groundwater level monitoring recommence in the existing wells, and continue for at least 1 month after the ground floor slabs have been constructed.

Based on the predicted initial pump out volumes, a Water Supply Works (WSW) approval will need to be obtained from WaterNSW or Natural Resource Access Regulator (NRAR), prior to the commencement of dewatering. From our understanding of the Water Management (General) Regulation 2018, a Water Access Licence (WAL) exemption for construction dewatering applies.

A detailed Dewatering Management Plan (DMP) will need to be prepared and include the required monitoring to be carried out during construction, such as groundwater level monitoring, groundwater extraction monitoring, groundwater quality monitoring, etc. The DMP will include the results of this investigation and the groundwater quality testing completed by JK Environments. If any of the existing monitoring wells are located inside the proposed work areas, then they will need to be replaced with additional wells, as appropriate.

5 UPDATED COMMENTS AND RECOMMENDATIONS

5.1 Primary Geotechnical and Hydrogeological Issues

Based on the results of our investigation, we consider the following to be the primary geotechnical and hydrogeological issues for the proposed redevelopment:

1. Groundwater Seepage Inflows into the Proposed Basement Excavations
   Based on the groundwater level monitoring results, the proposed basement excavations will partially extend below the measured groundwater levels. Groundwater seepage inflows into the proposed basement excavations are therefore expected and will need to be controlled by a sump and pump and/or gravity drainage systems. A WSW approval will need to be obtained from the relevant authority to allow for the drainage and discharge. In order to obtain the WSW approval, a DMP will need to be prepared.
2. Basement Structure
   From our groundwater seepage analyses, drained basement structures appear geotechnically feasible. For the purpose of this report, we have assumed that drained basement structures will be permitted.
3. Rock Excavation
   The proposed basement levels will require excavation into medium and high strength sandstone bedrock. Ripping by dozers, and rock hammers fitted to excavators, will be required for effective removal.
4. Headfort House
   The proposed Building I & J basement excavation immediately adjacent to Headfort House, will be about 4m deep. A detailed dilapidation survey will therefore need to be completed on Headfort House. The retention system supporting Headfort House will therefore need to be relatively stiff to limit lateral movements and settlement.

The effects of the above geotechnical issues on design and construction are detailed in the sections which follow.

5.2 Site Preparation

5.2.1 Dilapidation Surveys

Prior to the commencement of any site work, we recommend that a detailed dilapidation survey report be compiled on the neighbouring structures to the west (91 Stanhope Road), on Headfort House and on at least the southern half of the retained 'Killara Glades Care Community' buildings to the north.

The dilapidation reports can be used as a benchmark against which to set vibration limits for trafficking and operation of plant, rock excavation, and soil compaction, and for assessing possible future claims for damage arising from the works.

The owners of the above-mentioned properties should be asked to confirm in writing that the dilapidation reports present a fair assessment of existing conditions. As dilapidation reports are relied upon for the assessment of potential damage claims, they must be carried out thoroughly by reputable companies with all defects rigorously described (i.e. defect type, defect location, crack width, crack length, etc.) and photographed. The dilapidation survey reports must be reviewed by JK Geotechnics and the structural engineer.

5.2.2 Vibration Monitoring

We recommend that full-time quantitative vibration monitoring be carried out on the neighbouring structures to the west (91 Stanhope Road), on Headfort House and on the retained 'Killara Glades Care Community' buildings to the north, whenever tracked plant, rock hammers, and compaction equipment are operating on site. The vibrations on the structures at 91 Stanhope Road and 'Killara Glades Care Community' should be tentatively limited to a peak particle velocity (PPV) of 5mm/sec, subject to review of the dilapidation survey reports and confirmation by JK Geotechnics and the structural engineer. The vibrations on the 'heritage' Headfort House, however, should be tentatively limited to a peak particle velocity (PPV) of 3mm/sec, subject to review of the dilapidation survey reports and confirmation by the structural engineer. An acoustic consultant will need to be engaged to carry out the vibration monitoring. The monitoring locations must be jointly nominated by the acoustic consultant and JK Geotechnics, following review of the dilapidation survey reports.

If it is found that transmitted vibrations are excessive, particularly during rock excavation, then further advice will need to be sought from JK Geotechnics. Notwithstanding, if higher vibrations are recorded, then they should be assessed against the attached Vibration Emission Design Goals as higher vibrations may be acceptable depending on the associated vibration frequency. Reference should be made to Section 5.3.2 below if it is confirmed that transmitted vibrations are excessive during rock excavation.

5.2.3 Early Works

The proposed redevelopment will require demolition of all existing structures, retaining walls and pavements, and removal of existing vegetation. Following this, all topsoil, root affected soils and any deleterious or contaminated fill should be stripped. Reference should be made to the Prensa report for guidance on the offsite disposal of site soils and rock. Care must be taken during demolition, site stripping and excavation not to undermine or remove lateral support from the site boundaries and Headfort House.

5.3 Excavation

Prior to any excavation commencing, we recommend that reference be made to the NSW Government 'Code of Practice, Excavation Work' dated January 2020.

5.3.1 Excavation Conditions

Excavation of the soil, extremely weathered rock and very low strength sandstone profiles can be carried out using a 'digging bucket' fitted to a large hydraulic excavator (say, at least 30 tonnes), using a ripping tyne where necessary, and/or by using a dozer.

Large dozers and hydraulic rock hammers will be required for the excavation of the low, medium and high strength sandstone bedrock. 'Hard ripping' or 'hard rock' excavation conditions should be expected for the medium and high strength sandstone bedrock; ripping may only just be possible with a Caterpillar D10 dozer and a generous allowance will need to be made for hydraulic rock hammer assistance to the ripping. Notwithstanding, rock hammers will need to be used for detailed footing, pit and trench excavations.

Grid rock sawing the bedrock would facilitate excavation when using rock hammers, and would also assist in dampening the transmission of ground borne vibrations to nearby buildings (i.e. would reduce vibrations) provided the base of the saw slot is maintained below excavation level. Dust suppression by spraying with water should be carried out whenever rock saws are being used.

5.3.2 Potential Vibration Risks

As discussed in Section 5.2.2, excavation using rock hammers will need to be strictly controlled as there may be direct transmission of ground vibrations to the neighbouring structures and to Headfort House. If it is found that the transmitted vibrations are excessive, then it would be necessary to change to alternative rock excavation methods such as a tighter grid of rock saw slots and/or a smaller rock hammer.

The following procedures are recommended to reduce vibrations:

- Rock saw the faces of the proposed excavations. This will effectively reduce ground borne vibrations on nearby structures. The base of the rock saw slot must be maintained at a lower level than the adjacent excavation at all times;
- Maintain the rock hammer oriented towards the face and enlarge the excavation by breaking small wedges off the face. Grid sawing the base would facilitate removal;
- Operate the hammer in short bursts only, to reduce amplification of vibrations;
- Use excavation contractors with appropriate experience and a competent supervisor who is aware of vibration damage risks, etc. The contractor must have all appropriate statutory and public liability insurances and must be provided with a full copy of this report and JKG 2022.

5.3.3 Drainage

Groundwater inflows into the proposed excavations are expected to occur as local seepage flows above the soil/bedrock interface, and through joints and bedding partings within the bedrock profile, particularly after heavy and/or prolonged rainfall events. Any concentrated leakage from the sandstone cut faces, emanating from these joints and bedding partings, may need to be rectified by rock grouting.

We recommend that a spoon drain be provided in front of all cut faces to intercept potential seepage. Similarly, subsoil drains must be provided behind all retaining walls. Seepage volumes into the excavations are expected to be controllable by sump and pump methods and/or gravity discharge methods. Discharge from the drainage system should be piped to the stormwater system once approval from the relevant authority has been obtained. The excavations must be monitored as they progress by the contractor, JK Geotechnics and the hydraulic consultant to confirm the drainage requirements and to assess whether rock grouting is required to reduce concentrated groundwater seepage inflows.

5.4 Retention Systems

5.4.1 Temporary Batter Slopes

Where space permits, the shallow soil, extremely weathered rock and very low strength sandstone profiles should be temporarily battered back at no steeper than 1 Vertical (V) on 1.5 Horizontal (H) for stability considerations. Surcharge loads (e.g. soil stockpiles, plant and equipment, etc.) must be kept well away from the crests of the temporary batter slopes. Where temporary batter slopes descend onto cut rock faces, then a bench width of at least 0.5m should be provided between the crest of the rock face and the toe of the batter slope. This bench width would provide sufficient space for sand bagging if groundwater seepage is encountered.

All temporary cut batter slopes must be inspected by JK Geotechnics to assess whether untoward conditions exist. If present, the temporary batter slopes will need to be appropriately flattened or stabilised.

We expect that the low strength and stronger sandstone can be cut vertically. However, based on the rock defects encountered in the current and previous cored boreholes and observed within the rock outcrops, we strongly recommend that all vertically cut rock faces be progressively inspected by an experienced geotechnical engineer or engineering geologist at no more than 1.5m depth increments and on completion of each stage of excavation (including lift pits) to identify features which may require stabilisation (e.g. underpinning, rock bolting and/or shotcrete and mesh).

Provision must be made in the construction program and budget for the batter slope and rock face inspections and stabilisation works.

Cantilever block retaining walls can then be constructed in front of the temporary cut batter slopes and cut rock faces, and then backfilled. Where battering cannot be accommodated and/or is not preferred

(e.g. adjacent to Headfort House), then a cast-insitu retention system will need to be installed prior to the commencement of excavation, as discussed below in Section 5.4.2.

5.4.2 Cast-Insitu Retention System

We recommend that the proposed vertical cuts in the soil, extremely weathered rock and sandstone bedrock profiles be supported by cast-insitu retention systems, which will need to be installed prior to the commencement of excavation. We expect that the proposed vertical cuts will need to be supported by either contiguous pile walls (in areas which are highly sensitive to lateral movement) or by soldier pile walls with shotcrete infill panels.

Where piled wall deflections are to be minimised, then they must be progressively shotcreted and anchored, or internally propped, as the excavation proceeds (i.e. once the restraining point has been uncovered). The piles must be embedded well below BEL (including nearby footings, service trenches and pits) at suitable depths to satisfy stability considerations.

Due to the presence of medium and high strength sandstone bedrock, only high torque piling rigs should be brought to site. Piles should only be cleaned out when concrete is ready to be poured. Cleaning buckets must be used to remove debris and sludge from the base of each pile hole. All piles must be tremie poured due to the expected depths of the pile holes and groundwater seepage inflows. The prospective contractors must be provided with a full copy of this report and JKG 2022 so that appropriate plant and equipment are brought to site.

Construction of the basement walls must be of high quality. The construction sequence must be fully specified and carefully controlled to reduce potential movements.

5.4.3 Retention Design Parameters

The major consideration in the selection of earth pressures for the design of retaining walls is the need to limit deformations occurring outside the excavation. The following characteristic earth pressure coefficients and soil and rock parameters may be adopted for the design of the retaining walls:

- For cantilevered block retaining walls and cantilevered piled walls where movements are undesirable (e.g. if movement sensitive buried services are present behind the walls) and/or are incorporated into the proposed buildings), a triangular earth pressure distribution with an 'at-rest' earth pressure coefficient (K_0) of 0.55 should be adopted for the soil, extremely weathered rock and very low strength sandstone profiles, assuming a horizontal retained surface.
- For cantilevered block retaining walls and cantilevered piled walls supporting areas where some movement can be accepted and which are independent of the proposed buildings, a triangular lateral earth pressure distribution with an 'active' earth pressure coefficient (K_a) of 0.35 for the soil, extremely weathered rock and very low strength sandstone profiles, assuming a horizontal retained surface.

- An average bulk unit weight of 21kN/m^3 should be adopted for the soil, extremely weathered rock and very low strength sandstone profiles.
- For progressively anchored or propped piled walls, we recommend the use of a trapezoidal earth pressure distribution, and a lateral earth pressure of 8H (kPa) for the soil, extremely weathered rock and very low strength sandstone profiles, where H is the retained height in metres (i.e. between ground surface level and the surface of the low strength or stronger sandstone). The maximum lateral earth pressure should apply over the central 50% of the height of the retention system, tapering to zero at the crest and at the surface level of the low strength or stronger sandstone. This lateral earth pressure assumes a horizontal retained surface.
- The vertically cut low strength or stronger sandstone can be taken to be self-supporting, assuming the inspections and stabilisation works (if required) recommended in Section 5.4.1 are undertaken. Notwithstanding, a nominal lateral pressure of 10kPa should be allowed for in design to account for small wedges pushing behind the basement walls. Under ultimate load conditions, the design should also be checked for a potential large sliding wedge of rock inclined at 60° to 65° to the horizontal and daylighting at or just above BEL. The joint should be assumed to be clay coated and smooth with a friction angle of 28°.
- Any surcharge affecting the retaining walls (e.g. construction traffic, compaction stresses during backfilling, pavement/slab loads, inclined retained surfaces, etc.) must be allowed in the design using the appropriate earth pressure coefficient from above.
- All retaining walls must be founded in Class IV or better-quality sandstone bedrock and designed in accordance with the advice provided in Section 5.7.
- Block retaining walls should be secured against sliding by the provision of dowels, which should be designed in shear. An allowable bond stress of 150kPa in tension can also be adopted for the Class IV or better-quality sandstone. Permanent dowels must be designed for corrosion resistance and for long-term durability (e.g. stainless steel or hot dipped galvanised with protective sheathing).
- Further, for resistance to sliding for block retaining walls, an effective angle of friction (ϕ') of 35° can be adopted for the Class IV or better-quality sandstone bedrock. To optimise frictional resistance, the surface of the foundation material should be roughened using the teeth of a 'digging bucket' (parallel to the wall alignment), with the loose debris then cleaned off.
- The passive toe resistance for piled walls embedded at least 1.5m below BEL may be estimated based on an allowable lateral resistance of 500kPa for the Class IV or better-quality sandstone bedrock. The passive resistance should be ignored to at least 0.5m below BEL, including below footing, service trench and pit excavations due to the potential for fracturing of the sandstone during bulk excavation.
- Block retaining walls should be designed as permanently drained. Subsurface drains should incorporate (1) an appropriately sized 'ag' pipe with filter sock, surrounded by (2) free draining, single size, durable aggregate, such as 'Blue Metal' gravel or crushed concrete aggregate, and encapsulated within (3) a non-woven geotextile filter fabric such as Bidim A34 to control subsoil erosion. All drainage water should be piped to the stormwater system.

- The piled walls should be designed to induce complete and permanent drainage of the ground behind the walls. Weep hole outlets (also known as spitter pipes) should be provided between contiguous piles at a horizontal spacing no greater than 1.35m and should incorporate a non-woven geotextile filter fabric (at the inserted end) to reduce subsoil erosion. Between soldier piles, at least two equally spaced strip drains (with weep hole outlets) should be provided behind the shotcrete. Two rows of weep hole outlets should be provided; that is, at the base of the walls and a short distance above the soil-rock interface. All drainage water should be piped to the stormwater system.

5.4.4 Temporary Rock Anchors

For temporary rock anchors, permission must be sought from the neighbouring property owners prior to installation. We recommend that requests for permission commence early in the design process as our experience has shown that it can take significant time for such permission to be granted. If permission is not forthcoming, then the alternative is to provide lateral support by internal bracing or propping.

Rock anchors bonded at least 3m into Class IV or better-quality sandstone bedrock, beyond a 45° line inclined up from BEL (including nearby footings and service trenches), may be designed for an allowable bond stress of 300kPa. Each anchor should have a minimum free length of 3m.

All anchors should be proof loaded to at least 1.3 times their design working load before locking off at about 85% of the working load. Lift-off tests should be carried out on at least 10% of the anchors about 4 days following locking off to confirm that the anchors are holding their load. The testing may allow an upgrade of the above bond stress. We recommend that only experienced contractors be considered for the anchor installations. We have assumed that permanent lateral support of the basement walls will be provided by the proposed structure, after which time the rock anchors can be de-stressed.

5.4.5 Backfilling Behind Retaining Walls

All earthworks recommendations provided below must be complemented by reference to AS3798-2007 'Guidelines on Earthworks for Commercial and Residential Developments'.

Backfilling behind retaining walls must be carried out using engineered fill in order to reduce post-construction settlements. From a geotechnical perspective, the excavated soil, extremely weathered rock and very low strength sandstone are considered suitable for reuse as engineered fill on condition that they are free of organic matter, and contain a maximum particle size not exceeding 50mm. Excavated low strength or stronger sandstone will require crushing in order to meet this maximum particle size requirement. Crushing will most likely not be practical or cost effective.

Compaction of the engineered fill behind retaining walls should be carried out using a hand operated vertical rammer compactor for the lower layers and immediately behind the wall in the upper layers. Elsewhere a small static roller can be used. Engineered fill comprising site won materials should be compacted in maximum 150mm thick loose layers to a density ratio of at least 95% of Standard Maximum Dry Density

(SMDD) and at a moisture content within 2% of Standard Optimum Moisture Content (SOMC). This specification assumes that the retaining walls will be supporting landscaped areas only. If the backfill is to support pavements, then engineered fill comprising site won materials should be compacted in maximum 150mm thick loose layers to a density ratio of at least 98% of SMDD and at a moisture content within 2% of SOMC.

Compaction of engineered fill behind retaining walls is very difficult and time consuming. The use of a single sized durable aggregate, such as 'Blue Metal' gravel or crushed concrete aggregate (free of fines), which do not require significant compactive effort is often preferred if good performance is a priority; at least in the lower layers. We expect that the gap between the back of the retaining walls and vertically cut rock faces would be backfilled with aggregate. The aggregate should be nominally compacted using a hand operated vibrating plate (sled) compactor in maximum 200mm thick loose layers. A non-woven geotextile filter fabric such as Bidim A34 should be placed as a separation layer immediately above the cut batter slope (prior to backfilling) to control subsoil erosion. Provided the aggregate backfill is placed as recommended above, density testing would not be required. The geotextile should then be wrapped over the surface of the aggregate backfill and capped with at least a 0.3m thick compacted layer of engineered fill.

Insitu density tests must be carried out on the engineered backfill (for material other than single sized aggregate) to confirm the above specifications are achieved. The frequency of density testing for retaining wall backfill should be at least one test per two layers per 50m^2 (assumes maximum 150mm thick loose layers). This implies that at each test location, the full depth of two compacted layers will be tested simultaneously.

Based on the scale of the proposed backfilling works, we recommend that Level 1 control of fill placement and compaction in accordance with Section 8 of AS3798-2007 should be carried out. Due to a potential conflict of interest, the geotechnical inspection and testing authority (GITA) should be directly engaged by Levande (or their representative) or by the Head Contractor, and not by the earthworks contractor.

As discussed in Section 5.2.2, vibration monitoring on the neighbouring structures to the west (91 Stanhope Road), on Headfort House and on the retained 'Killara Glades Care Community' buildings to the north must be completed whenever vibratory compaction of engineered backfill is being undertaken in close proximity.

5.5 Permanent Batter Slopes

Where permanent batter slopes are proposed, we recommend that they be graded at no steeper than 1V on 2.5H. Flatter batter slopes may be preferred from a mowing perspective. Surface erosion protection, for example, quick establishing grass, topsoil and turf, or approved proprietary systems should be provided to the permanent batter slopes. Drainage (e.g. kerbs and gutters, dish drains, etc.) should also be provided along the crests of all permanent batter slopes to intercept surface water run-off. Discharge should be piped to the stormwater system.

5.6 Footings

5.6.1 Geotechnical Design

Where bedrock is exposed, we recommend that the proposed buildings be supported on pad and strip footings. Where bedrock is not exposed, we recommend that the proposed buildings be supported on conventional bored piles.

Pad and strip footings founded on Class IV or better-quality sandstone bedrock may be designed for an allowable bearing pressure of 2,000kPa. Similarly, retaining wall footings founded on Class IV or better-quality sandstone bedrock below BEL may also be designed for an allowable bearing pressure of 2,000kPa.

Where pad and strip footings, and retaining wall footings, are positioned behind the crest of a cut rock face, within a 45° line inclined up from a lower excavation level, then they should be designed for a reduced allowable bearing pressure of 1,000kPa to account for the unconfined stress state along the face of the excavation. Notwithstanding, all cut rock faces must be inspected by JK Geotechnics and stabilised as recommended in Section 5.4.1.

Conventional bored piles socketed at least 0.3m into Class IV or better-quality sandstone bedrock may be designed for an allowable end bearing pressure of 2,000kPa. Pile sockets formed below the minimum 0.3m length requirement may be designed for an allowable shaft adhesion value of 200kPa in compression, on condition that the pile shafts are suitably roughened. Long rock socket lengths should be avoided in design as penetration through the medium and high strength sandstone will be slow and difficult. Provision should be made to the support the pile holes through the soil profile using sacrificial liners, particularly where collapsible sandy soils are encountered.

The bearing pressures provided above are based upon serviceability criteria of deflections at the footing/pile base of less than 1% of the minimum footing dimension/pile diameter. We note that these footing settlements will be of an elastic nature and are expected to occur as construction proceeds.

We recommend that all pad, strip and retaining wall footing excavations be inspected by a geotechnical engineer (prior to the installation of reinforcement cages) to confirm that a satisfactory bearing stratum has been achieved. This is particularly important for all footings located immediately outside excavations that may be founded on potentially unstable bedrock. All footing excavations must be cleaned out prior to inspection and pouring.

All bored piles must be cleaned out, inspected and poured on the same day as drilling. We recommend that the pile drilling be inspected by a geotechnical engineer during the initial stages and then periodically during the works, and compared to the borehole information to confirm that a satisfactory bearing stratum and embedment have been achieved.

5.6.2 Earthquake Design Parameters

The following parameters should be adopted for earthquake design in accordance with AS1170.4:2024 'Structural Design Actions, Part 4: Earthquake Actions in Australia':

- Hazard Factor (Z) = 0.08
- Site Subsoil Class = Class B_e

5.6.3 Exposure Classification

The soil and extremely weathered rock aggression test results have indicated moderately acidic to alkaline conditions and low sulphate contents. In accordance with Table 4.8.1 of AS3600:2018 'Concrete Structures' and Table 6.4.2(C) of AS2159-2009 'Piling – Design and Installation', the exposure classification to concrete footings and concrete piles is 'A2' and 'mild', respectively.

5.7 Bulk Earthworks

All earthworks recommendations provided below must be complemented by reference to AS3798-2007.

5.7.1 Subgrade Preparation

The proposed basements and internal road network will require cut and fill earthworks. Following stripping and excavation, the exposed subgrade must be proof rolled with at least six passes of a static (non-vibratory) smooth drum roller of at least 12 tonnes deadweight. The final pass of proof rolling should be carried out under the direction of an experienced geotechnical engineer for the detection of unstable or soft areas.

Subgrade heaving during proof rolling may occur in areas where clayey soils have become 'saturated' and/or where under-compacted existing fill exists. Heaving areas must be locally removed to a stable base and replaced with engineered fill, as outlined in Section 5.7.2 below. Alternative subgrade improvement options, as appropriate, should be provided by the geotechnical engineer following the proof rolling inspection.

If soil softening occurs after rainfall periods, then the subgrade must be over-excavated to below the depth of moisture softening and replaced with engineered fill. If clayey subgrade exhibits shrinkage cracking, then the surface must be moistened with a water cart and rolled until the shrinkage cracks are no longer evident.

Engineered fill must be reused to raise site levels up to the design subgrade levels.

5.7.2 Engineered Fill

From a geotechnical perspective, the excavated soil, extremely weathered rock and very low strength sandstone are considered suitable for reuse as engineered fill on condition that they are free of organic matter, and contain a maximum particle size not exceeding 50mm. Excavated low strength or stronger sandstone will require crushing in order to meet this maximum particle size requirement. Crushing will most likely not be practical or cost effective.

Engineered fill comprising site won materials should be compacted in maximum 250mm thick loose layers using a large static (non-vibratory) pad-foot roller (say, at least 15 tonnes deadweight) to a density ratio of at least 98% of SMDD and at a moisture content within 2% of SOMC.

Backfilling of service trenches must be carried out using engineered fill in order to reduce post-construction settlements. Due to the reduced energy output of compaction plant that can be placed in trenches, backfilling should be carried out in maximum 150mm thick loose layers and compacted using a trench roller, a pad foot roller attachment fitted to an excavator, and/or a vertical rammer compactor (also known as a 'Wacker Packer'). The compaction specification provided above is applicable.

Insitu density tests must be carried out on the engineered fill to confirm the above specification is achieved, as outlined below:

- The frequency of density testing for general engineered fill should be at least one test per layer per 500m^2, or one test per 100m^3 distributed reasonably evenly throughout the full depth and area, or 3 tests per visit, whichever requires the most tests (assumes maximum 250mm thick loose layers);
- The frequency of density testing for trench backfill should be at least one test per two layers per 40 linear metres (assumes maximum 150mm thick loose layers). This implies that at each test location, the full depth of two compacted layers will be tested simultaneously.

Based on the scale of the proposed earthworks, we recommend that Level 1 control of fill placement and compaction in accordance with Section 8 of AS3798-2007 should be carried out, including for the trench backfill. Due to a potential conflict of interest, the GITA should be directly engaged by Levande (or their representative) or by the Head Contractor, and not by the earthworks contractor or service installation sub-contractors.

5.8 Basement On-Grade Floor Slabs

On-grade basement floor slabs are feasible on condition that the earthworks recommended in Section 5.7 are satisfactorily completed. On-grade basement floor slabs should be constructed independent of the building footings and walls (i.e. designed as 'floating' slabs), as a variable subgrade of soil and rock is expected. Slab joints should be designed to resist shear forces but not bending moments by providing dowelled or keyed joints. The basement floor slabs should be provided with at least a 100mm thick sub-base of good quality, durable, single size, crushed rock (free of fines) such as 'Blue Metal' gravel or crushed concrete aggregate (free of fines), which will also act as underfloor drainage.

The underfloor drainage should include a sump and pump drainage system and/or a gravity discharge system. The drainage from behind the surrounding basement walls should be connected into the underfloor drainage system. Again, groundwater seepage monitoring must be carried out during excavation prior to finalising the design of the pump out facilities. In order to avoid flooding, appropriately sized sumps with automatic level control pumps may be required to intermittently discharge the seepage water to the stormwater system. Discharge from the drainage system should be piped to the stormwater system once approval from the appropriate authority has been obtained.

5.9 Internal Road Network

Based on the laboratory test results from JKG 2022, and our experience with similar site soils, we recommend that all proposed new pavements be designed for a CBR value of 4% for the soil subgrade prepared in accordance with Section 5.7.

If proposed concrete pavements are to be supported on an unbound granular sub-base, then it should be at least 100mm thick and comprise DGB20 (TfNSW QA Specification 3051 unbound granular material) and compacted to a density ratio of at least 98% of Modified Maximum Dry Density (MMDD). Adequate moisture conditioning to within 2% of Modified Optimum Moisture Content (MOMC) should be provided during placement so as to reduce the potential for material breakdown during compaction. The sub-base material would provide more uniform slab support and would reduce 'pumping' of subgrade 'fines' at joints due to vehicular movements. Slab joints should be designed to resist shear forces but not bending moments by providing dowelled or keyed joints.

For new AC pavements, we recommend that all base course materials comprise DGB20. The base course material should be compacted in maximum 200mm thick loose layers using a large static smooth drum roller to at least 98% of MMDD and to within 2% of MOMC (at the time of placement). We further recommend that all sub-base materials comprise DGS20 or DGS40 (TfNSW QA Specification 3051). The sub-base material should be compacted in maximum 200mm thick loose layers using a large static smooth drum roller to at least 95% of MMDD and to within 2% of MOMC (at the time of placement).

Insitu density tests should be carried out on the granular pavement materials to confirm the above specifications are achieved. The frequency of density testing should be at least one test per layer per 1000m^2, or three tests per layer, or three tests per visit, whichever requires the most tests. Level 2 testing of fill

compaction is the minimum permissible in AS3798-2007. The geotechnical testing authority (GTA) should be directly engaged by Levande (or their representative) or by the Head Contractor.

In order to protect the pavement edges, subsoil drains should be provided at least along the high side of all new road/car parking areas, with invert levels of at least 200mm below design subgrade level. Where the new roads and car parking areas are in relatively level ground, then the subsoil drains should be provided along all sides. The drainage trenches should be excavated with a uniform/consistent longitudinal fall to appropriate discharge points so as to reduce the risk of water ponding. The subgrade should be graded to promote water flow towards the subsoil drains. Discharge from the subsoil drains should be piped to the stormwater system.

5.10 Further Geotechnical and Hydrogeological Input

The following is a summary of the further geotechnical and hydrogeological input which is required and which has been detailed in the preceding sections of this report:

- Dilapidation survey reports on the neighbouring property to the west (91 Stanhope Road), on Headfort House, and on at least the southern half of the retained 'Killara Glades Care Community' buildings to the north, prior to the commencement of demolition;
- Review of the dilapidation survey reports;
- Full-time quantitative vibration monitoring on the neighbouring property to the west (91 Stanhope Road). on Headfort House and on the retained 'Killara Glades Care Community' buildings to the north, whenever tracked plant, rock hammers, and compaction equipment are operating on site;
- Inspection of all temporary cut batter slopes and of all vertically cut rock faces;
- Groundwater seepage monitoring;
- Pad, strip and retaining wall footing and conventional bored pile inspections;
- Proof rolling inspections;
- Insitu density testing of all engineered fill, including retaining wall and service trench backfill, to Level 1 control by a GITA;
- Insitu density testing of all granular pavement materials to Level 2 control by a GTA.

6 GENERAL COMMENTS

The recommendations presented in this report include specific issues to be addressed during the design and construction phases of the project. As an example, special treatment of soft spots may be required as a result of their discovery during proof-rolling, etc. In the event that any of the advice presented in this report is not implemented, the general recommendations may become inapplicable and JK Geotechnics accept no responsibility whatsoever for the performance of the structure where recommendations are not implemented in full and properly tested, inspected and documented.

The long-term successful performance of basement floor slabs and external pavements is dependent on the satisfactory completion of the earthworks. In order to achieve this, the quality assurance program should not be limited to routine compaction density testing only. Other critical factors associated with the earthworks may include subgrade preparation, selection of fill materials, control of moisture content and drainage, etc. The satisfactory control and assessment of these items may require judgment from an experienced engineer. Such judgment often cannot be made by a technician who may not have formal engineering qualifications and experience. In order to identify potential problems, we recommend that a pre-construction meeting be held so that all parties involved understand the earthworks requirements and potential difficulties. This meeting should clearly define the lines of communication and responsibility.

Occasionally, the subsurface conditions between the completed boreholes may be found to be different (or may be interpreted to be different) from those expected. Variation can also occur with groundwater conditions, especially after climatic changes. If such differences appear to exist, we recommend that you immediately contact this office.

This report provides advice on geotechnical aspects for the proposed civil and structural design. As part of the documentation stage of this project, Contract Documents and Specifications may be prepared based on our report. However, there may be design features we are not aware of or have not commented on for a variety of reasons. The designers should satisfy themselves that all the necessary advice has been obtained. If required, we could be commissioned to review the geotechnical aspects of contract documents to confirm the intent of our recommendations has been correctly implemented.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in this report then all recommendations should be reviewed. Copyright in this report is the property of JK Geotechnics. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report. The report shall not be reproduced except in full.

References:

1. Department of Planning and Environment (DPE 2022). Minimum Requirements for Building Site Groundwater Investigations and Reporting. NSW Department of Planning and Environment, Revision V02.2210, October 2022
2. Pells, P. J. N., Mostyn, G., Bertuzzi, R. and Wong, P. K. (2019) Classification of Sandstones and Shales in the Sydney Region: A Forty Year Review. Australian Geomechanics, Volume 54, No. 2, June 2019

TABLE A
POINT LOAD STRENGTH INDEX TEST REPORT

Client: Levande Pty Ltd **Ref No:** 34446A3

Project: PROPOSED REDEVELOPMENT **Report:** A

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW **Report Date:** 5/01/26

BOREHOLE NUMBER	DEPTH (m)	$I_{S(50)}$ (MPa)	ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (MPa)	TEST DIRECTION
101	2.77 - 2.81	0.6	12	A
	2.95 - 2.97	0.2	4	A
	3.23 - 3.26	0.3	6	A
	3.66 - 3.68	0.4	8	A
	4.00 - 4.02	0.6	12	A
102	2.71 - 2.74	0.6	12	A
	2.88 - 2.92	0.7	14	A
	3.03 - 3.06	0.6	12	A
	3.91 - 3.94	0.9	18	A
	4.15 - 4.18	0.7	14	A
	4.63 - 4.65	0.5	10	A
103	2.67 - 2.70	0.4	8	A
	2.87 - 2.91	0.4	8	A
	3.13 - 3.15	0.1	2	A
	3.43 - 3.46	0.4	8	A
	3.86 - 3.90	0.3	6	A
	4.41 - 4.46	0.4	8	A
	4.85 - 4.89	0.6	12	A
	5.36 - 5.40	0.3	6	A
	5.71 - 5.74	0.2	4	A
	5.90 - 5.93	1	20	A
	6.00 - 6.04	1.5	30	A
	6.49 - 6.52	0.4	8	A
	6.89 - 6.92	0.8	16	A
	7.27 - 7.31	0.5	10	A

NOTE: SEE PAGE 6

TABLE A
POINT LOAD STRENGTH INDEX TEST REPORT

Client: Levande Pty Ltd **Ref No:** 34446A3

Project: PROPOSED REDEVELOPMENT **Report:** A

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW **Report Date:** 5/01/26

BOREHOLE NUMBER	DEPTH (m)	$I_{S\,(50)}$ (MPa)	ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (MPa)	TEST DIRECTION
103	7.73 - 7.77	0.7	14	A
	8.37 - 8.42	0.7	14	A
	8.91 - 8.95	0.8	16	A
	9.34 - 9.38	1.1	22	A
	9.77 - 9.82	1.1	22	A
104	1.33 - 1.36	0.7	14	A
	1.74 - 1.77	0.5	10	A
	2.08 - 2.11	1	20	A
	2.22 - 2.26	0.3	6	A
	2.86 - 2.89	0.8	16	A
	3.34 - 3.37	1	20	A
	3.78 - 3.80	0.9	18	A
	4.33 - 4.36	0.6	12	A
	4.84 - 4.88	1.1	22	A
	5.22 - 5.25	1.2	24	A
	5.59 - 5.63	0.7	14	A
	5.96 - 5.99	0.9	18	A
	6.20 - 6.22	1	20	A
	6.55 - 6.60	0.9	18	A
	6.84 - 6.88	1.6	32	A
	7.35 - 7.39	1.6	32	A
	7.80 - 7.85	1	20	A
	8.19 - 8.22	1.1	22	A
	8.63 - 8.66	0.8	16	A
	9.08 - 9.13	1.1	22	A

NOTE: SEE PAGE 6

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POINT LOAD STRENGTH INDEX TEST REPORT

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Project: PROPOSED REDEVELOPMENT **Report:** A

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW **Report Date:** 5/01/26

BOREHOLE NUMBER	DEPTH (m)	$I_{S\,(50)}$ (MPa)	ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (MPa)	TEST DIRECTION
104	9.50 - 9.54	1.2	24	A
	9.95 - 9.98	1.1	22	A
105	1.36 - 1.40	0.3	6	A
	1.71 - 1.76	0.4	8	A
	2.27 - 2.30	0.4	8	A
	2.56 - 2.59	0.3	6	A
	2.86 - 2.89	0.3	6	A
	3.23 - 3.26	0.4	8	A
	3.67 - 3.70	0.5	10	A
	4.11 - 4.13	0.5	10	A
	4.86 - 4.89	0.9	18	A
	5.21 - 5.24	0.9	18	A
	5.66 - 5.69	0.8	16	A
	6.20 - 6.22	0.8	16	A
	6.84 - 6.86	1	20	A
	7.19 - 7.22	0.8	16	A
	7.65 - 7.68	1.1	22	A
	8.16 - 8.18	0.9	18	A
	8.75 - 8.77	1	20	A
	9.15 - 9.17	0.8	16	A
	9.67 - 9.70	2.2	44	A
	10.16 - 10.19	1.4	28	A
	10.41 - 10.44	1.2	24	A
106	1.40 - 1.44	0.8	16	A
	1.74 - 1.76	0.8	16	A

NOTE: SEE PAGE 6

TABLE A
POINT LOAD STRENGTH INDEX TEST REPORT

Client: Levande Pty Ltd **Ref No:** 34446A3

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BOREHOLE NUMBER	DEPTH (m)	$I_{S(50)}$ (MPa)	ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (MPa)	TEST DIRECTION
106	2.22 - 2.26	1.4	28	A
	2.57 - 2.60	0.9	18	A
	2.75 - 2.79	0.7	14	A
	3.06 - 3.10	1	20	A
	3.75 - 3.78	0.8	16	A
	4.11 - 4.14	0.4	8	A
	4.35 - 4.38	0.4	8	A
107	1.32 - 1.35	0.2	4	A
	1.85 - 1.88	0.7	14	A
	2.25 - 2.29	0.6	12	A
	2.72 - 2.74	0.8	16	A
	3.08 - 3.11	1.6	32	A
	3.87 - 3.90	0.6	12	A
	4.07 - 4.10	1.1	22	A
	4.73 - 4.76	1.2	24	A
	5.11 - 5.15	1.2	24	A
	5.83 - 5.87	1	20	A
	6.20 - 6.24	0.9	18	A
	6.79 - 6.82	0.5	10	A
	7.20 - 7.22	1	20	A
	7.70 - 7.73	0.8	16	A
	8.30 - 8.33	0.8	16	A
108	1.42 - 1.45	0.2	4	A
	1.82 - 1.85	0.6	12	A
	2.22 - 2.25	0.4	8	A

NOTE: SEE PAGE 6

TABLE A
POINT LOAD STRENGTH INDEX TEST REPORT

Client: Levande Pty Ltd **Ref No:** 34446A3

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Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW **Report Date:** 5/01/26

BOREHOLE NUMBER	DEPTH (m)	$I_{S\,(50)}$ (MPa)	ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (MPa)	TEST DIRECTION
108	2.66 - 2.69	0.5	10	A
	3.37 - 3.40	0.5	10	A
	3.94 - 3.96	0.9	18	A
	4.14 - 4.17	1.2	24	A
	4.80 - 4.83	0.9	18	A
109	1.50 - 1.53	0.2	4	A
	1.74 - 1.77	0.3	6	A
	2.19 - 2.22	0.4	8	A
	2.60 - 2.65	0.7	14	A
	3.05 - 3.09	0.6	12	A
	3.45 - 3.48	1	20	A
	3.84 - 3.87	1.1	22	A
	4.32 - 4.36	2.3	46	A
	4.51 - 4.55	0.6	12	A
	4.78 - 4.81	0.4	8	A
	5.17 - 5.20	0.7	14	A
	5.69 - 5.73	0.9	18	A
	6.33 - 6.37	0.7	14	A
	6.81 - 6.85	1	20	A
	7.07 - 7.11	0.8	16	A
	7.60 - 7.63	1.2	24	A
	7.96 - 7.98	0.7	14	A
	8.40 - 8.45	0.7	14	A
	8.87 - 8.91	0.7	14	A
	9.34 - 9.38	1.2	24	A

NOTE: SEE PAGE 6

TABLE A
POINT LOAD STRENGTH INDEX TEST REPORT

Client:	Levande Pty Ltd	**Ref No:**	34446A3
Project:	PROPOSED REDEVELOPMENT	**Report:**	A
Location:	LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW	**Report Date:**	5/01/26
		Page 6 of 6	

BOREHOLE NUMBER	DEPTH (m)	$I_{S\,(50)}$ (MPa)	ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (MPa)	TEST DIRECTION
109	9.68 - 9.72	1.3	26	A
	10.15 - 10.19	1.6	32	A
	10.63 - 10.67	1.2	24	A
	11.00 - 11.04	1.4	28	A
	11.56 - 11.60	1.9	38	A
	11.95 - 11.99	2.1	42	A
	12.28 - 12.33	1.5	30	A
	12.75 - 12.79	1.7	34	A
	13.06 - 13.10	0.9	18	A
	13.22 - 13.25	0.8	16	A
	13.56 - 13.59	1.5	30	A
	13.95 - 13.98	0.7	14	A
	14.40 - 14.44	0.9	18	A
	14.78 - 14.82	1.6	32	A
	15.07 - 15.11	1.9	38	A

NOTES

1. In the above table, testing was completed in test direction A for the axial direction, D for the diametral direction, B for the block test and L for the lump test.
2. The above strength tests were completed at the 'as received' moisture content.
3. Test Method: RMS T223.
4. For reporting purposes, the $I_{S(50)}$ has been rounded to the nearest 0.1MPa, or to one significant figure if less than 0.1MPa.
5. The estimated Unconfined Compressive Strength was calculated from the Point Load Strength Index based on the correlation provided in AS1726:2017 'Geotechnical Site Investigations' and rounded off to the nearest whole number: U.C.S. = 20 $I_{S(50)}$.

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CERTIFICATE OF ANALYSIS 400214

Client Details

Client	JK Geotechnics
Attention	A Luong, Quang Minh Vu
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**34446A3 - Louders Retirement Village**
Number of Samples	12 Soil
Date samples received	21/01/2026
Date completed instructions received	21/01/2026

Analysis Details

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

Samples were analysed as received from the client unless as indicated below in the method summaries. Results relate specifically to the samples as received.

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

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

Report Details

Date results requested by	29/01/2026
Date of Issue	28/01/2026

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Results Approved By
Diego Bigolin, Inorganics Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

Misc Inorg - Soil						
Our Reference		400214-1	400214-2	400214-3	400214-4	400214-5
Your Reference	UNITS	101	101	102	103	103
Depth		0.5-0.95	1.5-1.95	0.5-0.8	0.5-0.8	1.5-1.65
Date Sampled		21/01/2026	21/01/2026	21/01/2026	21/01/2026	21/01/2026
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/01/2026	23/01/2026	23/01/2026	23/01/2026	23/01/2026
Date analysed	-	23/01/2026	23/01/2026	23/01/2026	23/01/2026	23/01/2026
pH 1:5 soil:water	pH Units	7.2	4.5	4.5	7.0	5.3
Sulphate, SO4 1:5 soil:water	mg/kg	20	150	180	<10	10

Misc Inorg - Soil						
Our Reference		400214-6	400214-7	400214-8	400214-9	400214-10
Your Reference	UNITS	104	105	106	106	107
Depth		0.2-0.4	0.50-0.65	0.5-0.8	0.8-1.0	0.5-0.8
Date Sampled		21/01/2026	21/01/2026	21/01/2026	21/01/2026	21/01/2026
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/01/2026	23/01/2026	23/01/2026	23/01/2026	23/01/2026
Date analysed	-	23/01/2026	23/01/2026	23/01/2026	23/01/2026	23/01/2026
pH 1:5 soil:water	pH Units	5.7	5.6	8.7	9.3	6.1
Sulphate, SO4 1:5 soil:water	mg/kg	73	48	22	100	35

Misc Inorg - Soil			
Our Reference		400214-11	400214-12
Your Reference	UNITS	108	109
Depth		0.5-0.95	0.5-0.95
Date Sampled		21/01/2026	21/01/2026
Type of sample		Soil	Soil
Date prepared	-	23/01/2026	23/01/2026
Date analysed	-	23/01/2026	23/01/2026
pH 1:5 soil:water	pH Units	6.0	7.7
Sulphate, SO4 1:5 soil:water	mg/kg	20	20

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	400214-2
Date prepared	-			23/01/2026	1	23/01/2026	23/01/2026		23/01/2026	23/01/2026
Date analysed	-			23/01/2026	1	23/01/2026	23/01/2026		23/01/2026	23/01/2026
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	7.2	7.2	0	99	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	1	20	20	0	109	#

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	23/01/2026	23/01/2026		[NT]	[NT]
Date analysed	-			[NT]	11	23/01/2026	23/01/2026		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	11	6.0	6.0	0	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	11	20	20	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.

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.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

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

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

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

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

Measurement Uncertainty estimates can be downloaded from the Envirolab Resources website or obtained directly by contacting the laboratory.

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.

For Dust Deposit Gauge (DDG) analysis the sampling, sampling period and funnel exposure area do not fall under Envirolab's NATA accreditation (unless the Newcastle laboratory where responsible for the sampling), hence the annotation on the DDG units of reporting.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

Report Comments

MISC_INORG_DRY: # Percent recovery is not applicable due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

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BOREHOLE LOG

Borehole No. 101

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~104.5 m

Date: 15/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									-	ASPHALTIC CONCRETE: 30mm.t FILL: Sandy silty clay, low plasticity, orange brown and yellow brown, fine to medium grained sand, with fine to coarse grained ironstone gravel, trace of root fibres.	w<PL			
					N = 17 6,8,9	104			CI	Silty sandy CLAY: medium plasticity, yellow brown and red brown, fine grained sand, with fine to medium grained ironstone gravel, trace of root fibres.	w<PL	Hd	>600 600 600	RESIDUAL
					N > 16 10,16/ 150mm REFUSAL	103	1		-	Extremely Weathered sandstone: silty sandy CLAY, low plasticity, light grey and red brown, fine to medium grained sand, with fine to medium grained ironstone gravel.	XW	Hd	>600 >600	HAWKESBURY SANDSTONE
						102	2			SANDSTONE: fine to medium grained, light grey and red brown. REFER TO CORED BOREHOLE LOG	MW	M		MODERATE 'TC' BIT RESISTANCE GROUNDWATER MONITORING WELL INSTALLED TO 4.1m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.6m TO 4.1m. CASING 0.05m TO 2.6m. 2mm SAND FILTER PACK 2.6m TO 4.1m. BENTONITE SEAL 1.6m TO 2.6m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER. TWIN GROUNDWATER MONITORING WELL INSTALLED TO 2.5m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.5m TO 2.5m. CASING 0.05m TO 0.5m. 2mm SAND FILTER PACK 0.5m TO 2.5m. BENTONITE SEAL 0.05m TO 0.5m. COMPLETED WITH A CONCRETED GATIC COVER.
						101	3							
						100	4							
						99	5							
						98	6							

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CORED BOREHOLE LOG

Borehole No. 101

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~104.5 m

Date: 15/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		102			START CORING AT 2.56m						
100% RETURN		101	3		SANDSTONE: fine to medium grained, light grey and yellow brown, with an occasional red brown band, bedded at 0-20°.	MW	L - M	0.60 0.20 0.30 0.40 0.60		(2.90m) J, 60°, P, R, Cn (3.69m) Be, 0°, P, R, Fe Ct (3.77m) Be x 2, 0°, P, R, Fe Ct	Hawkesbury Sandstone
		100	5		END OF BOREHOLE AT 4.10 m						
		99	6								
		98	7								
		97	8								
		96									

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PROJECT: PROPOSED REDEVELOPMENT
PROJECT No: 34446A3
DATE: 18/12/2025
LOCATION ID: BH 101
DEPTH: 2.56m - 4.10m
JKGeotechnics
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
34446A3 BH 101 START CORING AT 2.56m.
2
3
4
END OF BOREHOLE AT 4.10m.

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BOREHOLE LOG

Borehole No. 102

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~105.2 m

Date: 16/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING						105				ASPHALTIC CONCRETE: 75mm.t				
									-	FILL: Gravelly sand, fine to medium grained, grey, fine to medium grained igneous gravel.	M			
					N = 15 5,8,7				CI-CH	FILL: Silty sand, fine to medium grained, orange brown, trace of fine to coarse grained ironstone gravel.	w<PL	Hd	500 520 500	RESIDUAL
							1		CI	Silty sandy CLAY: medium to high plasticity, yellow brown and red brown, fine to medium grained sand, trace of fine to medium grained ironstone gravel.			>600 600 600	
						104				Silty sandy CLAY: medium plasticity, light grey and red brown, fine to medium grained sand.				
					N=SPT 11/ 100mm REFUSAL				-	SANDSTONE: fine to medium grained, red brown.	MW	M		HAWKESBURY SANDSTONE
							2			SANDSTONE: fine to medium grained, light grey.	SW	M - H		MODERATE 'TC' BIT RESISTANCE
						103				REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 4.82m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.82m TO 4.82m. CASING 0.05m TO 1.82m. 2mm SAND FILTER PACK 1.7m TO 4.82m. BENTONITE SEAL 0.3m TO 1.7m. COMPLETED WITH A CONCRETED GATIC COVER.
						102	3							
						101	4							
						100	5							
						99	6							

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CORED BOREHOLE LOG

Borehole No. 102

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~105.2 m

Date: 16/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		103			START CORING AT 2.60m						
100% RETURN		102	3		SANDSTONE: fine to medium grained, banded orange brown and light grey, with occasional dark brown seams, bedded at 0-20°.	SW	M	0.60, 0.70, 0.60			Hawkesbury Sandstone
						MW					
		101	4			FR		0.90, 0.70		(3.50m) Be, 5°, P, R, Cn (3.55m) Be, 10°, P, R, Clay Ct (3.69m) J, 70°, Un, R, Cn (3.74m) J, 50°, Un, Po, Cn	
						MW		0.50		(4.32m) Be, 15°, P, R, Cb Ct (4.55m) Be, 20°, P, S, Cn, Shear displacement 5mm (4.71m) Be, 0°, P, R, Clay Ct	
		100	5		END OF BOREHOLE AT 4.82 m						
		99	6								
		98	7								
		97	8								

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PROJECT: PROPOSED REDEVELOPMENT
PROJECT No: 34446A3
DATE: 18/12/2025
LOCATION ID: BH102
DEPTH: 2.60 - 4.82 m
JKGeotechnics
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
34446A3 BH102 START CORING AT 2.60m
2
3
4
END OF BOREHOLE AT 4.82m

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BOREHOLE LOG

Borehole No. 103

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~98.8 m

Date: 15/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE: 40mm.t				
					N = 9 5,6,3	98	1		-	FILL: Silty sand, fine to medium grained, light grey and yellow brown, trace of fine to medium grained sandstone gravel, and ash.	M			APPEARS POORLY COMPACTED
										FILL: Silty sandy clay, low plasticity, orange brown and dark brown, fine to medium grained sand, trace of fine to coarse grained igneous and sandstone gravel, and concrete fragments.	w>PL			
					N=SPT 6/ 150mm REFUSAL	97	2		-	Extremely Weathered sandstone: silty sandy CLAY, low plasticity, light grey, fine to medium grained sand, with occasional very low strength seams.	XW	Hd		HAWKESBURY SANDSTONE
										SANDSTONE: fine to medium grained, light grey and dark grey.	MW	L - M		LOW 'TC' BIT RESISTANCE
						96	3			REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 10.04m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.60m TO 10.04m. CASING 0.05m TO 2.60m. 2mm SAND FILTER PACK 2.60m TO 10.04m. BENTONITE SEAL 0.15m TO 2.60m. COMPLETED WITH A CONCRETED GATIC COVER.
						95	4							
						94	5							
						93	6							
						92								

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CORED BOREHOLE LOG

Borehole No. 103 **2 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~98.8 m

Date: 15/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 2.60m						
		96	3		SANDSTONE: fine to medium grained, light grey, with dark grey laminae and occasional orange brown staining, bedded at 0-20°.	SW	L - M	0.40, 0.40, 0.10, 0.40, 0.30, 0.40		(2.77m) Be, 0°, P, R, Clay FILLED, 2 mm.t (3.32m) XWS, 0°, 20 mm.t	Hawkesbury Sandstone
		95	4								
					NO CORE 0.10m					~~(4.74m) XWS, 0°, 55 mm.t~~	
		94	5		SANDSTONE: fine to medium grained, light grey, with dark grey laminae and occasional orange brown staining, bedded at 0-20°.	SW	L - M	0.60, 0.30, 0.20		(5.18m) Be, 15°, P, R, Fe Ct (5.21m) Be, 15°, P, R, Fe Ct	Hawkesbury Sandstone
90% RETURN		93	6				H	1.0, 1.5		(5.80m) XWS, 0°, 42 mm.t (6.25m) XWS, 10°, 70 mm.t	
					as above, but with no orange brown staining.	FR	M	0.40, 0.80, 0.50, 0.70		(7.91-8.30m) J, 85°, P, R, Cn	
		92	7								
		91	8					0.70		(8.52-8.78m) J, 85°, P, R, Cn	
		90						0.80			

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CORED BOREHOLE LOG

Borehole No. 103 **3 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~98.8 m

Date: 15/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL -0.1, L -0.3, M -1, H -3, VH -10, EH	DEFECT DETAILS SPACING (mm) 600, 200, 60, 20	DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
90% RETURN		89	10		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, trace of carbonaceous lenses, bedded at 0-20°.	FR	H	1.1 1.1			Hawkesbury Sandstone
		88	11		END OF BOREHOLE AT 10.04 m						
		87	12								
		86	13								
		85	14								
		84	15								
		83									

JK 9.02.4 LIB:GLB Log JK CORED BOREHOLE - MASTER 34446A KILLARA.GPJ <<DrawingFile>> 30/04/2026 10:13 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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FRACTURES NOT MARKED ARE CONSIDERED TO BE DRILLING AND HANDLING BREAKS


PROJECT: PROPOSED REDEVELOPMENT
PROJECT No: 34446A3
DATE: 18/12/2025
LOCATION ID: BH103
DEPTH: 2.60 – 10.04m
JKGeotechnics
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
34446A3 BH103 START CORING AT 2.60m
2
3
4
5
6
7
8
9
10
NO CORE 0.10m
← END OF BOREHOLE AT 10.04m

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BOREHOLE LOG

Borehole No. 104

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~106.2 m

Date: 16/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									-	ASPHALTIC CONCRETE: 50mm.t	M			
						106			CL	FILL: Gravelly sand, fine to medium grained, grey, fine to medium grained igneous gravel.	w<PL	VSt		RESIDUAL
					N > 7 7,7/ 100mm REFUSAL					Silty sandy CLAY: low plasticity, red brown, fine to medium grained sand, trace of fine to medium grained ironstone gravel.			300 320 310	
							1		-	as above, but light grey.	MW	M		HAWKESBURY SANDSTONE
						105				SANDSTONE: fine to medium grained, red brown.				MODERATE 'TC' BIT RESISTANCE
							2			SANDSTONE: fine to medium grained, yellow brown.				GROUNDWATER MONITORING WELL INSTALLED TO 10.12m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 4.12m TO 10.12m. CASING 0.05m TO 4.12m. 2mm SAND FILTER PACK 4.10m TO 10.12m. BENTONITE SEAL 0.30m TO 4.10m. COMPLETED WITH A CONCRETED GATIC COVER.
						104				REFER TO CORED BOREHOLE LOG				
							3							
						103								
							4							
						102								
							5							
						101								
							6							
						100								

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CORED BOREHOLE LOG

Borehole No. 104

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~106.2 m

Date: 16/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 1.16m						
100% RETURN		105	1		SANDSTONE: fine to medium grained, banded yellow brown, dark brown and light grey, bedded at 0-20°.	MW	M	0.70, 0.50, 1.0, 0.30			Hawkesbury Sandstone
		104	2								
		103	3		SANDSTONE: fine to medium grained, light grey, with dark grey laminae and occasional carbonaceous lenses, bedded at 0-15°.	FR		0.80, 1.0, 0.90		(3.42m) Be, 5°, P, R, Clay Ct	
		102	4							(4.07m) Be, 0°, P, R, Clay Ct; (4.18m) Be, 5°, P, R, Clay Ct	
		101	5				M - H	0.60, 1.1, 1.2, 0.70			
		100	6					0.90, 1.0, 0.90, 1.6			
		99	7					1.6, 1.0			

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CORED BOREHOLE LOG

Borehole No. 104 **3 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~106.2 m

Date: 16/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
100% RETURN		98			SANDSTONE: fine to medium grained, light grey, with dark grey laminae and occasional carbonaceous lenses, bedded at 0-15°. *(continued)*	FR	M - H	1.1; 0.80			Hawkesbury Sandstone
			9		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, occasional carbonaceous lenses and siltstone bands, bedded at 0-15°.		H	1.1; 1.2; 1.1		(9.36m) Be, 0°, P, R, Cb Ct	
		97									
			10								
		96			END OF BOREHOLE AT 10.12 m						
			11								
		95									
			12								
		94									
			13								
		93									
			14								
		92									

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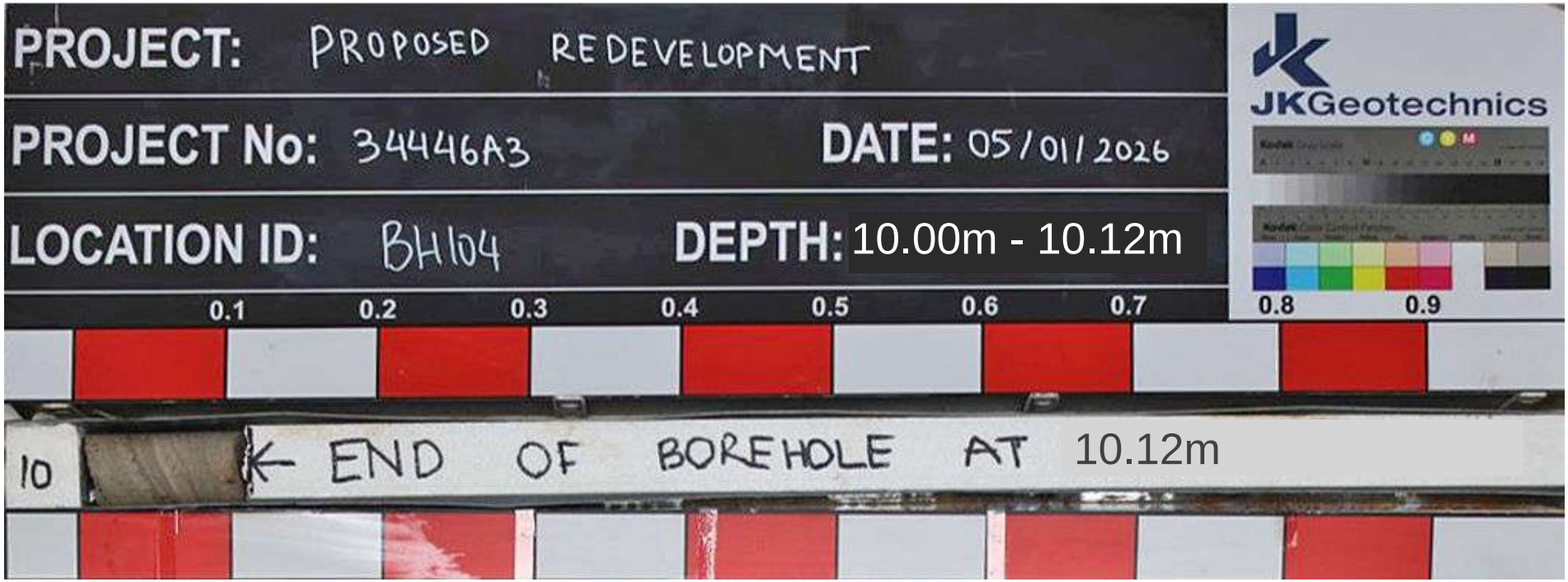
PROJECT: PROPOSED REDEVELOPMENT

PROJECT No: 34446A3 DATE: 18/12/2025

LOCATION ID: BH104 DEPTH: 1.16m - 10.00m

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PROJECT: PROPOSED REDEVELOPMENT
PROJECT No: 34446A3
DATE: 05/01/2026
LOCATION ID: BH104
DEPTH: 10.00m - 10.12m
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0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
10
END OF BOREHOLE AT 10.12m

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BOREHOLE LOG

Borehole No. 105

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~106.6 m

Date: 18/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING				■					-	ASPHALTIC CONCRETE: 50mm.t	M			
				■					CL	FILL: Gravelly sand, fine to medium grained, dark brown, fine to medium grained igneous gravel.	w<PL	VSt		RESIDUAL
				■	N=SPT 9/ 150mm REFUSAL	106			-	Silty sandy CLAY: low plasticity, red brown and light grey, fine to medium grained sand.	XW	Hd		HAWKESBURY SANDSTONE
							1			Extremely Weathered sandstone: silty CLAY, low plasticity, light grey and red brown, with fine to medium grained sand, trace of fine to medium grained ironstone gravel.	MW	M		MODERATE 'TC' BIT RESISTANCE
						105	2			SANDSTONE: fine to medium grained, red brown.				GROUNDWATER MONITORING WELL INSTALLED TO 10.52m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 4.52m TO 10.52m. CASING 0.05m TO 4.52m. 2mm SAND FILTER PACK 4.50m TO 10.52m. BENTONITE SEAL 0.30m TO 4.50m. COMPLETED WITH A CONCRETED GATIC COVER.
						104	3			REFER TO CORED BOREHOLE LOG				
						103	4							
						102	5							
						101	6							
						100								

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CORED BOREHOLE LOG

Borehole No. 105

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~106.6 m

Date: 18/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	SPACING (mm)	DEFECT DETAILS DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 1.15m						
100% RETURN		105	2		SANDSTONE: fine to medium grained, yellow brown and light grey, with occasional brown bands, bedded at 0-5°.	MW	M	0.30 0.40 0.40		(1.56m) Be, 5°, P, R, Cn (2.16m) Be, 0°, P, R, Fe Ct (2.17m) Be, 0°, P, R, Fe Ct	Hawkesbury Sandstone
		104	3		NO CORE 0.08m SANDSTONE: fine to medium grained, yellow brown and light grey, with occasional brown bands, bedded at 0-5°.	MW	L - M	0.30 0.30 0.40		(2.43m) Be, 0°, P, S, Cn (2.79m) J, 40°, P, R, Cn (3.12m) J, 45°, P, R, Fe Sn (3.34m) Be, 0°, P, S, Fe Sn (3.60m) Be, 0°, P, S, Fe Sn	Hawkesbury Sandstone
		103	4		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, occasional carbonaceous lenses and siltstone bands, bedded at 0-20°.	FR	M	0.50 0.50			
		102	5					0.90 0.90		(4.71m) J, 40°, P, R, Clay FILLED, 2 mm.t	
		101	6					0.80 0.80			
		100	7				M - H	1.0 0.80		(7.32m) Be, 5°, Un, R, Cn	
		99						1.1			

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CORED BOREHOLE LOG

Borehole No. 105 **3 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~106.6 m

Date: 18/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
100% RETURN		98	9		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, occasional carbonaceous lenses and siltstone bands, bedded at 0-20°. *(continued)*	FR	M - H	0.90; 1.0; 0.80		(8.70m) Be, 0°, P, R, Cb Ct, & Jh x 2, 30°, P	Hawkesbury Sandstone
		97	10				H	2.2; 1.4; 1.2		(9.72m) Be, 0°, P, R, Cb Vn	
		96	11		END OF BOREHOLE AT 10.52 m						
		95	12								
		94	13								
		93	14								
		92									

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PROJECT: PROPOSED REDEVELOPMENT

PROJECT No: 34446A3 DATE: 05/01/2026

LOCATION ID: BH105 DEPTH: 1.15 - 10.00m

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PROJECT: PROPOSED REDEVELOPMENT
PROJECT No: 34446A3
DATE: 05/01/2026
LOCATION ID: BH105
DEPTH: 10.00 – 10.52m
JKGeotechnics
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
10
END OF BOREHOLE AT 10.52m

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BOREHOLE LOG

Borehole No. 106

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~101.6 m

Date: 19/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE: 90mm.t				
									-	FILL: Silty sandy clay, low plasticity, dark grey and orange brown, fine to medium grained sand, trace of fine to medium grained igneous and sandstone gravel.	w<PL M			APPEARS POORLY COMPACTED
					N > 2 2,2/ 150mm REFUSAL	101				FILL: Silty sand, fine to medium grained, yellow brown, trace of fine to coarse grained ironstone gravel.				
									CL		w<PL	Hd		RESIDUAL
							1		-	Silty sandy CLAY: low plasticity, red brown, fine to medium grained sand, trace of fine to coarse grained ironstone gravel.	MW	M		HAWKESBURY SANDSTONE
										SANDSTONE: fine to medium grained, red brown.				MODERATE 'TC' BIT RESISTANCE
						100	2			REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 4.45m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.45m TO 4.45m. CASING 0.05m TO 4.45m. 2mm SAND FILTER PACK 1.45m TO 4.45m. BENTONITE SEAL 0.30m TO 1.45m. COMPLETED WITH A CONCRETED GATIC COVER.
						99	3							
						98	4							
						97	5							
						96	6							
						95								

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CORED BOREHOLE LOG

Borehole No. 106

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~101.6 m

Date: 19/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 1.20m						
100% RETURN		100	2		SANDSTONE: fine to medium grained, banded yellow brown, light grey and brown, with occasional dark grey laminae, bedded at 0-15°.	MW	M	0.80, 0.80		(1.81m) Be, 0°, P, R, Fe Sn	Hawkesbury Sandstone
		99	3				M - H	1.4, 0.90, 0.70, 1.0		(2.12m) Be, 0°, P, R, Fe Ct; (2.35m) Be, 15°, P, R, Cn; (2.46m) Be, 0°, P, R, Fe Ct; (2.53m) Be, 0°, P, R, Fe Ct; (2.65m) Be, 5°, P, S, Fe Ct; (2.66m) Be, 5°, P, S, Fe Ct	
		98	4		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°.	FR	M	0.80, 0.40, 0.40		(4.20m) XWS, 0°, 30 mm.t	
		97	5		END OF BOREHOLE AT 4.46 m						
		96	6								
		95	7								
		94									

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PROJECT: PROPOSED REDEVELOPMENT
PROJECT No: 34446A3
DATE: 05/01/2026
LOCATION ID: BH106
DEPTH: 1.20m - 4.46m
JKGeotechnics
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
34446A3 BH106 START CORING AT 1.20m
1
2
3
4
END OF BOREHOLE AT 4.46m

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BOREHOLE LOG

Borehole No. 107

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~99.4 m

Date: 18/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE: 50mm.t				
						99			-	FILL: Silty sandy clay, low plasticity, dark brown and yellow brown, fine to medium grained sand, trace of fine to medium grained igneous and ironstone gravel.	w<PL			APPEARS POORLY COMPACTED
					N = 9 3,2,7									
							1		-	Extremely Weathered sandstone: silty CLAY, low plasticity, red brown, with fine to medium grained sand.	XW	Hd		HAWKESBURY SANDSTONE
											HW	VL - L		VERY LOW 'TC' BIT RESISTANCE
										SANDSTONE: fine to medium grained, yellow brown and light grey.	MW	L - M		MODERATE RESISTANCE
						98				REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 8.47m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.70m TO 8.47m. CASING 0.05m TO 1.70m. 2mm SAND FILTER PACK 1.70m TO 8.47m. BENTONITE SEAL 0.30m TO 1.70m. COMPLETED WITH A CONCRETED GATIC COVER.
							2							
						97								
							3							TWIN GROUNDWATER MONITORING WELL INSTALLED TO 1.20m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.50m TO 1.20m. CASING 0.05m TO 0.50m. 2mm SAND FILTER PACK 0.50m TO 1.20m. BENTONITE SEAL 0.05m TO 0.50m. COMPLETED WITH A CONCRETED GATIC COVER.
						96								
							4							
						95								
							5							
						94								
							6							
						93								

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CORED BOREHOLE LOG

Borehole No. 107 **2 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.4 m

Date: 18/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL 0.1 L 0.3 M 1 H 3 VH 10 EH	DEFECT DETAILS SPACING (mm) 600 200 60 20 DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 1.24m					
100% RETURN		98	1		SANDSTONE: fine to medium grained, banded yellow brown, light grey and brown, with dark grey and brown laminae, bedded at 0-20°.	MW	L - M	0.20	(1.44m) Be, 0°, P, R, Fe Ct (1.45m) Be, 0°, P, R, Fe Ct (1.57m) XWS, 0°, 40 mm.t	Hawkesbury Sandstone
							M - H	0.70		
			2					0.60		
		97							(2.49m) Be, 0°, P, R, Clay Ct	
								0.80		
			3						(2.90m) XWS, 10°, 40 mm.t	
		96						1.6	(3.29m) Be, 0°, P, S, Clay Ct	
									(3.79m) Be, 0°, P, R, Cn	
			4		SANDSTONE: fine to medium grained, orange brown and light grey, with dark grey laminae, bedded at 0-20°.	SW		0.60		
		95						1.1		
								1.2		
			5					1.2		
		94							(5.73m) Be, 0°, P, S, Clay Ct	
			6					1.0		
								0.90		
		93								
			7		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°.	FR	M	0.50		
								1.0	(7.23m) Be, 0°, P, S, Cn	
		92						0.80		

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CORED BOREHOLE LOG

Borehole No. 107

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.4 m

Date: 18/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL 0.1 L 0.3 M 1 H 3 VH 10 EH	DEFECT DETAILS SPACING (mm) 600 200 60 20 DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
		91			SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°. *(continued)*	FR	M	0.80		
		90	9		END OF BOREHOLE AT 8.47 m					
		89	10							
		88	11							
		87	12							
		86	13							
		85	14							

JK 9.02.4 LIB:GLB Log JK CORED BOREHOLE - MASTER 34446A KILLARA.GPJ <<DrawingFile>> 30/04/2026 10:15 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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PROJECT: PROPOSED REDEVELOPMENT

PROJECT No: 34446A3 DATE: 05/01/2026

LOCATION ID: BH107 DEPTH: 1.24m - 8.47m

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BOREHOLE LOG

Borehole No. 108

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~102.2 m

Date: 16/12/25 TO 17/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE: 90mm.t				
						102			-	FILL: Silty sandy clay, low plasticity, brown, grey and red brown, fine to medium grained sand, trace of fine to medium grained sandstone and igneous gravel, and concrete fragments.	w<PL			
					N = 9 6,5,4				CL		w<PL	Hd	500 480 500	RESIDUAL
							1			Silty sandy CLAY: low plasticity, light grey and yellow brown, fine to medium grained sand.				
						101			-	as above, but red brown.	MW	L - M		HAWKESBURY SANDSTONE
										SANDSTONE: fine to medium grained, red brown. REFER TO CORED BOREHOLE LOG				MODERATE 'TC' BIT RESISTANCE GROUNDWATER MONITORING WELL INSTALLED TO 5.03m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.03m TO 5.03m. CASING 0.05m TO 2.03m. 2mm SAND FILTER PACK 2.00m TO 5.03m. BENTONITE SEAL 0.30m TO 2.00m. COMPLETED WITH A CONCRETED GATIC COVER. TWIN GROUNDWATER MONITORING WELL INSTALLED TO 1.20m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.50m TO 1.20m. CASING 0.05m TO 0.50m. 2mm SAND FILTER PACK 0.50m TO 1.20m. BENTONITE SEAL 0.05m TO 0.50m. COMPLETED WITH A CONCRETED GATIC COVER.
						100	2							
						99	3							
						98	4							
						97	5							
						96	6							

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CORED BOREHOLE LOG

Borehole No. 108 **2 / 2**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~102.2 m

Date: 16/12/25 TO 17/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		101			START CORING AT 1.23m						
100% RETURN		101	0		SANDSTONE: fine to medium grained, banded yellow brown, light grey and brown, bedded at 0-15°.	MW	L - M	0.20			Hawkesbury Sandstone
							M	0.60		(1.85m) Be, 0°, Un, R, Cn	
		100	2					0.40			
								0.50		(2.77m) Be, 0°, P, R, Fe Ct (2.83m) J, 40°, C, R, Cn (2.85m) J, 30°, P, R, Fe Ct (2.91m) Jh, 40°, P	
		99	3		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°.	FR	M - H	0.50		(3.14m) Be, 0°, P, S, Fe Ct	
								0.90			
		98	4					1.2			
			5					0.90			
		97			END OF BOREHOLE AT 5.03 m						
		96	6								
		95	7								

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PROJECT: PROPOSED REDEVELOPMENT

PROJECT No: 34446A3 DATE: 18/12/2025

LOCATION ID: BH108 DEPTH: 1.23 - 5.03m

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BOREHOLE LOG

Borehole No. 109

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~99.0 m

Date: 17/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									-	ASPHALTIC CONCRETE: 40mm.t	M			APPEARS POORLY COMPACTED
										FILL: Gravelly sand, fine to medium grained, grey, fine to medium grained igneous gravel.	w>PL			
					N = 5 2,1,4					FILL: Silty sandy clay, low plasticity, brown and red brown, fine to medium grained sand, trace of fine to coarse grained ironstone gravel, and ash.				
						98	1		-	SANDSTONE: fine to medium grained, yellow brown.	MW	L		HAWKESBURY SANDSTONE
										REFER TO CORED BOREHOLE LOG				MODERATE 'TC' BIT RESISTANCE
						97	2							GROUNDWATER MONITORING WELL INSTALLED TO 15.19m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.73m TO 15.19m. CASING 0.05m TO 1.73m. 2mm SAND FILTER PACK 1.73m TO 15.19m. BENTONITE SEAL 0.30m TO 1.73m. COMPLETED WITH A CONCRETED GATIC COVER.
						96	3							
						95	4							
						94	5							
						93	6							

JK 9.02.4 LIB:GLB Log JK AUGERHOLE - MASTER 34446A KILLARA.GPJ <<DrawingFile>> 30/04/2026 09:03 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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CORED BOREHOLE LOG

Borehole No. 109

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.0 m

Date: 17/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	SPACING (mm)	DEFECT DETAILS DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 1.23m						
50% RETURN		97	2		SANDSTONE: fine to medium grained, banded orange brown, red brown and light grey, bedded at 0-20°.	MW	L - M	0.20 0.30		(1.38m) Be, 5°, P, R, Clay FILLED, 10 mm.t (1.57m) Be, 5°, P, R, Cn	Hawkesbury Sandstone
							M	0.40 0.70		(2.03m) Be, 10°, P, R, Clay FILLED, 15 mm.t (2.44m) CS, 5°, 20 mm.t (2.80m) Be, 5°, P, S, Fe Sn (2.85m) J, 45°, Ir, R, Fe Sn (2.96m) CS, 0°, 60 mm.t	
		96	3		NO CORE 0.06m			0.60			
0% RETURN					SANDSTONE: fine to medium grained, banded orange brown, red brown and light grey, bedded at 0-20°.	MW	M - H	1.0 1.1 2.3		(3.17m) CS, 0°, 10 mm.t	
		95	4					0.60		(4.47m) Be, 0°, P, S, Cn	
					SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°.	FR	M	0.40 0.70 0.90			Hawkesbury Sandstone
		94	5								
		93	6					0.70			
							M - H	1.0 0.80			
		92	7					1.2 0.70			

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CORED BOREHOLE LOG

Borehole No. 109

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.0 m

Date: 17/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL 0.1 L 0.3 M 1 H 3 VH 10 EH	SPACING (mm) 600 200 60 20	DEFECT DETAILS DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
0% RETURN		90	9		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°. *(continued)*	FR	M - H	0.70 0.70		(8.35m) Be, 0°, P, S, Clay Vn	Hawkesbury Sandstone
							H	1.2 1.3			
		89	10					1.6 1.2			
		88	11					1.4		(11.28m) Be, 0°, P, S, Clay Vn	
								1.9 2.1			
		87	12					1.5 1.7			
		86	13		SANDSTONE: fine to medium grained, grey, with dark grey laminae and occasional siltstone bands, bedded at 0-10°.		M - H	0.90 0.80		(13.43m) Be, 10°, P, R, Clay Vn	
								1.5			
		85	14					0.70			
								0.90			
							H	1.6			

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CORED BOREHOLE LOG

Borehole No. 109

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.0 m

Date: 17/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					SANDSTONE: fine to medium grained, grey, with dark grey laminae and occasional siltstone seams, bedded at 0-10°.	FR	H	1.9			
					END OF BOREHOLE AT 15.19 m						
		83	16								
		82	17								
		81	18								
		80	19								
		79	20								
		78	21								

JK 9.02.4 LIB:GLB Log JK CORED BOREHOLE - MASTER 34446A KILLARA.GPJ <<DrawingFile>> 30/04/2026 10:16 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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PROJECT: PROPOSED REDEVELOPMENT

PROJECT No: 34446A3 DATE: 18/12/2025

LOCATION ID: BH109 DEPTH: 1.23 - 10.00m

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PROJECT: PROPOSED REDEVELOPMENT

PROJECT No: 34446A3 DATE: 18/12/2025

LOCATION ID: BH109 DEPTH: 10.00 - 15.19m

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AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

This plan should be read in conjunction with the JK Geotechnics report.

Title: **SITE LOCATION PLAN**

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Report No: 34446A3

Figure No: 1

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PLOT DATE: 11/05/2026 9:24:42 AM DWG FILE: S:\6 GEOTECHNICAL\6F GEOTECHNICAL JOBS\34000'S\34446A KILLARA\CAD (P54758A)\34446A3.DWG

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HEADFORT HOUSE

ROAD

STANHOPE ROAD

PROPOSED SITE BOUNDARY

OUTLINE OF PROPOSED LOWER GROUND 2

OUTLINE OF PROPOSED LOWER GROUND 1

101 102 103 104 105 106 107 108 109

LEGEND

- JKG 1981 BOREHOLE
- JKG 1989 BOREHOLE
- JKG 2001 BOREHOLE
- JKG 2010A BOREHOLE
- JKG 2010B BOREHOLE
- JKG 2014 BOREHOLE
- JKG 2022 BOREHOLE
- JKG 2022 BOREHOLE AND GROUNDWATER MONITORING WELL
- CURRENT BOREHOLE AND GROUNDWATER MONITORING WELL

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

This plan should be read in conjunction with the JK Geotechnics report.

Title: **BOREHOLE LOCATION PLAN**

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Report No: 34446A3

Figure No: 2

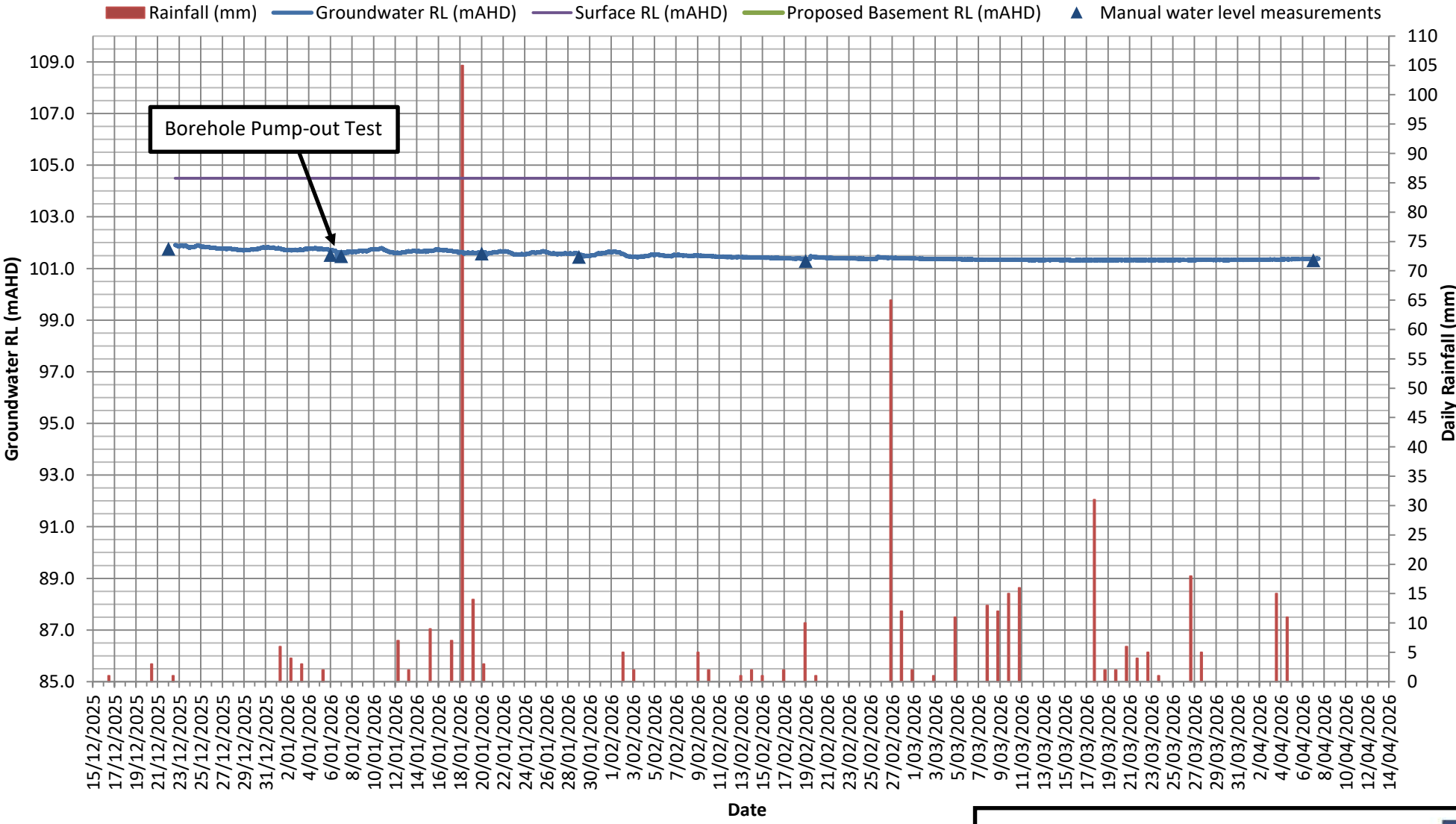
JKGeotechnics

PLOT DATE: 11/05/2026 10:19:38 AM DWG FILE: S:\6 GEOTECHNICAL\6F GEOTECHNICAL JOBS\34000'S\34446A KILLARA\CAD (P54758A)\34446A3.DWG

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File Name: BH101 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH101



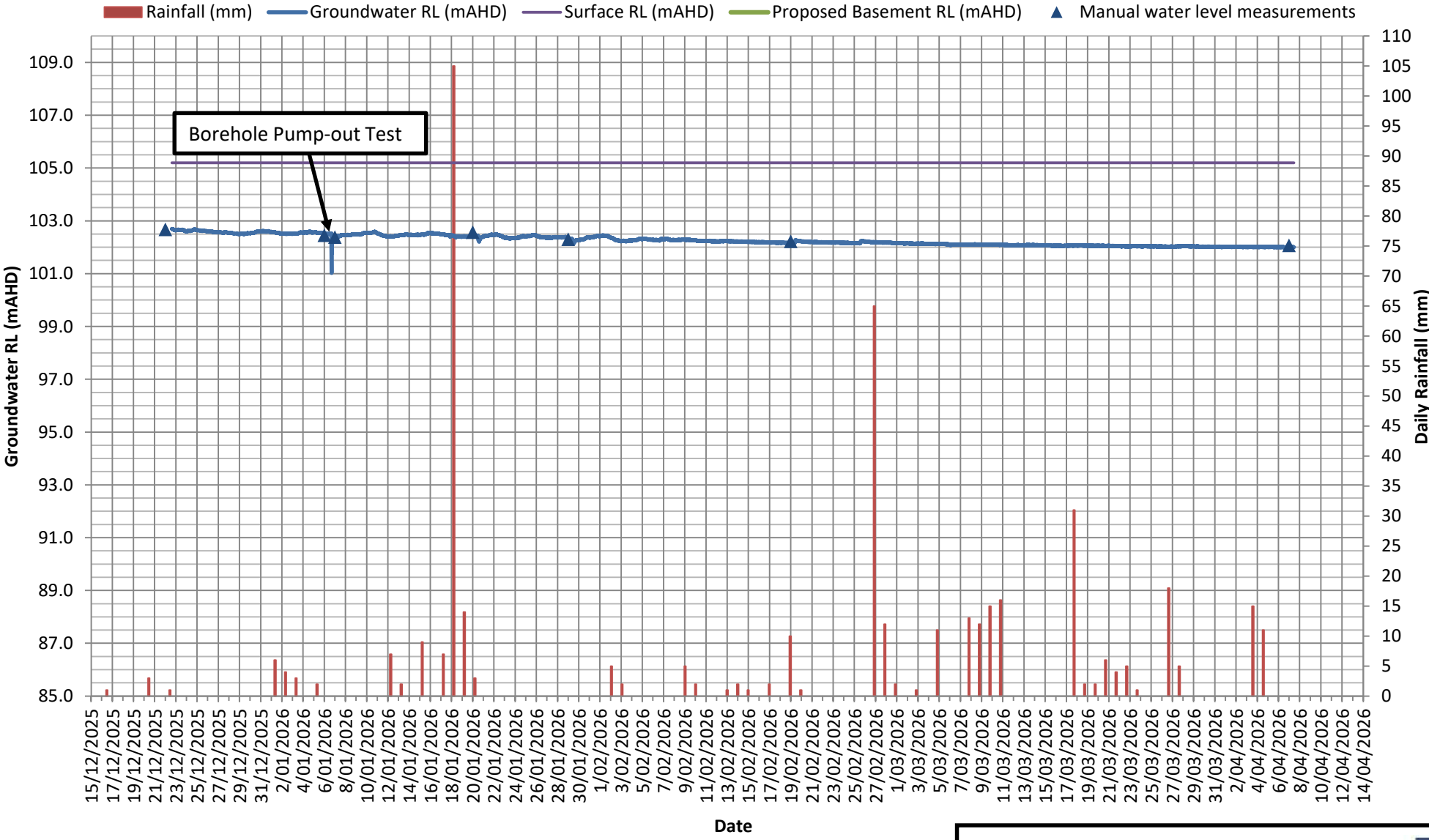
Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 3

File Name: BH102 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH102



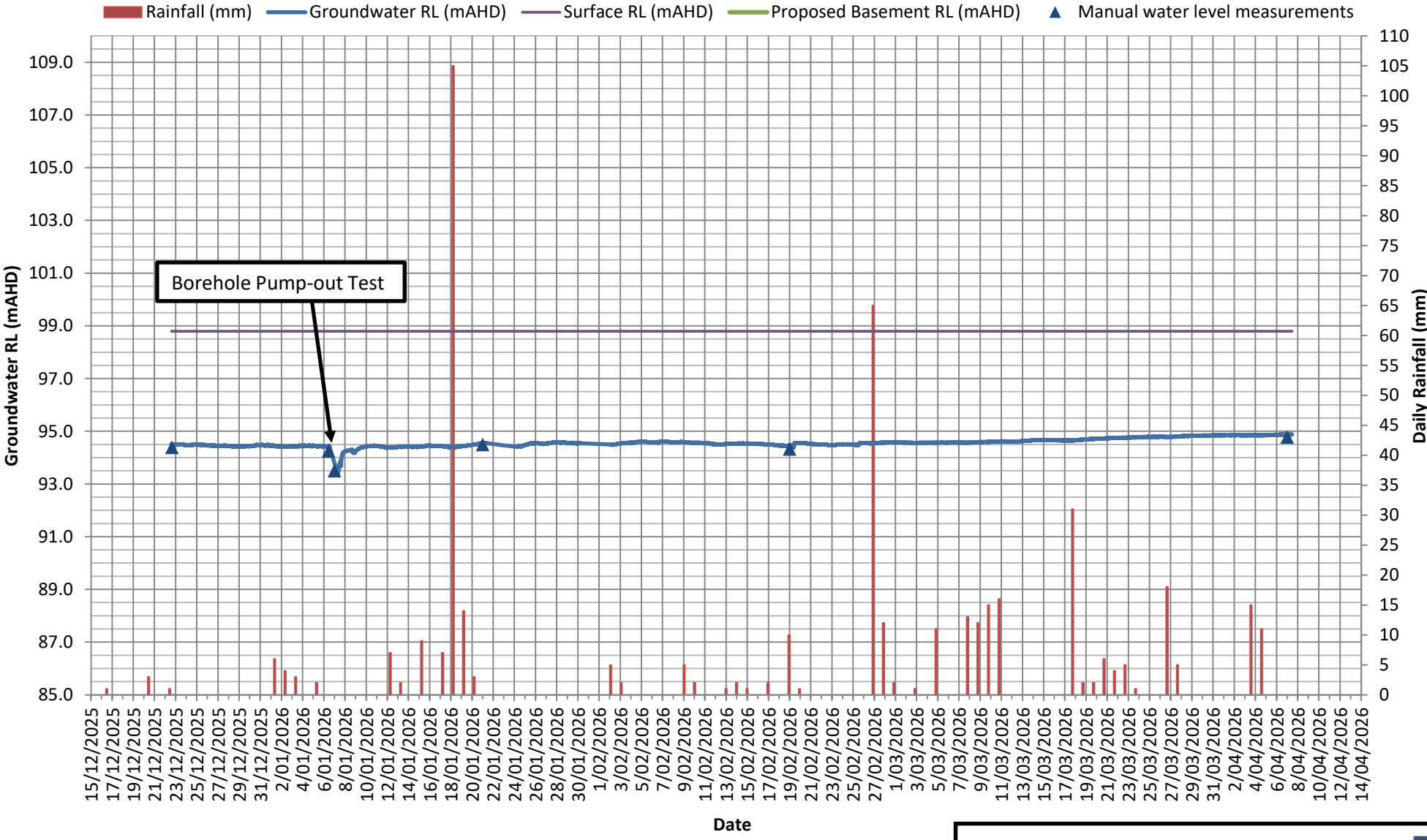
Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 4

File Name: BH103 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH103



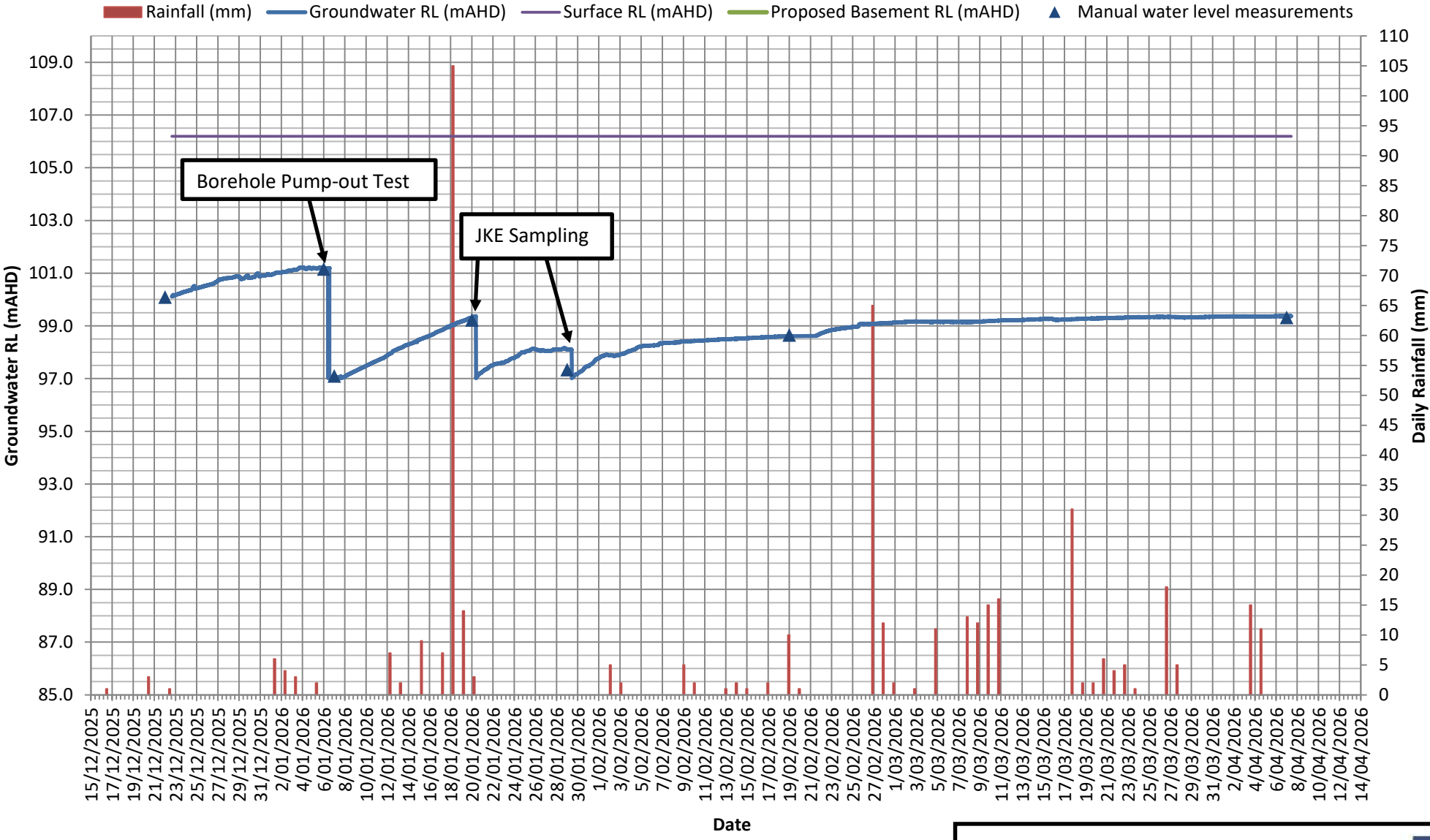
Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 5

File Name: BH104 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH104



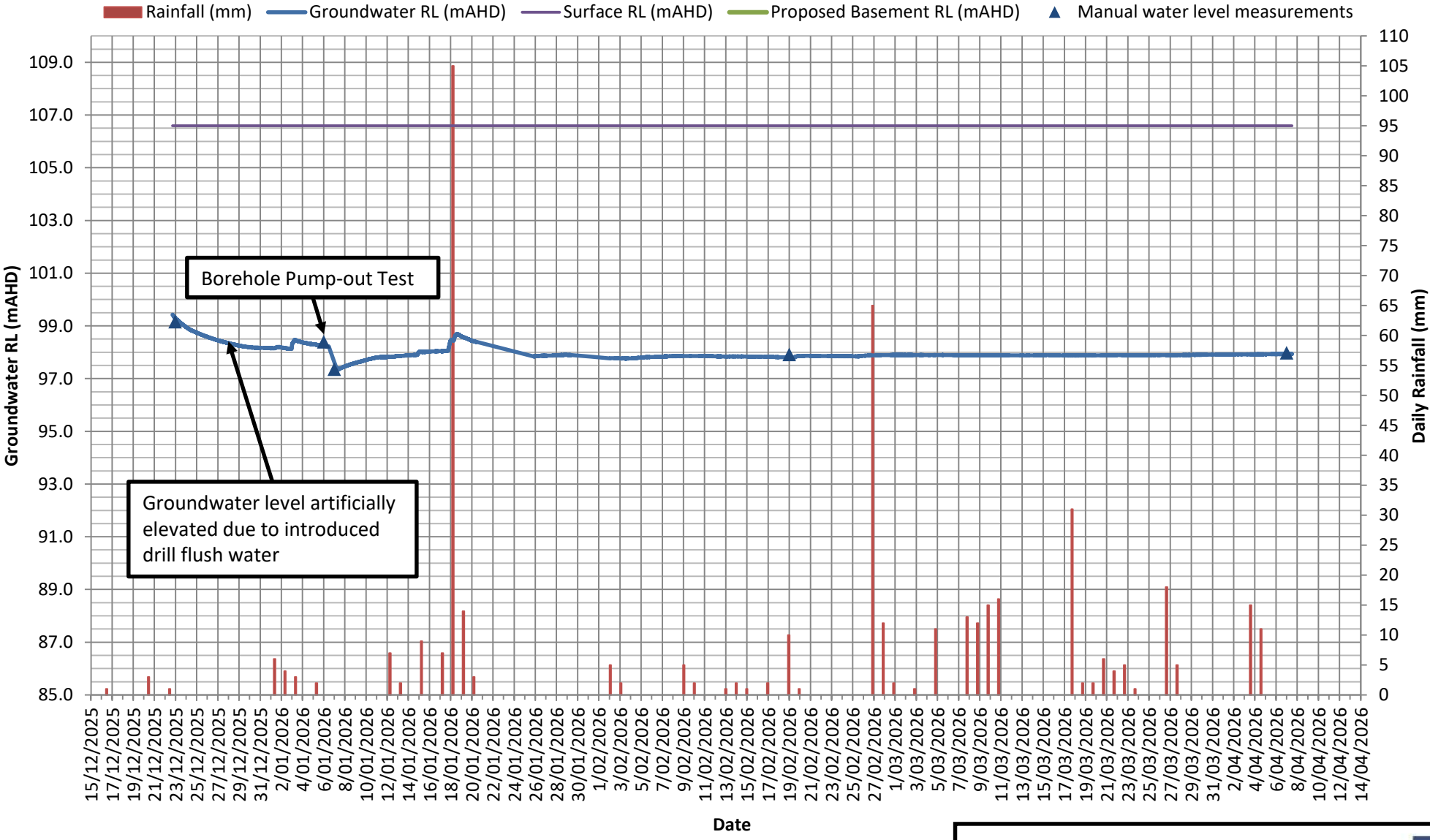
Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 6

File Name: BH105 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH105



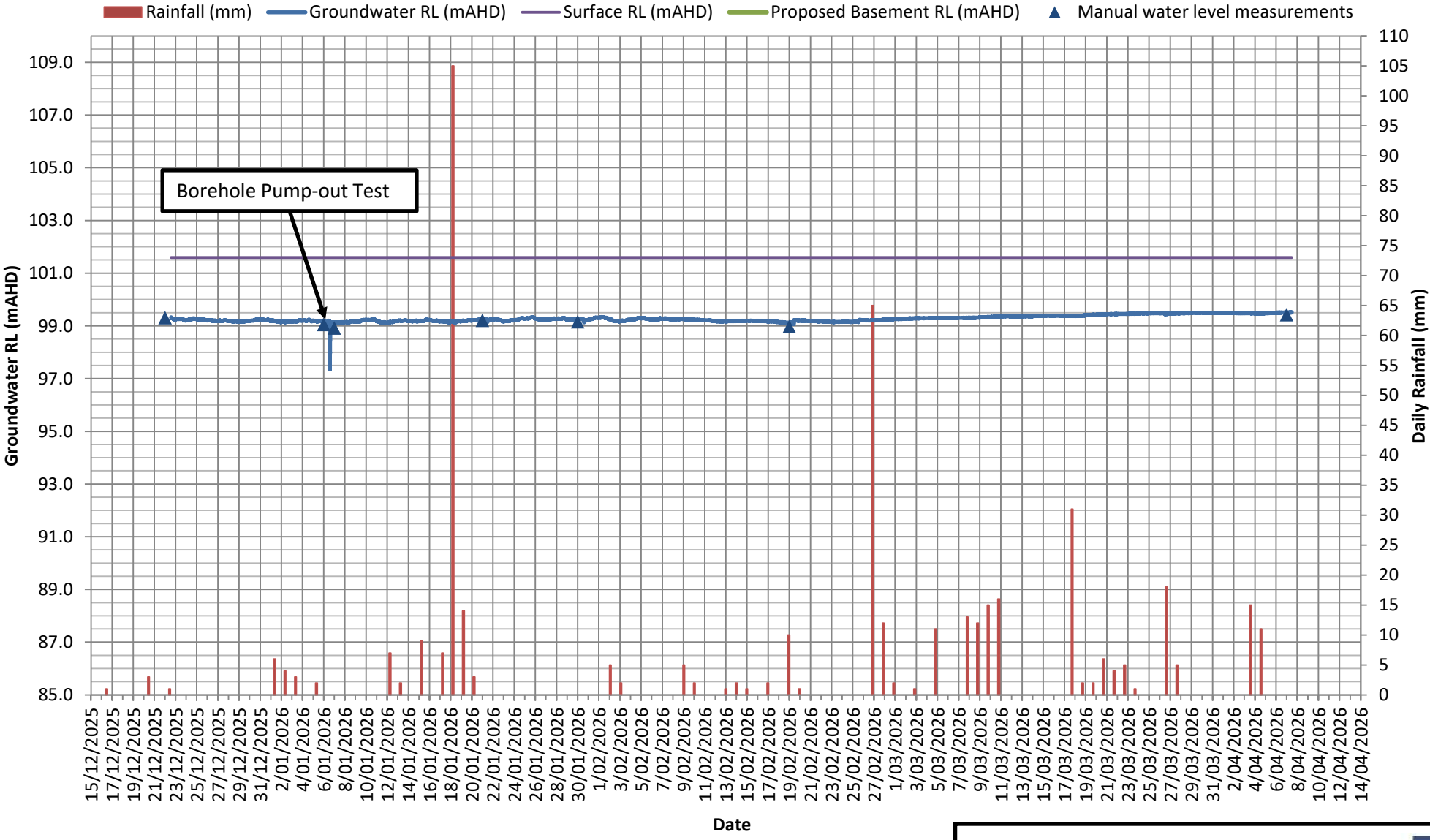
Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 7

File Name: BH106 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH106



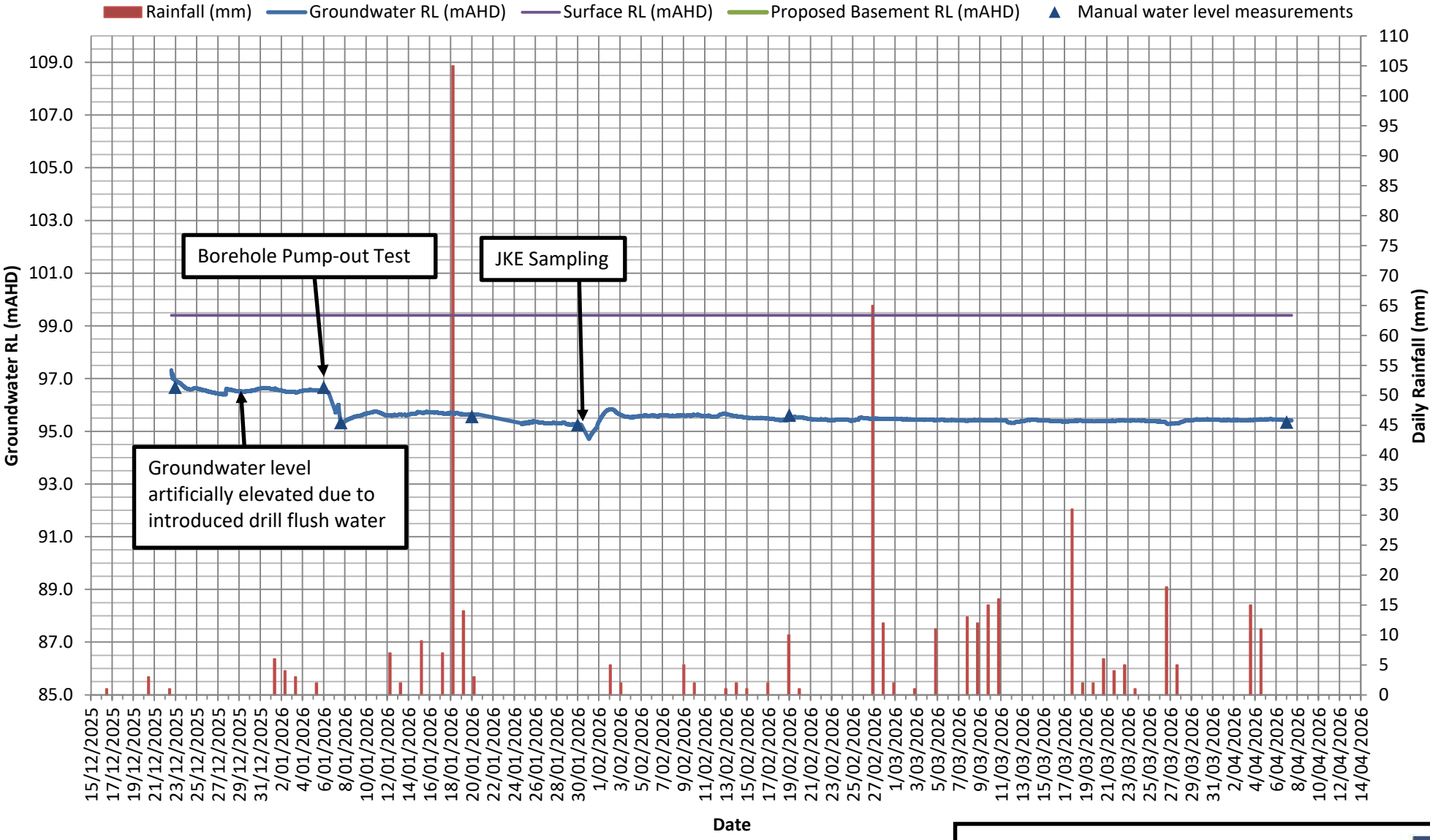
Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 8

File Name: BH107 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH107



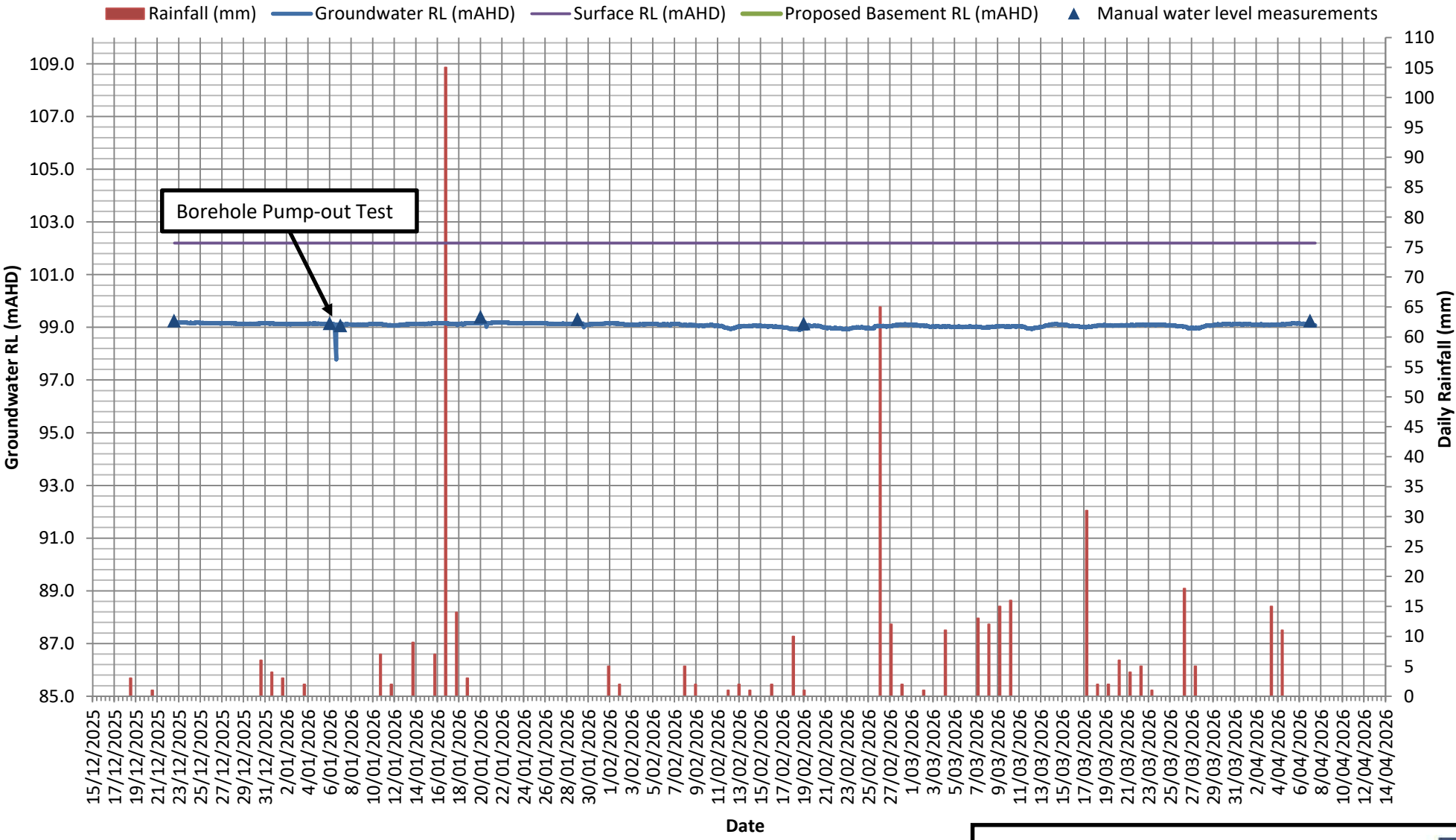
Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 9

File Name: BH108 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH108



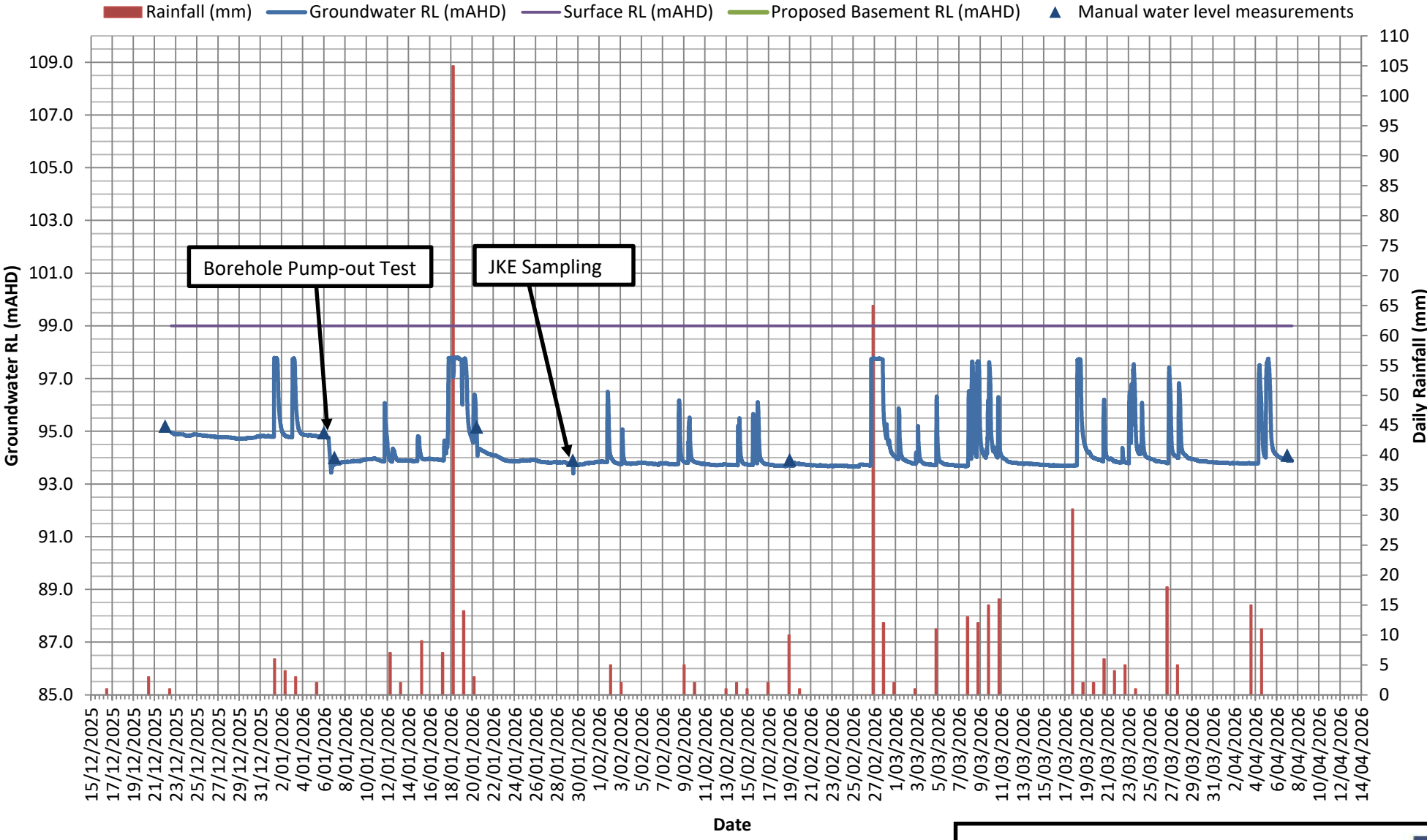
Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 10

File Name: BH109 GW-vs Rainfall & K Value
Date Printed: 1/05/2026

Groundwater Level and Daily Rainfall -v- Time Plot
BH109



Rainfall data from: Chatswood Bowling Club (Station No: 066011)

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Report No. 34446A3 Figure No. 11

VIBRATION EMISSION DESIGN GOALS

German Standard DIN 4150-3:2016-12 'Vibrations in Buildings – Part 3: Effects on Structures' provides guideline levels of vibration velocity for evaluating the effects of vibration in structures. The limits presented in this standard are generally recognised to be conservative.

The DIN 4150 values [maximum levels measured in any direction at the foundation, OR, maximum levels measured in (x) or (y) horizontal directions, in the uppermost floor, and in the (z) vertical direction for floor slabs], are summarised in Table 1 below.

It should be noted that peak vibration velocities higher than the minimum figures in Table 1 for low frequencies may be quite 'safe', depending on the frequency content of the vibration and the actual condition of the structure.

It should also be noted that these levels are 'safe limits', up to which no damage due to vibration effects has been observed for the particular group of building. 'Damage' is defined by DIN 4150 to include even minor non-structural effects such as superficial cracking in cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls. Should damage be observed at vibration levels lower than the 'safe limits', then it may be attributed to other causes. DIN 4150 also states that when vibration levels higher than the 'safe limits' are present, it does not necessarily follow that damage will occur. Values given are only a broad guide.

Table 1: DIN 4150 – Structural Damage – Safe Limits for Building Vibration

Group	Type of Structure	Peak Vibration Velocity in mm/s				
		At Foundation Level, all Directions, at a Frequency of:			Uppermost Floor, Horizontal Direction	Floor Slabs, Vertical Direction
		Less than 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies	All Frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design.	20	20 to 40	40 to 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy.	5	5 to 15	15 to 20	15	20
3	Structures that, because of their particular sensitivity to vibration, cannot be classified as Group 1 or 2, and are of great intrinsic value (e.g. heritage buildings).	3	3 to 8	8 to 10	8	20

Note: For frequencies above 100Hz, the higher values in the 50Hz to 100Hz column should be used.

REPORT EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the geotechnical report in regard to classification methods, field procedures and certain matters relating to the Comments and Recommendations section. Not all notes are necessarily relevant to all reports.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Geotechnical engineering involves gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) is referred to as 'laminite'.

SAMPLING

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

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon the degree of disturbance, some information on strength and structure. Bulk samples are similar but of greater volume required for some test procedures.

Undisturbed samples are taken by pushing a thin-walled sample tube, usually 50mm diameter (known as a U50), into the soil and withdrawing it with a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shrink-swell behaviour, strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm 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 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N > 30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as 'N_c' on the borehole logs, together with the number of blows per 150mm penetration.

Cone Penetrometer Testing (CPT) and Interpretation: The cone penetrometer is sometimes referred to as a Dutch Cone. The test is described in Australian Standard 1289.6.5.1–1999 (R2013) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Static Cone Penetration Resistance of a Soil – Field Test using a Mechanical and Electrical Cone or Friction-Cone Penetrometer'*.

In the tests, a 35mm or 44mm diameter rod with a conical tip is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with a hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the frictional resistance on a separate 134mm or 165mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are electrically connected by wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck. The CPT does not provide soil sample recovery.

As penetration occurs (at a rate of approximately 20mm per second), the information is output as incremental digital records every 10mm. The results given in this report have been plotted from the digital data.

The information provided on the charts comprise:

- Cone resistance – the actual end bearing force divided by the cross sectional area of the cone – expressed in MPa. There are two scales presented for the cone resistance. The lower scale has a range of 0 to 5MPa and the main scale has a range of 0 to 50MPa. For cone resistance values less than 5MPa, the plot will appear on both scales.
- Sleeve friction – the frictional force on the sleeve divided by the surface area – expressed in kPa.
- Friction ratio – the ratio of sleeve friction to cone resistance, expressed as a percentage.

  The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and occasionally very soft clays, rising to 4% to 10% in stiff clays and peats. Soil descriptions based on cone resistance and friction ratios are only inferred and must not be considered as exact.

Correlations between CPT and SPT values can be developed for both sands and clays but may be site specific.

Interpretation of CPT values can be made to empirically derive modulus or compressibility values to allow calculation of foundation settlements.

Stratification can be inferred from the cone and friction traces and from experience and information from nearby boreholes etc. Where shown, this information is presented for general guidance, but must be regarded as interpretive. The test method provides a continuous profile of engineering properties but, where precise information on soil classification is required, direct drilling and sampling may be preferable.

There are limitations when using the CPT in that it may not penetrate obstructions within any fill, thick layers of hard clay and very dense sand, gravel and weathered bedrock. Normally a 'dummy' cone is pushed through fill to protect the equipment. No information is recorded by the 'dummy' probe.

Flat Dilatometer Test: The flat dilatometer (DMT), also known as the Marchetti Dilometer comprises a stainless steel blade having a flat, circular steel membrane mounted flush on one side.

The blade is connected to a control unit at ground surface by a pneumatic-electrical tube running through the insertion rods. A gas tank, connected to the control unit by a pneumatic cable, supplies the gas pressure required to expand the membrane. The control unit is equipped with a pressure regulator, pressure gauges, an audio-visual signal and vent valves.

The blade is advanced into the ground using our CPT rig or one of our drilling rigs, and can be driven into the ground using an SPT hammer. As soon as the blade is in place, the membrane is inflated, and the pressure required to lift the membrane (approximately 0.1mm) is recorded. The pressure then required to lift the centre of the membrane by an additional 1mm is recorded. The membrane is then deflated before pushing to the next depth increment, usually 200mm down. The pressure readings are corrected for membrane stiffness.

The DMT is used to measure material index (I_D), horizontal stress index (K_D), and dilatometer modulus (E_D). Using established correlations, the DMT results can also be used to assess the 'at rest' earth pressure coefficient (K_o), over-consolidation ratio (OCR), undrained shear strength (C_u), friction angle (ϕ), coefficient of consolidation (C_h), coefficient of permeability (K_h), unit weight (γ), and vertical drained constrained modulus (M).

The seismic dilatometer (SDMT) is the combination of the DMT with an add-on seismic module for the measurement of shear wave velocity (V_s). Using established correlations, the SDMT results can also be used to assess the small strain modulus (G_o).

Portable Dynamic Cone Penetrometers: Portable Dynamic Cone Penetrometer (DCP) tests are carried out by driving a 16mm diameter rod with a 20mm diameter cone end with a 9kg hammer dropping 510mm. The test is described in Australian Standard 1289.6.3.2–1997 (R2013) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – 9kg Dynamic Cone Penetrometer Test'*.

The results are used to assess the relative compaction of fill, the relative density of granular soils, and the strength of cohesive soils. Using established correlations, the DCP test results can also be used to assess California Bearing Ratio (CBR).

Refusal of the DCP can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Vane Shear Test: The vane shear test is used to measure the undrained shear strength (C_u) of typically very soft to firm fine grained cohesive soils. The vane shear is normally performed in the bottom of a borehole, but can be completed from surface level, the bottom and sides of test pits, and on recovered undisturbed tube samples (when using a hand vane).

The vane comprises four rectangular blades arranged in the form of a cross on the end of a thin rod, which is coupled to the bottom of a drill rod string when used in a borehole. The size of the vane is dependent on the strength of the fine grained cohesive soils; that is, larger vanes are normally used for very low strength soils. For borehole testing, the size of the vane can be limited by the size of the casing that is used.

For testing inside a borehole, a device is used at the top of the casing, which suspends the vane and rods so that they do not sink under self-weight into the 'soft' soils beyond the depth at which the test is to be carried out. A calibrated torque head is used to rotate the rods and vane and to measure the resistance of the vane to rotation.

With the vane in position, torque is applied to cause rotation of the vane at a constant rate. A rate of 6° per minute is the common rotation rate. Rotation is continued until the soil is sheared and the maximum torque has been recorded. This value is then used to calculate the undrained shear strength. The vane is then rotated rapidly a number of times and the operation repeated until a constant torque reading is obtained. This torque value is used to calculate the remoulded shear strength. Where appropriate, friction on the vane rods is measured and taken into account in the shear strength calculation.

LOGS

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

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than 'straight line' variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

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

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it 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 and may not be the same at the time of construction.
- 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 be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to 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 perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse engineering characteristics or behaviour. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 *'Methods of Testing Soils for Engineering Purposes'* or appropriate NSW Government Roads & Maritime Services (RMS) test methods. Details of the test procedure used are given on the individual report forms.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building) the information and interpretation may not be relevant if the design proposal is changed (eg. to a twenty storey building). If this happens, the Company will be pleased to review the report and the sufficiency of the investigation work.

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

- Unexpected variations in ground conditions – the potential for this will be partially dependent on borehole spacing and sampling frequency as well as investigation technique.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of persons or contractors responding to commercial pressures.
- Details of the development that the Company could not reasonably be expected to anticipate.

If these occur, the Company will be pleased to assist with investigation or advice to resolve any problems occurring.

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, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

REPRODUCTION OF INFORMATION FOR CONTRACTUAL PURPOSES

Where information obtained from this investigation 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. The Company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Copyright in all documents (such as drawings, borehole or test pit logs, reports and specifications) provided by the Company shall remain the property of Jeffery and Katauskas Pty Ltd. Subject to the payment of all fees due, the Client alone shall have a licence to use the documents provided for the sole purpose of completing the project to which they relate. Licence to use the documents may be revoked without notice if the Client is in breach of any obligation to make a payment to us.

REVIEW OF DESIGN

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/constraints are quite complex, it is prudent to have a joint design review which involves an experienced geotechnical engineer/engineering geologist.

SITE INSPECTION

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

Requirements could range from:

i) a site visit to confirm that conditions exposed are no worse than those interpreted, to

ii) a visit to assist the contractor or other site personnel in identifying various soil/rock types and appropriate footing or pile founding depths, or

iii) full time engineering presence on site.

SYMBOL LEGENDS

SOIL


FILL


TOPSOIL


CLAY (CL, CI, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CI, CH)


SILTY CLAY (CL, CI, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CI, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML, MH)


PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK


CONGLOMERATE


SANDSTONE


SHALE/MUDSTONE


SILTSTONE


CLAYSTONE


COAL


LAMINITE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

OTHER MATERIALS


BRICKS OR PAVERS


CONCRETE


ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
Fine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

$$C_U = \frac{D_{60}}{D_{10}} \qquad and \qquad C_C = \frac{(D_{30})^2}{D_{10}\, D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

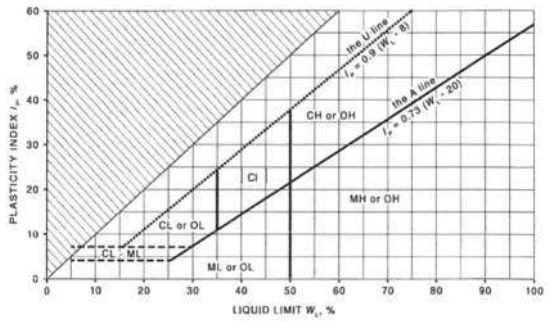
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

2 Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.

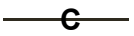
3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.

4 The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record		Standing water level. Time delay following completion of drilling/excavation may be shown.
		Extent of borehole/test pit collapse shortly after drilling/excavation.
		Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES	Sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos analysis.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25	Vane shear reading in kPa of undrained shear strength.
	PID = 100	Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	*w* > PL	Moisture content estimated to be greater than plastic limit.
	w ≈ PL	Moisture content estimated to be approximately equal to plastic limit.
	w < PL	Moisture content estimated to be less than plastic limit.
	w ≈ LL	Moisture content estimated to be near liquid limit.
	w > LL	Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D	DRY – runs freely through fingers.
	M	MOIST – does not run freely but no free water visible on soil surface.
	W	WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS	VERY SOFT – unconfined compressive strength ≤ 25kPa.
	S	SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa.
	F	FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa.
	St	STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa.
	VSt	VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa.
	Hd	HARD – unconfined compressive strength > 400kPa.
	Fr	FRIABLE – strength not attainable, soil crumbles.
	( )	Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)		**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)**: VERY LOOSE ≤ 15 / 0 – 4; LOOSE > 15 and ≤ 35 / 4 – 10; MEDIUM DENSE > 35 and ≤ 65 / 10 – 30; DENSE > 65 and ≤ 85 / 30 – 50; VERY DENSE > 85 / > 50
	VL	
	L	
	MD	
	D	
	VD	
	( )	Bracketed symbol indicates estimated density based on ease of drilling or other assessment.
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.

Log Column	Symbol	Definition
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as: RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock. EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock. ALLUVIAL – soil deposited by creeks and rivers. ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents. MARINE – soil deposited in a marine environment. AEOLIAN – soil carried and deposited by wind. COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits. LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
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	Distinctly Weathered (Note 1)	HW	DW	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		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'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 weathering products in pores'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Abbreviations Used in Defect Description

Cored Borehole Log Column		Symbol Abbreviation	Description
Point Load Strength Index		• 0.6	Axial point load strength index test result (MPa)
		x 0.6	Diametral point load strength index test result (MPa)
Defect Details	– Type	Be	Parting – bedding or cleavage
		CS	Clay seam
		Cr	Crushed/sheared seam or zone
		J	Joint
		Jh	Healed joint
		Ji	Incipient joint
		XWS	Extremely weathered seam
	– Orientation	Degrees	Defect orientation is measured relative to normal to the core axis (ie. relative to the horizontal for a vertical borehole)
	– Shape	P	Planar
		C	Curved
		Un	Undulating
		St	Stepped
		Ir	Irregular
	– Roughness	Vr	Very rough
		R	Rough
		S	Smooth
		Po	Polished
		Sl	Slickensided
	– Infill Material	Ca	Calcite
		Cb	Carbonaceous
		Clay	Clay
		Fe	Iron
		Qz	Quartz
		Py	Pyrite
	– Coatings	Cn	Clean
		Sn	Stained – no visible coating, surface is discoloured
		Vn	Veneer – visible, too thin to measure, may be patchy
		Ct	Coating ≤ 1mm thick
		Filled	Coating > 1mm thick
	– Thickness	mm.t	Defect thickness measured in millimetres

APPENDIX C

'Preliminary Groundwater Quality Screening'
Report prepared by JK Environments
(Ref. E38092BrptRev2 dated 21 May 2026)

REPORT TO

LEVANDE PTY LTD

ON

PRELIMINARY GROUNDWATER QUALITY SCREENING

FOR

PROPOSED REDEVELOPMENT

AT

LOURDES RETIREMENT VILLAGE,
95-97 STANHOPE ROAD, KILLARA, NSW

Date: 21 May 2026
Ref: E38092BrptRev2

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DOCUMENT REVISION RECORD

Report Reference	Report Status	Report Date
E38092Brpt	Final Report	12 May 2026
E38092BrptRev1	Revised Report – updated development details	19 May 2026
E38092BrptRev2	Revised Report – addressing client comments	21 May 2026

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Appendix D: Laboratory Report/s & COC Documents
Appendix E: Fieldwork Document
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Appendix G: Report Explanatory Notes

Abbreviations

Australian Drinking Water Guidelines	**ADWG**
Australian Height Datum	**AHD**
Below Ground Level	**BGL**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Contaminants of Potential Concern	**CoPC**
Chain of Custody	**COC**
Development Application	**DA**
Environment Protection Authority	**EPA**
Environmental Site Assessment	**ESA**
International Organisation of Standardisation	**ISO**
JK Environments	**JKE**
JK Geotechnics	**JKG**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Polycyclic Aromatic Hydrocarbons	**PAH**
Practical Quantitation Limit	**PQL**
Quality Assurance	**QA**
Quality Control	**QC**
Relative Percentage Difference	**RPD**
Site Assessment Criteria	**SAC**
Standing Water Level	**SWL**
Standard Sampling Procedure	**SSP**
Trip Blank	**TB**
Total Recoverable Hydrocarbons	**TRH**
Trip Spike	**TS**
Volatile Organic Compounds	**VOC**
Work Health and Safety	**WHS**

Units	
Litres	**L**
Metres BGL	**mBGL**
Metres	**m**
Micrograms per litre	**µg/L**

1 INTRODUCTION

Levande Pty Ltd ('the client') commissioned JK Environments (JKE) to undertake a preliminary groundwater quality screening for the proposed redevelopment at Lourdes Retirement Village located at 95-97 Stanhope Road, Killara, NSW ('the site'). The site location is shown on Figure 1 and the screening was confined to the proposed development area within the site as shown on Figure 2 attached in the appendices.

The screening was undertaken to support a State Significant Development Application (SSDA) for a seniors housing development, comprising subdivision, key infrastructure, alterations/upgrades and refurbishment works to a residential care facility, and the redevelopment of independent living units (ILU's) and community amenities and facilities at the existing retirement village.

A preliminary geotechnical investigation was previously undertaken by our geotechnical division, JK Geotechnics (JKG). The results of the investigation are presented in a separate report (Ref: 34446Arpt)[1]. JKG also undertook an additional geotechnical and hydrogeological investigation in conjunction with this screening in 2026 (Ref: 34446A3rptRev1)[2]. This report should be read in conjunction with the JKG reports.

1.1 Overview

As an overview, based on the information provided, we understand that the proposed redevelopment will comprise:

- Staged demolition of the existing 172 seniors housing dwellings which is highly considered on existing residents and includes site preparation works, including removal of the ILU's and serviced retirement apartments within the highest bushfire risk areas;
- Significant bushfire safety measures including creation of an Asset Protection Zone (APZ) for the site, reduced dwellings to the existing retirement village, upgrades to infrastructure to support bushfire protection, improved construction materials and standards and evacuation planning to increase resident and visitor safety;
- Torrens subdivision of land to completely separate the existing partly subdivided residential aged care facility from the remainder of the retirement living site;
- Alterations to the existing residential aged care facility, including:
    - Demolition of the existing connection with the hostel building and associated internal and external alterations and additions;
    - Ember protection upgrades to the facades of the building to comply with relevant Rural Fire Services (RFS) requirements;
    - Demolition of the buildings connecting the residential aged care to the retirement serviced apartments, including new aged care facade and service, and internal alterations;
    - Relocation and upgraded water tanks and sprinkler system; and
    - Provision of new services infrastructure to support the subdivision;

[1]JKG (2022) *Report to Stockland on Preliminary Geotechnical Investigation for Proposed Redevelopment at Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW*. (Ref: 34446Arpt dated 29 September 2022) Referred to as JKG 2022 report

[2]JKG (2026) *Special Advice to Levande Pty Ltd on Additional Geotechnical and Hydrogeological Investigation for Proposed Redevelopment at Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW*. (Ref: 34446A3rptRev1 dated 18 May 2026) Referred to as JKG 2026 report

- Construction of a new seniors housing development comprising:
  - Nine boutique seniors housing blocks with a total of 145 ILU's varying between two and four storeys in height; and
  - Provision of a new community facility to support a range of social and recreational uses;
- High quality landscape works that appropriately respond to and embrace the bushland setting, enabling significant tree and biodiversity retention and avoiding impacts on remnant and contiguous bushland vegetation along the boundary adjoining Seven Little Australians Park;
- Adaptive re-use of the heritage listed Headfort House, including conservation works, curtilage improvements and sympathetic surrounding built form to improve the streetscape and allow for improved appreciation of the heritage item;
- Two consolidated one to two storey basements, providing car parking and associated services;
- Public domain works, including new roads and on-grade parking, and extensive landscaping within the APZ and throughout the site; and
- Extension and augmentation of physical infrastructure and utilities as required.

For a detailed project description, refer to the 'Environmental Impact Statement' prepared by Beam Planning and the architectural drawings prepared by PBD Architects.

1.2 Objectives

The primary objective of this screening was to provide preliminary groundwater quality data that could be used to support an application for a temporary construction dewatering license.

1.3 Scope of Work

The screening was undertaken generally in accordance with a JKG proposal (Ref: P73152A) of 6 November 2025 and consultancy agreement (CA) between the client and JKG. The scope of work included the following:

- Sampling from nine monitoring wells installed at the site by JKG;
- Analysis of groundwater samples for a range of contaminants and parameters;
- Interpretation of the results with reference to relevant screening criteria;
- Data quality assessment; and
- Preparation of a report.

The analytical schedule was selected with reference to the 'mandatory' testing requirements outlined in the NSW DPIE Minimum requirements for building site groundwater investigations and reporting (2022)[3] document.

[3] NSW DPIE, (2022). *Minimum requirements for building site groundwater investigations and reporting.* (Referred to as DPIE 2022).

2 SITE INFORMATION

2.1 Background

JKG has completed multiple investigations at the site since 1981. Between circa 1981 and 2014, JKG undertook six investigations and drilled around 22 boreholes in various sections of the site. a summary of the subsurface information obtained by JKG is summarised in their 2022 investigation report. The most recent investigation was carried out in 2026 in conjunction with this screening. The investigation included drilling nine boreholes in selected areas of the proposed development as shown on Figure 2. Groundwater monitoring wells were installed in the wells for long term monitoring of groundwater conditions.

2.2 Site Identification and Description

Table 2-1: Site Identification

Site Address:	Lourdes Retirement Village, 95-97 Stanhope Road, Killara, NSW
Lot & Deposited Plan:	Lot 21 and 22 in DP 634645
Current Land Use:	Residential
Local Government Authority (LGA):	Ku-ring-gai Council
Wider Site Area (m^2):	52,898m^2
RL (metres AHD) (approx.):	95-107
Geographical Location (MGA) (approx.):	Latitude: -33.766501 Longitude: 151.17443

The site is located on the south side of Stanhope Road, and is occupied by Lourdes Retirement Village and Killara Glades as shown on Figure 1. The site lies at an elevation of approximately 95-107m above sea level on the crest of a hill, falling to the east and west at approximately 3-6°, and to the south towards Swain Gardens to the south at 5-15°. Based on the supplied survey plans, the maximum elevation relief across the site, between the northern relatively level portion and the lower lying southernmost road is approximately 14m. Beyond the southern and eastern site boundaries, the steep bushland covered hillsides grade between 15° and 45°.

At the time of the screening, the site contained numerous one to three storey brick buildings (some with a single basement car parking level), garages and carports, suspended concrete footbridges and ramps, concrete and brick paved footpaths, and an internal road network with adjoining car parking areas, which were surfaced with asphaltic concrete (AC) or concrete.

2.3 Regional Geology

The geological map of Sydney (1983)[4] indicates the site to be located on the boundary of two geological units. Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminite is located on the central and west sections of the site. Hawkesbury Sandstone of the Triassic Group, which typically consists of medium- to coarse-grained quartz sandstone displaying small- to large-scale, high-angle crossbedding; minor shale and laminite lenses is located in the east section.

2.4 Registered Groundwater Bores

A review of groundwater bore records available within the Lotsearch report was undertaken for the screening. The search was limited to registered bores located within a radius of approximately 500m of the site. The search indicated approximately six registered bores within the search area. A brief summary of relevant information is presented below:

Table 2-2: Summary of Groundwater Bores

Reference	Distance from Site (m) approx.)	Direction & Gradient from Site	Final Depth (m)	Standing Water Level (SWL) (m)	Registered Purpose	Potential Receptor
GW115591	340	South West	Unknown	Unknown	Unknown	Gordon Creek
GW115587	340	South West	Unknown	Unknown	Unknown	Gordon Creek
GW115588	345	South West	Unknown	Unknown	Unknown	Gordon Creek
GW115589	350	South West	Unknown	Unknown	Unknown	Gordon Creek
GW115592	350	South West	Unknown	Unknown	Unknown	Gordon Creek
GW115590	355	South West	Unknown	Unknown	Unknown	Gordon Creek

[4] Department of Mineral Resources, (1983). *1:100,000 Geological Map of Sydney (Series 9130)*

3 SCREENING CRITERIA

The client should obtain advice from the consent authority regarding specific groundwater disposal criteria based on the preferred disposal method. In the absence of this information, JKE have screened the groundwater against the following criteria in relation to potential disposal to stormwater:

- Groundwater Investigation Levels for 95% protection of 'freshwater' species were adopted based on the Default Guideline Values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[5]. The 99% trigger values were adopted where required to account for bioaccumulation. Low and moderate reliability trigger values were also adopted for some contaminants where high-reliability trigger values don't exist;
- The Australian Drinking Water Guidelines 2011 (updated 2021)[6] multiplied by a factor of 10 to assess potential risks associated with incidental/recreational-type exposure to groundwater (e.g. within down-gradient water bodies) and
- A site-specific assessment (SSA) for the Tier 1 screening of human health risks posed by volatile contaminants in groundwater. The assessment included selection of alternative Tier 1 criteria that were considered suitably protective of human health. These criteria are based on drinking water guidelines and have been referred to as HSL-SSA. The criteria were based on the following (as shown in the attached report tables):
  - Australian Drinking Water Guidelines 2011 (updated 2025)[7] for BTEX compounds and selected VOCs;
  - World Health Organisation (WHO) document titled Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality (2008)[8] for petroleum hydrocarbons. We have conservatively adopted the value of 100µg/L for TRH F1 and F2;
  - USEPA Region 9 screening levels for naphthalene (threshold value for tap water); and
  - The use of the laboratory PQLs for other contaminants where there were no Australian guidelines.

The screening criteria are referred to as Site Assessment Criteria (SAC).

Reference should be made to the attached Table G1 and Table G2 for the specific criteria.

[5] Australian and New Zealand Governments (ANZG), (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (referred to as ANZG 2018)

[6] National Health and Medical Research Council (NHMRC), (2021). *National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011* (referred to as ADWG 2011)

[7] National Health and Medical Research Council (NHMRC), (2021). *National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011* (referred to as ADWG 2011)

[8] World Health Organisation (WHO), (2008). *Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality* (referred to as WHO 2008)

4 INVESTIGATION PROCEDURE

4.1 Subsurface Investigation and Groundwater Sampling

Nine groundwater monitoring wells MW101 to MW109 inclusive were installed in boreholes drilled for the JKG additional geotechnical investigation from 15 December 2025 to 19 December 2025. The sampling locations are shown on Figure 2 attached in the appendices.

A summary of the sampling/screening methodology is presented in the following table:

Table 4-1: Groundwater Sampling/Screening Methodology

Aspect	Input
Sampling Plan	Assuming that groundwater flow is likely to be towards the south (based on the topography and the nearest surface water body), MW101, MW102, and MW104 are considered to be capturing the groundwater conditions in the 'up-gradient' area of the site, and MW107 to MW109 inclusive are considered to be capturing the groundwater conditions in the 'down-gradient' area of the site.
Monitoring Well Installation Procedure	The monitoring well construction details are documented on the borehole logs attached in the appendices. The monitoring wells were installed to depths ranging from approximately 4.1m to 15.2m below ground level (BGL). The wells were generally constructed as follows: • A 50mm diameter Class 18 PVC casing and machine slotted screen (wells screen depths varied from 1.45m to 15.19mBGL); • A 2mm sand filter pack was installed around the slotted screen to approximately 0.0 to 0.12m above the screen interval, with the exception of MW104, in which the sand filter pack was installed 0.08m below the top of the screen; • A bentonite seal/plug was installed above the filter pack to seal the wells at depths ranging from approximately 0.15m to 1.6m below ground level; • The void around the casing was backfilled with spoil as required; and • A gatic cover was installed at the surface with a concrete plug to limit the inflow of surface water, and the wells were sealed with an envirocap.
Monitoring Well Development	The monitoring wells were developed on 20 and 21 January 2026 using a submersible electrical pump. All wells were pumped until effectively dry and the following parameters were monitored using calibrated field instruments: • Standing water level (SWL) using an electronic dip meter; and • pH, temperature, electrical conductivity (EC), dissolved oxygen (DO) and redox potential (Eh) using a YSI Multi-probe water quality meter. The field monitoring records are attached in the appendices. Calibration data is retained on file by JKE.
Groundwater Sampling	Groundwater samples were obtained on date 29 and 30 January 2026. Prior to sampling, the monitoring wells were checked for the presence of Light Non-Aqueous Phase Liquids (LNAPLs) using an inter-phase probe electronic dip meter.

Aspect	Input
	The samples were obtained using a peristaltic pump. During sampling, parameters were recorded as outlined in the development step in order to assess steady state conditions. Groundwater samples were obtained directly from the single use tubing and placed in the sample containers. When steady state was not achievable due to low water volume and SWL within the well (MW104 and MW105), a single use plastic bailer was used for sampling. A duplicate sample was obtained by alternate filling of sample containers. This technique was adopted to minimise disturbance of the sample and loss of volatile contaminants associated with mixing of liquids in secondary containers, etc. Groundwater removed from the wells during development and sampling was transported to JKE in jerry cans and stored in holding drums prior to collection by a licensed waste water contractor for off-site disposal. The field monitoring records are attached in the appendices. Calibration data is retained on file by JKE.
Sample Preservation	The samples were placed in appropriate plastic and glass containers (preserved as required). Samples for heavy metals analysis were field filtered. On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

4.2 Laboratory Analysis

Samples were analysed for a range of potential contaminants and water quality parameters based on the 'mandatory' analysis suite outlined in DPIE 2022. The analytes are outlined below:

- Heavy metals including: arsenic, cadmium, chromium (total), copper, lead, mercury, nickel, zinc, aluminium, antimony, boron, beryllium, cobalt, iron, lithium, manganese, molybdenum, selenium, silver, strontium, uranium and vanadium;
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Volatile Organic Compounds (VOCs);
- Total Recoverable Hydrocarbons (TRHs);
- Monocyclic aromatic hydrocarbons including benzene, toluene, ethylbenzene and xylene (BTEX);
- EC, pH, redox potential, dissolved oxygen (DO) and hardness;
- Total dissolved solids (TDS), total suspended solids (TSS) and turbidity;
- Total organic carbon (TOC), sodium adsorption ratio (SAR) and silica (SiO_2);
- Ammonia, nitrate, nitrite, total nitrogen and nitrogen oxides (NOx);
- Phosphorus and phosphate;
- Ionic balance including: calcium, potassium, sodium, magnesium, alkalinity, chloride and sulphate; and
- Faecal coliforms and Escherichia coli (E coli).

Samples were analysed by Envirolab Services (NATA Accreditation Number – 2901. Reference should be made to the laboratory report (Ref: 400883) attached in the appendices for further information regarding the laboratory methods and practical quantitation limits (PQLs) for each analyte.

5 RESULTS

5.1 Groundwater Levels and Screening

SWLs recorded during development and sampling ranged from approximately 2.39m to 8.91mBGL. LNAPL was not detected during development or sampling and there were no hydrocarbon odours or other obvious visual or olfactory indicators of contamination observed.

5.2 Laboratory Results

Reference should be made to the attached Table G1 and G2 for a summary of the laboratory results compared to the screening criteria presented in Section 3. The following results were above the SAC and are also shown on Figure 3:

- The zinc concentrations in the majority of the wells excluding MW104 exceeded the ecological SAC;
- The cadmium levels in MW103 and MW109 exceeded the ecological SAC;
- The copper concentrations in MW101, MW101 [LAB_DUP], MW102, MW103, MW105, MW106, MW108, MW109 and field duplicate GWDUP1 exceeded he ecological SAC;
- The lead concentrations in MW101, MW101 [LAB_DUP], MW103 and field duplicate GWDUP1 exceeded the ecological SAC;
- The total mercury concentrations in MW102 and MW102 [LAB_DUP] exceeded the ecological SAC;
- The nickel concentrations in MW103, MW104, MW105, MW106, MW107 and MW109 exceeded the ecological SAC;
- The zinc concentrations in all primary samples except MW104 exceeded the ecological SAC. MW101 - [LAB_DUP] and GWDUP1 also exceeded the ecological SAC;
- The aluminium concentrations in MW101, MW101 [LAB_DUP], MW102, MW103, MW105 and MW106 exceeded the ecological SAC;
- The TRH F2 concentration exceeded the human health-based SAC relating to vapour intrusion in MW104; and
- The pH in all wells except for MW104 was outside the range for recreational and marine waters.

5.3 Assessment of Data Quality

For the purpose of the screening, JKE have undertaken a preliminary assessment of the data quality against the following Data Quality Indicators (DQIs): precision, accuracy, representativeness, completeness and comparability. In this regard, we are of the opinion that the data quality is suitable for the purpose of the screening based on the following:

- Standard sampling procedures (SSP) were complied with. The SSP is attached in the appendices;
- Representative groundwater samples were analysed for a broad range of potential contaminants;
- Field indicators were used as a screening tool;
- Samples were analysed by a NATA registered laboratory. Laboratory quality control/quality assurance (QA/QC) samples were analysed and were generally within the acceptance criteria adopted by the laboratory; and
- One field duplicate sample GWDUP1 of primary sample MW101 was analysed for the screening. The relative percentage difference (RPD) was calculated for each analyte based on the formula provided in

the appendices. The results are presented on Table Q1 attached in the appendices. The analysis indicted that field sampling and laboratory precision were acceptable; and

- One trip spike sample TS1 was analysed for BTEX. The spike recovery was acceptable and the results did not show any cross contamination associated with the sampling.

6 DISCUSSION AND RECOMMENDATIONS

The groundwater samples analysed for the screening identified elevated concentrations of selected metals (cadmium, copper, lead, total mercury, nickel, zinc and aluminium), TRH F2 in MW104 outside the SAC adopted for this screening. The elevated results are shown on Figure 3. The pH of all primary samples excluding MW104 were outside the range for recreational and fresh waters. The results indicate that the groundwater will require treatment prior to off-site disposal to the stormwater during construction phase dewatering.

Council approval must be obtained prior to discharge and conditions imposed by Council on the discharge should be complied with.

A specialist contractor must be contacted to design an appropriate water treatment system to facilitate the disposal of groundwater during temporary construction dewatering, should off-site disposal of groundwater to stormwater be required. Use of a 'WETSEP' system or equivalent to hold and treat water prior to discharge could be considered to achieve the water quality standards imposed by the authority (e.g. Council) permitting the discharge of groundwater. The 'WETSEP' system combines treatment processes including flocculation which may reduce concentrations of heavy metals which are likely to be at least partly associated with sediment particles in the groundwater. Organic contaminants such as TRHs can be treated via filtration through activated carbon and the pH can be adjusted by passing through a dosing unit. The client will need to consider these site-specific factors, in addition to the potential volume of water being extracted, in consultation with the dewatering contractor and the manufacturers of any treatment system to be utilised for the project.

Turbidity and pH are parameters that can fluctuate depending on site conditions and activities such as excavation. JKE recommend that the extracted groundwater be held in a settlement tank or lined sump pit so that the turbidity and pH can be measured. If required (i.e. if the turbidity is greater than 50NTU or the pH is outside the range of 6.5 and 8.5) the pH can be adjusted by passing through a dosing unit and the turbidity can be adjusted by use of a flocculent.

The relevant consent authorities should be contacted to clarify the requirements to obtain disposal approval to stormwater or sewer. In addition, a licence from WaterNSW may be required for temporary construction dewatering. JKE understands that JKG is preparing a Dewatering Management Plan (DMP) for submission to WaterNSW.

In the event unexpected conditions are encountered during development work or during dewatering that may pose a contamination risk, all works should stop and an environmental consultant should be engaged to inspect the site and address the issue.

7 LIMITATIONS

The report limitations are outlined below:

- JKE accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the JKE proposal; and terms of contract between JKE and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Groundwater conditions may vary, especially after climatic changes and wet/dry periods;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- JKE have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. JKE should be contacted immediately in such circumstances;
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose;
- Copyright in this report is the property of JKE. JKE has used a degree of care, skill and diligence normally exercised by consulting professionals in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report;
- If the client, or any person, provides a copy of this report to any third party, such third party must not rely on this report except with the express written consent of JKE; and
- Any third party who seeks to rely on this report without the express written consent of JKE does so entirely at their own risk and to the fullest extent permitted by law, JKE accepts no liability whatsoever, in respect of any loss or damage suffered by any such third party.

Important Information about this Report

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

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

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

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

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

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

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

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

Misinterpretation of Site Assessments by Design Professionals

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

Logs Should not be Separated from the Assessment Report

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

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

Read Responsibility Clauses Closely

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

Appendix A: Report Figures



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

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

Title: **SITE LOCATION PLAN**

Location: LOURDES VILLAGE, STANHOPE ROAD, KILLARA, NSW

Project No: E38092B

Figure No: 1

JKEnvironments

PLOT DATE: 25/02/2026 11:53:54 AM DWG FILE: K:\SC EIS JOBS\38000'S\E38092B KILLARA\CAD (P54759A)\E38092B.DWG

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ROAD

STANHOPE

BH/MW101 (0.5)

BH/MW102 (0.5)

BH/MW104 (0.1)

BH/MW105 (0.1)

BH/MW106 (0.8)

BH/MW103 (1.2)

BH/MW107 (0.8)

BH/MW108 (0.4)

BH/MW109 (1.1)

OUTLINE OF PROPOSED BASEMENT LG2

OUTLINE OF PROPOSED BASEMENT LG1

LEGEND

APPROXIMATE SITE BOUNDARY

BH/MW(Fill Depth) BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

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

Title: **SAMPLE LOCATION PLAN**

Location: LOURDES VILLAGE, STANHOPE ROAD, KILLARA, NSW

Project No: E38092B

Figure No: 2

JKEnvironments

PLOT DATE: 25/02/2026 11:54:05 AM DWG FILE: K:\5C EIS JOBS\38000'S\E38092B KILLARA\CAD (P54758A)\E38092B.DWG

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MW101		Lab Dup	GDUP1
pH	3.6	3.6	NA
Copper	7µg/L	8µg/L	7µg/L
Lead	8µg/L	8µg/L	8µg/L
Zinc	16µg/L	16µg/L	16µg/L
Aluminium	6,000µg/L	5,900µg/L	NA

MW102		Lab Dup
pH	4.0	NA
Copper	6µg/L	NA
Total Mercury	0.09µg/L	0.09µg/L
Zinc	17µg/L	NA
Aluminium	1,700µg/L	NA

MW104	
Nickel	14µg/L
>C_9-C_{14}	200µg/L

MW105	
pH	4.8
Copper	96µg/L
Nickel	50µg/L
Zinc	91µg/L
Aluminium	410µg/L

MW106	
pH	4.9
Copper	3µg/L
Nickel	18µg/L
Zinc	140µg/L
Aluminium	150µg/L

MW103	
pH	4.0
Cadmium	1.8µg/L
Copper	44µg/L
Lead	18µg/L
Nickel	33µg/L
Zinc	410µg/L
Aluminium	3,900µg/L

MW107	
pH	5.5
Nickel	41µg/L
Zinc	75µg/L

MW108	
pH	6.2
Zinc	13µg/L

MW109	
pH	5.5
Cadmium	0.9µg/L
Copper	3µg/L
Nickel	28µg/L
Zinc	130µg/L

ROAD

STANHOPE

BH/MW101 (0.5)

BH/MW102 (0.5)

BH/MW104 (0.1)

BH/MW105 (0.1)

BH/MW106 (0.8)

BH/MW103 (1.2)

BH/MW107 (0.8)

BH/MW108 (0.4)

BH/MW109 (1.1)

OUTLINE OF PROPOSED BASEMENT LG2

OUTLINE OF PROPOSED BASEMENT LG1

LEGEND

APPROXIMATE SITE BOUNDARY

BH/MW(Fill Depth) BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)

SAMPLE ID	-
CHEMICAL	CONCENTRATION (µg/L)

GROUNDWATER SAMPLE EXCEEDANCE

GROUNDWATER CONTAMINATION ABOVE SAC

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

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

Title: **SAC EXCEEDANCE PLAN**

Location: LOURDES VILLAGE, STANHOPE ROAD, KILLARA, NSW

Project No: E38092B

Figure No: 3

JKEnvironments

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Appendix B: Laboratory Results Summary Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

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

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Grounwater Quality Screening
Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW
E38092B

Table G1
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	Recreational (10 x NHMRC ADWG)	ANZG 2018 Fresh Waters	MW101	MW101 - [LAB_DUP]	MW102	MW102 - [LAB_DUP]	MW103	MW103 - [LAB_DUP]	MW104	MW105	MW105 - [LAB_DUP]	MW106	MW107	MW107 - [LAB_DUP]	MW108	MW109	GWDUP1	GWDUP1 - [LAB_DUP]
Inorganic Compounds and Parameters																			
pH		6.5 - 8.5	6.5 - 8.5	**3.6**	**3.6**	**4**	[NT]	**3.8**	[NT]	**7.2**	**4.8**	[NT]	**4.9**	**5.5**	[NT]	**6.2**	**5.5**	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	NSL	**970**	**970**	**460**	[NT]	**890**	[NT]	**850**	**1100**	[NT]	**430**	**530**	[NT]	**660**	**480**	NA	NA
Turbidity (NTU)		NSL	NSL	7	[NT]	13	[NT]	24	[NT]	97	440	[NT]	5.1	65	68	120	19	NA	NA
Redox Potential (Eh)	-	NSL	NSL	420	[NT]	409	[NT]	432	[NT]	414	415	[NT]	402	322	[NT]	374	365	NA	NA
Total Dissolved Solids (TDS) (mg/L)	5	NSL	NSL	**500**	600	**270**	[NT]	**550**	[NT]	**470**	**640**	[NT]	**330**	**320**	[NT]	**410**	**290**	NA	NA
Total Suspended Solids (TSS) (mg/L)	5	NSL	NSL	**8**	[NT]	**12**	[NT]	**16**	[NT]	**160**	**840**	860	<5	**49**	[NT]	**70**	**16**	NA	NA
Total Organic Carbon (TOC) (mg/L)	1	NSL	NSL	**4**	[NT]	**2**	[NT]	**3**	[NT]	**2**	**2**	[NT]	**2**	**5**	[NT]	**2**	**1**	NA	NA
Dissolved Oxygen (mg/L)	0.1	NSL	NSL	**6.3**	[NT]	**6.1**	[NT]	**6**	[NT]	**5.9**	**6.1**	[NT]	**6.2**	**5.9**	[NT]	**6.3**	**6.1**	NA	NA
Total Hardness (mg/L)	3	NSL	NSL	**62**	60	**29**	[NT]	**80**	[NT]	**190**	**160**	[NT]	**57**	**63**	[NT]	**140**	**81**	NA	NA
Silica (SiO2) (mg/L)	0.1	NSL	NSL	**8.8**	[NT]	**6.5**	[NT]	**8**	[NT]	**12**	**1**	1.1	**1.4**	**3.8**	[NT]	**2.6**	**2.4**	NA	NA
Phosphorus (mg/L)	0.05	NSL	NSL	<0.05	<0.05	<0.05	[NT]	<0.05	<0.05	<0.05	<0.05	[NT]	<0.05	<0.05	[NT]	<0.05	<0.05	NA	NA
Acidity (as CaCO3)	5	NSL	NSL	<5	<5	<5	[NT]	<5	[NT]	**250**	<5	[NT]	**5**	**32**	[NT]	**110**	**23**	NA	NA
Metals and Metalloids																			
Arsenic (As III)	1	100	24	<1	<1	<1	[NT]	<1	NA	**6**	<1	NA	<1	<1	NA	<1	1	<1	NA
Cadmium	0.1	20	0.2	<0.1	<0.1	<0.1	[NT]	**1.8**	NA	<0.1	<0.1	NA	**0.2**	**0.2**	NA	<0.1	**0.9**	<0.1	NA
Chromium (total)	1	500	3.3	1	1	<1	[NT]	1	NA	<1	<1	NA	<1	<1	NA	<1	<1	1	NA
Copper	1	20000	1.4	**7**	**8**	**6**	[NT]	**44**	NA	**1**	**96**	NA	**3**	1	NA	<1	**3**	**7**	NA
Lead	1	100	3.4	**8**	**8**	**3**	[NT]	**18**	NA	<1	<1	NA	<1	<1	NA	<1	<1	**8**	NA
Total Mercury (inorganic)	0.05	10	0.06	<0.05	[NT]	**0.09**	**0.09**	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA
Nickel	1	200	11	**4**	**4**	**5**	[NT]	**33**	NA	**14**	**50**	NA	**18**	**41**	NA	**7**	**28**	**4**	NA
Zinc	1	30000	8	**16**	**16**	**17**	[NT]	**410**	NA	**5**	**91**	NA	**140**	**75**	NA	**13**	**130**	**16**	NA
Aluminium	10	NSL	55	**6000**	**5900**	**1700**	[NT]	**3900**	NA	**10**	**410**	NA	**150**	40	NA	<10	50	NA	NA
Antimony	1	30	NSL	<1	<1	<1	[NT]	<1	NA	1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Barium	1	20000	NSL	**45**	**45**	**46**	[NT]	**110**	NA	**74**	**130**	NA	**140**	**140**	NA	**40**	**200**	NA	NA
Boron	20	40000	940	<20	<20	<20	[NT]	<20	NA	<20	<20	NA	<20	<20	NA	**20**	<20	NA	NA
Beryllium	0.05	600	NSL	**0.7**	**0.6**	<0.5	[NT]	**2**	NA	<0.5	**5**	NA	**2**	**1**	NA	<0.5	**0.9**	NA	NA
Cobalt	1	NSL	NSL	**4**	**4**	**5**	[NT]	**36**	NA	**5**	**56**	NA	**27**	**31**	NA	**8**	**31**	NA	NA
Iron	10	NSL	NSL	**2200**	**2200**	**10**	[NT]	**560**	NA	<10	30	NA	**3200**	**12000**	NA	**9300**	**6700**	NA	NA
Lithium	1	NSL	NSL	**4**	**4**	**2**	[NT]	**5**	NA	10	9	NA	**2**	**3**	NA	<1	**3**	NA	NA
Manganese	5	5000	1900	**47**	**48**	**33**	[NT]	**350**	NA	<5	**1800**	NA	**1500**	**890**	NA	**770**	**920**	NA	NA
Molybdenum	1	500	NSL	<1	<1	<1	[NT]	<1	NA	**18**	<1	NA	<1	<1	NA	<1	<1	NA	NA
Selenium	1	100	5	<1	<1	<1	[NT]	<1	NA	**2**	<1	NA	<1	<1	NA	<1	<1	NA	NA
Silver	1	1000	0.05	<1	<1	<1	[NT]	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Strontium	1	NSL	NSL	**8**	**9**	**11**	[NT]	**33**	NA	**180**	**65**	NA	**17**	**36**	NA	**210**	**35**	NA	NA
Uranium	0.5	200	NSL	**0.7**	**0.7**	**0.5**	[NT]	**8.5**	NA	**6.9**	**0.6**	NA	<0.5	<0.5	NA	<0.5	**0.5**	NA	NA
Vanadium	1	NSL	NSL	<1	<1	<1	[NT]	<1	NA	1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																			
Benzene	1	10	950	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	<1	<1
Toluene	1	8000	180	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	<1	<1
Ethylbenzene	1	3000	80	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	<1	<1
m+p-xylene	2	NSL	75	<2	<2	<2	NA	<2	NA	<2	<2	NA	<2	<2	NA	<2	<2	<2	<2
o-xylene	1	NSL	350	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	<1	<1
Total xylenes	2	6000	NSL	<2	<2	<2	NA	<2	NA	<2	<2	NA	<2	<2	NA	<2	<2	<2	<2
Total Recoverable Hydrocarbons (TRHs)																			
TRH F1	10	NSL	NSL	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	<10	<10
TRH F2	50	NSL	NSL	<50	<50	<50	NA	<50	NA	200	<50	NA	<50	<50	NA	<50	<50	<50	NA
TRH F3	100	NSL	NSL	<100	<100	<100	NA	<100	NA	<100	<100	NA	<100	<100	NA	<100	<100	<100	NA
TRH F4	100	NSL	NSL	<100	<100	<100	NA	<100	NA	<100	<100	NA	<100	<100	NA	<100	<100	<100	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs																			
Dichlorodifluoromethane	10	NSL	NSL	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Chloromethane	10	NSL	NSL	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Vinyl Chloride	10	3	100	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Bromomethane	10	NSL	NSL	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Chloroethane	10	NSL	NSL	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Trichlorofluoromethane	10	NSL	NSL	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
1,1-Dichloroethene	**1**	300	700	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Trans-1,2-dichloroethene	1	600	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1-dichloroethane	1	NSL	90	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Cis-1,2-dichloroethene	1	600	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Bromochloromethane	1	2500	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Chloroform	1		370	<1	<1	<1	NA	**1**	NA	**8**	<1	NA	**1**	<1	NA	<1	**2**	NA	NA
2,2-dichloropropane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dichloroethane	1	30	1900	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1,1-trichloroethane	1	NSL	270	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1-dichloropropene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Cyclohexane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Carbon tetrachloride	1	30	240	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Benzene	1	10	950	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Dibromomethane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dichloropropane	1	NSL	900	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Trichloroethene	1	NSL	330	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Bromodichloromethane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
trans-1,3-dichloropropene	1	1000	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
cis-1,3-dichloropropene	1	1000	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1,2-trichloroethane	1	NSL	6500	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Toluene	1	8000	180	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,3-dichloropropane	1	NSL	1100	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Dibromochloromethane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dibromoethane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Tetrachloroethene	1	500	70	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1,1,2-tetrachloroethane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Chlorobenzene	1	3000	55	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Ethylbenzene	1	3000	80	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Bromoform	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
m+p-xylene	2	NSL	75	<2	<2	<2	NA	<2	NA	<2	<2	NA	<2	<2	NA	<2	<2	NA	NA
Styrene	1	300	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1,2,2-tetrachloroethane	1	NSL	400	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
o-xylene	1	NSL	350	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2,3-trichloropropane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Isopropylbenzene	1	NSL	30	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Bromobenzene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
n-propyl benzene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
2-chlorotoluene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
4-chlorotoluene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,3,5-trimethyl benzene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Tert-butyl benzene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2,4-trimethyl benzene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,3-dichlorobenzene	1	200	260	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Sec-butyl benzene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,4-dichlorobenzene	1	400	60	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	2	NA	<1	<1	NA	NA
4-isopropyl toluene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dichlorobenzene	1	15000	160	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
n-butyl benzene	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dibromo-3-chloropropane	1	NSL	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2,4-trichlorobenzene	1	300	85	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2,3-trichlorobenzene	1	300	3	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Hexachlorobutadiene	1	7	NSL	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Naphthalene	0.2	NSL	16	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Acenaphthylene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	NSL	0.6	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Anthracene	0.1	NSL	0.01	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	NSL	1	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	NSL	<0.2	<0.2	<0.2	NA	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.1	0.1	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	NSL	<0.1	<0.1	<0.1	NA	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1	NA
Anions and Cations																			
Calcium (mg/L)	0.5	NSL	NSL	**2**	**2**	**3**	[NT]	**6.8**	[NT]	**36**	**13**	[NT]	**4**	**7.8**	[NT]	**38**	**10**	NA	NA
Potassium (mg/L)	0.5	NSL	NSL	**1**	**1**	**0.9**	[NT]	**1**	[NT]	**4**	**4**	[NT]	**1**	**5.4**	[NT]	**5.8**	**2**	NA	NA
Sodium (mg/L)	0.5	NSL	NSL	**120**	**120**	**70**	[NT]	**110**	[NT]	**110**	**140**	[NT]	**54**	**64**	[NT]	**68**	**53**	NA	NA
Magnesium (mg/L)	0.5	NSL	NSL	**14**	**14**	**5.6**	[NT]	**15**	[NT]	**24**	**30**	[NT]	**12**	**11**	[NT]	**11**	**13**	NA	NA
Hydroxide Alkalinity (as CaCO3) (mg/L)	5	NSL	NSL	<5	<5	<5	[NT]	<5	[NT]	<5	<5	[NT]	<5	<5	[NT]	<5	<5	NA	NA
Bicarbonate Alkalinity (as CaCO3) (mg/L)	5	NSL	NSL	<5	<5	<5	[NT]	<5	[NT]	**250**	<5	[NT]	**5**	**32**	[NT]	**110**	**23**	NA	NA
Carbonate Alkalinity (as CaCO3) (mg/L)	5	NSL	NSL	<5	<5	<5	[NT]	<5	[NT]	<5	<5	[NT]	<5	<5	[NT]	<5	<5	NA	NA
Total Alkalinity (as CaCO3) (mg/L)	5	NSL	NSL	<5	<5	<5	[NT]	<5	[NT]	**250**	<5	[NT]	**5**	**32**	[NT]	**110**	**23**	NA	NA
Sulphate (mg/L)	1	NSL	NSL	**81**	**94**	**71**	[NT]	**45**	[NT]	**34**	**130**	[NT]	**35**	**38**	[NT]	**110**	**14**	NA	NA
Chloride (mg/L)	1	NSL	NSL	**240**	**240**	**85**	[NT]	**250**	[NT]	**120**	**290**	[NT]	**110**	**120**	[NT]	**83**	**130**	NA	NA
Ionic Balance (%)	-	NSL	NSL	-13	-15	-3	[NT]	-11	[NT]	-1	-6	[NT]	-5	-7	[NT]	-7	-4	NA	NA
Sodium Adsorption Ratio (SAR)	0.01	NSL	NSL	**6.6**	**6.6**	**5.6**	[NT]	**5.2**	[NT]	**3.5**	**5**	[NT]	**3.1**	**3.4**	[NT]	**2.5**	**2.6**	NA	NA
Nutrients																			
Ammonia (mg/L) (pH dependent)	0.005	NSL	0.9	**0.008**	[NT]	<0.005	NA	<0.005	<0.005	<0.005	**0.02**	[NT]	**0.008**	**0.56**	[NT]	0.88	0.01	NA	NA
Nitrate (mg/L)	0.005	500000	NSL	<0.005	[NT]	0.059	NA	<0.005	<0.005	0.02	<0.005	[NT]	0.007	0.008	[NT]	<0.005	<0.005	NA	NA
Nitrite (mg/L)	0.005	30000	NSL	<0.005	[NT]	<0.005	NA	<0.005	<0.005	<0.005	<0.005	[NT]	<0.005	<0.005	[NT]	<0.005	<0.005	NA	NA
Nitrogen Oxides (NOX) (mg/L)	0.005	NSL	NSL	<0.005	[NT]	0.059	NA	<0.005	<0.005	0.02	<0.005	[NT]	0.008	0.009	[NT]	<0.005	0.006	NA	NA
Total Nitrogen (mg/L)	0.1	NSL	NSL	**0.2**	**0.2**	<0.1	NA	**0.7**	[NT]	<0.1	<0.1	[NT]	**5.3**	**1.1**	[NT]	**1**	<0.1	NA	NA
Phosphate (mg/L)	0.005	NSL	NSL	<0.005	[NT]	<0.005	NA	0.009	<0.005	<0.005	<0.005	[NT]	<0.005	<0.005	[NT]	<0.005	<0.005	NA	NA
Microbiological Organisms																			
Faecal Coliforms (MPN/100mL)	1	NA	NSL	<10	NA	<100	NA	<10	NA	<100	<1,000 NBO	NA	<1,000	<1,000	NA	<100	<100	NA	NA
E Coli (MPN/100mL)	1	NA	NSL	<10	NA	<100	NA	<10	NA	<100	<1,000 NBO	NA	<1,000	<1,000	NA	<100	<100	NA	NA

Concentration above the SAC	**Bold**
Positive result	**Bold**
GIL >PQL	Red
Draft GIL	Orange

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TABLE G2
GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	SAMPLES															
					MW101	MW101 - [LAB_DUP]	MW102	MW102 - [LAB_DUP]	MW103	MW103 - [LAB_DUP]	MW104	MW105	MW105 - [LAB_DUP]	MW106	MW107	MW107 - [LAB_DUP]	MW108	MW109	GWDUP1	GWDUP1 - [LAB_DUP]
Total Recoverable Hydrocarbons (TRH)																				
C_6-C_9 Aliphatics (assessed using F1)	10	-	100	-	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	<10	<10
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	100	-	<50	<50	<50	NA	<50	NA	**200**	<50	NA	<50	<50	NA	<50	<50	<50	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																				
Benzene	1	1	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	<1	<1
Toluene	1	800	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	<1	<1
Ethylbenzene	1	300	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	<1	<1
Total xylenes	2	600	-	-	<2	<2	<2	NA	<2	NA	<2	<2	NA	<2	<2	NA	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons (PAHs)																				
Naphthalene	1	-	-	6.1	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	<1	<1
Volatile Organic Compounds (VOCs), including chlorinated VOCs																				
Dichlorodifluoromethane	10	-	-	-	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Chloromethane	10	-	-	-	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Vinyl Chloride	10	0.3	-	-	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Bromomethane	10	-	-	-	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Chloroethane	10	-	-	-	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
Trichlorofluoromethane	10	-	-	-	<10	<10	<10	NA	<10	NA	<10	<10	NA	<10	<10	NA	<10	<10	NA	NA
1,1-Dichloroethene	1	30	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Trans-1,2-dichloroethene	1	60	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1-dichloroethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Cis-1,2-dichloroethene	1	60	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Bromochloromethane	1	250	-	-	<1	<1	<1	NA	**<1**	NA	**<1**	<1	NA	**<1**	<1	NA	<1	**<1**	NA	NA
Chloroform	1		-	-	<1	<1	<1	NA	**1**	NA	**8**	<1	NA	**1**	<1	NA	<1	**2**	NA	NA
2,2-dichloropropane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dichloroethane	1	3	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1,1-trichloroethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1-dichloropropene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Cyclohexane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Carbon tetrachloride	1	3	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Benzene	1	1	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Dibromomethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dichloropropane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Trichloroethene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Bromodichloromethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
trans-1,3-dichloropropene	1	100	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
cis-1,3-dichloropropene	1	100	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1,2-trichloroethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Toluene	1	800	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,3-dichloropropane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Dibromochloromethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dibromoethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Tetrachloroethene	1	50	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1,1,2-tetrachloroethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Chlorobenzene	1	300	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Ethylbenzene	1	300	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Bromoform	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
m+p-xylene	2	-	-	-	<2	<2	<2	NA	<2	NA	<2	<2	NA	<2	<2	NA	<2	<2	NA	NA
Styrene	1	30	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,1,2,2-tetrachloroethane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
o-xylene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2,3-trichloropropane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Isopropylbenzene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Bromobenzene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
n-propyl benzene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
2-chlorotoluene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
4-chlorotoluene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,3,5-trimethyl benzene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Tert-butyl benzene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2,4-trimethyl benzene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,3-dichlorobenzene	1	20	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Sec-butyl benzene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,4-dichlorobenzene	1	40	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	**2**	NA	<1	<1	NA	NA
4-isopropyl toluene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dichlorobenzene	1	1500	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
n-butyl benzene	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2-dibromo-3-chloropropane	1	-	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2,4-trichlorobenzene	1	30	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
1,2,3-trichlorobenzene	1		-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA
Hexachlorobutadiene	1	7	-	-	<1	<1	<1	NA	<1	NA	<1	<1	NA	<1	<1	NA	<1	<1	NA	NA

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

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TABLE Q1
GROUNDWATER QA/QC SUMMARY

		Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	Trans-1,2-dichloroethene	1,1-dichloroethane	Cis-1,2-dichloroethene	Bromochloromethane	Chloroform	2,2-dichloropropane	1,2-dichloroethane	1,1,1-trichloroethane	1,1-dichloropropene	Cyclohexane	Carbon tetrachloride	Benzene	Dibromomethane	1,2-dichloropropane	Trichloroethene	Bromodichloromethane	trans-1,3-dichloropropene	cis-1,3-dichloropropene	1,1,2-trichloroethane	Toluene	1,3-dichloropropane	Dibromochloromethane	1,2-dibromoethane	Tetrachloroethene	1,1,1,2-tetrachloroethane	Chlorobenzene	Ethylbenzene	Bromoform	m+p-xylene	Styrene	1,1,2,2-tetrachloroethane	o-xylene	1,2,3-trichloropropane	Isopropylbenzene	Bromobenzene	n-propyl benzene	2-chlorotoluene	4-chlorotoluene	1,3,5-trimethyl benzene	Tert-butyl benzene	1,2,4-trimethyl benzene	1,3-dichlorobenzene	Sec-butyl benzene	1,4-dichlorobenzene	4-isopropyl toluene	1,2-dichlorobenzene	n-butyl benzene	1,2-dibromo-3-chloropropane	1,2,4-trichlorobenzene	Hexachlorobutadiene	1,2,3-trichlorobenzene
	PQL Envirolab SYD	*10*	*10*	*10*	*10*	*10*	*10*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*10*	*10*	*10*	*10*	*10*	*10*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Intra	MW101	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	GWDUP1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

		TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene	Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD	*10*	*50*	*100*	*100*	*1*	*1*	*1*	*2*	*1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
	PQL Envirolab VIC	*10*	*50*	*100*	*100*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
Intra	MW101	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	1	7	8	<0.05	4	16
laboratory	GWDUP1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	1	7	8	<0.05	4	16
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	1	7	8	nc	4	16
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	0%	0%	nc	0%	0%
Trip	TS1	-	-	-	-	116%	114%	113%	111%	113%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Spike	29/01/2026																																

Result outside of QA/QC acceptance criteria Value

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Appendix C: Borehole Logs

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BOREHOLE LOG

Borehole No. 101

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~104.5 m

Date: 15/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									-	ASPHALTIC CONCRETE: 30mm.t FILL: Sandy silty clay, low plasticity, orange brown and yellow brown, fine to medium grained sand, with fine to coarse grained ironstone gravel, trace of root fibres.	w<PL			
					N = 17 6,8,9	104			CI	Silty sandy CLAY: medium plasticity, yellow brown and red brown, fine grained sand, with fine to medium grained ironstone gravel, trace of root fibres.	w<PL	Hd	>600 600 600	RESIDUAL
					N > 16 10,16/ 150mm REFUSAL	103	1		-	Extremely Weathered sandstone: silty sandy CLAY, low plasticity, light grey and red brown, fine to medium grained sand, with fine to medium grained ironstone gravel.	XW	Hd	>600 >600	HAWKESBURY SANDSTONE
						102	2			SANDSTONE: fine to medium grained, light grey and red brown. REFER TO CORED BOREHOLE LOG	MW	M		MODERATE 'TC' BIT RESISTANCE GROUNDWATER MONITORING WELL INSTALLED TO 4.1m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.6m TO 4.1m. CASING 0.05m TO 2.6m. 2mm SAND FILTER PACK 2.6m TO 4.1m. BENTONITE SEAL 1.6m TO 2.6m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER. TWIN GROUNDWATER MONITORING WELL INSTALLED TO 2.5m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.5m TO 2.5m. CASING 0.05m TO 0.5m. 2mm SAND FILTER PACK 0.5m TO 2.5m. BENTONITE SEAL 0.05m TO 0.5m. COMPLETED WITH A CONCRETED GATIC COVER.
						101	3							
						100	4							
						99	5							
						98	6							

JK 9.02.4 LIB:GLB Log JK AUGERHOLE - MASTER 34446A KILLARA.GPJ <<DrawingFile>> 30/04/2026 09:01 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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CORED BOREHOLE LOG

Borehole No. 101

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~104.5 m

Date: 15/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		102			START CORING AT 2.56m						
100% RETURN		101	3		SANDSTONE: fine to medium grained, light grey and yellow brown, with an occasional red brown band, bedded at 0-20°.	MW	L - M	0.60 0.20 0.30 0.40 0.60		(2.90m) J, 60°, P, R, Cn (3.69m) Be, 0°, P, R, Fe Ct (3.77m) Be x 2, 0°, P, R, Fe Ct	Hawkesbury Sandstone
		100	5		END OF BOREHOLE AT 4.10 m						
		99	6								
		98	7								
		97	8								
		96									

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BOREHOLE LOG

Borehole No. 102

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~105.2 m

Date: 16/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING						105				ASPHALTIC CONCRETE: 75mm.t				
									-	FILL: Gravelly sand, fine to medium grained, grey, fine to medium grained igneous gravel.	M			
					N = 15 5,8,7				CI-CH	FILL: Silty sand, fine to medium grained, orange brown, trace of fine to coarse grained ironstone gravel.	w<PL	Hd	500 520 500	RESIDUAL
							1		CI	Silty sandy CLAY: medium to high plasticity, yellow brown and red brown, fine to medium grained sand, trace of fine to medium grained ironstone gravel.			>600 600 600	
						104				Silty sandy CLAY: medium plasticity, light grey and red brown, fine to medium grained sand.				
					N=SPT 11/ 100mm REFUSAL				-	SANDSTONE: fine to medium grained, red brown.	MW	M		HAWKESBURY SANDSTONE
							2			SANDSTONE: fine to medium grained, light grey.	SW	M - H		MODERATE 'TC' BIT RESISTANCE
						103				REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 4.82m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.82m TO 4.82m. CASING 0.05m TO 1.82m. 2mm SAND FILTER PACK 1.7m TO 4.82m. BENTONITE SEAL 0.3m TO 1.7m. COMPLETED WITH A CONCRETED GATIC COVER.
						102	3							
						101	4							
						100	5							
						99	6							

JK 9.02.4 LIB:GLB Log JK AUGERHOLE - MASTER 34446A KILLARA.GPJ <<DrawingFile>> 30/04/2026 09:01 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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CORED BOREHOLE LOG

Borehole No. 102

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~105.2 m

Date: 16/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		103			START CORING AT 2.60m						
100% RETURN		102	3		SANDSTONE: fine to medium grained, banded orange brown and light grey, with occasional dark brown seams, bedded at 0-20°.	SW	M	0.60, 0.70, 0.60			Hawkesbury Sandstone
						MW					
		101	4			FR		0.90, 0.70		(3.50m) Be, 5°, P, R, Cn (3.55m) Be, 10°, P, R, Clay Ct (3.69m) J, 70°, Un, R, Cn (3.74m) J, 50°, Un, Po, Cn	
						MW		0.50		(4.32m) Be, 15°, P, R, Cb Ct (4.55m) Be, 20°, P, S, Cn, Shear displacement 5mm (4.71m) Be, 0°, P, R, Clay Ct	
		100	5		END OF BOREHOLE AT 4.82 m						
		99	6								
		98	7								
		97	8								

JK 9.02.4 LIB:GLB Log JK CORED BOREHOLE - MASTER 34446A KILLARA.GPJ <<DrawingFile>> 30/04/2026 10:12 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0.2018-03-20

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BOREHOLE LOG

Borehole No. 103

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~98.8 m

Date: 15/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE: 40mm.t				
					N = 9 5,6,3	98	1		-	FILL: Silty sand, fine to medium grained, light grey and yellow brown, trace of fine to medium grained sandstone gravel, and ash.	M			APPEARS POORLY COMPACTED
										FILL: Silty sandy clay, low plasticity, orange brown and dark brown, fine to medium grained sand, trace of fine to coarse grained igneous and sandstone gravel, and concrete fragments.	w>PL			
					N=SPT 6/ 150mm REFUSAL	97	2		-	Extremely Weathered sandstone: silty sandy CLAY, low plasticity, light grey, fine to medium grained sand, with occasional very low strength seams.	XW	Hd		HAWKESBURY SANDSTONE
										SANDSTONE: fine to medium grained, light grey and dark grey.	MW	L - M		LOW 'TC' BIT RESISTANCE
						96	3			REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 10.04m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.60m TO 10.04m. CASING 0.05m TO 2.60m. 2mm SAND FILTER PACK 2.60m TO 10.04m. BENTONITE SEAL 0.15m TO 2.60m. COMPLETED WITH A CONCRETED GATIC COVER.
						95	4							
						94	5							
						93	6							
						92								

JK 9.02.4 LIB:GLB Log JK AUGERHOLE - MASTER 34446A KILLARA.GPJ <<DrawingFile>> 30/04/2026 09:01 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: JK 9.02.4 2019-05-31 Prj: JK 9.01.0 2018-03-20

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CORED BOREHOLE LOG

Borehole No. 103 **2 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~98.8 m

Date: 15/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 2.60m						
		96	3		SANDSTONE: fine to medium grained, light grey, with dark grey laminae and occasional orange brown staining, bedded at 0-20°.	SW	L - M	0.40, 0.40, 0.10, 0.40, 0.30, 0.40		(2.77m) Be, 0°, P, R, Clay FILLED, 2 mm.t (3.32m) XWS, 0°, 20 mm.t	Hawkesbury Sandstone
		95	4								
					NO CORE 0.10m					~~(4.74m) XWS, 0°, 55 mm.t~~	
		94	5		SANDSTONE: fine to medium grained, light grey, with dark grey laminae and occasional orange brown staining, bedded at 0-20°.	SW	L - M	0.60, 0.30, 0.20		(5.18m) Be, 15°, P, R, Fe Ct (5.21m) Be, 15°, P, R, Fe Ct	Hawkesbury Sandstone
90% RETURN		93	6				H	1.0, 1.5		(5.80m) XWS, 0°, 42 mm.t (6.25m) XWS, 10°, 70 mm.t	
					as above, but with no orange brown staining.	FR	M	0.40, 0.80, 0.50, 0.70		(7.91-8.30m) J, 85°, P, R, Cn	
		92	7								
		91	8					0.70		(8.52-8.78m) J, 85°, P, R, Cn	
		90						0.80			

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CORED BOREHOLE LOG

Borehole No. 103 **3 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~98.8 m

Date: 15/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL -0.1, L -0.3, M -1, H -3, VH -10, EH	DEFECT DETAILS SPACING (mm) 600, 200, 60, 20	DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
90% RETURN		89	10		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, trace of carbonaceous lenses, bedded at 0-20°.	FR	H	1.1 1.1			Hawkesbury Sandstone
		88	11		END OF BOREHOLE AT 10.04 m						
		87	12								
		86	13								
		85	14								
		84	15								
		83									

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BOREHOLE LOG

Borehole No. 104

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~106.2 m

Date: 16/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									-	ASPHALTIC CONCRETE: 50mm.t	M			
						106			CL	FILL: Gravelly sand, fine to medium grained, grey, fine to medium grained igneous gravel.	w<PL	VSt		RESIDUAL
					N > 7 7,7/ 100mm REFUSAL					Silty sandy CLAY: low plasticity, red brown, fine to medium grained sand, trace of fine to medium grained ironstone gravel.			300 320 310	
							1		-	as above, but light grey.	MW	M		HAWKESBURY SANDSTONE
						105				SANDSTONE: fine to medium grained, red brown.				MODERATE 'TC' BIT RESISTANCE
							2			SANDSTONE: fine to medium grained, yellow brown.				GROUNDWATER MONITORING WELL INSTALLED TO 10.12m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 4.12m TO 10.12m. CASING 0.05m TO 4.12m. 2mm SAND FILTER PACK 4.10m TO 10.12m. BENTONITE SEAL 0.30m TO 4.10m. COMPLETED WITH A CONCRETED GATIC COVER.
						104				REFER TO CORED BOREHOLE LOG				
							3							
						103								
							4							
						102								
							5							
						101								
							6							
						100								

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CORED BOREHOLE LOG

Borehole No. 104

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~106.2 m

Date: 16/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 1.16m						
100% RETURN		105	1		SANDSTONE: fine to medium grained, banded yellow brown, dark brown and light grey, bedded at 0-20°.	MW	M	0.70, 0.50, 1.0, 0.30			Hawkesbury Sandstone
		104	2								
		103	3		SANDSTONE: fine to medium grained, light grey, with dark grey laminae and occasional carbonaceous lenses, bedded at 0-15°.	FR		0.80, 1.0, 0.90		(3.42m) Be, 5°, P, R, Clay Ct	
		102	4							(4.07m) Be, 0°, P, R, Clay Ct; (4.18m) Be, 5°, P, R, Clay Ct	
		101	5				M - H	0.60, 1.1, 1.2, 0.70			
		100	6					0.90, 1.0, 0.90, 1.6			
		99	7					1.6, 1.0			

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CORED BOREHOLE LOG

Borehole No. 104 **3 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~106.2 m

Date: 16/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
100% RETURN		98			SANDSTONE: fine to medium grained, light grey, with dark grey laminae and occasional carbonaceous lenses, bedded at 0-15°. *(continued)*	FR	M - H	1.1; 0.80			Hawkesbury Sandstone
			9		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, occasional carbonaceous lenses and siltstone bands, bedded at 0-15°.		H	1.1; 1.2; 1.1		(9.36m) Be, 0°, P, R, Cb Ct	
		97									
			10								
		96			END OF BOREHOLE AT 10.12 m						
			11								
		95									
			12								
		94									
			13								
		93									
			14								
		92									

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BOREHOLE LOG

Borehole No. 105

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~106.6 m

Date: 18/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING				■					-	ASPHALTIC CONCRETE: 50mm.t	M			
				■					CL	FILL: Gravelly sand, fine to medium grained, dark brown, fine to medium grained igneous gravel.	w<PL	VSt		RESIDUAL
				■	N=SPT 9/ 150mm REFUSAL	106			-	Silty sandy CLAY: low plasticity, red brown and light grey, fine to medium grained sand.	XW	Hd		HAWKESBURY SANDSTONE
							1			Extremely Weathered sandstone: silty CLAY, low plasticity, light grey and red brown, with fine to medium grained sand, trace of fine to medium grained ironstone gravel.	MW	M		MODERATE 'TC' BIT RESISTANCE
						105	2			SANDSTONE: fine to medium grained, red brown.				GROUNDWATER MONITORING WELL INSTALLED TO 10.52m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 4.52m TO 10.52m. CASING 0.05m TO 4.52m. 2mm SAND FILTER PACK 4.50m TO 10.52m. BENTONITE SEAL 0.30m TO 4.50m. COMPLETED WITH A CONCRETED GATIC COVER.
						104	3			REFER TO CORED BOREHOLE LOG				
						103	4							
						102	5							
						101	6							
						100								

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CORED BOREHOLE LOG

Borehole No. 105

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~106.6 m

Date: 18/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	SPACING (mm)	DEFECT DETAILS DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 1.15m						
100% RETURN		105	2		SANDSTONE: fine to medium grained, yellow brown and light grey, with occasional brown bands, bedded at 0-5°.	MW	M	0.30 0.40 0.40		(1.56m) Be, 5°, P, R, Cn (2.16m) Be, 0°, P, R, Fe Ct (2.17m) Be, 0°, P, R, Fe Ct	Hawkesbury Sandstone
		104	3		NO CORE 0.08m SANDSTONE: fine to medium grained, yellow brown and light grey, with occasional brown bands, bedded at 0-5°.	MW	L - M	0.30 0.30 0.40		(2.43m) Be, 0°, P, S, Cn (2.79m) J, 40°, P, R, Cn (3.12m) J, 45°, P, R, Fe Sn (3.34m) Be, 0°, P, S, Fe Sn (3.60m) Be, 0°, P, S, Fe Sn	Hawkesbury Sandstone
		103	4		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, occasional carbonaceous lenses and siltstone bands, bedded at 0-20°.	FR	M	0.50 0.50			
		102	5					0.90 0.90		(4.71m) J, 40°, P, R, Clay FILLED, 2 mm.t	
		101	6					0.80 0.80			
		100	7				M - H	1.0 0.80		(7.32m) Be, 5°, Un, R, Cn	
		99						1.1			

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CORED BOREHOLE LOG

Borehole No. 105 **3 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~106.6 m

Date: 18/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
100% RETURN		98	9		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, occasional carbonaceous lenses and siltstone bands, bedded at 0-20°. *(continued)*	FR	M - H	0.90; 1.0; 0.80		(8.70m) Be, 0°, P, R, Cb Ct, & Jh x 2, 30°, P	Hawkesbury Sandstone
		97	10				H	2.2; 1.4; 1.2		(9.72m) Be, 0°, P, R, Cb Vn	
		96	11		END OF BOREHOLE AT 10.52 m						
		95	12								
		94	13								
		93	14								
		92									

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BOREHOLE LOG

Borehole No. 106

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~101.6 m

Date: 19/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE: 90mm.t				
									-	FILL: Silty sandy clay, low plasticity, dark grey and orange brown, fine to medium grained sand, trace of fine to medium grained igneous and sandstone gravel.	w<PL M			APPEARS POORLY COMPACTED
					N > 2 2,2/ 150mm REFUSAL	101				FILL: Silty sand, fine to medium grained, yellow brown, trace of fine to coarse grained ironstone gravel.				
									CL		w<PL	Hd		RESIDUAL
							1		-	Silty sandy CLAY: low plasticity, red brown, fine to medium grained sand, trace of fine to coarse grained ironstone gravel.	MW	M		HAWKESBURY SANDSTONE
										SANDSTONE: fine to medium grained, red brown.				MODERATE 'TC' BIT RESISTANCE
						100	2			REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 4.45m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.45m TO 4.45m. CASING 0.05m TO 4.45m. 2mm SAND FILTER PACK 1.45m TO 4.45m. BENTONITE SEAL 0.30m TO 1.45m. COMPLETED WITH A CONCRETED GATIC COVER.
						99	3							
						98	4							
						97	5							
						96	6							
						95								

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CORED BOREHOLE LOG

Borehole No. 106

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~101.6 m

Date: 19/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					START CORING AT 1.20m						
100% RETURN		100	2		SANDSTONE: fine to medium grained, banded yellow brown, light grey and brown, with occasional dark grey laminae, bedded at 0-15°.	MW	M	0.80, 0.80		(1.81m) Be, 0°, P, R, Fe Sn	Hawkesbury Sandstone
		99	3				M - H	1.4, 0.90, 0.70, 1.0		(2.12m) Be, 0°, P, R, Fe Ct; (2.35m) Be, 15°, P, R, Cn; (2.46m) Be, 0°, P, R, Fe Ct; (2.53m) Be, 0°, P, R, Fe Ct; (2.65m) Be, 5°, P, S, Fe Ct; (2.66m) Be, 5°, P, S, Fe Ct	
		98	4		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°.	FR	M	0.80, 0.40, 0.40		(4.20m) XWS, 0°, 30 mm.t	
		97	5		END OF BOREHOLE AT 4.46 m						
		96	6								
		95	7								
		94									

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BOREHOLE LOG

Borehole No. 107

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~99.4 m

Date: 18/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE: 50mm.t				
						99			-	FILL: Silty sandy clay, low plasticity, dark brown and yellow brown, fine to medium grained sand, trace of fine to medium grained igneous and ironstone gravel.	w<PL			APPEARS POORLY COMPACTED
					N = 9 3,2,7									
							1		-	Extremely Weathered sandstone: silty CLAY, low plasticity, red brown, with fine to medium grained sand.	XW	Hd		HAWKESBURY SANDSTONE
											HW	VL - L		VERY LOW 'TC' BIT RESISTANCE
										SANDSTONE: fine to medium grained, yellow brown and light grey.	MW	L - M		MODERATE RESISTANCE
						98				REFER TO CORED BOREHOLE LOG				GROUNDWATER MONITORING WELL INSTALLED TO 8.47m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.70m TO 8.47m. CASING 0.05m TO 1.70m. 2mm SAND FILTER PACK 1.70m TO 8.47m. BENTONITE SEAL 0.30m TO 1.70m. COMPLETED WITH A CONCRETED GATIC COVER.
							2							
						97								
							3							TWIN GROUNDWATER MONITORING WELL INSTALLED TO 1.20m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.50m TO 1.20m. CASING 0.05m TO 0.50m. 2mm SAND FILTER PACK 0.50m TO 1.20m. BENTONITE SEAL 0.05m TO 0.50m. COMPLETED WITH A CONCRETED GATIC COVER.
						96								
							4							
						95								
							5							
						94								
							6							
						93								

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CORED BOREHOLE LOG

Borehole No. 107 **2 / 3**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.4 m

Date: 18/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL 0.1 L 0.3 M 1 H 3 VH 10 EH	DEFECT DETAILS SPACING (mm) 600 200 60 20 DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 1.24m					
100% RETURN		98	1		SANDSTONE: fine to medium grained, banded yellow brown, light grey and brown, with dark grey and brown laminae, bedded at 0-20°.	MW	L - M	0.20	(1.44m) Be, 0°, P, R, Fe Ct (1.45m) Be, 0°, P, R, Fe Ct (1.57m) XWS, 0°, 40 mm.t	Hawkesbury Sandstone
							M - H	0.70		
			2					0.60		
		97							(2.49m) Be, 0°, P, R, Clay Ct	
								0.80		
			3						(2.90m) XWS, 10°, 40 mm.t	
		96						1.6	(3.29m) Be, 0°, P, S, Clay Ct	
									(3.79m) Be, 0°, P, R, Cn	
			4		SANDSTONE: fine to medium grained, orange brown and light grey, with dark grey laminae, bedded at 0-20°.	SW		0.60		
		95						1.1		
								1.2		
			5					1.2		
		94							(5.73m) Be, 0°, P, S, Clay Ct	
			6					1.0		
								0.90		
		93								
			7		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°.	FR	M	0.50		
								1.0	(7.23m) Be, 0°, P, S, Cn	
		92						0.80		

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CORED BOREHOLE LOG

Borehole No. 107

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.4 m

Date: 18/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL 0.1 L 0.3 M 1 H 3 VH 10 EH	DEFECT DETAILS SPACING (mm) 600 200 60 20 DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
		91			SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°. *(continued)*	FR	M	0.80		
		90	9		END OF BOREHOLE AT 8.47 m					
		89	10							
		88	11							
		87	12							
		86	13							
		85	14							

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BOREHOLE LOG

Borehole No. 108

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~102.2 m

Date: 16/12/25 TO 17/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING										ASPHALTIC CONCRETE: 90mm.t				
						102			-	FILL: Silty sandy clay, low plasticity, brown, grey and red brown, fine to medium grained sand, trace of fine to medium grained sandstone and igneous gravel, and concrete fragments.	w<PL			
					N = 9 6,5,4				CL		w<PL	Hd	500 480 500	RESIDUAL
							1			Silty sandy CLAY: low plasticity, light grey and yellow brown, fine to medium grained sand.				
						101			-	as above, but red brown.	MW	L - M		HAWKESBURY SANDSTONE
										SANDSTONE: fine to medium grained, red brown. REFER TO CORED BOREHOLE LOG				MODERATE 'TC' BIT RESISTANCE GROUNDWATER MONITORING WELL INSTALLED TO 5.03m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.03m TO 5.03m. CASING 0.05m TO 2.03m. 2mm SAND FILTER PACK 2.00m TO 5.03m. BENTONITE SEAL 0.30m TO 2.00m. COMPLETED WITH A CONCRETED GATIC COVER. TWIN GROUNDWATER MONITORING WELL INSTALLED TO 1.20m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 0.50m TO 1.20m. CASING 0.05m TO 0.50m. 2mm SAND FILTER PACK 0.50m TO 1.20m. BENTONITE SEAL 0.05m TO 0.50m. COMPLETED WITH A CONCRETED GATIC COVER.
						100	2							
						99	3							
						98	4							
						97	5							
						96	6							

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CORED BOREHOLE LOG

Borehole No. 108 **2 / 2**

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~102.2 m

Date: 16/12/25 TO 17/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	DEFECT DETAILS: SPACING (mm)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
		101			START CORING AT 1.23m						
100% RETURN		101	0		SANDSTONE: fine to medium grained, banded yellow brown, light grey and brown, bedded at 0-15°.	MW	L - M	0.20			Hawkesbury Sandstone
							M	0.60		(1.85m) Be, 0°, Un, R, Cn	
		100	2					0.40			
								0.50		(2.77m) Be, 0°, P, R, Fe Ct (2.83m) J, 40°, C, R, Cn (2.85m) J, 30°, P, R, Fe Ct (2.91m) Jh, 40°, P	
		99	3		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°.	FR	M - H	0.50		(3.14m) Be, 0°, P, S, Fe Ct	
								0.90			
		98	4					1.2			
			5					0.90			
		97			END OF BOREHOLE AT 5.03 m						
		96	6								
		95	7								

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BOREHOLE LOG

Borehole No. 109

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Method:** SPIRAL AUGER **R.L. Surface:** ~99.0 m

Date: 17/12/25 **Datum:** AHD

Plant Type: JK310 **Logged/Checked By:** A.T.L./A.J.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	RL (m AHD)	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel Density	Hand Penetrometer Readings (kPa)	Remarks
DRY ON COMPLETION OF AUGERING									-	ASPHALTIC CONCRETE: 40mm.t	M			APPEARS POORLY COMPACTED
										FILL: Gravelly sand, fine to medium grained, grey, fine to medium grained igneous gravel.	w>PL			
					N = 5 2,1,4					FILL: Silty sandy clay, low plasticity, brown and red brown, fine to medium grained sand, trace of fine to coarse grained ironstone gravel, and ash.				
						98	1		-	SANDSTONE: fine to medium grained, yellow brown.	MW	L		HAWKESBURY SANDSTONE
										REFER TO CORED BOREHOLE LOG				MODERATE 'TC' BIT RESISTANCE
						97	2							GROUNDWATER MONITORING WELL INSTALLED TO 15.19m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.73m TO 15.19m. CASING 0.05m TO 1.73m. 2mm SAND FILTER PACK 1.73m TO 15.19m. BENTONITE SEAL 0.30m TO 1.73m. COMPLETED WITH A CONCRETED GATIC COVER.
						96	3							
						95	4							
						94	5							
						93	6							

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CORED BOREHOLE LOG

Borehole No. 109

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.0 m

Date: 17/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$	SPACING (mm)	DEFECT DETAILS DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
					START CORING AT 1.23m						
50% RETURN		97	2		SANDSTONE: fine to medium grained, banded orange brown, red brown and light grey, bedded at 0-20°.	MW	L - M	0.20 0.30		(1.38m) Be, 5°, P, R, Clay FILLED, 10 mm.t (1.57m) Be, 5°, P, R, Cn	Hawkesbury Sandstone
							M	0.40 0.70		(2.03m) Be, 10°, P, R, Clay FILLED, 15 mm.t (2.44m) CS, 5°, 20 mm.t (2.80m) Be, 5°, P, S, Fe Sn (2.85m) J, 45°, Ir, R, Fe Sn (2.96m) CS, 0°, 60 mm.t	
		96	3		NO CORE 0.06m			0.60			
0% RETURN					SANDSTONE: fine to medium grained, banded orange brown, red brown and light grey, bedded at 0-20°.	MW	M - H	1.0 1.1 2.3		(3.17m) CS, 0°, 10 mm.t	
		95	4					0.60		(4.47m) Be, 0°, P, S, Cn	
					SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°.	FR	M	0.40 0.70 0.90			Hawkesbury Sandstone
		94	5								
		93	6					0.70			
							M - H	1.0 0.80			
		92	7					1.2 0.70			

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CORED BOREHOLE LOG

Borehole No. 109

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.0 m

Date: 17/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ VL 0.1 L 0.3 M 1 H 3 VH 10 EH	SPACING (mm) 600 200 60 20	DEFECT DETAILS DESCRIPTION Type, orientation, defect shape and roughness, defect coatings and seams, openness and thickness Specific / General	Formation
0% RETURN		90	9		SANDSTONE: fine to medium grained, light grey, with dark grey laminae, bedded at 0-15°. *(continued)*	FR	M - H	0.70 0.70		(8.35m) Be, 0°, P, S, Clay Vn	Hawkesbury Sandstone
							H	1.2 1.3			
		89	10					1.6 1.2			
		88	11					1.4		(11.28m) Be, 0°, P, S, Clay Vn	
								1.9 2.1			
		87	12					1.5 1.7			
		86	13		SANDSTONE: fine to medium grained, grey, with dark grey laminae and occasional siltstone bands, bedded at 0-10°.		M - H	0.90 0.80		(13.43m) Be, 10°, P, R, Clay Vn	
								1.5			
		85	14					0.70			
								0.90			
							H	1.6			

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CORED BOREHOLE LOG

Borehole No. 109

Client: LEVANDE PTY LTD

Project: PROPOSED REDEVELOPMENT

Location: LOURDES RETIREMENT VILLAGE, 95 STANHOPE ROAD, KILLARA, NSW

Job No.: 34446A3 **Core Size:** NMLC **R.L. Surface:** ~99.0 m

Date: 17/12/25 **Inclination:** VERTICAL **Datum:** AHD

Plant Type: JK310 **Bearing:** N/A **Logged/Checked By:** A.T.L./A.J.

Water Loss\Level	Barrel Lift	RL (m AHD)	Depth (m)	Graphic Log	CORE DESCRIPTION: Rock Type, grain characteristics, colour, texture and fabric, features, inclusions and minor components	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_s(50)$ (VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	DEFECT DETAILS: SPACING (mm) (600, 200, 60, 20)	DEFECT DETAILS: DESCRIPTION (Specific / General)	Formation
					SANDSTONE: fine to medium grained, grey, with dark grey laminae and occasional siltstone seams, bedded at 0-10°.	FR	H	1.9			
					END OF BOREHOLE AT 15.19 m						
		83	16								
		82	17								
		81	18								
		80	19								
		79	20								
		78	21								

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ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the environmental report in regard to classification methods, field procedures and certain matters relating to the logging of soil and rock. Not all notes are necessarily relevant to all reports.

Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies include gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geoenvironmental practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) are referred to as 'laminite'.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the

structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm 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 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N > 30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as 'N_c' on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

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

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than 'straight line' variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

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

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it 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 and may not be the same at the time of construction.
- 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 be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to 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 perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse environmental characteristics or behaviour. If the volume and nature of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classification and rock strengths indicated on the environmental logs unless noted in the report.

SYMBOL LEGENDS

SOIL


FILL


TOPSOIL


CLAY (CL, CI, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CI, CH)


SILTY CLAY (CL, CI, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CI, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML, MH)


PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK


CONGLOMERATE


SANDSTONE


SHALE/MUDSTONE


SILTSTONE


CLAYSTONE


COAL


LAMINITE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

OTHER MATERIALS


BRICKS OR PAVERS


CONCRETE


ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
ine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

$$C_U = \frac{D_{60}}{D_{10}} \qquad and \qquad C_C = \frac{(D_{30})^2}{D_{10}\, D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

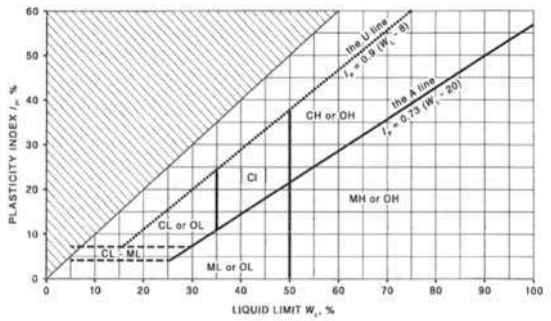
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

2 Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.

3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.

4 The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record		Standing water level. Time delay following completion of drilling/excavation may be shown.
		Extent of borehole/test pit collapse shortly after drilling/excavation.
		Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES	Sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos analysis.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
	PFAS	Soil sample taken over depth indicated, for analysis of Per- and Polyfluoroalkyl Substances.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL $w \approx$ PL w < PL $w \approx$ LL w > LL	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. Moisture content estimated to be near liquid limit. Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D M W	DRY – runs freely through fingers. MOIST – does not run freely but no free water visible on soil surface. WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt Hd Fr ( )	VERY SOFT – unconfined compressive strength ≤ 25kPa. SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa. FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa. STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa. VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa. HARD – unconfined compressive strength > 400kPa. FRIABLE – strength not attainable, soil crumbles. Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)** VERY LOOSE ≤ 15 / 0 – 4 LOOSE > 15 and ≤ 35 / 4 – 10 MEDIUM DENSE > 35 and ≤ 65 / 10 – 30 DENSE > 65 and ≤ 85 / 30 – 50 VERY DENSE > 85 / > 50 Bracketed symbol indicates estimated density based on ease of drilling or other assessment.

Log Column	Symbol	Definition
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as: RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock. EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock. ALLUVIAL – soil deposited by creeks and rivers. ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents. MARINE – soil deposited in a marine environment. AEOLIAN – soil carried and deposited by wind. COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits. LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
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	Distinctly Weathered (Note 1)	HW	DW	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		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'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 weathering products in pores'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Appendix D: Laboratory Report/s & COC Documents

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CERTIFICATE OF ANALYSIS 400883

Client Details

Client	JK Environments
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E38092B, Killara**
Number of Samples	11 Water
Date samples received	30/01/2026
Date completed instructions received	30/01/2026

Analysis Details

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

Samples were analysed as received from the client unless as indicated below in the method summaries. 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	06/02/2026
Date of Issue	06/02/2026

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Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Greta Petzold, Operation Manager
Jack Wallis, Senior Chemist
Jenny He, Inorganic Team Leader
Priya Samarawickrama, Senior Chemist
Tabitha Roberts, Senior Chemist
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

VOCs in water						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date Extracted	-	03/02/2026	03/02/2026	03/02/2026	03/02/2026	03/02/2026
Date Analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	1	8	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1

VOCs in water						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	93	100	99	104	99
Surrogate Toluene-d8	%	101	99	100	101	98
Surrogate 4-Bromofluorobenzene	%	97	99	98	100	94

VOCs in water					
Our Reference		400883-6	400883-7	400883-8	400883-9
Your Reference	UNITS	MW106	MW107	MW108	MW109
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water
Date Extracted	-	03/02/2026	03/02/2026	03/02/2026	03/02/2026
Date Analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1
Chloroform	µg/L	1	<1	<1	2
2,2-dichloropropane	µg/L	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1

VOCs in water					
Our Reference		400883-6	400883-7	400883-8	400883-9
Your Reference	UNITS	MW106	MW107	MW108	MW109
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	2	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	107	107	109	101
Surrogate Toluene-d8	%	101	105	97	100
Surrogate 4-Bromofluorobenzene	%	100	97	99	98

vTRH(C6-C10)/BTEXN in Water						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	03/02/2026	03/02/2026	03/02/2026	03/02/2026	03/02/2026
Date analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	93	100	99	104	99
Surrogate Toluene-d8	%	101	99	100	101	98
Surrogate 4-Bromofluorobenzene	%	97	99	98	100	94

vTRH(C6-C10)/BTEXN in Water						
Our Reference		400883-6	400883-7	400883-8	400883-9	400883-10
Your Reference	UNITS	MW106	MW107	MW108	MW109	GWDUP1
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	03/02/2026	03/02/2026	03/02/2026	03/02/2026	03/02/2026
Date analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	107	107	109	101	102
Surrogate Toluene-d8	%	101	105	97	100	97
Surrogate 4-Bromofluorobenzene	%	100	97	99	98	103

vTRH(C6-C10)/BTEXN in Water		
Our Reference		400883-11
Your Reference	UNITS	TS1
Date Sampled		29/01/2026
Type of sample		Water
Date extracted	-	03/02/2026
Date analysed	-	04/02/2026
Benzene	µg/L	116%
Toluene	µg/L	114%
Ethylbenzene	µg/L	113%
m+p-xylene	µg/L	111%
o-xylene	µg/L	113%
Surrogate Dibromofluoromethane	%	97
Surrogate Toluene-d8	%	101
Surrogate 4-Bromofluorobenzene	%	97

svTRH (C10-C40) in Water						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Date analysed	-	03/02/2026	03/02/2026	03/02/2026	03/02/2026	03/02/2026
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	190	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	190	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	200	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	200	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	200	<50
Surrogate o-Terphenyl	%	97	97	120	93	112

svTRH (C10-C40) in Water						
Our Reference		400883-6	400883-7	400883-8	400883-9	400883-10
Your Reference	UNITS	MW106	MW107	MW108	MW109	GWDUP1
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Date analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	94	99	93	99	78

PAHs in Water						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Date analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	81	89	91	90	89

PAHs in Water						
Our Reference		400883-6	400883-7	400883-8	400883-9	400883-10
Your Reference	UNITS	MW106	MW107	MW108	MW109	GWDUP1
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Date analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	86	93	82	88	89

All metals in water-dissolved						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Date analysed	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Arsenic-Dissolved	µg/L	<1	<1	<1	6	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	1.8	<0.1	<0.1
Chromium-Dissolved	µg/L	1	<1	1	<1	<1
Copper-Dissolved	µg/L	7	6	44	1	96
Mercury-Dissolved	µg/L	<0.05	0.09	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	4	5	33	14	50
Lead-Dissolved	µg/L	8	3	18	<1	<1
Zinc-Dissolved	µg/L	16	17	410	5	91
Aluminium-Dissolved	µg/L	6,000	1,700	3,900	10	410
Silver-Dissolved	µg/L	<1	<1	<1	<1	<1
Antimony-Dissolved	µg/L	<1	<1	<1	1	<1
Barium-Dissolved	µg/L	45	46	110	74	130
Beryllium-Dissolved	µg/L	0.7	<0.5	2	<0.5	5
Boron-Dissolved	µg/L	<20	<20	<20	<20	<20
Cobalt-Dissolved	µg/L	4	5	36	5	56
Iron-Dissolved	µg/L	2,200	10	560	<10	30
Lithium-Dissolved	µg/L	4	2	5	10	9
Manganese-Dissolved	µg/L	47	33	350	<5	1,800
Molybdenum-Dissolved	µg/L	<1	<1	<1	18	<1
Selenium-Dissolved	µg/L	<1	<1	<1	2	<1
Strontium-Dissolved	µg/L	8	11	33	180	65
Uranium-Dissolved	µg/L	0.7	0.5	8.5	6.9	0.6
Vanadium-Dissolved	µg/L	<1	<1	<1	1	<1

All metals in water-dissolved						
Our Reference		400883-6	400883-7	400883-8	400883-9	400883-10
Your Reference	UNITS	MW106	MW107	MW108	MW109	GWDUP1
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Date analysed	-	02/02/2026	02/02/2026	02/02/2026	02/02/2026	02/02/2026
Arsenic-Dissolved	µg/L	<1	<1	<1	1	<1
Cadmium-Dissolved	µg/L	0.2	0.2	<0.1	0.9	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	1
Copper-Dissolved	µg/L	3	1	<1	3	7
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	18	41	7	28	4
Lead-Dissolved	µg/L	<1	<1	<1	<1	8
Zinc-Dissolved	µg/L	140	75	13	130	16
Aluminium-Dissolved	µg/L	150	40	<10	50	[NA]
Silver-Dissolved	µg/L	<1	<1	<1	<1	[NA]
Antimony-Dissolved	µg/L	<1	<1	<1	<1	[NA]
Barium-Dissolved	µg/L	140	140	40	200	[NA]
Beryllium-Dissolved	µg/L	2	1	<0.5	0.9	[NA]
Boron-Dissolved	µg/L	<20	<20	20	<20	[NA]
Cobalt-Dissolved	µg/L	27	31	8	31	[NA]
Iron-Dissolved	µg/L	3,200	12,000	9,300	6,700	[NA]
Lithium-Dissolved	µg/L	2	3	<1	3	[NA]
Manganese-Dissolved	µg/L	1,500	890	770	920	[NA]
Molybdenum-Dissolved	µg/L	<1	<1	<1	<1	[NA]
Selenium-Dissolved	µg/L	<1	<1	<1	<1	[NA]
Strontium-Dissolved	µg/L	17	36	210	35	[NA]
Uranium-Dissolved	µg/L	<0.5	<0.5	<0.5	0.5	[NA]
Vanadium-Dissolved	µg/L	<1	<1	<1	<1	[NA]

Metals in Waters - Acid extractable						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Date analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Phosphorus - Total	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05

Metals in Waters - Acid extractable					
Our Reference		400883-6	400883-7	400883-8	400883-9
Your Reference	UNITS	MW106	MW107	MW108	MW109
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water
Date prepared	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Date analysed	-	04/02/2026	04/02/2026	04/02/2026	04/02/2026
Phosphorus - Total	mg/L	<0.05	<0.05	<0.05	<0.05

Miscellaneous Inorganics						
Our Reference	UNITS	400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference		MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026	30/01/2026
Date analysed	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026	30/01/2026
pH	pH Units	3.6	4.0	3.8	7.2	4.8
Electrical Conductivity	µS/cm	970	460	890	850	1,100
Redox Potential*	mV	420	409	432	414	415
Dissolved Oxygen*	mg/L	6.3	6.1	6.0	5.9	6.1
Turbidity	NTU	7.0	13	24	97	440
Total Dissolved Solids (grav)	mg/L	500	270	550	470	640
Total Suspended Solids	mg/L	8	12	16	160	840
Total Organic Carbon	mg/L	4	2	3	2	2
Sodium Adsorption Ratio	-	6.6	5.6	5.2	3.5	5.0
Silica (Reactive - SiO_2)	mg/L	8.8	6.5	8.0	12	1.0
Ammonia as N in water	mg/L	0.008	<0.005	<0.005	<0.005	0.02
Nitrate as N in water	mg/L	<0.005	0.059	<0.005	0.02	<0.005
Nitrite as N in water	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
NOx as N in water	mg/L	<0.005	0.059	<0.005	0.02	<0.005
Total Nitrogen in water	mg/L	0.2	<0.1	0.7	<0.1	<0.1
TKN in water	mg/L	0.2	<0.1	0.7	<0.1	<0.1
Phosphate as P in water	mg/L	<0.005	<0.005	0.009	<0.005	<0.005
Organic Nitrogen as N	mg/L	<0.2	<0.2	0.7	<0.2	<0.2

Miscellaneous Inorganics					
Our Reference		400883-6	400883-7	400883-8	400883-9
Your Reference	UNITS	MW106	MW107	MW108	MW109
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water
Date prepared	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026
Date analysed	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026
pH	pH Units	4.9	5.5	6.2	5.5
Electrical Conductivity	µS/cm	430	530	660	480
Redox Potential*	mV	402	322	374	365
Dissolved Oxygen*	mg/L	6.2	5.9	6.3	6.1
Turbidity	NTU	5.1	65	120	19
Total Dissolved Solids (grav)	mg/L	330	320	410	290
Total Suspended Solids	mg/L	<5	49	70	16
Total Organic Carbon	mg/L	2	5	2	1
Sodium Adsorption Ratio	-	3.1	3.4	2.5	2.6
Silica (Reactive - SiO_2)	mg/L	1.4	3.8	2.6	2.4
Ammonia as N in water	mg/L	0.008	0.56	0.88	0.01
Nitrate as N in water	mg/L	0.007	0.008	<0.005	<0.005
Nitrite as N in water	mg/L	<0.005	<0.005	<0.005	<0.005
NOx as N in water	mg/L	0.008	0.009	<0.005	0.006
Total Nitrogen in water	mg/L	5.3	1.1	1.0	<0.1
TKN in water	mg/L	5.3	1.1	1.0	<0.1
Phosphate as P in water	mg/L	<0.005	<0.005	<0.005	<0.005
Organic Nitrogen as N	mg/L	5.3	0.6	<0.2	<0.2

Ion Balance						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026	30/01/2026
Date analysed	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026	30/01/2026
Calcium - Dissolved	mg/L	2	3	6.8	36	13
Potassium - Dissolved	mg/L	1	0.9	1	4	4
Sodium - Dissolved	mg/L	120	70	110	110	140
Magnesium - Dissolved	mg/L	14	5.6	15	24	30
Hardness (calc) equivalent $CaCO_3$	mg/L	62	29	80	190	160
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	250	<5
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	250	<5
Sulphate, SO4	mg/L	81	71	45	34	130
Chloride, Cl	mg/L	240	85	250	120	290
Ionic Balance	%	-13	-3.0	-11	-1.0	-6.0

Ion Balance					
Our Reference		400883-6	400883-7	400883-8	400883-9
Your Reference	UNITS	MW106	MW107	MW108	MW109
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water
Date prepared	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026
Date analysed	-	30/01/2026	30/01/2026	30/01/2026	30/01/2026
Calcium - Dissolved	mg/L	4	7.8	38	10
Potassium - Dissolved	mg/L	1	5.4	5.8	2
Sodium - Dissolved	mg/L	54	64	68	53
Magnesium - Dissolved	mg/L	12	11	11	13
Hardness (calc) equivalent $CaCO_3$	mg/L	57	63	140	81
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	32	110	23
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	5	32	110	23
Sulphate, SO4	mg/L	35	38	110	14
Chloride, Cl	mg/L	110	120	83	130
Ionic Balance	%	-5.0	-7.0	-7.0	-4.0

Microbiologocal Testing						
Our Reference		400883-1	400883-2	400883-3	400883-4	400883-5
Your Reference	UNITS	MW101	MW102	MW103	MW104	MW105
Date Sampled		29/01/2026	29/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water	Water
Date of testing	-	31/01/2026	31/01/2026	31/01/2026	31/01/2026	31/01/2026
Thermotolerant Coliforms	cfu/100mL	<10	<100	<10	<100	<1,000 NBO
E. coli	cfu/100mL	<10	<100	<10	<100	<1,000 NBO

Microbiologocal Testing					
Our Reference		400883-6	400883-7	400883-8	400883-9
Your Reference	UNITS	MW106	MW107	MW108	MW109
Date Sampled		30/01/2026	30/01/2026	29/01/2026	29/01/2026
Type of sample		Water	Water	Water	Water
Date of testing	-	31/01/2026	31/01/2026	31/01/2026	31/01/2026
Thermotolerant Coliforms	cfu/100mL	<1,000	<1,000	<100	<100
E. coli	cfu/100mL	<1,000	<1,000	<100	<100

Method ID	Methodology Summary
Ext-008	Subcontracted to Sonic Food & Water Testing. NATA Accreditation No. 4034.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation below:- TDS = EC * 0.6
Inorg-019	Suspended Solids - determined gravimetricially by filtration of the sample. The samples are dried at 104+/-5°C.
Inorg-022	Turbidity - measured nephelometrically using a turbidimeter, in accordance with APHA latest edition, 2130-B.
Inorg-035	Analysed using an electrode. Please note that the results for water analyses are indicative only, samples are ideally analysed on collection.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-055/062/127	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen. Alternatively analysed by combustion and chemiluminescence.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-062	TKN - determined colourimetrically based on APHA latest edition 4500 Norg. Alternatively, TKN can be derived from calculation (Total N - NOx).
Inorg-079	TOC determined using a TOC analyser using the combustion method. Dissolved requires filtering prior to determination. Analysis using APHA latest edition 5310B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-112	Dissolved Oxygen using membrane electrode. Note this analysis should ideally be carried out immediately after sampling.
INORG-120	Reactive Silica (SiO2) determined colorimetrically. Waters samples are filtered on receipt prior to analysis.

Method ID	Methodology Summary
Metals-020	Determination of various metals/elements by ICP-AES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation. Where molecular anion forms are calculated from an element (e.g. SO4 from S or PO4 from P stoichiometrically), the assumption is that the element is only present in that molecular anion form. Submission of low masses of sample e.g. for dust samples, may result in raised PQLs.
Metals-020	Calcium and Magnesium analysed by ICP-AES and SAR calculated.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly 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)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date Extracted	-			03/02/2026	1	03/02/2026	04/02/2026		03/02/2026	[NT]
Date Analysed	-			04/02/2026	1	04/02/2026	05/02/2026		04/02/2026	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	104	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	<1	<1	0	106	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	102	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	101	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	103	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	1	93	98	5	111	[NT]
Surrogate Toluene-d8	%		Org-023	99	1	101	98	3	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	97	1	97	100	3	100	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			03/02/2026	1	03/02/2026	04/02/2026		03/02/2026	[NT]
Date analysed	-			04/02/2026	1	04/02/2026	05/02/2026		04/02/2026	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	101	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	101	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	105	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	101	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	103	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	103	1	93	98	5	111	[NT]
Surrogate Toluene-d8	%		Org-023	102	1	101	98	3	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	102	1	97	100	3	100	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	03/02/2026	04/02/2026		[NT]	[NT]
Date analysed	-			[NT]	10	04/02/2026	05/02/2026		[NT]	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	[NT]	10	<10	<10	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	[NT]	10	<2	<2	0	[NT]	[NT]
o-xylene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Naphthalene	µg/L	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	[NT]	10	102	99	3	[NT]	[NT]
Surrogate Toluene-d8	%		Org-023	[NT]	10	97	98	1	[NT]	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	[NT]	10	103	101	2	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	400883-2
Date extracted	-			02/02/2026	1	02/02/2026	02/02/2026		02/02/2026	02/02/2026
Date analysed	-			03/02/2026	1	03/02/2026	03/02/2026		03/02/2026	03/02/2026
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	118	74
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	132	76
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	116	75
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	118	74
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	132	76
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	116	75
Surrogate o-Terphenyl	%		Org-020	92	1	97	90	7	96	112

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	400883-2
Date extracted	-			02/02/2026	1	02/02/2026	02/02/2026		02/02/2026	02/02/2026
Date analysed	-			04/02/2026	1	04/02/2026	04/02/2026		04/02/2026	04/02/2026
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	94
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	70	85
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	88
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	94
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	93
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	93
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	68	77
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	96
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	86	1	81	82	1	75	93

QUALITY CONTROL: All metals in water-dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date prepared	-			02/02/2026	1	02/02/2026	02/02/2026		02/02/2026	[NT]
Date analysed	-			02/02/2026	1	02/02/2026	02/02/2026		02/02/2026	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	96	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	96	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	1	1	0	106	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	7	8	13	107	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		99	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	4	4	0	92	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	8	8	0	97	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	16	16	0	98	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	<10	1	6000	5900	2	104	[NT]
Silver-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	100	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Barium-Dissolved	µg/L	1	Metals-022	<1	1	45	45	0	104	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	0.7	0.6	15	105	[NT]
Boron-Dissolved	µg/L	20	Metals-022	<20	1	<20	<20	0	114	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	1	4	4	0	104	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	2200	2200	0	102	[NT]
Lithium-Dissolved	µg/L	1	Metals-022	<1	1	4	4	0	115	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	1	47	48	2	97	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	88	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	99	[NT]
Strontium-Dissolved	µg/L	1	Metals-022	<1	1	8	9	12	94	[NT]
Uranium-Dissolved	µg/L	0.5	Metals-022	<0.5	1	0.7	0.7	0	[NT]	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	104	[NT]

QUALITY CONTROL: All metals in water-dissolved					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	02/02/2026	02/02/2026		[NT]	[NT]
Date analysed	-			[NT]	2	02/02/2026	02/02/2026		[NT]	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	[NT]		[NT]	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	[NT]	2	<0.1	[NT]		[NT]	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	[NT]		[NT]	[NT]
Copper-Dissolved	µg/L	1	Metals-022	[NT]	2	6	[NT]		[NT]	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	[NT]	2	0.09	0.09	0	[NT]	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	[NT]	2	5	[NT]		[NT]	[NT]
Lead-Dissolved	µg/L	1	Metals-022	[NT]	2	3	[NT]		[NT]	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	[NT]	2	17	[NT]		[NT]	[NT]
Aluminium-Dissolved	µg/L	10	Metals-022	[NT]	2	1700	[NT]		[NT]	[NT]
Silver-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	[NT]		[NT]	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	[NT]		[NT]	[NT]
Barium-Dissolved	µg/L	1	Metals-022	[NT]	2	46	[NT]		[NT]	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	[NT]	2	<0.5	[NT]		[NT]	[NT]
Boron-Dissolved	µg/L	20	Metals-022	[NT]	2	<20	[NT]		[NT]	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	[NT]	2	5	[NT]		[NT]	[NT]
Iron-Dissolved	µg/L	10	Metals-022	[NT]	2	10	[NT]		[NT]	[NT]
Lithium-Dissolved	µg/L	1	Metals-022	[NT]	2	2	[NT]		[NT]	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	[NT]	2	33	[NT]		[NT]	[NT]
Molybdenum-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	[NT]		[NT]	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	[NT]		[NT]	[NT]
Strontium-Dissolved	µg/L	1	Metals-022	[NT]	2	11	[NT]		[NT]	[NT]
Uranium-Dissolved	µg/L	0.5	Metals-022	[NT]	2	0.5	[NT]		[NT]	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	[NT]	2	<1	[NT]		[NT]	[NT]

QUALITY CONTROL: Metals in Waters - Acid extractable					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	400883-2
Date prepared	-			04/02/2026	1	04/02/2026	04/02/2026		04/02/2026	04/02/2026
Date analysed	-			04/02/2026	1	04/02/2026	04/02/2026		04/02/2026	04/02/2026
Phosphorus - Total	mg/L	0.05	Metals-020	<0.05	1	<0.05	<0.05	0	96	99

QUALITY CONTROL: Metals in Waters - Acid extractable					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	3	04/02/2026	04/02/2026		[NT]	[NT]
Date analysed	-			[NT]	3	04/02/2026	04/02/2026		[NT]	[NT]
Phosphorus - Total	mg/L	0.05	Metals-020	[NT]	3	<0.05	<0.05	0	[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	400883-4
Date prepared	-			30/01/2026	1	30/01/2026	30/01/2026		30/01/2026	30/01/2026
Date analysed	-			30/01/2026	1	30/01/2026	30/01/2026		30/01/2026	30/01/2026
pH	pH Units		Inorg-001	[NT]	1	3.6	3.6	0	100	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	1	970	970	0	101	[NT]
Redox Potential*	mV		Inorg-035	[NT]	1	420	[NT]		105	[NT]
Dissolved Oxygen*	mg/L	0.1	Inorg-112	<0.1	1	6.3	[NT]		[NT]	[NT]
Turbidity	NTU	0.1	Inorg-022	<0.1	1	7.0	[NT]		102	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	1	500	600	18	104	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	<5	1	8	[NT]		100	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	<1	1	4	[NT]		95	[NT]
Sodium Adsorption Ratio	-	0.01	Metals-020	<0.01	1	6.6	6.6	0	95	[NT]
Silica (Reactive - SiO_2)	mg/L	0.1	INORG-120	<0.1	1	8.8	[NT]		106	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	1	0.008	[NT]		103	92
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	1	<0.005	[NT]		105	101
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	1	<0.005	[NT]		104	95
NOx as N in water	mg/L	0.005	Inorg-055	<0.005	1	<0.005	[NT]		105	101
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	<0.1	1	0.2	0.2	0	103	[NT]
TKN in water	mg/L	0.1	Inorg-062	<0.1	1	0.2	[NT]		[NT]	[NT]
Phosphate as P in water	mg/L	0.005	Inorg-060	<0.005	1	<0.005	[NT]		112	105
Organic Nitrogen as N	mg/L	0.2	Inorg-055/062/127	<0.2	1	<0.2	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	3	30/01/2026	30/01/2026		[NT]	[NT]
Date analysed	-			[NT]	3	30/01/2026	30/01/2026		[NT]	[NT]
pH	pH Units		Inorg-001	[NT]	3	3.8	[NT]		[NT]	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	[NT]	3	890	[NT]		[NT]	[NT]
Redox Potential*	mV		Inorg-035	[NT]	3	432	[NT]		[NT]	[NT]
Dissolved Oxygen*	mg/L	0.1	Inorg-112	[NT]	3	6.0	[NT]		[NT]	[NT]
Turbidity	NTU	0.1	Inorg-022	[NT]	3	24	[NT]		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	3	550	[NT]		[NT]	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	[NT]	3	16	[NT]		[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	[NT]	3	3	[NT]		[NT]	[NT]
Sodium Adsorption Ratio	-	0.01	Metals-020	[NT]	3	5.2	[NT]		[NT]	[NT]
Silica (Reactive - SiO_2)	mg/L	0.1	INORG-120	[NT]	3	8.0	[NT]		[NT]	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	[NT]	3	<0.005	<0.005	0	[NT]	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	3	<0.005	<0.005	0	[NT]	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	[NT]	3	<0.005	<0.005	0	[NT]	[NT]
NOx as N in water	mg/L	0.005	Inorg-055	[NT]	3	<0.005	<0.005	0	[NT]	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	[NT]	3	0.7	[NT]		[NT]	[NT]
TKN in water	mg/L	0.1	Inorg-062	[NT]	3	0.7	[NT]		[NT]	[NT]
Phosphate as P in water	mg/L	0.005	Inorg-060	[NT]	3	0.009	<0.005	57	[NT]	[NT]
Organic Nitrogen as N	mg/L	0.2	Inorg-055/062/127	[NT]	3	0.7	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	5	30/01/2026	30/01/2026		[NT]	[NT]
Date analysed	-			[NT]	5	30/01/2026	30/01/2026		[NT]	[NT]
pH	pH Units		Inorg-001	[NT]	5	4.8	[NT]		[NT]	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	[NT]	5	1100	[NT]		[NT]	[NT]
Redox Potential*	mV		Inorg-035	[NT]	5	415	[NT]		[NT]	[NT]
Dissolved Oxygen*	mg/L	0.1	Inorg-112	[NT]	5	6.1	[NT]		[NT]	[NT]
Turbidity	NTU	0.1	Inorg-022	[NT]	5	440	[NT]		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	5	640	[NT]		[NT]	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	[NT]	5	840	860	2	[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	[NT]	5	2	[NT]		[NT]	[NT]
Sodium Adsorption Ratio	-	0.01	Metals-020	[NT]	5	5.0	[NT]		[NT]	[NT]
Silica (Reactive - SiO_2)	mg/L	0.1	INORG-120	[NT]	5	1.0	1.1	10	[NT]	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	[NT]	5	0.02	[NT]		[NT]	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	5	<0.005	[NT]		[NT]	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	[NT]	5	<0.005	[NT]		[NT]	[NT]
NOx as N in water	mg/L	0.005	Inorg-055	[NT]	5	<0.005	[NT]		[NT]	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	[NT]	5	<0.1	[NT]		[NT]	[NT]
TKN in water	mg/L	0.1	Inorg-062	[NT]	5	<0.1	[NT]		[NT]	[NT]
Phosphate as P in water	mg/L	0.005	Inorg-060	[NT]	5	<0.005	[NT]		[NT]	[NT]
Organic Nitrogen as N	mg/L	0.2	Inorg-055/062/127	[NT]	5	<0.2	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	7	30/01/2026	30/01/2026		[NT]	[NT]
Date analysed	-			[NT]	7	30/01/2026	30/01/2026		[NT]	[NT]
pH	pH Units		Inorg-001	[NT]	7	5.5	[NT]		[NT]	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	[NT]	7	530	[NT]		[NT]	[NT]
Redox Potential*	mV		Inorg-035	[NT]	7	322	[NT]		[NT]	[NT]
Dissolved Oxygen*	mg/L	0.1	Inorg-112	[NT]	7	5.9	[NT]		[NT]	[NT]
Turbidity	NTU	0.1	Inorg-022	[NT]	7	65	68	5	[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	7	320	[NT]		[NT]	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	[NT]	7	49	[NT]		[NT]	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	[NT]	7	5	[NT]		[NT]	[NT]
Sodium Adsorption Ratio	-	0.01	Metals-020	[NT]	7	3.4	[NT]		[NT]	[NT]
Silica (Reactive - SiO_2)	mg/L	0.1	INORG-120	[NT]	7	3.8	[NT]		[NT]	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	[NT]	7	0.56	[NT]		[NT]	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	[NT]	7	0.008	[NT]		[NT]	[NT]
Nitrite as N in water	mg/L	0.005	Inorg-055	[NT]	7	<0.005	[NT]		[NT]	[NT]
NOx as N in water	mg/L	0.005	Inorg-055	[NT]	7	0.009	[NT]		[NT]	[NT]
Total Nitrogen in water	mg/L	0.1	Inorg-055/062/127	[NT]	7	1.1	[NT]		[NT]	[NT]
TKN in water	mg/L	0.1	Inorg-062	[NT]	7	1.1	[NT]		[NT]	[NT]
Phosphate as P in water	mg/L	0.005	Inorg-060	[NT]	7	<0.005	[NT]		[NT]	[NT]
Organic Nitrogen as N	mg/L	0.2	Inorg-055/062/127	[NT]	7	0.6	[NT]		[NT]	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	400883-2
Date prepared	-			30/01/2026	1	30/01/2026	30/01/2026		30/01/2026	30/01/2026
Date analysed	-			30/01/2026	1	30/01/2026	30/01/2026		30/01/2026	30/01/2026
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	2	2	0	91	90
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	1	1	0	98	99
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	120	120	0	91	102
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	14	14	0	92	90
Hardness (calc) equivalent $CaCO_3$	mg/L	3	Metals-020	[NT]	1	62	60	3	[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	<5	0	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	<5	0	110	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	81	94	15	115	110
Chloride, Cl	mg/L	1	Inorg-081	<1	1	240	240	0	107	119
Ionic Balance	%		Inorg-040	[NT]	1	-13	-15	-14	[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.

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.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

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

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

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

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

Measurement Uncertainty estimates can be downloaded from the Envirolab Resources website or obtained directly by contacting the laboratory.

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.

For Dust Deposit Gauge (DDG) analysis the sampling, sampling period and funnel exposure area do not fall under Envirolab's NATA accreditation (unless the Newcastle laboratory where responsible for the sampling), hence the annotation on the DDG units of reporting.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

Report Comments

Microbiology analysed by Sonic Food & Water Testing. Report No. W2602358
NBO: The presence of competing background organisms in the sample may have reduced the count.
The time between collection and the commencement of testing should not exceed 24 hours. Samples tested outside this time may have their results compromised

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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Vittal Boggaram

Sample Login Details

Your reference	E38092B, Killara
Envirolab Reference	400883
Date Sample Received	30/01/2026
Date Instructions Received	30/01/2026
Date Results Expected to be Reported	06/02/2026

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	11 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	2
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water	All metals in water-dissolved	Metals in Waters - Acid extractable	pH	Electrical Conductivity	Redox Potential*	Dissolved Oxygen*	Turbidity	Total Dissolved Solids (grav)	Total Suspended Solids	Total Organic Carbon	Sodium Adsorption Ratio	Silica (Reactive - SiO2)	Ammonia as N in water	Nitrate as N in water	Nitrite as N in water	NOx as N in water	Total Nitrogen in water	TKN in water	Phosphate as P in water	Organic Nitrogen as N	Calcium - Dissolved	Potassium - Dissolved	Sodium - Dissolved	Magnesium - Dissolved	Hardness (calc) equivalent CaCO3	Hydroxide Alkalinity (OH-) as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Sulphate, SO4	Chloride, Cl	Ionic Balance	Microbiologocal Testing
MW101	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW102	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW103	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW104	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW105	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW106	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW107	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW108	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW109	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GWDUP1		✓	✓	✓	✓																																
TS1		✓																																			

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

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

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.

We acknowledge receipt of your samples and Purchase Order (PO) (if provided). If a PO includes your terms & conditions, Envirolab hereby expressly rejects and will not be bound by any external or third-party terms and conditions, including those referenced or attached to a PO.

All services to be performed by Envirolab will be governed exclusively by Envirolab's General Terms and Conditions attached to this acknowledgement (Envirolab Terms) via hyperlink or found on our websites.

If you do not object in writing within two (2) business days of the date of this acknowledgement, you will be deemed to have accepted the Envirolab Terms. In addition, your provision of further instructions, additional samples, payment of any invoice, or acceptance of services or results from Envirolab will constitute acceptance of the Envirolab Terms. For clarity, Envirolab's commencement or continuation of work following receipt of the PO is performed solely under the Envirolab Terms and does not constitute acceptance of any external terms. All rights are expressly reserved.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E380928 Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: VBoggaram@jkenvironments.com.au

Location: Killara

Sampler: OB

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Alkalinity suite	EC, pH, redox, DO	Turbidity	TDS, TSS, TOC, SAR	Ionic balance, including hardness	#3	Additional metals: Al, Ag, Sb, Ba, Be, B, Co, Fe, Li, Mn, Mo, Se, Sr, U, V	Silica (reactive) dissolved silica	Nutrient suite	Faecal coliforms + Escherichia (E) coli	BTEX	VOCs
29/01/2026	1	MW101	##	1.9	Water	X	X	X	X	X	X	X	X	X	X		X
29/01/2026	2	MW102	##	0.3	Water	X	X	X	X	X	X	X	X	X	X		X
30/01/2026	3	MW103	##	0.5	Water	X	X	X	X	X	X	X	X	X	X		X
29/01/2026	4	MW104	##	0.5	Water	X	X	X	X	X	X	X	X	X	X		X
29/01/2026	5	MW105	##	0.5	Water	X	X	X	X	X	X	X	X	X	X		X
30/01/2026	6	MW106	##	0.3	Water	X	X	X	X	X	X	X	X	X	X		X
30/01/2026	7	MW107	##	0.9	Water	X	X	X	X	X	X	X	X	X	X		X
29/01/2026	8	MW108	##	0.2	Water	X	X	X	X	X	X	X	X	X	X		X
29/01/2026	9	MW109	##	0.5	Water	X	X	X	X	X	X	X	X	X	X		X
29/01/2026	10	GWDUP1	#3	-	Duplicate						X						
29/01/2026	11	TS1	V	-	Trip Spike											X	

Remarks (comments/detection limits required):

Sample Containers:

Each sample includes: x2 amber bottles, x2 HCl preserved glass vials, x2 unpreserved plastic bottles, x2 nitric acid preserved bottles (1 is field filtered), x1 sulphuric acid preserved bottle and x1 sterile container V - BTEX Vial

Relinquished By: OB	Date: 30/1/26	Time: 13:30	Received By: O.WRIGHT	Date: 30/1/26

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

Job No: 400883

Date Received: 30/1/26

Time Received: 1520

Received By: OW

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

Appendix E: Fieldwork Document

JKEnvironments

PID FIELD CALIBRATION FORM

Client:	Levande Pty Ltd		
Project:	Proposed Development		
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW		
Job	E38092B		
PID			
Make: Honeywell	Model: MINIRAE LITE+	Unit: 3	Date of last factory calibration: 9/9/25
Date of calibration: 28/1/26		Name of Calibrator: VR	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100.5 ppm		Error in measured reading:	± 0.6 ppm
Measured reading Acceptable (Yes/No): Yes			
PID			
Make: Honeywell	Model: MINIRAE LITE+	Unit: 3	Date of last factory calibration: 9/9/25
Date of calibration: 28/1/26		Name of Calibrator: OB	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100.8 ppm		Error in measured reading:	± 0.8 ppm
Measured reading Acceptable (Yes/No): Yes			
PID			
Make: Honeywell	Model: MINIRAE LITE+	Unit: 3	Date of last factory calibration: 9/9/25
Date of calibration: 29/1/26		Name of Calibrator: OB	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100.7 ppm		Error in measured reading:	± 0.7 ppm
Measured reading Acceptable (Yes/No): Yes			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading:	± ppm
Measured reading Acceptable (Yes/No):			
PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: ppm		Error in measured reading:	± ppm
Measured reading Acceptable (Yes/No):			

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	Levande Pty Ltd			
Project:	Proposed Development			
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW			
Job Number:	E38092B			
DISSOLVED OXYGEN				
Make:	YSI	Model:	1	
Date of calibration:	20/1/26	Name of Calibrator:	OB	
Span value: 70% to 130%				
Measured value:	101%			
Measured reading Acceptable (Yes/No):	Yes			
pH				
Make:	YSI	Model:	1	
Date of calibration:	20/1/26	Name of Calibrator:	OB	
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date:	6/26	Lot No: CB190625
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date:	2/26	Lot No: CB2665
Measured reading of Buffer 1:	7.00			
Measured reading of Buffer 2:	4.03			
Slope:		Measured reading Acceptable (Yes/No):	Yes	
EC				
Make:	YSI	Model:	1	
Date:	20/1/26	Name of Calibrator:	OB	Temperature: 22 °C
Calibration solution:	Ajax Scientific	Expiry date:	6/26	Lot No: DC25065
Theoretical conductivity at temperature (see solution container):		1332	µS/cm	
Measured conductivity:	1270 µS/cm	Measured reading Acceptable (Yes/No):	Yes	
REDOX				
Make:	YSI	Model:	1	
Date of calibration:	20/1/26	Name of Calibrator:	OB	
Calibration solution:	HANNA	Expiry date:	10/29	Lot No: 0675
Theoretical redox value:	240mV			
Measured redox reading:	220.0 mV	Measured reading Acceptable (Yes/No):	Yes	

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WATER QUALITY METER CALIBRATION FORM

Client:	Levande Pty Ltd			
Project:	Proposed Development			
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW			
Job Number:	NSW E38092B			
DISSOLVED OXYGEN				
Make: YSI		Model: 1		
Date of calibration: 21/1/26		Name of Calibrator: OB		
Span value: 70% to 130%				
Measured value: 101 %				
Measured reading Acceptable (Yes/No): Yes				
pH				
Make: YSI		Model: 1		
Date of calibration: 21/1/26		Name of Calibrator: OB		
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date: 06/26	Lot No: CB190825	
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date: 02/26	Lot No: CC020425	
Measured reading of Buffer 1: 7.04				
Measured reading of Buffer 2: 4.04				
Slope:		Measured reading Acceptable (Yes/No): Yes		
EC				
Make: YSI		Model: 1		
Date: 21/1/26	Name of Calibrator: OB		Temperature: 24 °C	
Calibration solution: Lowe Scientific		Expiry date: 08/26	Lot No: DC250825	
Theoretical conductivity at temperature (see solution container): 1386 µS/cm				
Measured conductivity: 1302 µS/cm		Measured reading Acceptable (Yes/No): Yes		
REDOX				
Make: YSI		Model: 1		
Date of calibration: 21/1/26		Name of Calibrator: OB		
Calibration solution: HANNA		Expiry date: 10/29	Lot No: 0675	
Theoretical redox value: 240mV				
Measured redox reading: 236.1 mV		Measured reading Acceptable (Yes/No): Yes		

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WATER QUALITY METER CALIBRATION FORM

Client:	Levande Pty Ltd			
Project:	Proposed Development			
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW			
Job Number:	E38092B			
DISSOLVED OXYGEN				
Make:	YSI	Model:	1	
Date of calibration:	28/1/26	Name of Calibrator:	OB	
Span value: 70% to 130%				
Measured value:	99 %			
Measured reading Acceptable (Yes/No):	YES			
pH				
Make:	YSI	Model:	1	
Date of calibration:	28/1/26	Name of Calibrator:	OB	
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date:	06/26	Lot No: CB190675
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date:	02/26	Lot No: CC020425
Measured reading of Buffer 1:	7.05			
Measured reading of Buffer 2:	4.13			
Slope:		Measured reading Acceptable (Yes/No):	YES	
EC				
Make:	YSI	Model:	1	
Date:	28/1/26	Name of Calibrator:	OB	Temperature: 24 °C
Calibration solution:	Rowe Scientific	Expiry date:	06/26	Lot No: PC250625
Theoretical conductivity at temperature (see solution container):		1386	µS/cm	
Measured conductivity:	1383 µS/cm	Measured reading Acceptable (Yes/No):	YES	
REDOX				
Make:	YSI	Model:	1	
Date of calibration:	28/1/26	Name of Calibrator:	OB	
Calibration solution:	HANNA	Expiry date:	10/29	Lot No: 0675
Theoretical redox value:	240mV			
Measured redox reading:	231.7 mV	Measured reading Acceptable (Yes/No):	YES	

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WATER QUALITY METER CALIBRATION FORM

Client:	Levande Pty Ltd		
Project:	Proposed Development		
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW		
Job Number:	E38092B		
DISSOLVED OXYGEN			
Make: YSI		Model: 1	
Date of calibration: 30/1/26		Name of Calibrator: SP	
Span value: 70% to 130%			
Measured value: 99.5			
Measured reading Acceptable (Yes/No): Yes			
pH			
Make: YSI		Model: 1	
Date of calibration: 30/1/26		Name of Calibrator: SP	
Buffer 1: Theoretical pH = 7.01± 0.01		Expiry date: 06/26	Lot No: CR190625
Buffer 2: Theoretical pH = 4.01± 0.01		Expiry date: 02/26	Lot No: CC020425
Measured reading of Buffer 1: 7.01			
Measured reading of Buffer 2: 3.91			
Slope:		Measured reading Acceptable (Yes/No): Yes	
EC			
Make: YSI		Model: 1	
Date: 30/1/26	Name of Calibrator: SP		Temperature: 24 °C
Calibration solution: Rowe Scientific		Expiry date: 06/26	Lot No: DC250625
Theoretical conductivity at temperature (see solution container): 1386 µS/cm			
Measured conductivity: 1420 µS/cm		Measured reading Acceptable (Yes/No): Yes	
REDOX			
Make: YSI		Model: 1	
Date of calibration: 30/1/26		Name of Calibrator: SP	
Calibration solution: Hanna		Expiry date: 10/29	Lot No: 0675
Theoretical redox value: 240mV			
Measured redox reading: 235.3 mV		Measured reading Acceptable (Yes/No): Yes	

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Client:	Levande Pty Ltd	**Job No.:** E38092B ~~NSW~~	
Project:	Proposed Development	**Well No.:**	101
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	**Depth (m):**	4.1

TWM 2.5

WELL FINISH DETAILS

	Gatic Cover ☑	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Don Pump	**SWL – Before (m):**	2.91
Date:	20/1/26	**Time – Before:**	08:37
Undertaken By:	OB	**SWL – After (m):**	3.50
Total Vol. Removed:	10 L	**Time – After:**	08:50
PID Reading (ppm):	0.2		

DL OUT 08:36 IN 08:55

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
5	3.30	21.0	2.63	692	3.91	215.6
10	4.00	20.9	1.26	762	3.46	248.6
		well	pumped	effectively	dry	

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))

YSI Used:

well surging 1-m silt load. High methane. light brown

Tested By:	OB	**Remarks:**
Date Tested:	20/1/26	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	OB	
Date:	20.2.26	

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Client:	Levande Pty Ltd	**Job No.:** 238092B ~~NSW~~	
Project:	Proposed Development	**Well No.:**	102
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	**Depth (m):**	1.8

WELL FINISH DETAILS

	Gatic Cover ☑	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Dev Pump	**SWL – Before (m):**	2.63
Date:	20/1/26	**Time – Before:**	11:52
Undertaken By:	OB	**SWL – After (m):**	1.55
Total Vol. Removed:	10L	**Time – After:**	12:04
PID Reading (ppm):	0.5		

DL OUT 11:51 IN 12:05

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0.5		27.9	5.62	352.3	4.25	184.8
5		22.2	4.13	353.0	4.25	194.0
10	1.55	21.9	3.58	353.9	4.37	200.4
		well pumped effectively dry				

well surging

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))

YSI Used: 1

m-f silt load, brown, m-f recharge

Tested By:	OB
Date Tested:	20/1/26
Checked By:	OB
Date:	20.2.26

Remarks:

- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

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Client:	Levande Pty Ltd	Job No.: E38097B NSW	
Project:	Proposed Development	Well No.:	103
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	10.0

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Dev Pump	SWL – Before (m):	4.30
Date:	21/1/26	Time – Before:	08:36
Undertaken By:	OB	SWL – After (m):	9.95
Total Vol. Removed:	22L	Time – After:	09:06
PID Reading (ppm):	0.3		

DL OUT 08:35 IN 09:15

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0.5		20.9	4.79	676	5.37	175.0
5		19.7	1.50	704	3.59	196.1
10		20.1	1.07	671	3.76	198.0
15		19.0	1.02	703	3.72	201.8
→ 20		18.9	1.06	696	3.97	201.1
22	9.95	19.2	4.78	687	1.35	198.2
		well pumped effectively dry				

well surging

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))
YSI Used:

1-m silt load, grey brown, 1-m recharge

Tested By:	OB	**Remarks:**
Date Tested:	21/1/26	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductivelty less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	OB	
Date:	20.2.26	

JKEnvironments

Client:	Levande Pty Ltd	**Job No.:** E38092B NSW	
Project:	Proposed Development	**Well No.:**	104
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	**Depth (m):**	10.1

WELL FINISH DETAILS

	Gatic Cover ☑	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Dav Pump	**SWL – Before (m):**	6.98
Date:	20/1/26	**Time – Before:**	09:10
Undertaken By:	OB	**SWL – After (m):**	9.90
Total Vol. Removed:	10L	**Time – After:**	09.30
PID Reading (ppm):	0.0		

DL on T 9:09 in 09.35

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0.5		21.1	5.64	596	6.71	224.7
5	0	20.3	5.32	654	6.86	221.3
10	9.9	19.9	3.75	646	7.05	210.8
		well pumped effectively dry				

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 1

1-m silt load. grey brown, 1-m recharge

Tested By:	OB	**Remarks:**
Date Tested:	20/1/26	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	OB	
Date:	20.2.26	

JKEnvironments

Client:	Levande Pty Ltd	**Job No.:** E 38097B NSW	
Project:	Proposed Development	**Well No.:**	105
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	**Depth (m):**	10-5

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Peri Pump	**SWL – Before (m):**	8.10
Date:	20/1/26	**Time – Before:**	10:52
Undertaken By:	OB	**SWL – After (m):**	10.10
Total Vol. Removed:	5L	**Time – After:**	10:04
PID Reading (ppm):	0.0		
Comments:			

DL OUT 09:57 IN 10:09

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0.5		22.0	5.66	648	5.73	127.8
5	10.10	20.6	4.35	664	5.36	115.4
		well purged effectively dry				

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
YSI Used: |

1-0m silt loam. light brown. 1-m recharge

Tested By:	OB	**Remarks:**
Date Tested:	20/1/26	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	OB	
Date:	20.2.26	

JKEnvironments

Client:	Levande Pty Ltd	**Job No.:** E38092B NSW	
Project:	Proposed Development	**Well No.:**	106
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	**Depth (m):**	4.45

WELL FINISH DETAILS

	Gatic Cover ☑	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	TDW Pump	**SWL – Before (m):**	2.39
Date:	21/1/26	**Time – Before:**	09:28
Undertaken By:	OB	**SWL – After (m):**	4.30
Total Vol. Removed:	5L	**Time – After:**	09:47
PID Reading (ppm):	0.3		

DL Out 09:27 In 09:58

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0.5		21.6	3.56	361.3	5.38	144.7
2.5		21.8	1.65	400.6	5.14	130.1
5	4.30	21.4	5.05	420.1	5.13	104.0
		well pumped effectively dry				

well surging

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))
YSI Used: /

m-f silt load; light brown. 1-m recharge

Tested By:	OB
Date Tested:	21/1/26
Checked By:	OB
Date:	20.2.26

Remarks:
- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

Client:	Levande Pty Ltd	Job No.: E38092B ~~NSW~~	
Project:	Proposed Development	Well No.:	107
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	8.5

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Dev Pump	SWL – Before (m):	3.52
Date:	20/1/26	Time – Before:	13.26
Undertaken By:	OB	SWL – After (m):	18.25
Total Vol. Removed:	15L	Time – After:	13:31
PID Reading (ppm):	0.5		
Comments:			

TL OUT 13:15

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0.5		22.8	4.65	271.9	5.19	216.3
5		20.4	1.69	272.8	4.82	211.3
10		21.0	1.01	368.8	4.99	195.2
15	8.25	19.8	1.01	722.6	5.62	106.8
		well pumped effectively dry				

well surging

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
YSI Used: (light

High Silt load, brown, low recharge

Tested By:	OB	**Remarks:**
Date Tested:	20/1/26	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	OB	
Date:	20.2.26	

JKEnvironments

Client:	Levande Pty Ltd	**Job No.:** E38092B NSW	
Project:	Proposed Development	**Well No.:**	108
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	**Depth (m):**	5-0

TWIN 1-2

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Peri Pump	**SWL – Before (m):**	2.80
Date:	20/1/26	**Time – Before:**	12:38
Undertaken By:	OB	**SWL – After (m):**	4.85
Total Vol. Removed:	10L	**Time – After:**	12.50
PID Reading (ppm):	0.1		

DL OUT 12:37

DL IN 12:50

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0.5		22.6	0.91	195	5.66	134.2
5		23.5	0.92	195	5.62	127.9
10	4.85	22.5	1.10	510	5.83	104.9
		well pumped effectively dry				

well surging

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)) Sheen (YES / (NO)), Steady State Achieved (YES / (NO))
YSI Used: }

m-H silt load, brown. m-H recharge

Tested By:	OB	**Remarks:**
Date Tested:	29/1/26	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	OB	
Date:	20.2.26	

JKEnvironments

Client:	Levande Pty Ltd	**Job No.:** E38097B NSW	
Project:	Proposed Development	**Well No.:**	109
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	**Depth (m):**	15.2

WELL FINISH DETAILS

	Gatic Cover ☒	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Pow Pump	**SWL – Before (m):**	3.84
Date:	20/1/26	**Time – Before:**	10.30
Undertaken By:	OB	**SWL – After (m):**	13.50
Total Vol. Removed:	95 L	**Time – After:**	11:01
PID Reading (ppm):	0.0		

DL out 10:29 in 11:05

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	SWL	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
5		20.3	5.10	130.8	6.05	113.6
10		20.4	4.54	130.8	5.92	115.9
15		20.1	4.20	125.4	5.86	117.9
20	7.28	20.6	3.95	131.1	5.80	122.3
25		20.2	2.37	135.1	5.71	142.9
30		20.7	2.80	146.0	5.79	146.9
35		20.6	2.54	135.2	5.72	146.3
40	10.00	20.5	2.19	127.5	5.64	146.6
45		20.0	0.96	116.0	5.52	149.8
50		20.0	2.04	119.1	5.51	151.0
55		20.0	2.19	117.1	5.54	152.1
60	12.04	19.9	2.21	117.2	5.53	152.9
65		19.8	0.65	112.9	5.42	153.9
70		19.8	1.14	119.2	5.44	154.5
75		19.7	1.94	117.5	5.45	155.5
80	14.00	19.7	0.85	125.5	5.43	155.1
85		19.7	1.00	120.3	5.41	153.2
90		19.7	1.73	122.7	5.42	153.0
95 (Dry/Surging)	14.90	19.8	2.56	120.0	5.40	155.3
		well pumped effectively dry				

silt load clearer

Comments: Odours (YES / NO), NAPL/PSH (YES / NO) Sheen (YES / NO), Steady State Achieved (YES / NO)
YSI Used:

well recharging

mod recharge, 1-m silt load, grey brown

Tested By:	OB	**Remarks:**
Date Tested:	20/1/26	- Steady state conditions - Difference in the pH less than 0.2 units, difference in the conductivity less than 10% and SWL stable/not in drawdown - Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry
Checked By:	OB	
Date:	20.2.26	

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	MW01
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	4.1

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	SWL – Before:	3.04
Date:	29/01/26	Time – Before:	08:11
Undertaken By:	OB	Total Vol Removed:	~8L
Pump Program No:	medium	PID (ppm):	1.9

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
08.18 (0)	3.07	0.5	peri issues	21.8	3.90	986	3.19	218.5
08.40 (0)	3.07	1.5		22.4	3.03	967	3.85	291.4
08:43 (3)	3.09	2.5		21.5	1.60	920	3.33	206.5
08.46 (6)	3.12	3.5		21.4	0.92	890	3.26	224.8
08:49 (9)	3.15	4.5	pump stopped	21.3	0.83	876	3.25	238.7
08:52 (12)	3.14	5.2		21.4	0.50	874	3.26	246.1
08 57 (17)	3.14	6.0		21.4	0.50	881	3.26	255.0
		steady state achieved - start sampling						

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
Sampling Containers Used: 4 x glass amber, 6 x BTEX vials, 3 x HNO3 plastic, 1 x H2SO4 plastic, 1 x unpreserved plastic
YSI used: (

low silt load high recharge GWDUP1

Tested By:	OB
Date Tested:	29/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

TL OUT 08:10 IN 09:15

X 1 micro

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	MW102
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	4.8

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	SWL – Before:	2.90
Date:	29/1/26	Time – Before:	9.29
Undertaken By:	OB	Total Vol Removed:	~6.5L
Pump Program No:	medium	PID (ppm):	0.3

DL OUT 09.27 IN 10.06

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
09:35 (0)	3.04	0.75		23.0	5.29	417.4	8.90	236.7
09:38 (3)	3.19	1.75		22.5	4.48	414.8	3.83	239.7
09:41 (6)	3.33	2.75		22.6	4.23	412.5	3.86	241.8
09:44 (9)	3.47	3.75	pump slowed	22.6	3.84	416.1	3.81	242.1
09:47 (12)	3.46	4.50		22.8	3.76	417.1	3.88	243.1
	steady	state	achieved - start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
Sampling Containers Used: 2x glass amber, 4 x BTEX vials, 2x HNO3 plastic, 1x H2SO4 plastic, 1 x unpreserved plastic X1 micro
YSI used:

low silt load, m-f recharge

Tested By:	OB
Date Tested:	29/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	103
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	10.0

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	SWL – Before:	4.85
Date:	30/1/26	Time – Before:	10:40
Undertaken By:	OB	Total Vol Removed:	~12L
Pump Program No:	Low	PID (ppm):	0.5

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
10:50 (0)	5.07	0.5		21.7	4.83	834	3.40	222.2
10:53 (3)	5.34	2.0		20.6	4.91	798	3.57	754.6
10:56 (6)	5.65	3.0		20.6	4.71	795	3.59	260.2
10:59 (9)	5.95	4.0		20.1	4.57	795	3.60	267.4
11:02 (12)	6.26	5.5		20.3	4.62	822	3.55	275.5
11:05 (15)	6.53	6.5		20.4	4.70	856	3.50	283.5
11:08 (18)	6.81	8.0		20.4	4.75	854	3.58	291.2
11:11 (21)	7.10	9.0		20.4	3.85	775	3.76	291.4
11:14 (24)	7.37	10.0	pump lowest setting	20.3	2.06	712	3.89	190.2
11:17 (27)	7.13	10.15		21.3	1.72	731	3.85	211.1
11:20 (30)	7.13	10.30		27.1	1.70	750	3.82	221.7
			Steady State achieved					
			- Start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
Sampling Containers Used: 2 x glass amber, 4 x BTEX vials, 1 x HNO3 plastic, 1 x H2SO4 plastic, 1 x unpreserved plastic 1x micro
YSI used: /

low recharge, low silt load.

Tested By:	SD
Date Tested:	30/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	MW101
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	10.1

WELL FINISH

x	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Bailer	SWL – Before:	8.86
Date:	29/1/26	Time – Before:	10:18
Undertaken By:	OB	Total Vol Removed:	~ 2 L
Pump Program No:	–	PID (ppm):	0.5

PL OUT 10:15 IN 16:50

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
10:29 (0)	9.00	0.4		21.3	5.34	750	6.42	237.1
			Start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 2 x glass amber, 4 x BTEX vials, 2 x HNO3 plastic, 1 x H2SO4 plastic, 1 x unpreserved plastic X 1 MW10

YSI used:

very low recharge - SWL 6.98m on 20/1/26 - 9 days still hasn't replenished low silt load

Tested By:	OB
Date Tested:	29/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	105
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	10.5

WELL FINISH

x	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Bailer	SWL – Before:	8.91
Date:	29/1/26	Time – Before:	11:09
Undertaken By:	OB	Total Vol Removed:	~ 2L
Pump Program No:	—	PID (ppm):	0.5

PL OUT 11:07 IN 11:38

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
11:13	9.07	0.5		22.4	4.40	1067	4.83	1406
			start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, 1 x HNO3 plastic, 1 x H2SO4 plastic, 1 x unpreserved plastic x 1 micro
YSI used: 1

low recharge x 1.5m of water - bailer used 1-m silt load brown

Tested By:	OB
Date Tested:	29/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	106
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	4.45

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	SWL – Before:	2.44
Date:	30/1/26	Time – Before:	12:07
Undertaken By:	SP	Total Vol Removed:	~ 11.5L
Pump Program No:	Fast	PID (ppm):	0.3

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
12:12 (0)	2.14	0.5		25.2	3.00	490.1	4.85	196.6
12:15 (3)	2.56	1.5		23.2	2.80	445.1	4.82	200.3
12:18 (6)	2.72	3.0		23.1	2.71	441.1	4.81	202.8
12:21 (9)	2.94	4.5		23.2	1.66	414.8	4.79	203.9
12:24 (12)	3.17	6.0		23.1	1.75	420.6	4.64	204.6
12:27 (15)	3.42	7.5	pump shutoff	23.0	1.81	422.6	4.83	202.1
12:30 (18)	3.40	8.5		24.5	1.77	439.6	4.90	196.2
12:33 (21)	3.40	9.5		24.4	1.69	438.2	4.92	194.0
		steady	state achieved - start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
Sampling Containers Used: 2 x glass amber, 4 x BTEX vials, 2 x HNO3 plastic, 1 x H2SO4 plastic, 1 x unpreserved plastic 1x Micro
YSI used: 1

low silt load, m-H reducing C

Tested By:	SP
Date Tested:	30/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	107
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	8.5

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	SWL – Before:	4.15
Date:	30/1/26	Time – Before:	8:25
Undertaken By:	OB	Total Vol Removed:	12 L
Pump Program No:	low	PID (ppm):	0.9

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
08:37 (6)	4.30	0.5		21.4	2.89	567.0	4.99	168.6
08:40 (3)	4.56	2.5		20.9	0.37	458.9	4.70	136.3
08:43 (6)	4.84	4.0		21.0	0.35	459.5	4.76	126.7
08:46 (9)	5.09	5.5		21.1	0.34	466.1	4.77	123.7
08:49 (12)	5.36	6.5		21.2	0.40	465.1	4.79	123.9
08:52 (15)	5.57	7.5		21.3	0.35	473.1	4.82	123.2
08:55 (18)	5.81	8.5		21.2	0.31	477.1	4.86	121.7
08:58 (21)	6.05	9.5	pump slowed	21.1	0.29	480.2	4.92	117.3
09:01 (24)	6.31	9.75	pump on lowest setting	21.0	0.24	484.0	5.04	85.3
09:04 (27)	6.35	10		22.0	0.29	510.0	5.05	84.5
09:07 (30)	6.35	10.25		22.9	0.36	518	5.07	91.7
			Steady State Achieved - start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
Sampling Containers Used: 2x glass amber, 4x BTEX vials, 2 x HNO_3 plastic, | x H_2SO_4 plastic, | x unpreserved plastic x1 micro
YSI used:

medium silt loud, grey brown, low recharge

Tested By:	SP
Date Tested:	30/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	108
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	5.0

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	SWL – Before:	2.89
Date:	29/1/26	Time – Before:	13:18
Undertaken By:	OB	Total Vol Removed:	~9L
Pump Program No:	Fast	PID (ppm):	0.2

PL OUT 13:16

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
13:24 (0)	2.96	1.0		24.4	4.37	591	5.62	137.4
13:27 (3)	3.00	2.5		23.8	3.51	588	5.64	131.7
13:30 (6)	3.03	4.0		24.0	3.58	599	5.66	119.7
13:33 (9)	3.06	5.0	pump slowed	24.1	3.17	637	5.79	94.3
13:36 (12)	3.05	6.0		24.7	3.23	651	5.83	76.4
13:39 (15	3.05	7.0		24.9	3.20	655	5.83	68.8
			steady state achieved - start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)
Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, 2 x HNO3 plastic, 1x H2SO4 plastic, 1 x unpreserved plastic x1 micro
YSI used:

low silt load, high recharge

Tested By:	OB
Date Tested:	29/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	Levande Pty Ltd	Job No.:	E38092B
Project:	Proposed Development	Well No.:	109
Location:	Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW	Depth (m):	15.2

WELL FINISH

X	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Peristaltic Pump	SWL – Before:	4.90
Date:	29/1/26	Time – Before:	12:22
Undertaken By:	OB	Total Vol Removed:	~12L
Pump Program No:	medium	PID (ppm):	0.5

DL
Out
12:20
In
13:03

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
12.29 (0)	5.01	1.0		23.2	7.59	370.8	4.58	162.9
12.32 (3)	5.12	2.5		21.6	3.71	423.1	3.89	184.0
12.35 (6)	5.25	4.0		21.0	3.39	421.1	4.00	198.3
12:38 (9)	5.37	5.5		21.0	2.61	419.5	4.54	200.0
12.41 (12)	5.45	7.0		20.9	2.00	424.4	4.88	194.7
12.44 (15)	5.54	8.5	pump slowed	20.9	1.58	424.0	5.01	195.7
12:47 (18)	5.54	9.5		21.3	0.11	439.5	5.17	167.5
12:50 (21)	5.54	10.5		21.4	0.09	441.6	5.20	160.8
			steady state achieved					
			- start sampling					

Comments: Odours (YES / (NO)) NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / NO)
Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, 2 x HNO3 plastic, 1 x H2SO4 plastic, 1 x unpreserved plastic x 1 mm C/C
YSI used:

low silt load. m.H recharge

Tested By:	OB
Date Tested:	29/1/26
Checked By:	OB
Date:	20.2.2

Remarks:
- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

Appendix F: Lotsearch Environmental Report

LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 23 Jan 2026 17:14:48

Reference: LS117402 EP

Address: Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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:

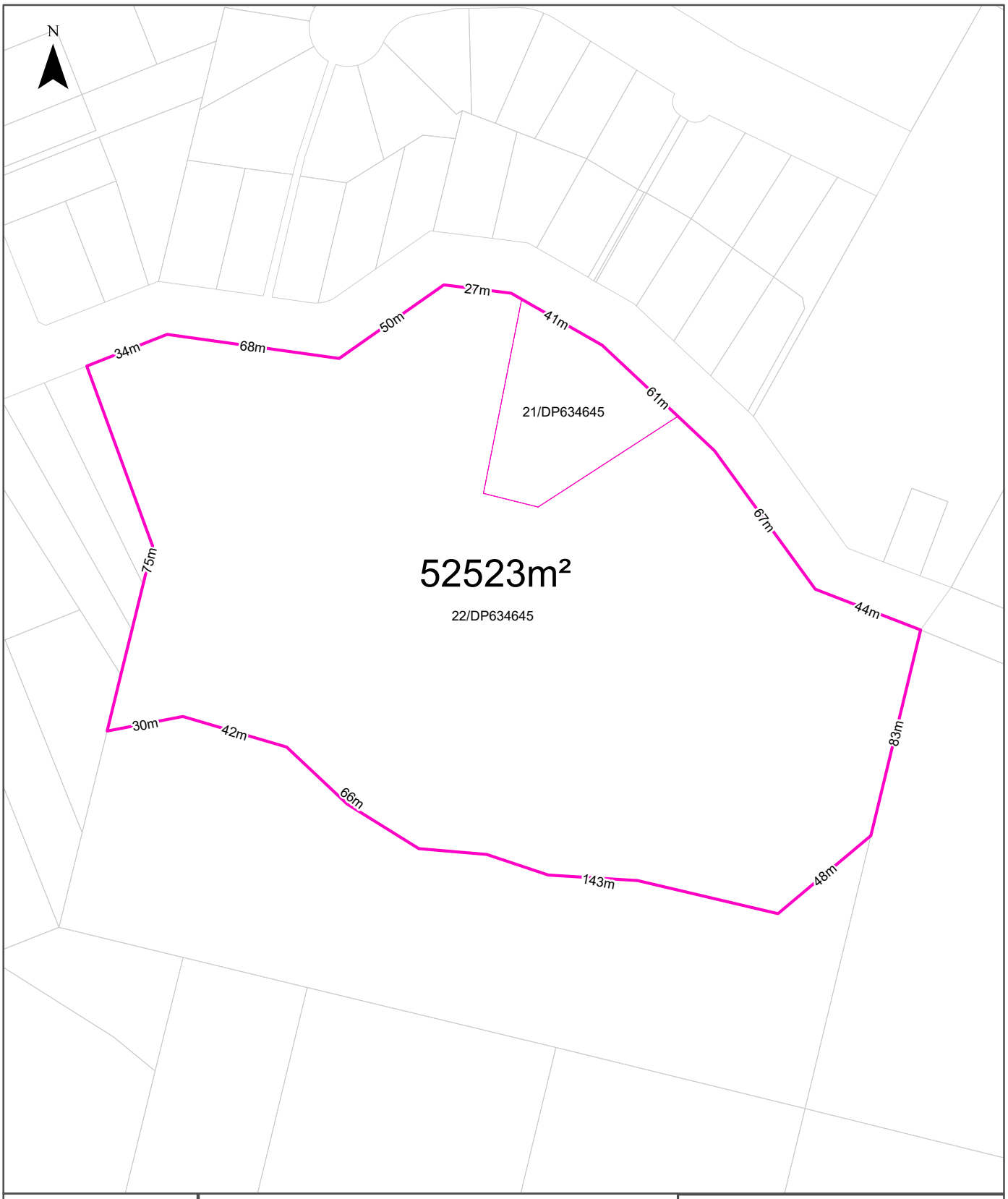
Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Customer Service - Spatial Services	13/01/2026	13/01/2026	Monthly	-	-	-	-
Topographic Data	NSW Department of Customer Service - Spatial Services	20/05/2025	20/05/2025	Annually	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority NSW	19/01/2026	09/12/2025	Monthly	1000m	0	0	0
Contaminated Land Records of Notice	Environment Protection Authority NSW	19/01/2026	19/01/2026	Monthly	1000m	0	0	0
Former Gasworks	Environment Protection Authority NSW	13/11/2025	23/06/2025	Quarterly	1000m	0	0	0
Notices under the POEO Act 1997	Environment Protection Authority NSW	19/01/2026	19/01/2026	Monthly	1000m	0	0	1
National Waste Management Facilities Database	Geoscience Australia	30/05/2025	19/01/2023	Annually	1000m	0	0	1
National Liquid Fuel Facilities	Geoscience Australia	28/10/2025	30/11/2022	Annually	1000m	0	0	1
EPA PFAS Investigation Program	Environment Protection Authority NSW	12/01/2026	15/11/2025	Monthly	2000m	0	0	0
Rural Fire Service PFAS Environmental Investigations	NSW Rural Fire Service	08/01/2026	23/12/2025	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Australian Department of Defence	13/01/2026	13/01/2026	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Australian Department of Defence	13/01/2026	13/01/2026	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	12/01/2026	21/05/2025	Monthly	2000m	0	0	0
Defence Controlled Areas	Australian Department of Defence	13/01/2026	13/01/2026	Quarterly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Australian Department of Defence	12/11/2025	02/09/2022	Quarterly	2000m	0	0	0
National Unexploded Ordnance (UXO)	Australian Department of Defence	13/01/2026	13/01/2026	Quarterly	2000m	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority NSW	03/12/2025	13/10/2025	Annually	1000m	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority NSW	07/01/2026	07/01/2026	Monthly	1000m	0	0	1
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority NSW	07/01/2026	07/01/2026	Monthly	1000m	0	0	1
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority NSW	07/01/2026	07/01/2026	Monthly	1000m	0	3	3
Lotsearch Research	Lotsearch Pty Ltd			As required	1000m	0	0	0
UBD Business Directories (Premise & Intersection Matches)	Hardie Grant			Not required	150m	3	3	3
UBD Business Directories (Road & Area Matches)	Hardie Grant			Not required	150m	-	0	0
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500m	0	0	0
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500m	-	0	0
Points of Interest	NSW Department of Customer Service - Spatial Services	18/11/2025	18/11/2025	Quarterly	1000m	2	2	53
Tanks (Areas)	NSW Department of Customer Service - Spatial Services	18/11/2025	18/11/2025	Quarterly	1000m	0	0	0
Tanks (Points)	NSW Department of Customer Service - Spatial Services	18/11/2025	18/11/2025	Quarterly	1000m	0	0	1
Major Easements	NSW Department of Customer Service - Spatial Services	17/11/2025	17/11/2025	Quarterly	1000m	0	0	3

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
State Forest	Forestry Corporation of NSW	17/12/2025	14/12/2025	Annually	1000m	0	0	0
Hydrogeology Map of Australia	Geoscience Australia	22/04/2025	19/08/2019	Annually	1000m	1	1	1
Temporary Water Restriction (Botany Sands Groundwater Source) Order 2024	NSW Department of Climate Change, Energy, the Environment and Water	12/11/2025	28/06/2024	Quarterly	1000m	0	0	0
National Groundwater Information System (NGIS) Boreholes	Bureau of Meteorology; Water NSW	30/05/2025	04/03/2025	Annually	2000m	0	0	14
NSW Seamless Geology Single Layer: Rock Units	NSW Department of Primary Industries and Regional Development	19/05/2025	16/04/2024	Annually	1000m	2	2	2
NSW Seamless Geology Single Layer: Geological Boundaries and Faults	NSW Department of Primary Industries and Regional Development	19/05/2025	16/04/2024	Annually	1000m	0	0	0
NSW Seamless Geology Single Layer: Trendlines	NSW Department of Primary Industries and Regional Development	19/05/2025	16/04/2024	Annually	1000m	0	0	0
NSW Seamless Geology Single Layer: Fold Axes	NSW Department of Primary Industries and Regional Development	19/05/2025	16/04/2024	Annually	1000m	0	0	0
Naturally Occurring Asbestos Potential	NSW Department of Primary Industries and Regional Development	05/05/2025	30/09/2015	Annually	1000m	0	0	0
Atlas of Australian Soils	Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES)	13/01/2026	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	17/12/2025	27/07/2020	Annually	1000m	2	2	4
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning, Housing and Infrastructure	12/01/2026	14/11/2025	Monthly	500m	1	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	13/01/2026	21/02/2013	Annually	1000m	1	1	2
Dryland Salinity - National Assessment	Australian Bureau of Agricultural and Resource Economics and Sciences	03/06/2025	15/04/2025	Annually	1000m	0	0	0
Mining Subsidence Districts	NSW Department of Customer Service	18/11/2025	18/11/2025	Quarterly	1000m	0	0	0
Current Mining Titles	NSW Department of Primary Industries and Regional Development	13/01/2026	13/01/2026	Monthly	1000m	0	0	0
Mining Title Applications	NSW Department of Primary Industries and Regional Development	13/01/2026	13/01/2026	Monthly	1000m	0	0	0
Historic Mining Titles	NSW Department of Primary Industries and Regional Development	13/01/2026	13/01/2026	Monthly	1000m	10	10	11
Environmental Planning Instrument SEPP State Significant Precincts	NSW Department of Planning, Housing and Infrastructure	12/01/2026	08/09/2023	Monthly	1000m	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning, Housing and Infrastructure	12/01/2026	12/12/2025	Monthly	1000m	1	6	73
Commonwealth Heritage List	Australian Department of Climate Change, Energy, the Environment and Water	28/10/2025	04/12/2014	Annually	500m	0	0	0
National Heritage List	Australian Department of Climate Change, Energy, the Environment and Water	28/10/2025	04/12/2014	Annually	500m	0	1	1
State Heritage Register - Curtilages	NSW Department of Planning, Industry and Environment	17/11/2025	31/10/2025	Quarterly	500m	0	0	0
Environmental Planning Instrument Local Heritage	NSW Department of Planning, Housing and Infrastructure	12/01/2026	12/12/2025	Monthly	500m	2	5	46
Bush Fire Prone Land	NSW Rural Fire Service	07/01/2026	23/12/2025	Monthly	1000m	2	2	3
NSW Native Vegetation Type Map	NSW Department of Climate Change, Energy, the Environment and Water	12/12/2025	18/11/2025	Quarterly	1000m	7	10	197
Ramsar Wetlands of Australia	Australian Department of Climate Change, Energy, the Environment and Water	19/05/2025	05/03/2025	Annually	1000m	0	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Collaborative Australian Protected Areas Database (CAPAD) 2022 - Terrestrial	Australian Department of Climate Change, Energy, The Environment and Water	20/03/2025	19/06/2024	Annually	1000m	0	0	1
Collaborative Australian Protected Areas Database (CAPAD) 2022 - Marine	Australian Department of Climate Change, Energy, The Environment and Water	20/03/2025	30/06/2022	Annually	1000m	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	30/05/2025	07/05/2020	Annually	1000m	0	0	2
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	30/05/2025	07/05/2020	Annually	1000m	0	0	2
NSW BioNet Species Sightings	NSW Department of Climate Change, Energy, the Environment and Water	19/01/2026	19/01/2026	Monthly	10000m	-	-	-

Site Diagram

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Legend

- Site Boundary
- Internal Parcel Boundaries

Total Area: 52523m²

Total Perimeter: 957m

Disclaimers:

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 25 50 100 Meters

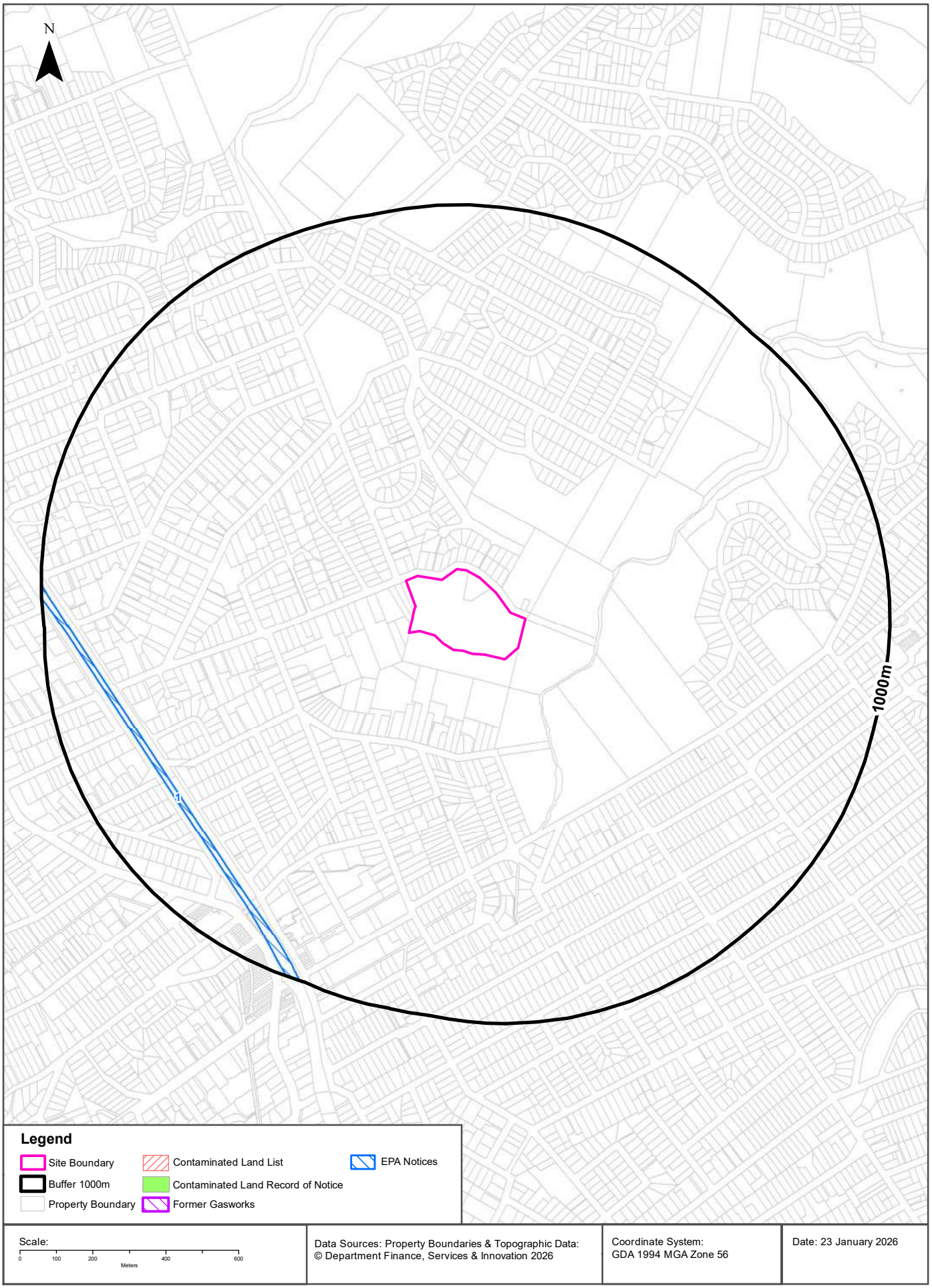
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2026

Coordinate System: GDA 1994 MGA Zone 56

Date: 23 January 2026

Contaminated Land

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Contaminated Land

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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
N/A	No records in buffer								

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: 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

EPA Notices

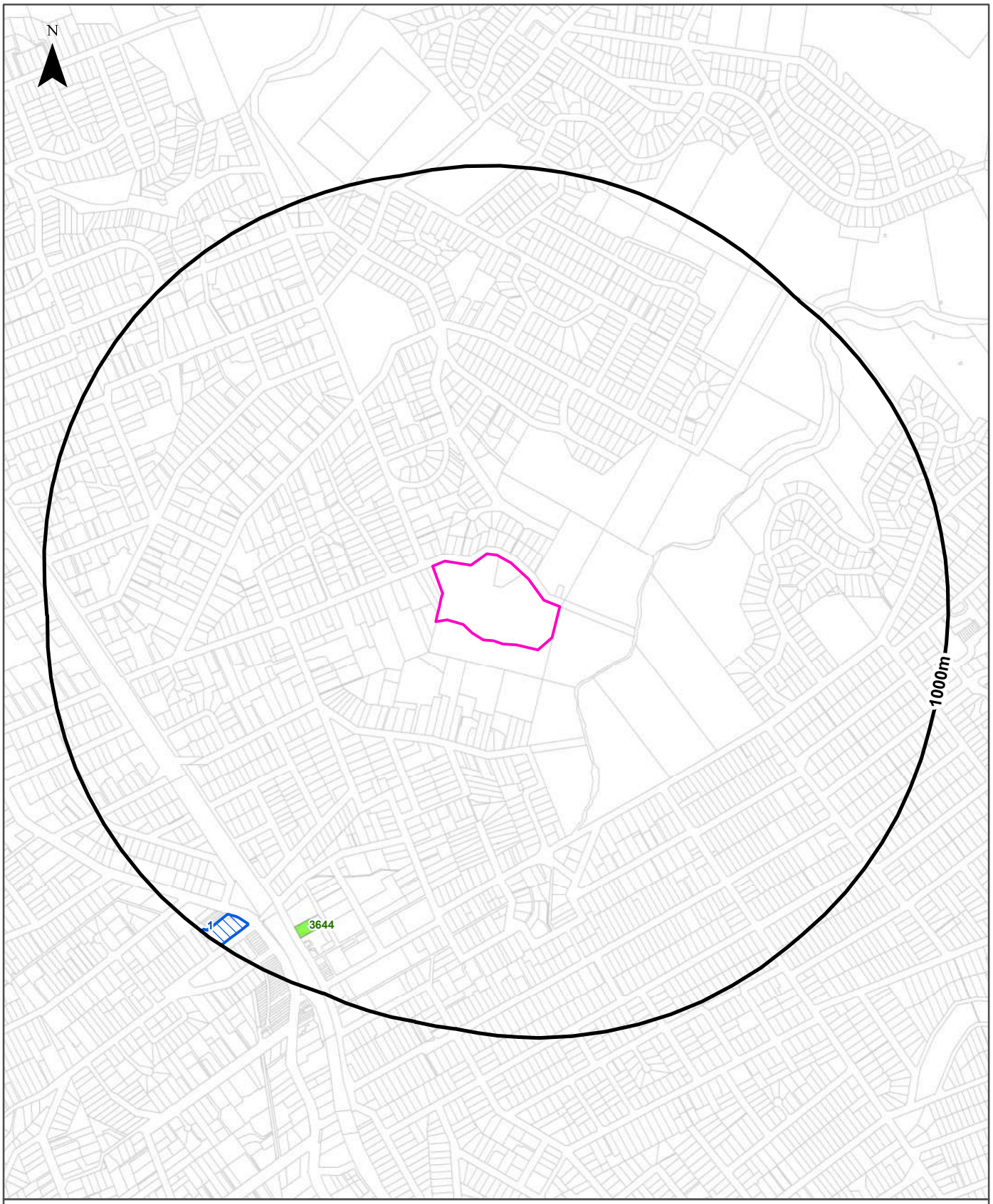
Penalty Notices, s.91 & s.92 Clean up Notices and s.96 Prevention Notices within the dataset buffer:

Map ID	Number	Type	Name	Address	Status	Issued Date	Act	Offence	Offence Date	Loc Conf	Dist	Dir
1	3173530755	Penalty Notice	SYDNEY TRAINS	SYDNEY TRAINS, HAYMARKET, NSW 1238	Issued	10/11/2021	Protection of the Environment Operations Act 1997 - 64(1)	Contravene condition of licence - Corporation	31/05/2021	Network of Features	770m	South West

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

Waste Management & Liquid Fuel Facilities

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Legend

- Site Boundary
- Buffer 1000m
- Property Boundary
- Waste Management Facilities
- National Liquid Fuel Facilities

Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2026	Coordinate System: GDA 1994 MGA Zone 56	Date: 23 January 2026

Waste Management & Liquid Fuel Facilities

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

National Waste Management Facilities Database

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

Map ID	Owner	Name	Address	Management Type	Facility Type	Status	Loc Conf	Dist	Dir
1	COLES	COLES SUPERMARKET	376-384 PACIFIC HIGHWAY, LINDFIELD	DROP-OFF	SOFT PLASTICS DROP-OFF FACILITY	OPERATIONAL	Premise Match	915m	South West

Source: Waste Management Facilities Database

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National Liquid Fuel Facilities

National Liquid Fuel Facilties within the dataset buffer:

Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist	Direction
3644	United	Lindfield	43-47 Lindfield Avenue	Lindfield	Petrol Station	Operational		25/07/2011	Premise Match	831m	South West

National Liquid Fuel Facilities Data Source: Geoscience Australia

Creative Commons 4.0 © Commonwealth of Australia

PFAS Investigation & Management Programs

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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

RFS PFAS Environmental Investigations

Sites that are part of the RFS PFAS Environmental Investigations within the dataset buffer:

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

NSW RFS PFAS Environmental Investigations Custodian: NSW Rural Fire Service

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

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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:

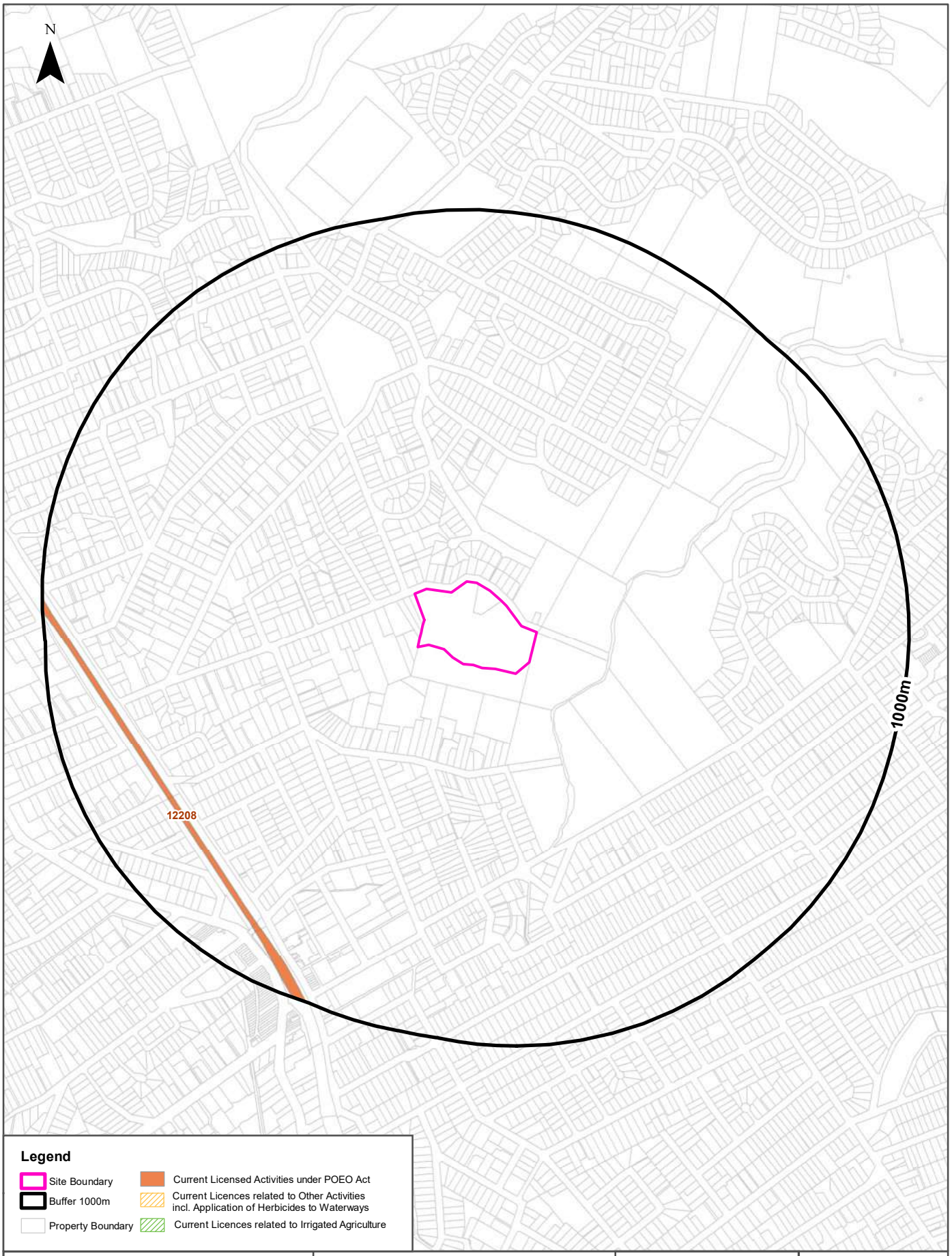
Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Current EPA Licensed Activities

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2026

Coordinate System: GDA 1994 MGA Zone 56

Date: 23 January 2026

EPA Activities

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Licensed Activities under the POEO Act 1997

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

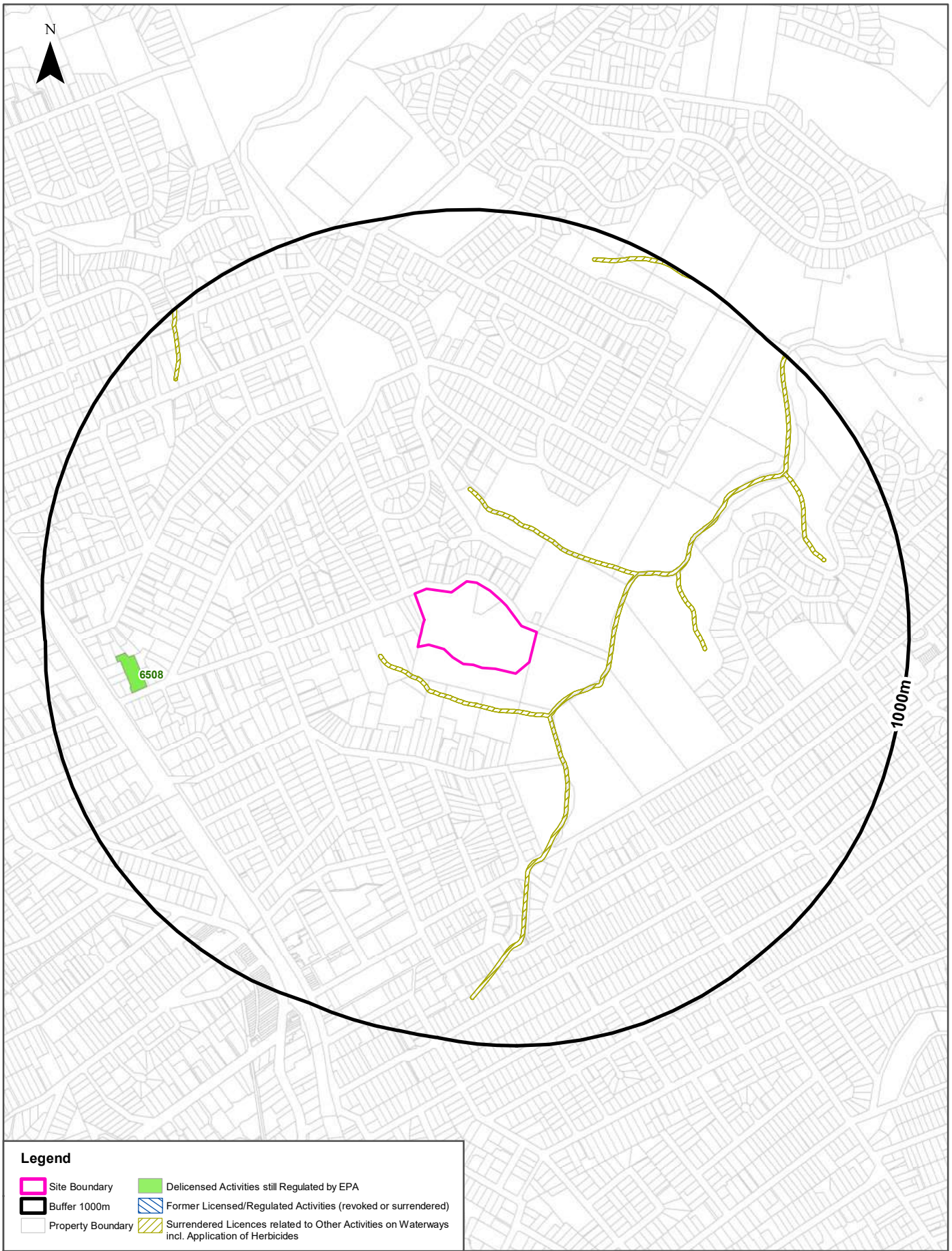
EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
12208	SYDNEY TRAINS		SYDNEY TRAINS, HAYMARKET, NSW 1238		Railway systems activities	Network of Features	770m	South West

POEO Licence Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Delicensed & Former Licensed EPA Activities

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



EPA Activities

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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
6508	DALCROSS MANAGEMENT PTY LIMITED	DALCROSS PRIVATE HOSPITAL	28 STANHOPE RD	KILLARA	Hazardous, Industrial or Group A Waste Generation or Storage	Premise Match	734m	West

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	70m	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	70m	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	70m	East

Former Licensed Activities Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Lotsearch Research

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

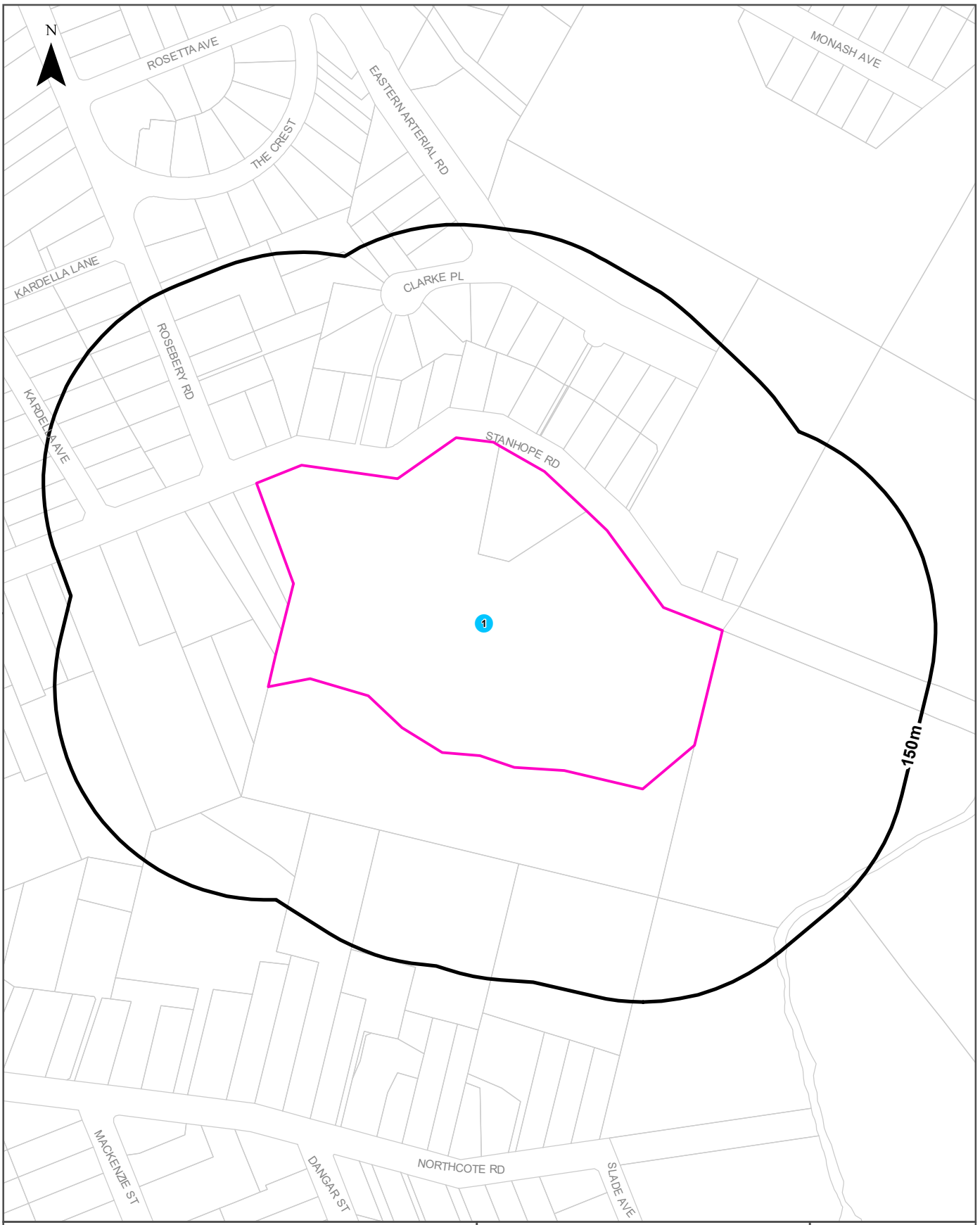
Contamination Sources

Features identified by proprietary research undertaken by Lotsearch within the dataset buffer: **Potential Landfills**. The listed sites may be historical, and the land use in the indicated area may have changed since the identification period. The identification period reflects when the site was identified in source materials and does not indicate the period of operation of the activity.

Map ID	Research Category	Activity	Earliest Source	Latest Source	Existence Confidence	Boundary Confidence	Dist	Dir
N/A	No records in buffer							

Historical Business Directories

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Legend

- Site Boundary
- Buffer 150m
- Property Boundary
- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- Business directory records mapped to a road corridor
- Business directory records mapped to a general area

Scale: 0 50 100 150 200 Meters

Coordinate System: GDA 1994 MGA Zone 56

Date: 23 January 2026

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018
Property Boundaries © NSW Department Finance, Services & Innovation 2026

Historical Business Directories

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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
1	Hospitals - Public	Lourdes Public Hospital, 95 Stanhope St., Killara	101105	1965	Premise Match	0m	On-site
	HOSPITALS-PRIVATE	Lardes T.B. Hospital, 95 Stanhope St., Killara	324782	1961	Premise Match	0m	On-site
	HOSPITALS-PRIVATE	Lourdes, T.B. Hospital, 95 Stanhope St., Killara	62678	1950	Premise Match	0m	On-site

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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
N/A	No records in buffer					

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Historical Business Directories

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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						

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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.

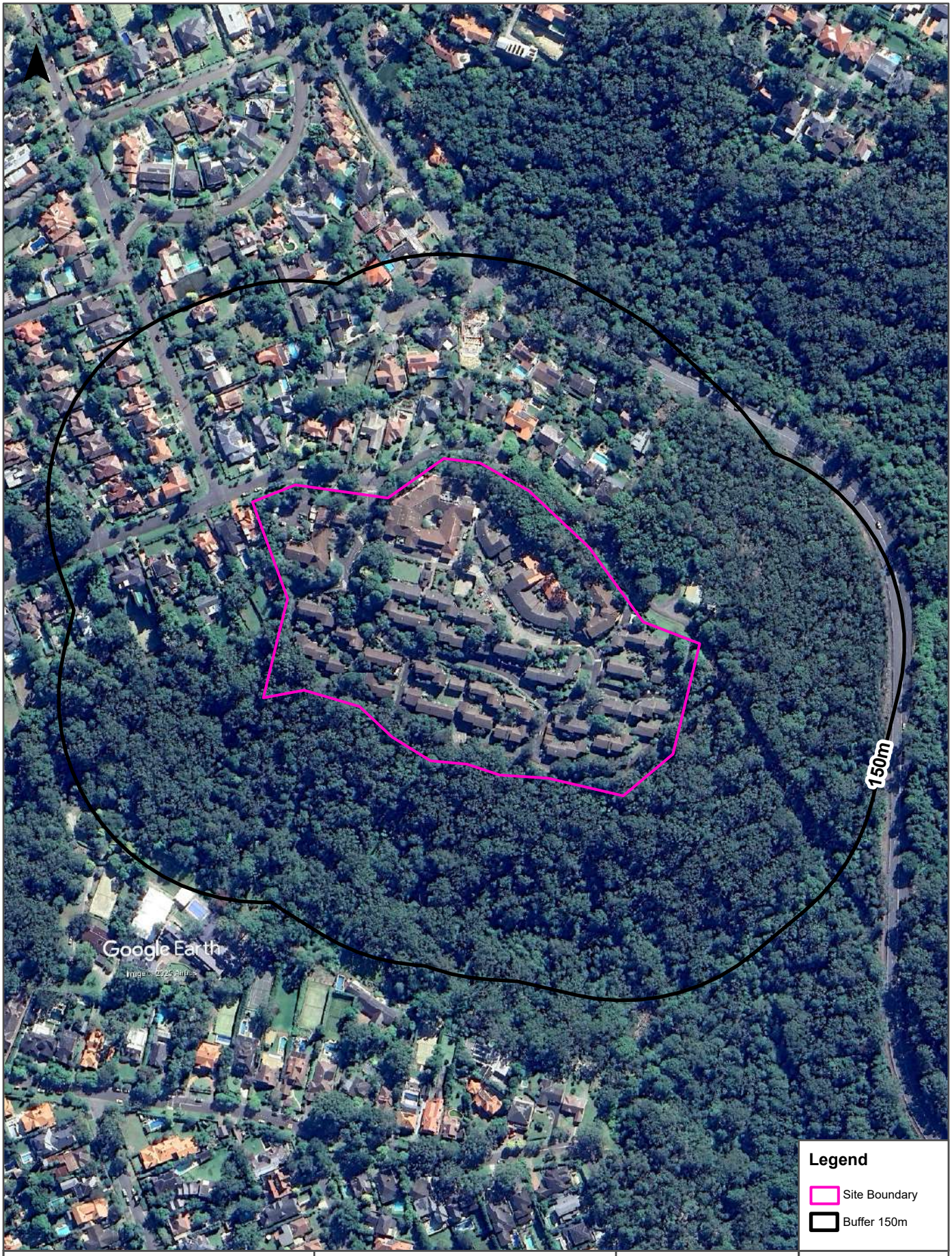
Note: The Universal Business Directories were published between 1948 and 1993. Dry Cleaners, Motor Garages & Service Stations have been extracted from all of these directories except the following years 1951, 1955, 1957, 1960, 1963, 1973, 1974, 1977, 1987.

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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Aerial Imagery 2025

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale:
0 40 80 120 160
Meters

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Coordinate System:
GDA 1994 MGA Zone 56

Date: 27 January 2026

Aerial Imagery 2014

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale:
0 40 80 120 160
Meters

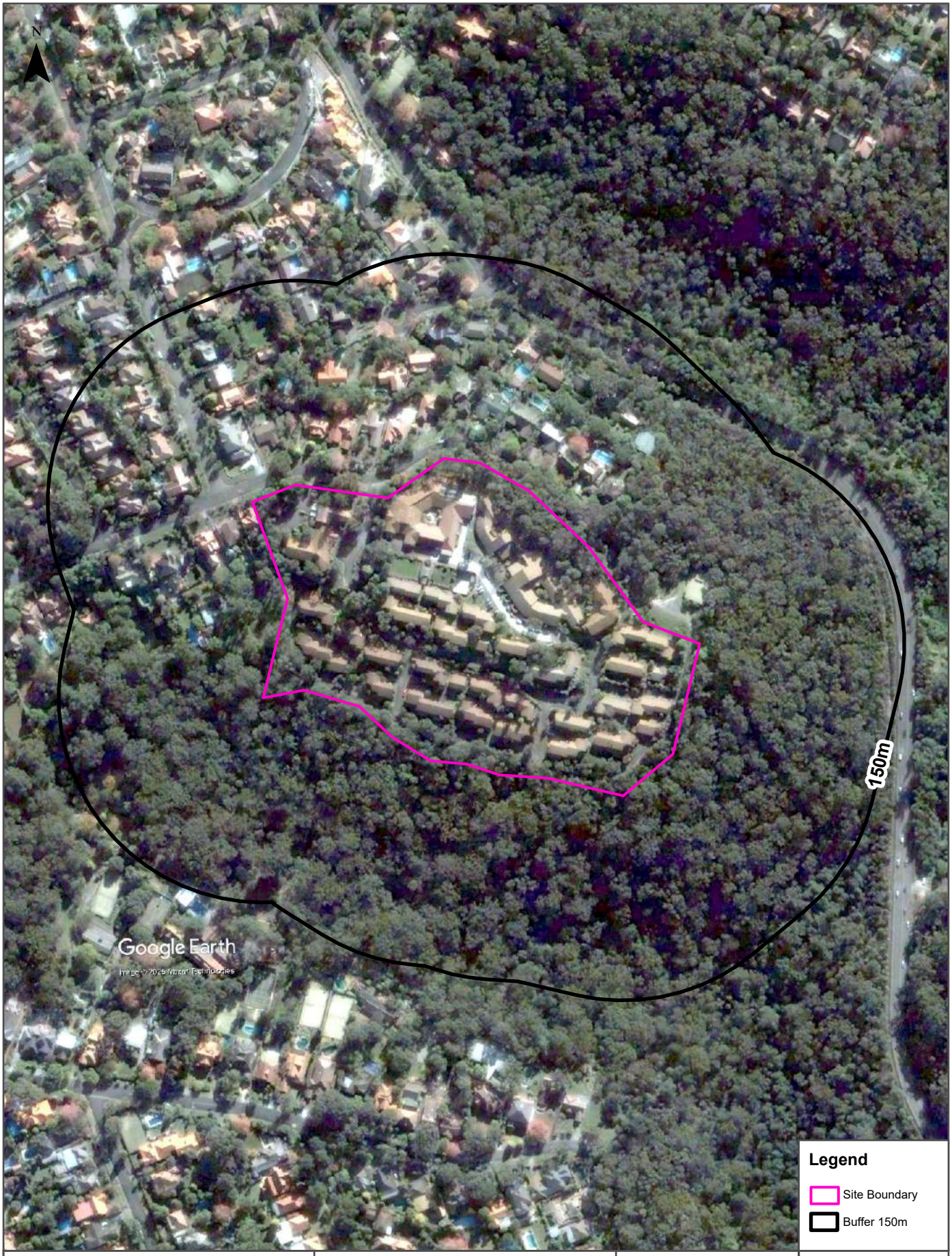
Data Source Aerial Imagery: © 2026 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 27 January 2026

Aerial Imagery 2005

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale:
0 40 80 120 160
Meters

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Coordinate System:
GDA 1994 MGA Zone 56

Date: 27 January 2026

Aerial Imagery 1994

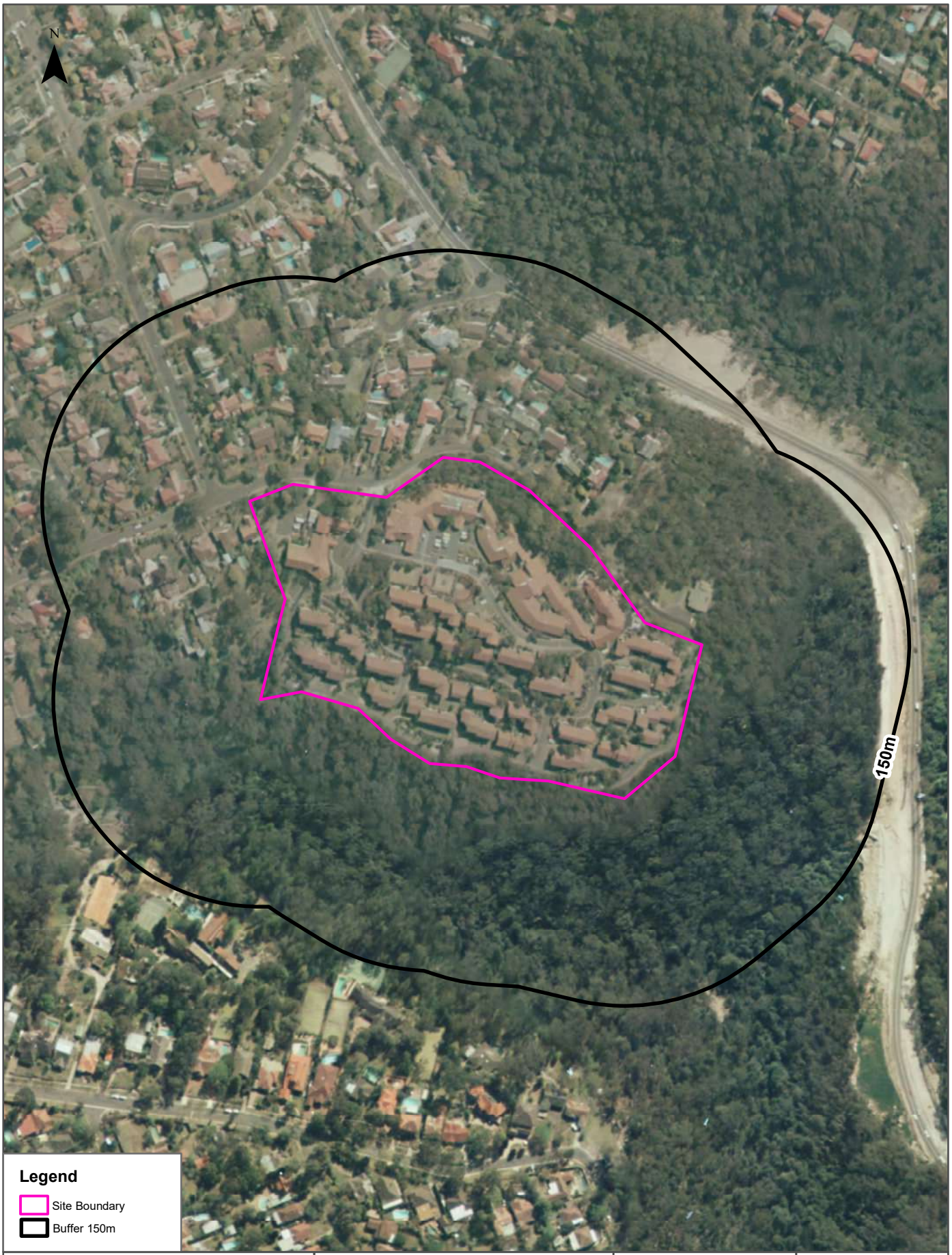
Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale:	Data Sources Aerial Imagery:	Coordinate System:	Date: 27 January 2026
0 40 80 120 160 Meters	© NSW Department of Customer Service	GDA 1994 MGA Zone 56	

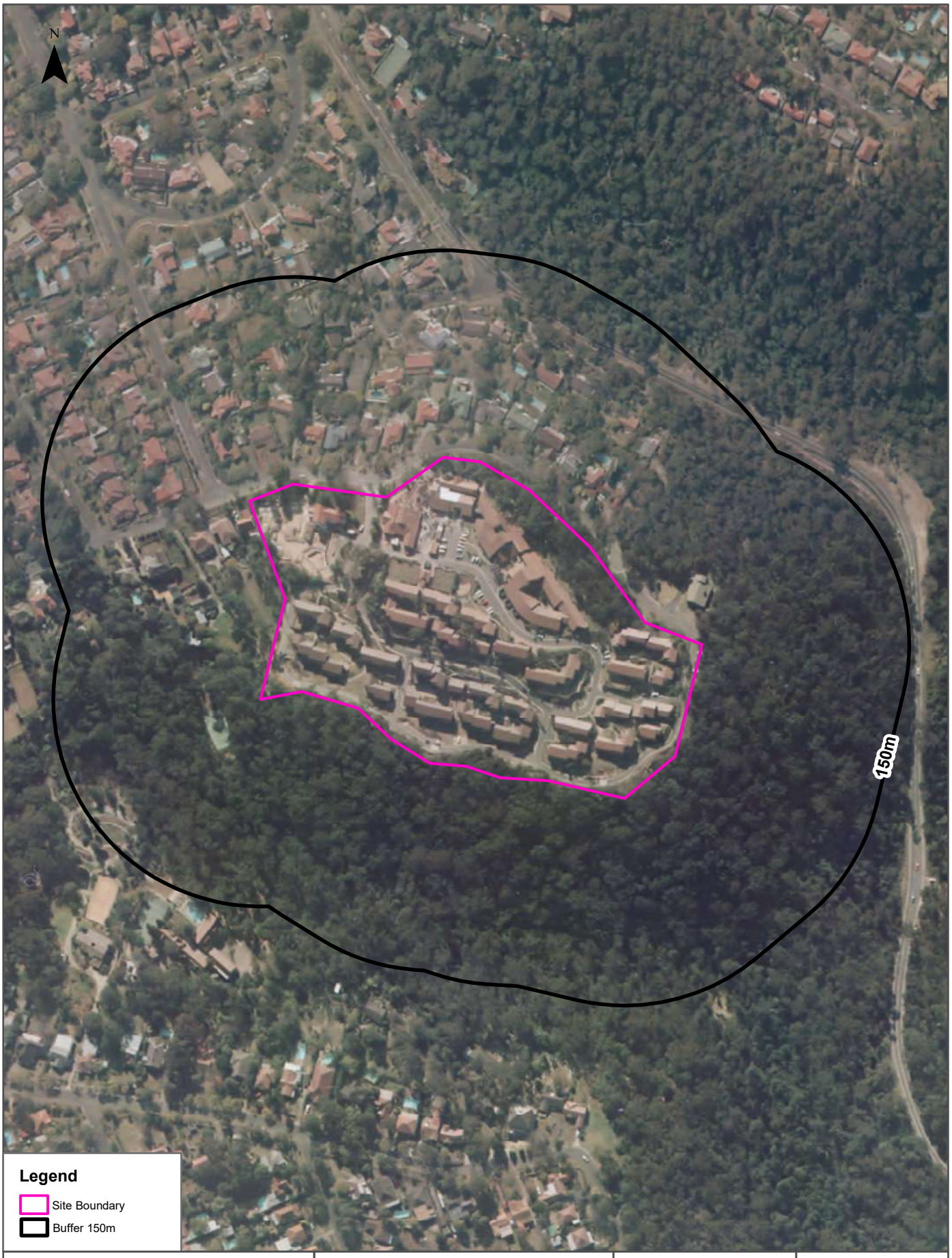
Aerial Imagery 1991

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Aerial Imagery 1986

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



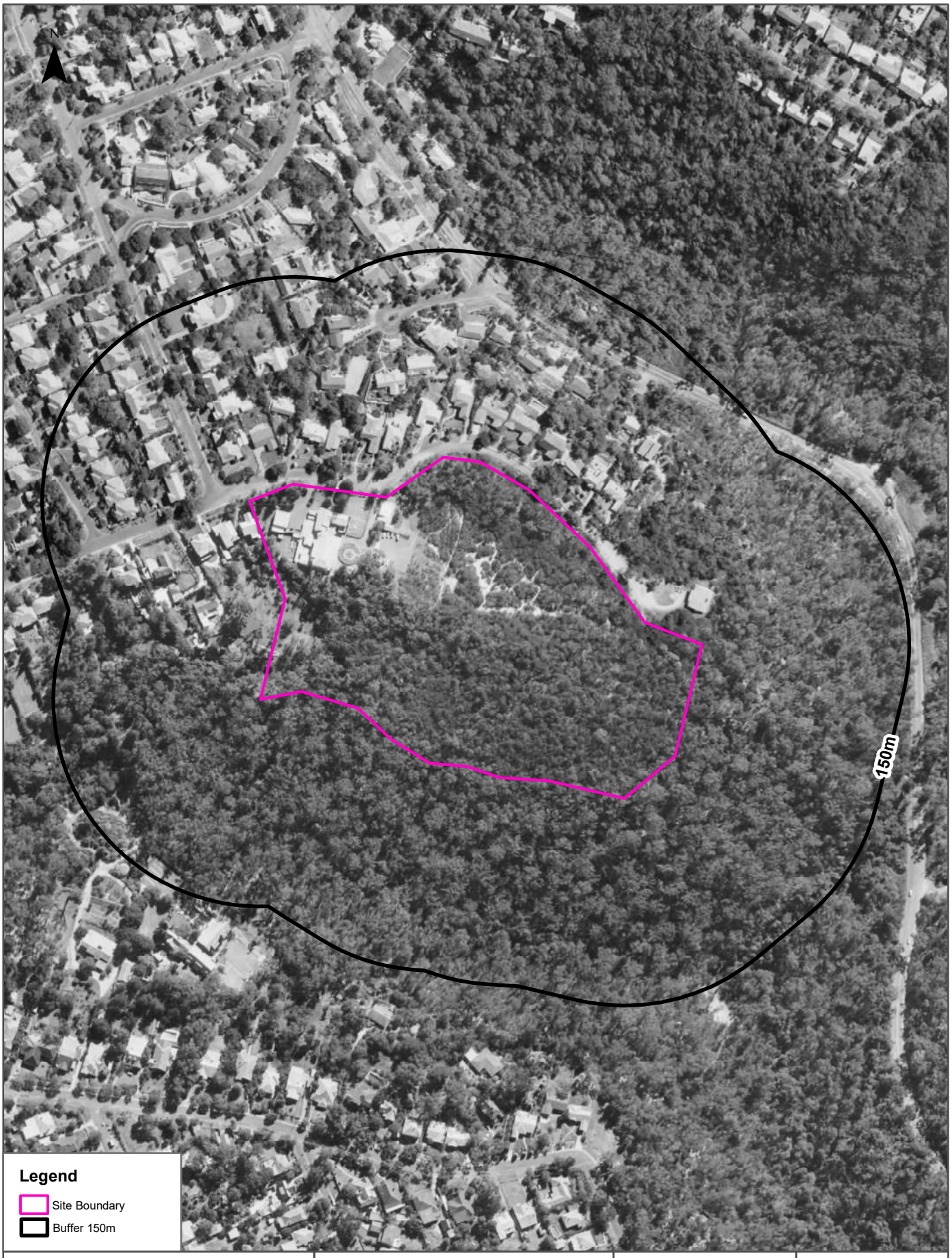
Aerial Imagery 1982

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Aerial Imagery 1978

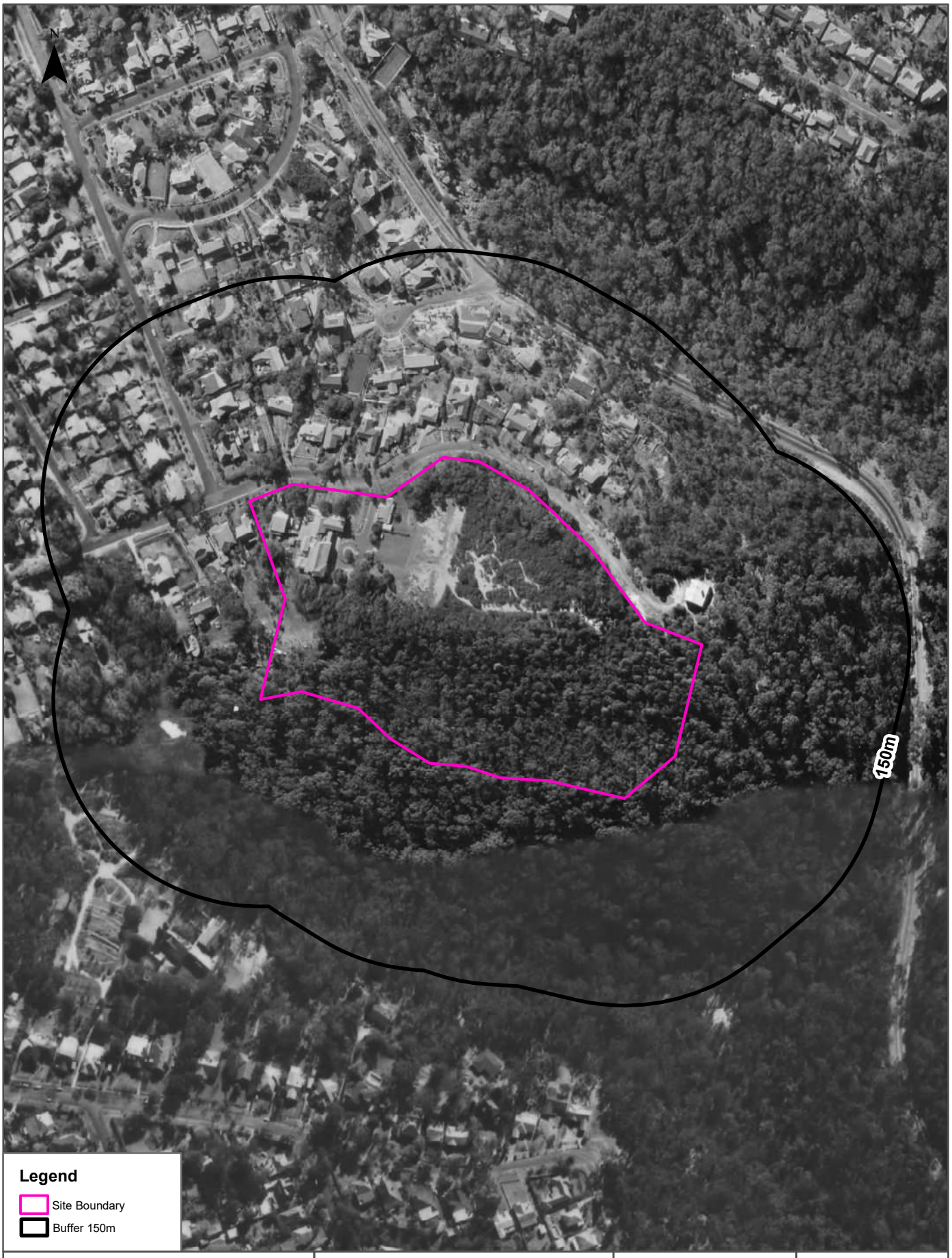
Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale: 0 40 80 120 160 Meters	Data Sources Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 January 2026

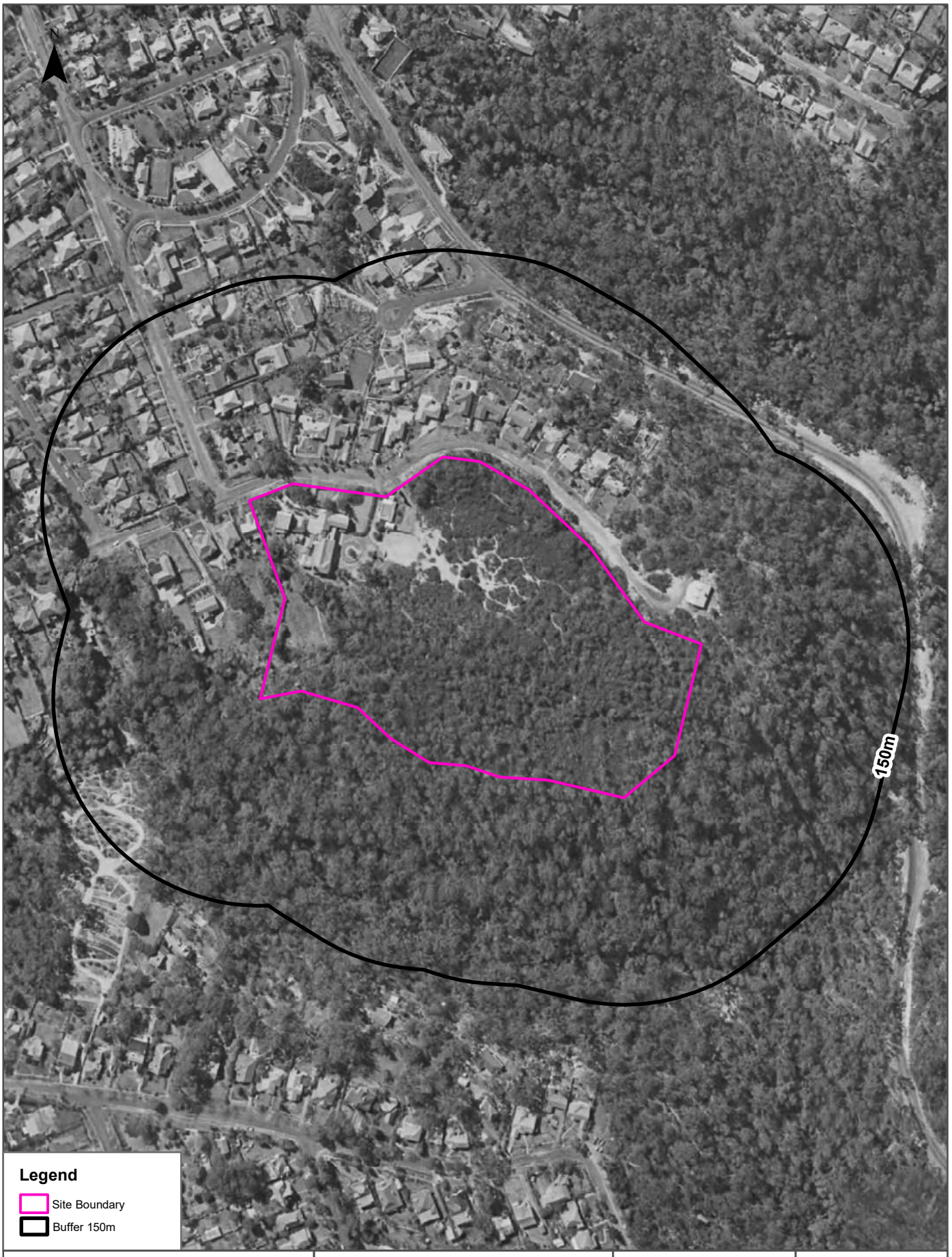
Aerial Imagery 1970

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Aerial Imagery 1965

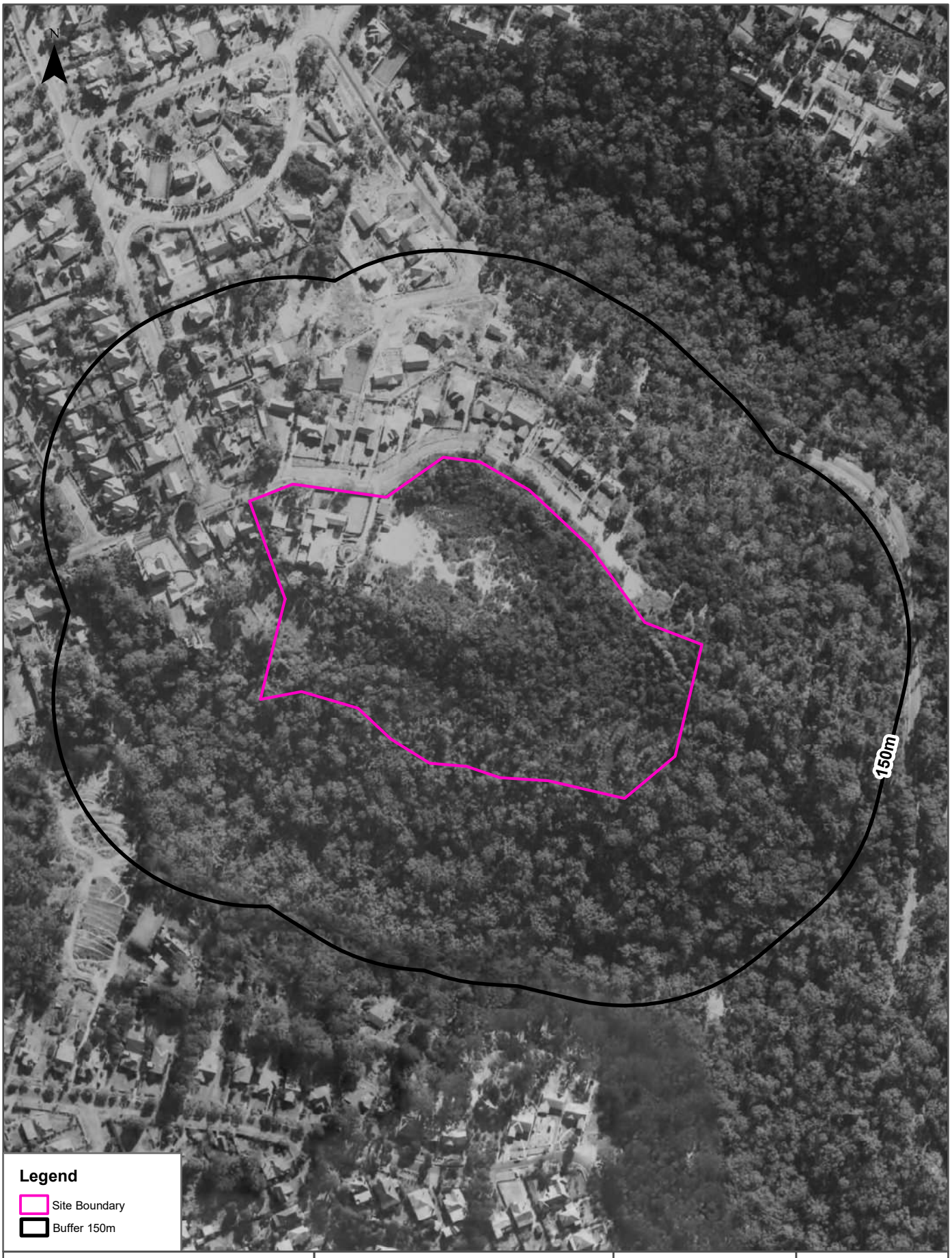
Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale: 0 40 80 120 160 Meters	Data Sources Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 January 2026

Aerial Imagery 1961

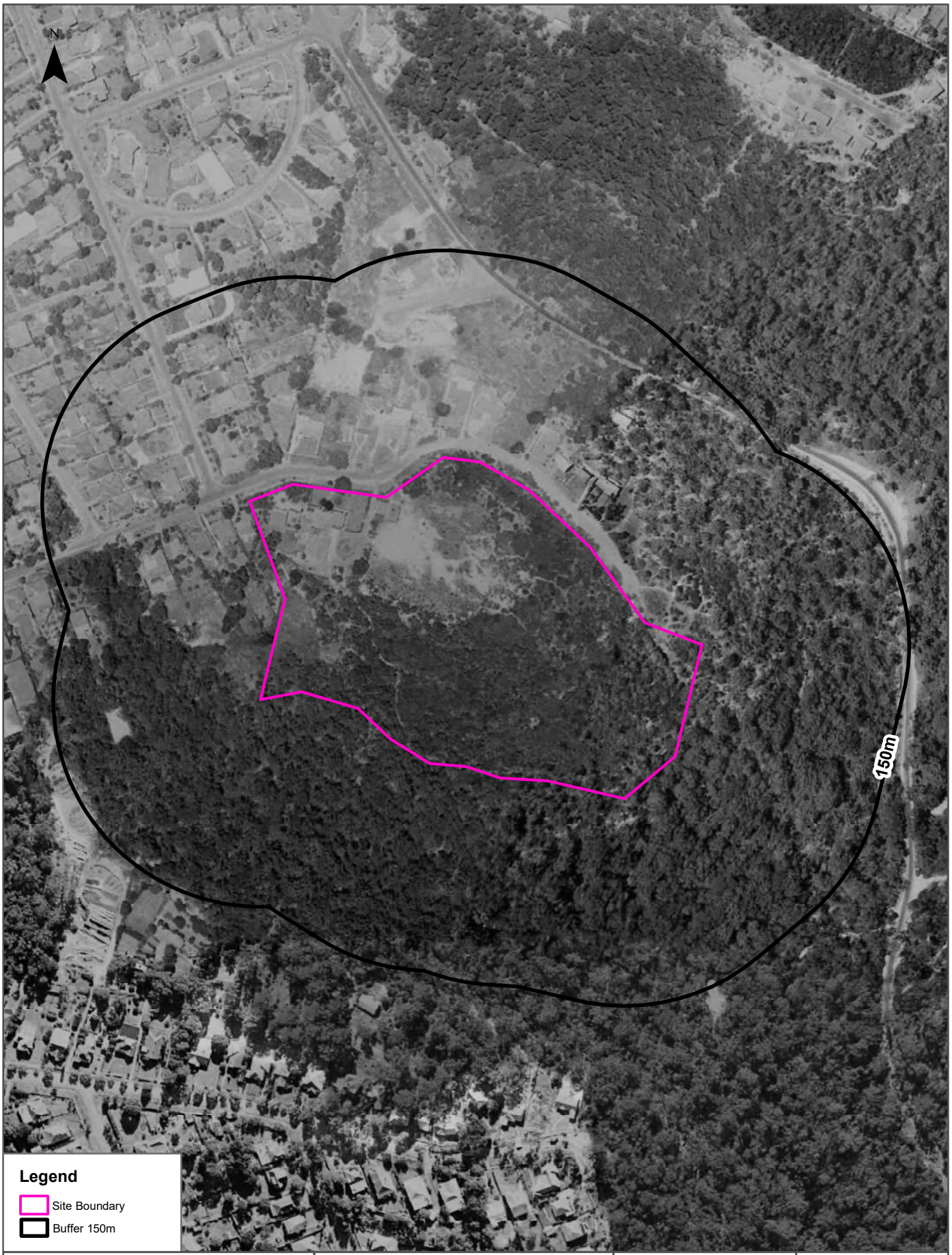
Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale: 0 40 80 120 160 Meters	Data Sources Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 January 2026

Aerial Imagery 1955-1956

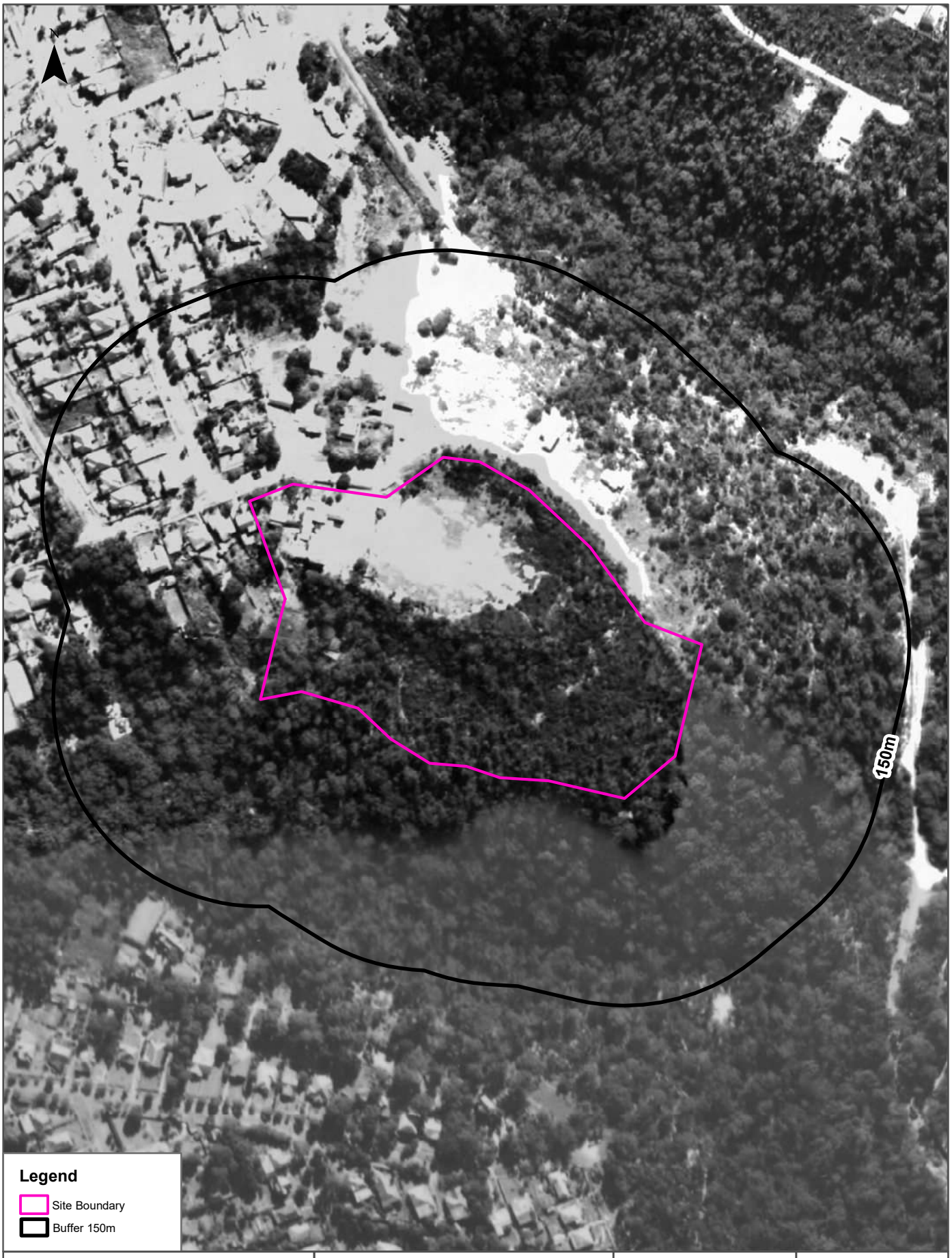
Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale: 0 40 80 120 160 Meters	Data Sources Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 January 2026

Aerial Imagery 1951

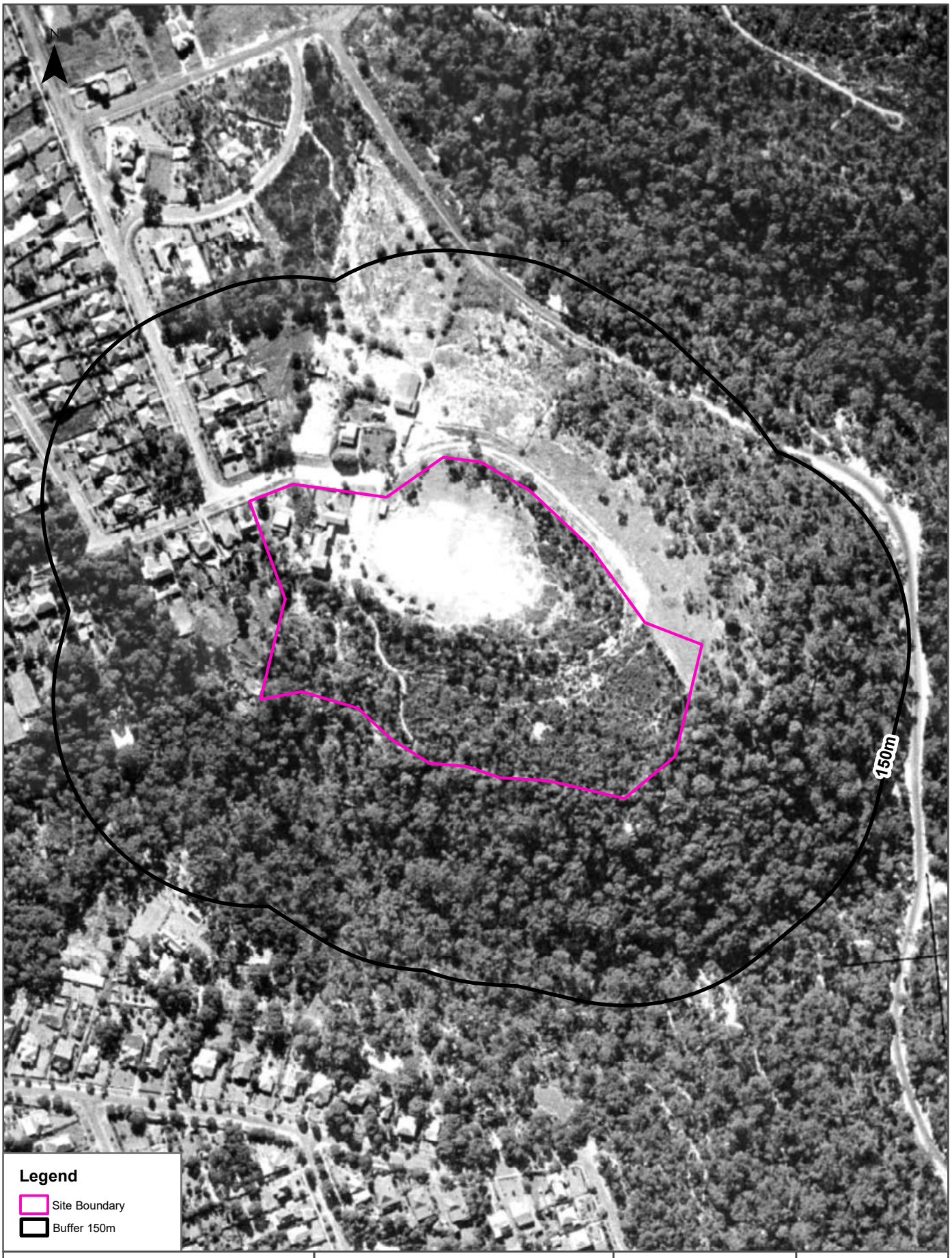
Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale: 0 40 80 120 160 Meters	Data Sources Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 January 2026

Aerial Imagery 1943

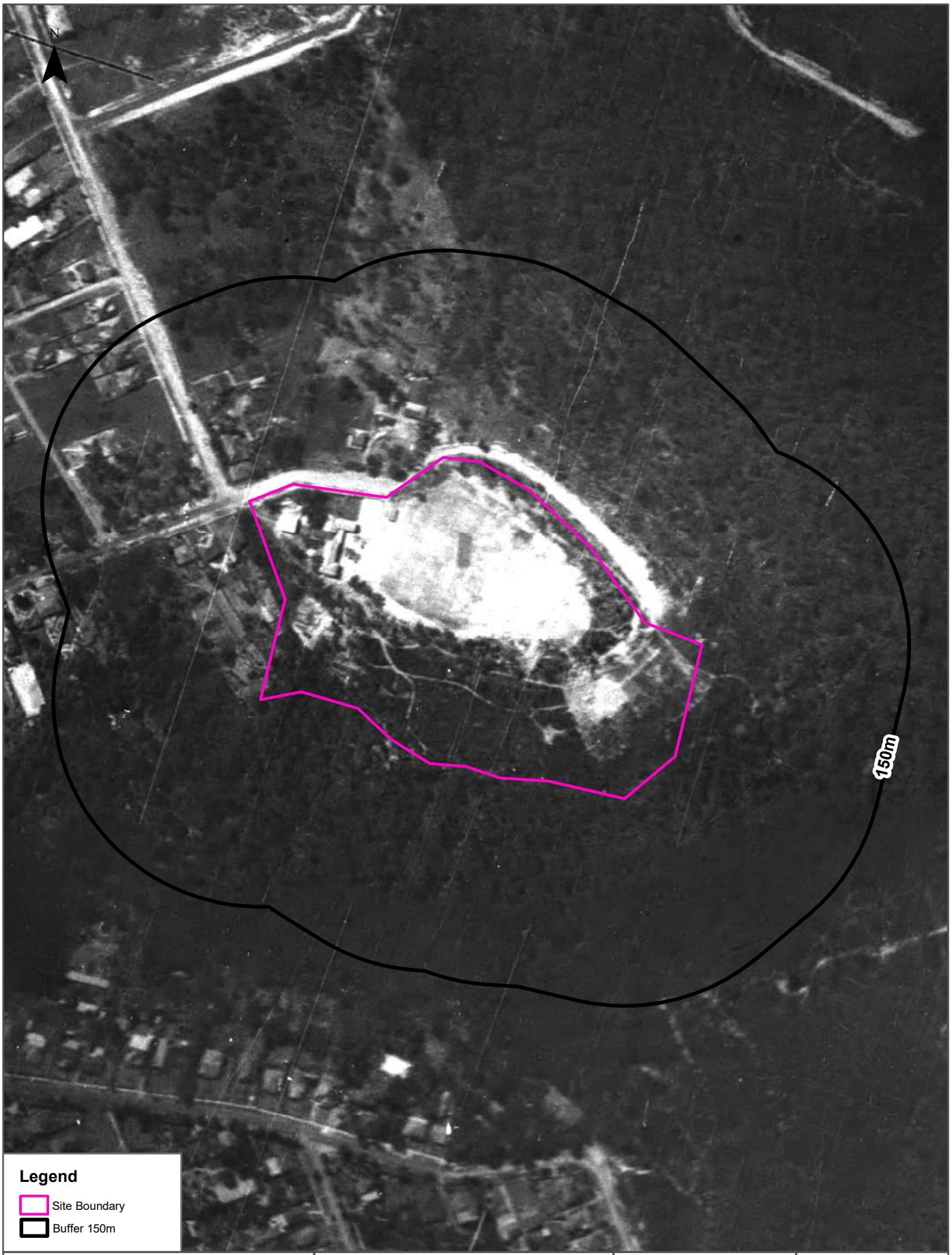
Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale: 0 40 80 120 160 Meters	Data Sources Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 January 2026

Aerial Imagery 1930

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Historical Map 1975

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale: 0 325 650 975 1,300 Meters

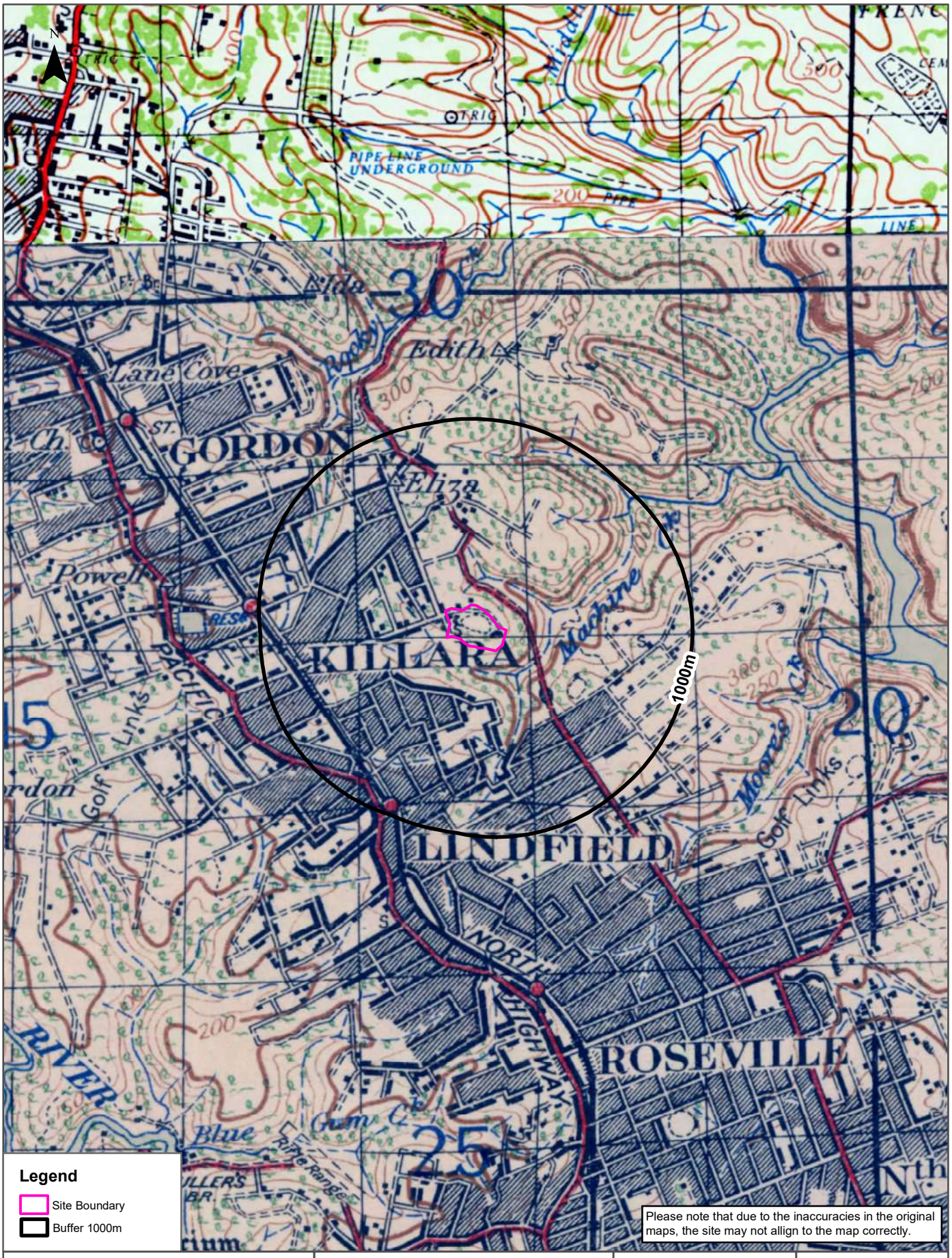
Data Sources: NATMAP 1:100,000 Topographic Maps Geoscience Australia

Coordinate System: GDA 1994 MGA Zone 56

Date: 27 January 2026

Historical Map 1936 - 1942

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Scale: 0 325 650 975 1,300 Meters

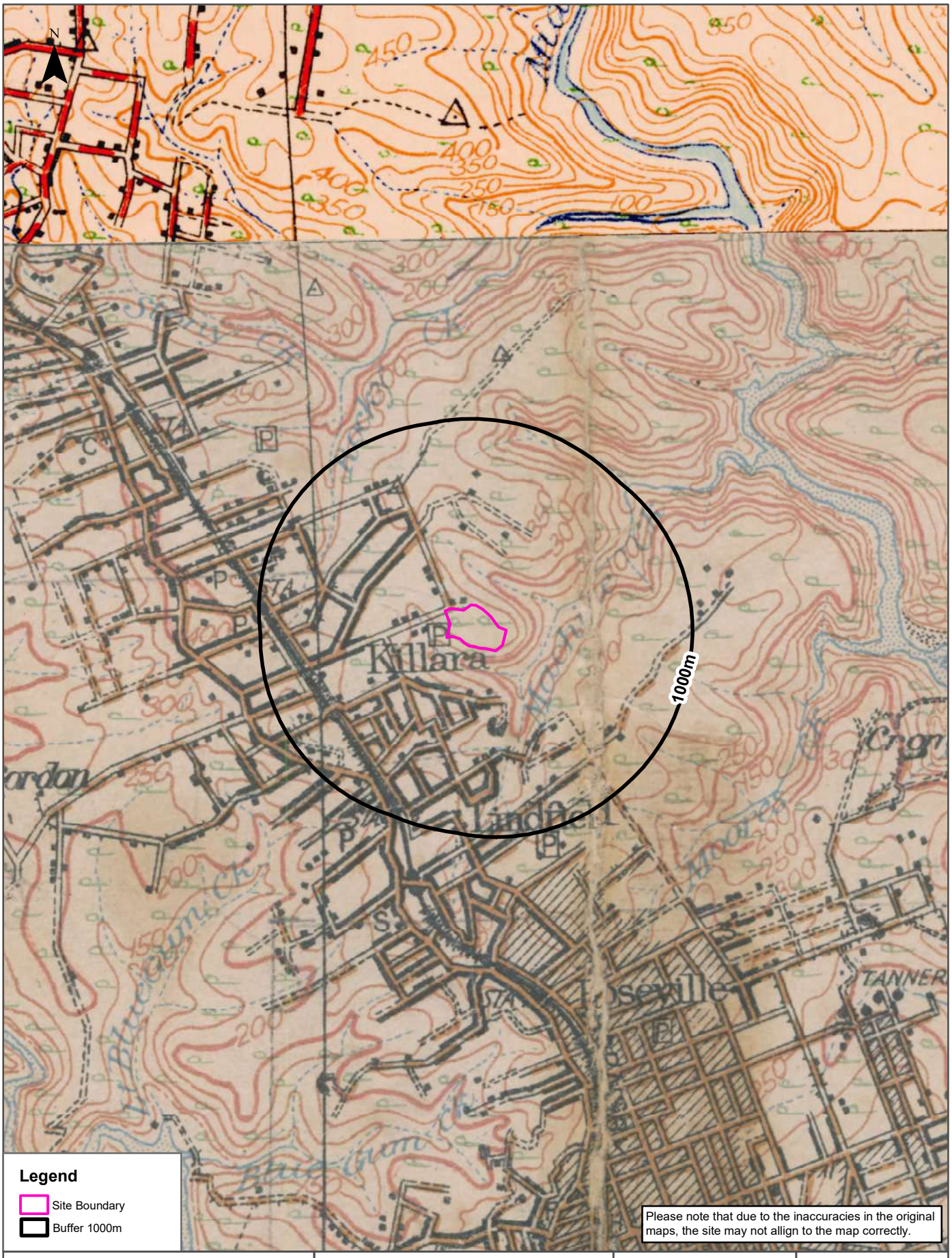
Data Sources: Australia 1:63360
Produced by Australian Section Imperial General Staff

Coordinate System:
GDA 1994 MGA Zone 56

Date: 27 January 2026

Historical Map 1917 - 1920

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

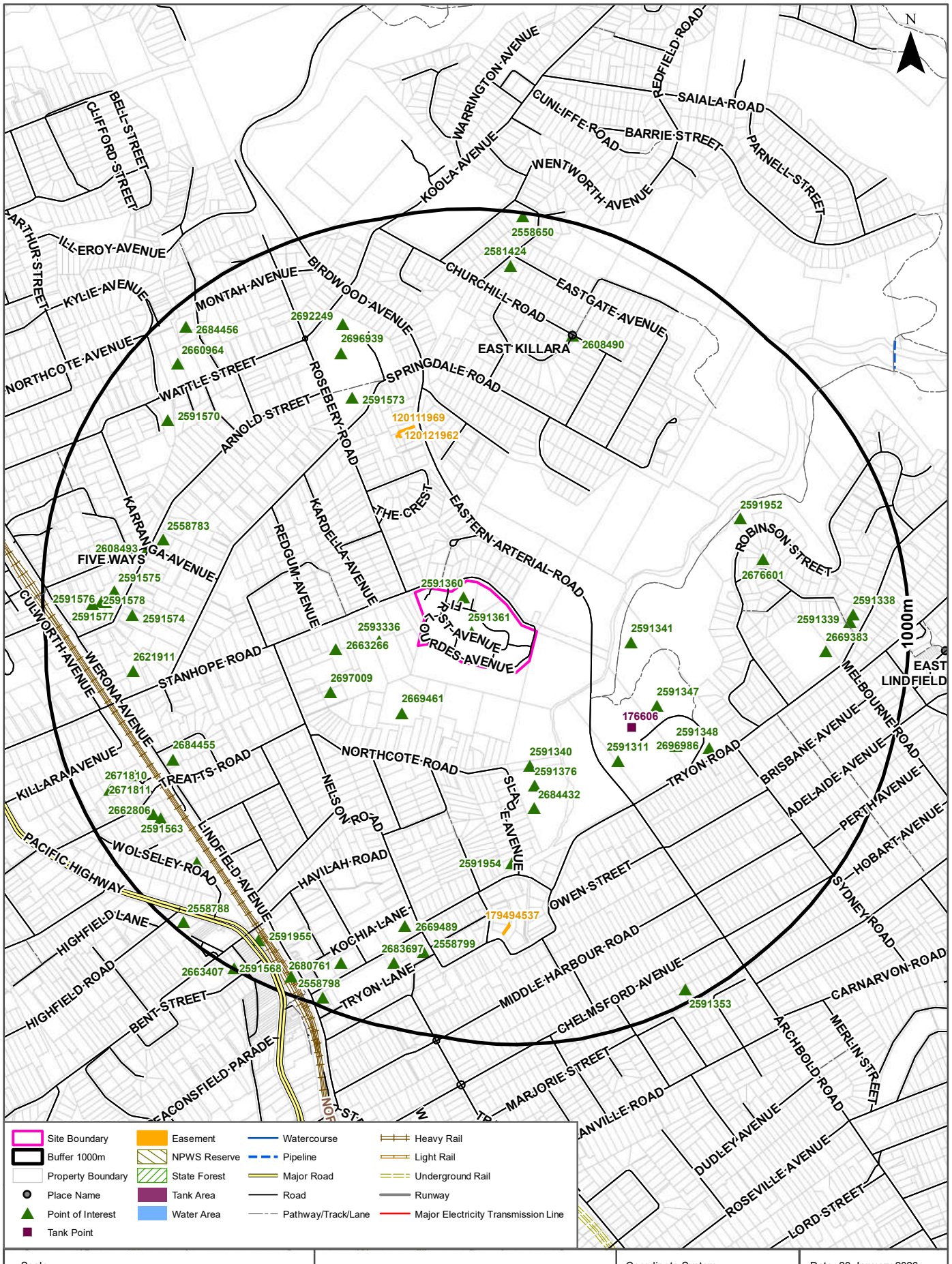


Scale:	Data Sources: Australia 1:63360 Produced by Australian Section Imperial General Staff	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 January 2026

0 325 650 975 1,300
Meters

Topographic Features

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Topographic Features

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
2591360	Nursing Home	OPAL LOURDES	0m	On-site
2591361	Retirement Village	KILLARA GLADES CARE COMMUNITY	0m	On-site
2593336	Park	THE SWAIN GARDENS	105m	West
2669461	Primary School	NEWINGTON COLLEGE LINDFIELD PREPARATORY SCHOOL	185m	South West
2663266	Retirement Village	SWAINS MANOR	220m	West
2591340	Park	SEVEN LITTLE AUSTRALIANS PARK	254m	South
2591341	Park	LINDFIELD PARK	255m	East
2697009	Park	WOMBIN RESERVE	265m	South West
2591376	Lookout	TURNER LOOKOUT	308m	South
2591311	Sports Court	LINDFIELD PARK TENNIS COURTS	358m	South East
2591347	Sports Field	PLAYING FIELD	363m	South East
2684432	Community Facility	1ST LINDFIELD SCOUT HALL	367m	South
2591348	Sports Field	LINDFIELD OVAL	455m	South East
2591954	Park	MACKS PLACE	513m	South
2696986	Park	LINDFIELD SOLDIERS MEMORIAL PARK	537m	South East
2591573	Park	KILLARA PARK	549m	North West
2591952	Park	HERMITS RETREAT	625m	East
2676601	Embassy	CONSULATE-GENERAL OF LUXEMBOURG	637m	East
2696939	Sports Field	KILLARA PARK	673m	North West
2558783	Place Of Worship	KILLARA UNITING CHURCH AND STAINED GLASS WINDOWS	691m	West
2608490	Suburb	EAST KILLARA	711m	North
2669489	Special School	CROMEHURST SCHOOL	724m	South
2608493	Urban Place	FIVE WAYS	726m	West
2684455	Historic Site	WOODLANDS	726m	South West
2692249	Park	KILLARA PARK TENNIS COURTS	745m	North West
2591574	Place Of Worship	ANGLICAN CHURCH	761m	West
2621911	General Hospital	DALCROSS ADVENTIST HOSPITAL	768m	West
2669383	Primary School	LINDFIELD EAST PUBLIC SCHOOL	779m	East
2558799	Place Of Worship	TRYON ROAD UNITING CHURCH	781m	South
2591575	Sports Court	TENNIS COURTS	807m	West
2591570	Park	GEARYS WAY	810m	North West
2683697	Nursing Home	WHITEHALL NURSING HOME	826m	South

Map Id	Feature Type	Label	Distance	Direction
2591967	Park	IBBITSON PARK	831m	South West
2591576	Club	KILLARA LAWN TENNIS CLUB	831m	West
2662806	Primary School	MASADA COLLEGE	832m	South West
2671811	Retirement Village	NORTHAVEN LINDFIELD	835m	South West
2591339	Place Of Worship	ANGLICAN CHURCH	842m	East
2591577	Club	KILLARA BOWLING CLUB	842m	West
2591563	Place Of Worship	SYNAGOGUE	842m	South West
2591338	Child Care Centre	EAST LINDFIELD COMMUNITY PRE-SCHOOL	851m	East
2581424	Park	JANE MCGILLIVRAY PARK	855m	North
2591578	Sports Field	BOWLING GREENS	867m	West
2680761	Community Medical Centre	LINDFIELD EARLY CHILDHOOD CENTRE	871m	South
2660964	Park	HARRY SEIDLER RESERVE	887m	North West
2591955	Park	LINDFIELD ROTARY PARK	898m	South West
2671810	Retirement Village	KIAH SELF CARE UNITS KOPWA	913m	South West
2684456	Historic Site	HARRY AND PENELOPE SEIDLER HOUSE	944m	North West
2591568	Railway Station	LINDFIELD RAILWAY STATION	951m	South West
2591353	Sports Field	ROSEVILLE PARK	966m	South East
2558788	Place Of Worship	CATHOLIC CHURCH	974m	South West
2558798	Place Of Worship	ANGLICAN CHURCH	976m	South
2558650	Place Of Worship	UNITING CHURCH	990m	North
2663407	Retirement Village	LINDFIELD MANOR RETIREMENT VILLAGE	997m	South West

Topographic Data Source: © Land and Property Information (2015)
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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
176606	Water	Operational		01/01/2002	327m	South East

Tanks Data Source: © Land and Property Information (2015)
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

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
120121962	Primary	Undefined		411m	North
120111969	Primary	Undefined		423m	North
179494537	Primary	Right of way	Whole Of Lot	673m	South

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

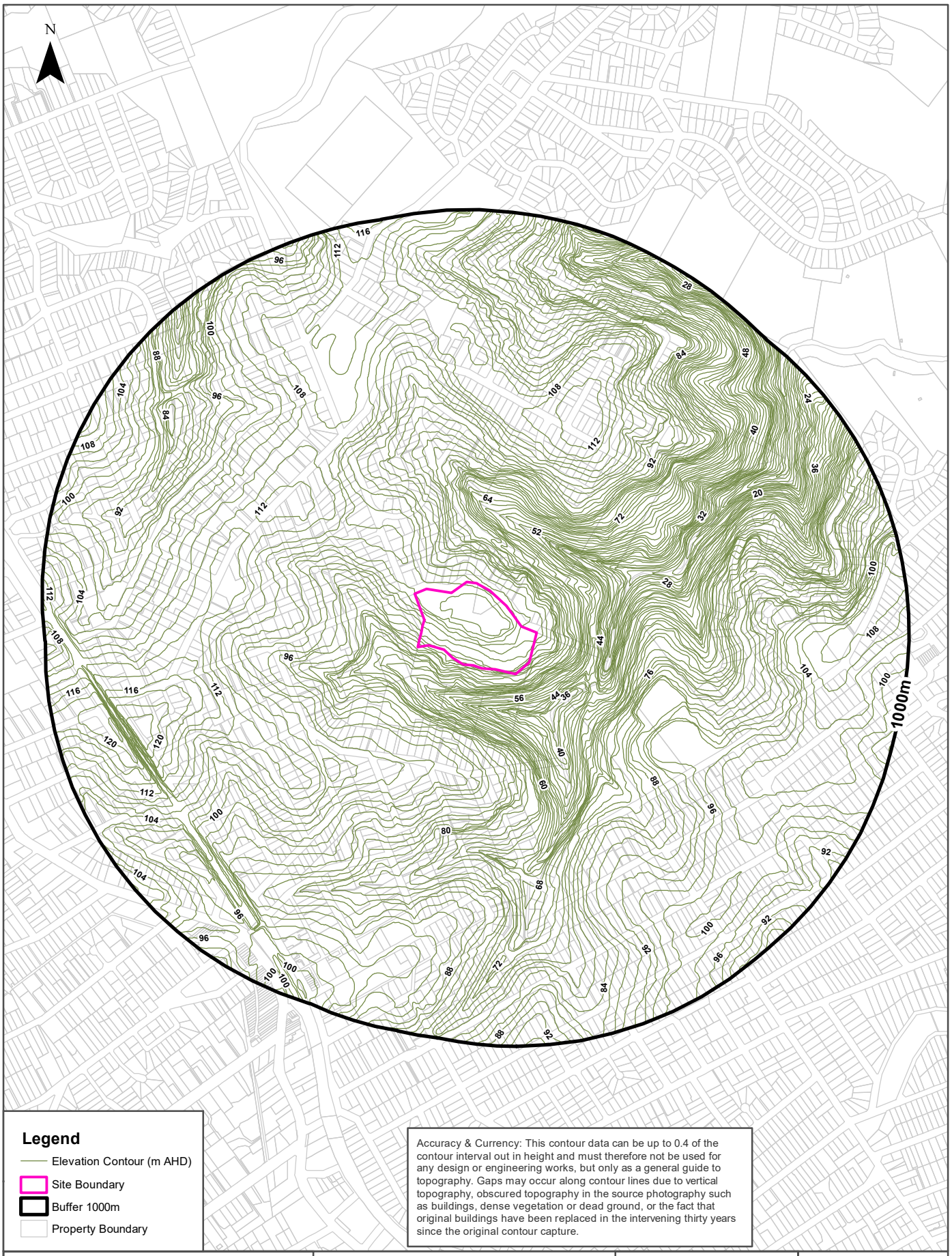
What State Forest exist within the dataset buffer?

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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Elevation Contours (m AHD)

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Hydrogeology & Groundwater

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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)
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2024

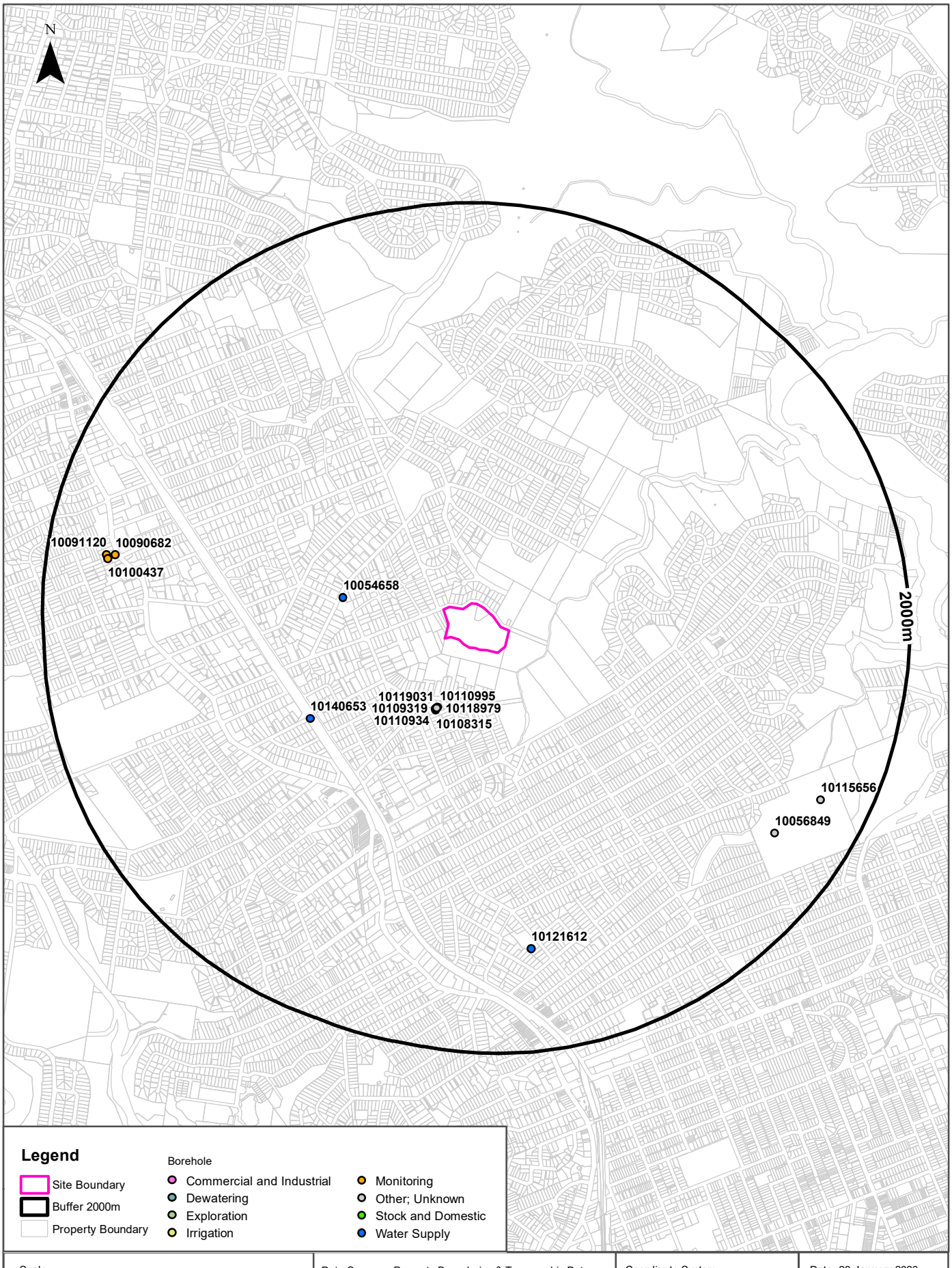
Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

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

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2024 Data Source : NSW Department of Primary Industries

Groundwater Boreholes

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Hydrogeology & Groundwater

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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
10118979	GW115591	Unknown	Unknown				AHD				339m	South West
10110995	GW115587	Unknown	Unknown				AHD				342m	South West
10119031	GW115588	Unknown	Unknown				AHD				345m	South West
10109319	GW115589	Unknown	Unknown				AHD				348m	South West
10110934	GW115592	Unknown	Unknown				AHD				350m	South West
10108315	GW115590	Unknown	Unknown				AHD				355m	South West
10054658	GW106029	Water Supply	Functioning	11/05/2004	180.00		AHD	1140	0.900	63.00	501m	West
10140653	GW023498	Water Supply	Unknown	01/01/1966	8.20		AHD	Good			781m	South West
10121612	GW108792	Water Supply	Functioning	25/05/2007	174.00		AHD	2800	0.300	65.00	1488m	South
10056849	GW103127	Other	Unknown	31/07/2000	138.00		AHD	Fresh			1638m	South East
10090682	GW104668	Monitoring	Functioning	16/02/2001	16.20		AHD				1658m	West
10100437	GW104669	Monitoring	Functioning	16/02/2001	7.00		AHD				1693m	West
10091120	GW104670	Monitoring	Unknown	16/02/2001	8.50		AHD				1702m	West
10115656	GW065075	Other	Functioning	15/02/1994	150.00		AHD	Fresh	6.000	44.00	1752m	South East

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

Driller's Logs

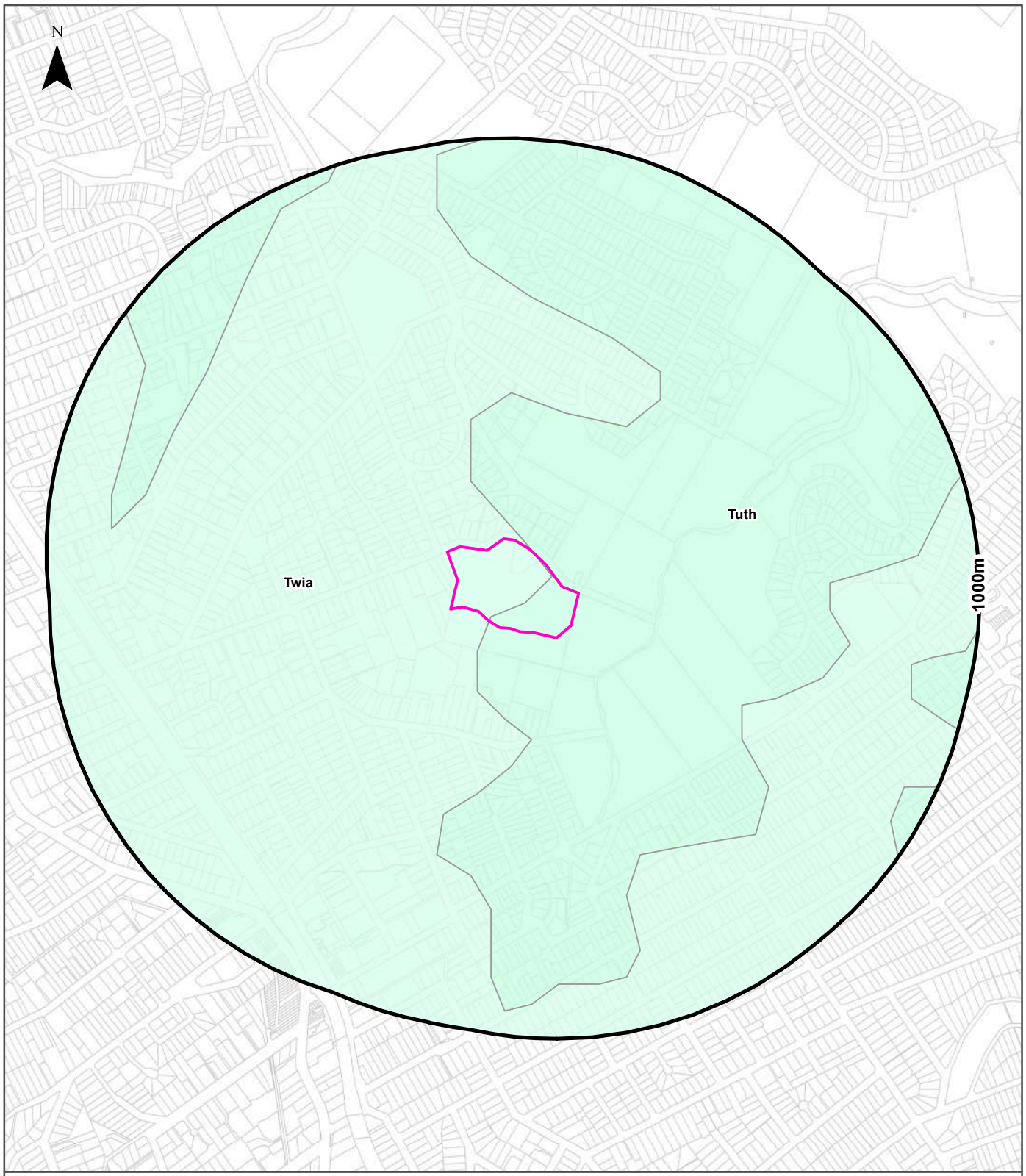
Drill log data relevant to the boreholes within the dataset buffer:

NGIS Bore ID	Drillers Log	Distance	Direction
10054658	0.00m-1.50m topsoil 1.50m-9.00m shale 9.00m-54.00m sandstone, grey 54.00m-56.10m sandstone, grey 56.10m-69.50m sandstone, grey & siltstone 69.50m-70.00m sandstone, grey with 0.1 70.00m-86.50m siltstone 86.50m-86.90m sandstone, grey light grey 86.90m-104.40m sandstone, light grey 104.40m-124.00m sandstone, grey dark grey 124.00m-151.50m sandstone, light grey 151.50m-158.00m sandstone, light grey - grey 158.00m-175.50m sandstone, light grey & quartz 175.50m-180.00m sandstone grey	501m	West
10140653	0.00m-6.70m Sand White 6.70m-8.22m Sand White Fossils:shell Fragments Water Supply	781m	South West
10121612	0.00m-4.00m clay 4.00m-15.00m shale 15.00m-52.00m sandstone, grey 52.00m-54.00m sandstone, quartz 54.00m-70.00m sandstone, grey 70.00m-75.00m sandstone, quartz 75.00m-76.00m shale 76.00m-80.00m sandstone, shale bands 80.00m-89.00m sandstone, grey 89.00m-90.00m shale 90.00m-94.00m sandstone, siltstone band 94.00m-110.00m sandstone, grey 110.00m-112.00m sandstone, quartz 112.00m-130.00m sandstone, grey 130.00m-131.00m sitlstone 131.00m-132.00m sandstone, grey 132.00m-135.50m sandstone, quartz 135.50m-145.00m sandstone, grey 145.00m-152.20m sandstone, quartz 152.20m-161.00m sandstone, grey 161.00m-168.00m sandstone, quartz 168.00m-174.00m sandstone, grey	1488m	South
10056849	0.00m-0.50m TOPSOIL 0.50m-1.50m SANDY CLAY 1.50m-5.20m SANDSTONE YELLOW 5.20m-39.70m SANDSTONE GREY 39.70m-40.10m SANDSTONE GREY W.B. 40.10m-70.40m SANDSTONE GREY 70.40m-74.00m SANDSTONE GREY 74.00m-130.50m SANDSTONE GREY 130.50m-132.20m SANDSTONE GREY W.B. 132.20m-138.00m SANDSTONE GREY	1638m	South East
10090682	0.00m-1.00m FILL, SILTY CLAY/BROWN 1.00m-3.70m FILL,SILTY CLAY RED-BROWN 3.70m-5.70m FILL,SILTY CLAY RED-BROWN/IRONS.GRAV 5.70m-11.00m SHALEY CLAY/IRONSTONE/GRAVELS 11.00m-16.20m SHALE GREY WITH SILTY CLAY	1658m	West
10100437	0.00m-1.50m FILL, SILTY CLAY 1.50m-7.00m SILTY CLAY, ORANGE BROWN	1693m	West
10091120	0.00m-0.50m BITUMEN,FILL,SILTY CLAY 0.50m-4.00m SILTY CLAY/ORANGE BROWN 4.00m-8.50m SILTY CLAY,HIGH PLASTICITY,GREY	1702m	West
10115656	0.00m-137.00m 137.00m-147.00m SHALE DARK GREY 147.00m-150.00m SANDSTONE GREY DARK	1752m	South East

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

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Legend

Linear Geological Structures and Boundaries

Site Boundary	Trendline	Marker Bed	Miscellaneous Boundary
Report Buffer	Fold Axis	Faulted Boundary	Water/Coastline Boundary
Property Boundary	Geological Boundary	Shear Zone or Schist Zone Boundary	State/Territory Border

Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2026	Coordinate System: GDA 1994 MGA Zone 56	Date: 23 January 2026

Geology

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Geological Units

Geological units within the dataset buffer:

Code	Unit Name	Description	Stratigraphy	Age Range	Dominant Lithology	Dist	Dir
Tuth	Hawkesbury Sandstone	Medium- to coarse-grained quartz sandstone displaying small- to large-scale, high-angle cross-bedding; minor shale and laminite lenses.	/Ungrouped Triassic units//Hawkesbury Sandstone//	Anisian (base) to Anisian (top)	Sandstone	0m	On-site
Twia	Ashfield Shale	Black to light grey shale and laminite.	/Wianamatta Group//Ashfield Shale//	Middle Triassic (base) to Middle Triassic (top)	Shale	0m	On-site

Linear Geological Structures

Fault and shear or schist zone boundaries within the dataset buffer:

Map ID	Boundary Type	Feature Description	Fault Dip Angle	Fault Dip Direction	Dist	Dir
NA	No records in buffer					

Trendlines within the dataset buffer:

Map ID	Feature Description	Observation Method	Structure Name	Dist	Dir
NA	No records in buffer				

Fold axes within the dataset buffer:

Map ID	Feature Description	Observation Method	Structure Name	Dist	Dir
NA	No records in buffer				

Marker beds within the dataset buffer:

Map ID	Feature Description	Rock Unit Description	Dist	Dir
NA	No records in buffer			

Geological Data Source: Statewide Seamless Geology v2.4, NSW Department of Primary Industries and Regional Development
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Naturally Occurring Asbestos Potential

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Naturally Occurring Asbestos Potential

Naturally Occurring Asbestos Potential within the dataset buffer:

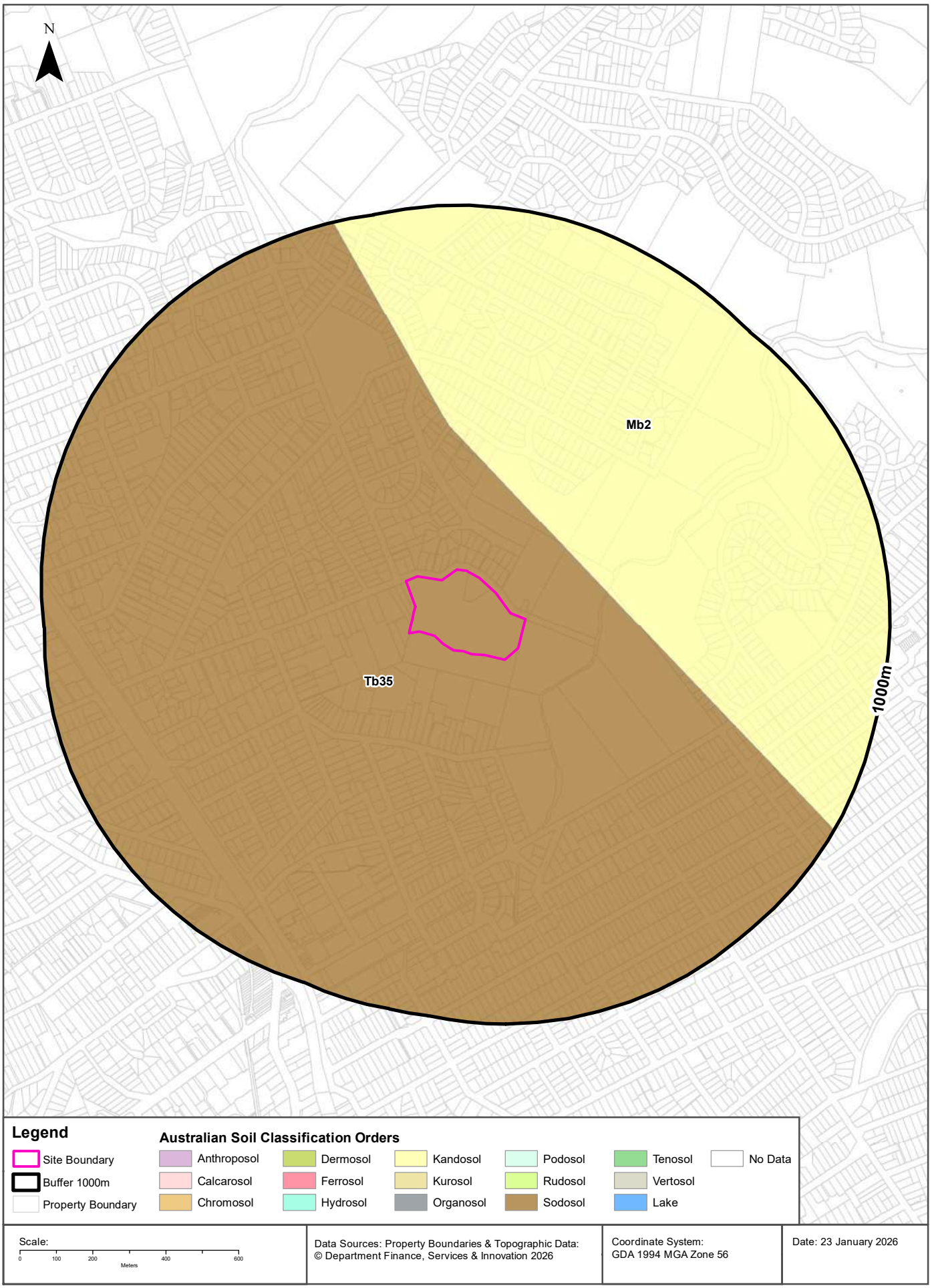
Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Naturally Occurring Asbestos Potential Data Source: Statewide Seamless Geology v2.4, NSW Department of Primary Industries and Regional Development

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Atlas of Australian Soils

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Soils

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Atlas of Australian Soils

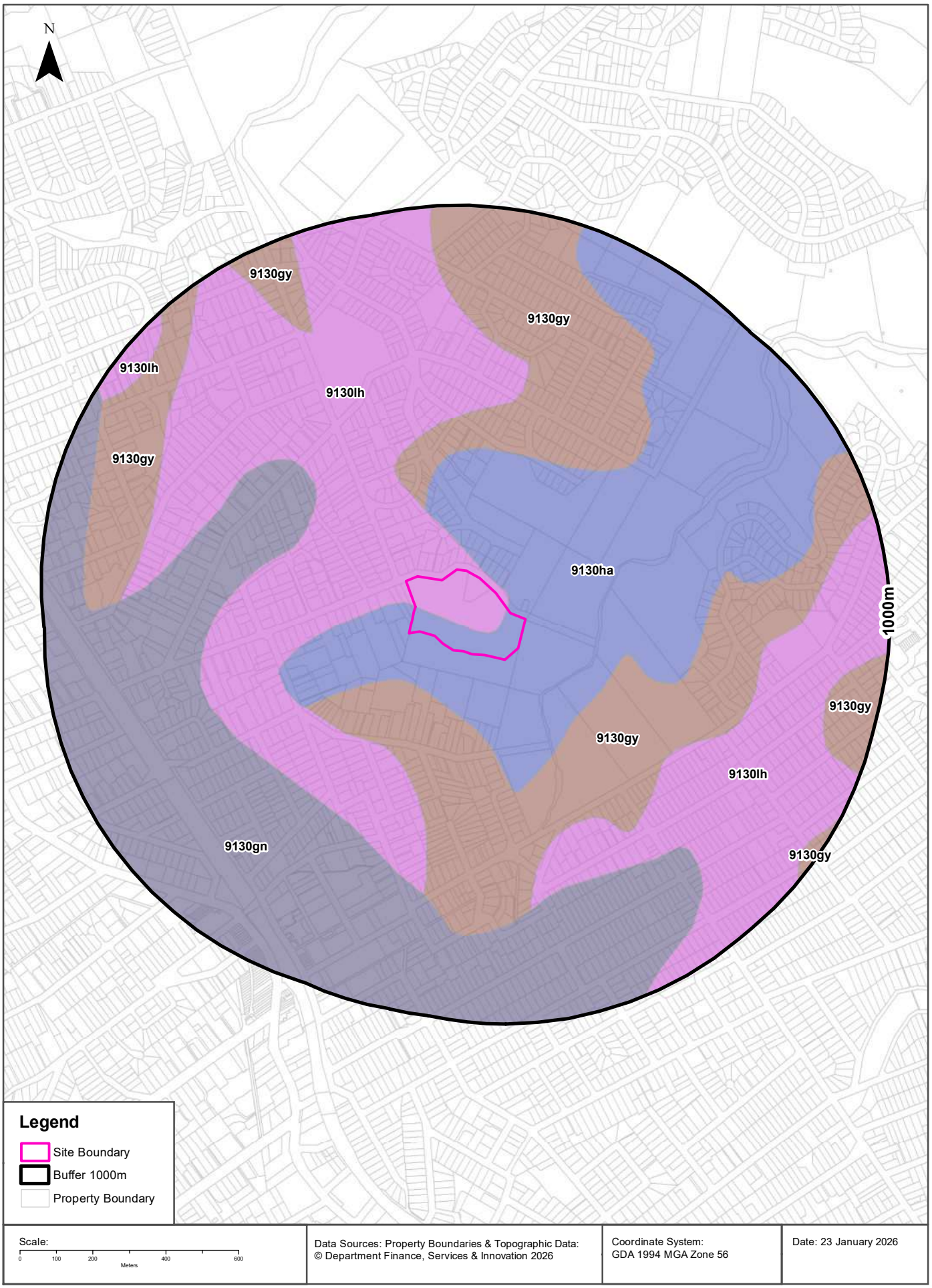
Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance	Direction
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.	0m	On-site
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.	212m	North East

Atlas of Australian Soils Data Source: CSIRO
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Soil Landscapes of Central and Eastern NSW

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Soil Landscapes of Central and Eastern NSW

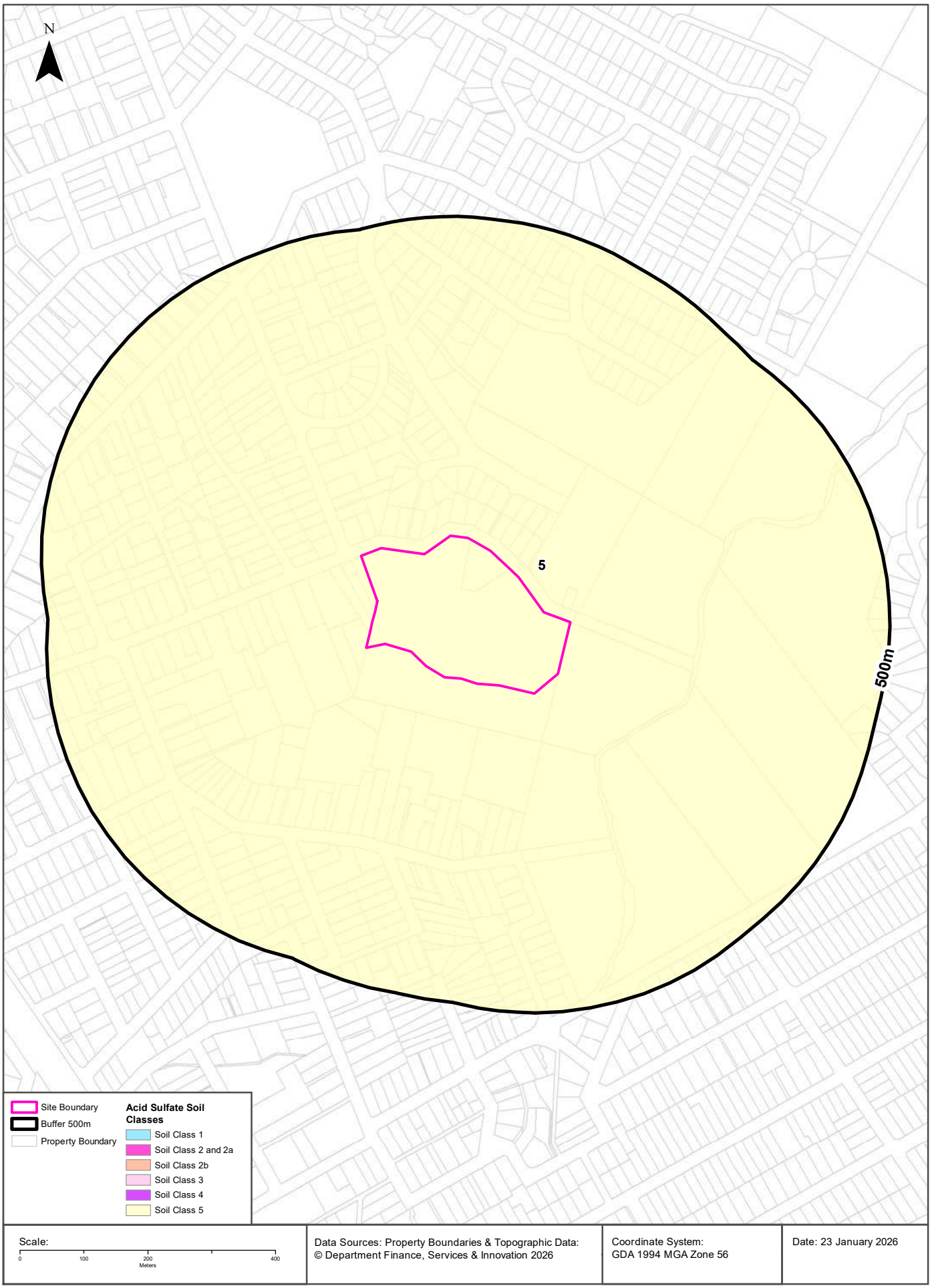
Soil Landscapes of Central and Eastern NSW within the dataset buffer:

Soil Code	Name	Distance	Direction
9130lh	Lucas Heights	0m	On-site
9130ha	Hawkesbury	0m	On-site
9130gy	Gymea	131m	South East
9130gn	Glenorie	308m	South West

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

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Acid Sulfate Soils

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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	Ku-ring-gai Local Environmental Plan 2015

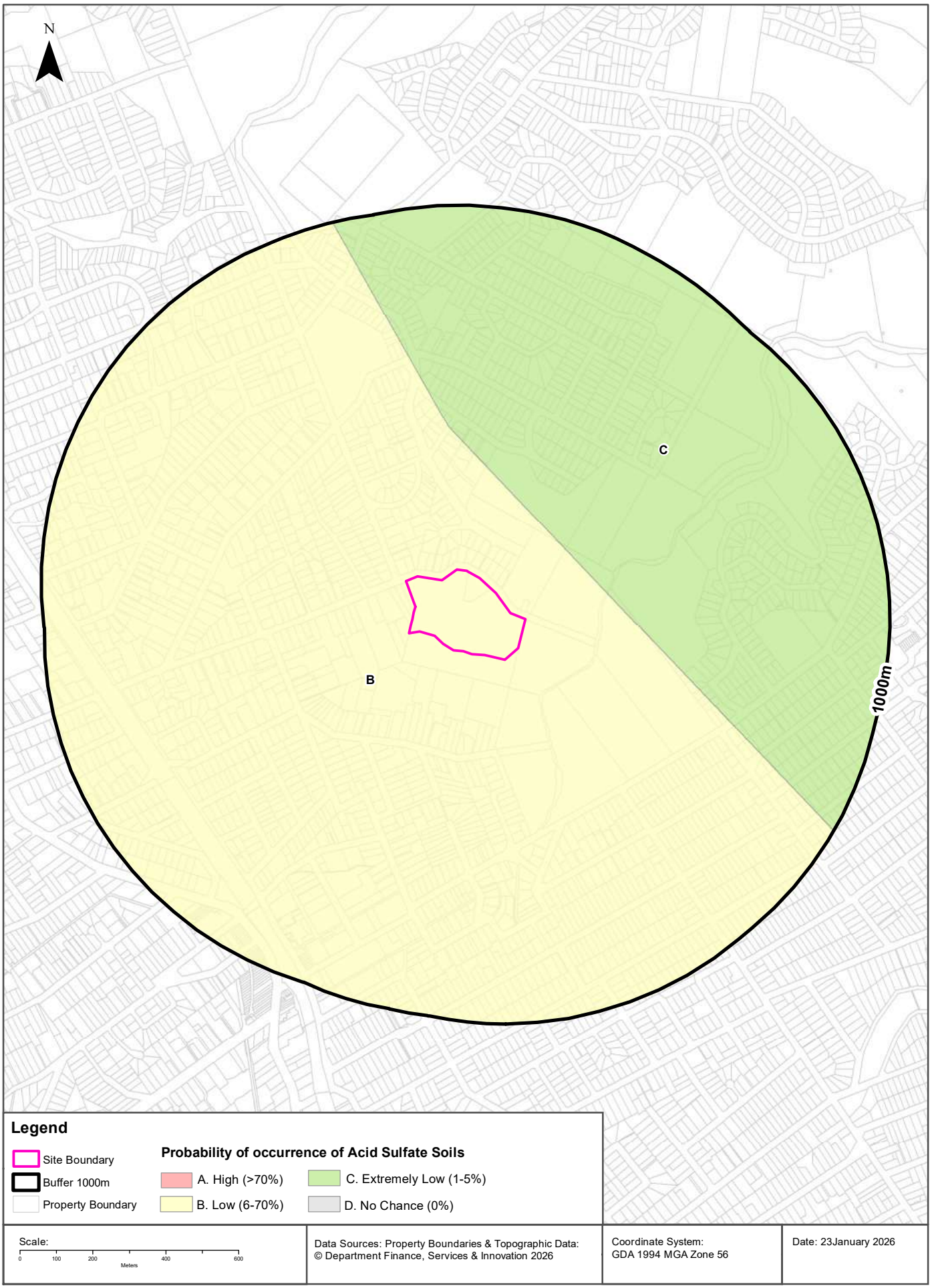
If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	EPI Name	Distance	Direction
None				

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Atlas of Australian Acid Sulfate Soils

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Acid Sulfate Soils

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Atlas of Australian Acid Sulfate Soils

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

Class	Description	Distance	Direction
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m	On-site
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	211m	North East

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Dryland Salinity

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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
The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. 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

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Mining Subsidence Districts

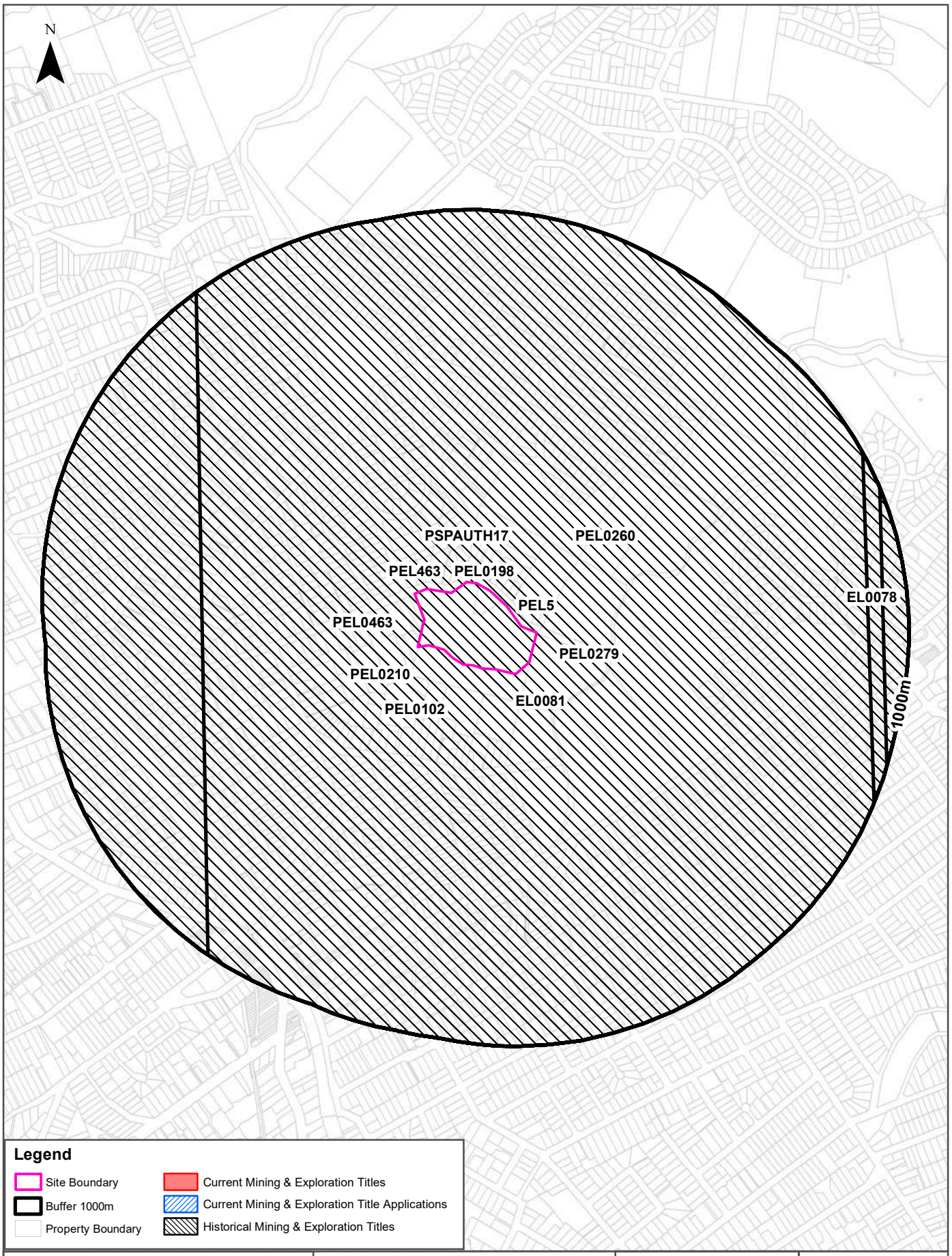
Mining Subsidence Districts within the dataset buffer:

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 & Exploration Titles

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Mining

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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: Statewide Seamless Geology v2.4, NSW Department of Primary Industries and Regional Development

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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: Statewide Seamless Geology v2.4, NSW Department of Primary Industries and Regional Development

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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
PEL0102	AUSTRALIAN OIL AND GAS CORPORATION LTD			PETROLEUM	Petroleum	0m	On-site
PSPAUTH17	MACQUARIE ENERGY PTY LTD	20070803	20080703	PETROLEUM	Petroleum	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
PEL0210	THE AUSTRALIAN GAS LIGHT COMPANY (AGL), NORTH BULLI COLLIERIES PTY LTD			PETROLEUM	Petroleum	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
PEL0198	JOHN STREVENS (TERRIGAL) NL			PETROLEUM	Petroleum	0m	On-site
PEL0279	THE ELECTRICITY COMMISSION OF NSW (TRADING AS PACIFIC POWER)	19910504	19931111	PETROLEUM	Petroleum	0m	On-site
EL0081	CONTINENTAL OIL CO OF AUSTRALIA LIMITED	19670201	19680201	MINERALS		0m	On-site
EL0078	CONTINENTAL OIL CO OF AUSTRALIA LIMITED	19670201	19680201	MINERALS		891m	East

Historical Mining & Exploration Titles Data Source: Statewide Seamless Geology v2.4, NSW Department of Primary Industries and Regional Development

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State Environmental Planning Policy

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

State Significant Precincts

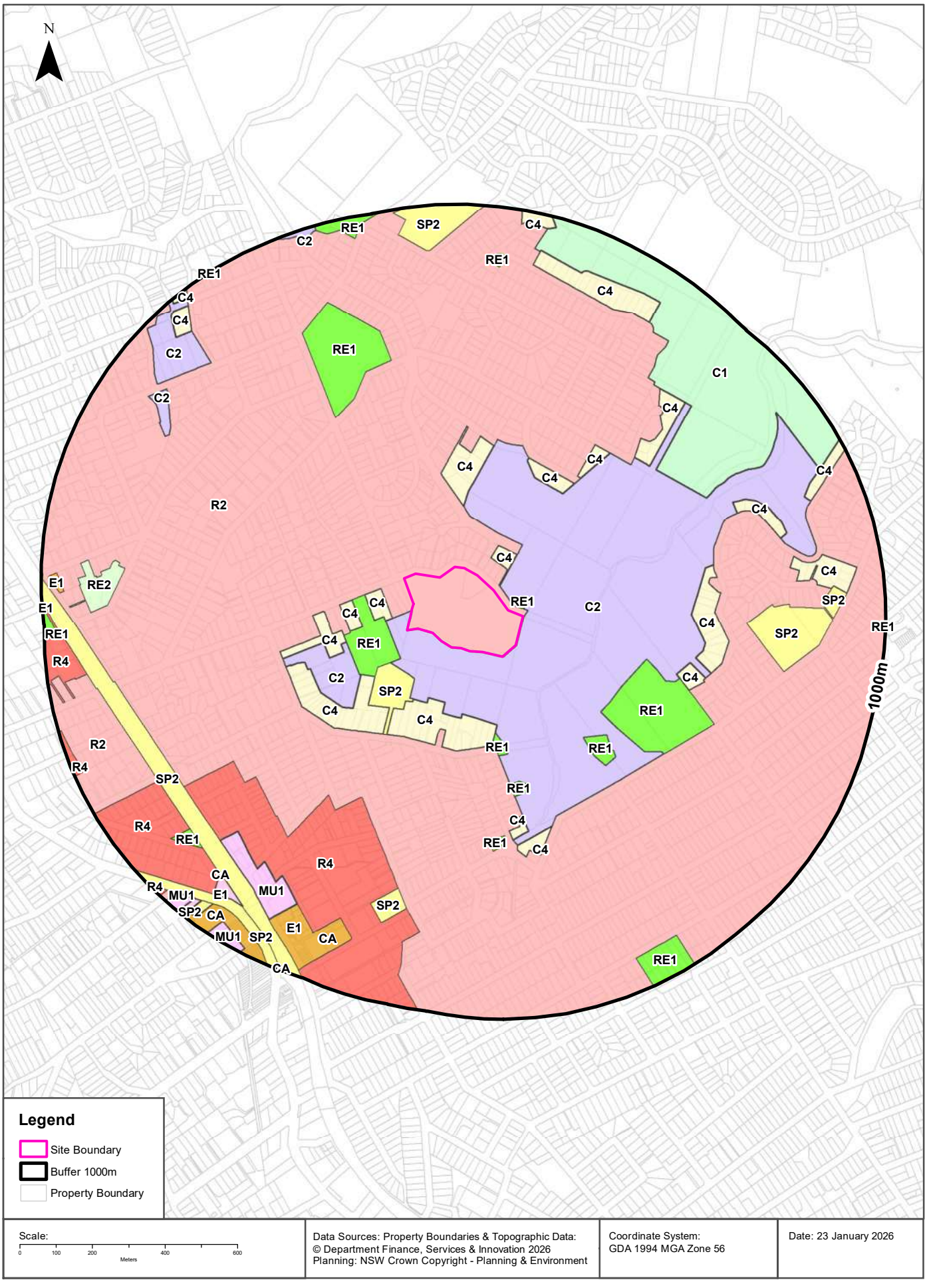
What SEPP State Significant Precincts exist within the dataset buffer?

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

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EPI Planning Zones

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Environmental Planning Instrument

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	0m	On-site
C2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	0m	East
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	20m	East
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	20m	North East
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	46m	West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	47m	West
SP2	Infrastructure	Educational Establishment	Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	101m	South West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	123m	West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	151m	South
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	154m	South West
C2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	167m	South West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	169m	North
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	170m	West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	212m	South
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	296m	South East
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	313m	South East
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	313m	North East
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	347m	South
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	387m	North East

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	442m	South
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	448m	East
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	463m	East
R4	High Density Residential		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	477m	South West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	483m	North West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	486m	South
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	494m	South
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	533m	North East
C1	National Parks and Nature Reserves		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	544m	North East
SP2	Infrastructure	Educational Establishment	Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	615m	East
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	654m	East
SP2	Infrastructure	Educational Establishment	Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	679m	South
MU1	Mixed Use		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	724m	South West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	746m	East
SP2	Infrastructure	Railway Infrastructure	Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	751m	South West
C2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	759m	North West
RE2	Private Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	770m	West
C2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	798m	North West

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
R4	High Density Residential		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	800m	South West
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	801m	West
E1	Local Centre		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	806m	South West
CA	Complex Area		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	806m	South West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	810m	South West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	822m	North East
SP2	Infrastructure	Educational Establishment	Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	824m	East
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	836m	North
CA	Complex Area		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	840m	South West
E1	Local Centre		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	840m	South West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	841m	East
SP2	Infrastructure	Educational Establishment	Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	876m	North
SP2	Infrastructure	Classified Road	Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	885m	South West
R4	High Density Residential		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	890m	West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	899m	North West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	904m	South East

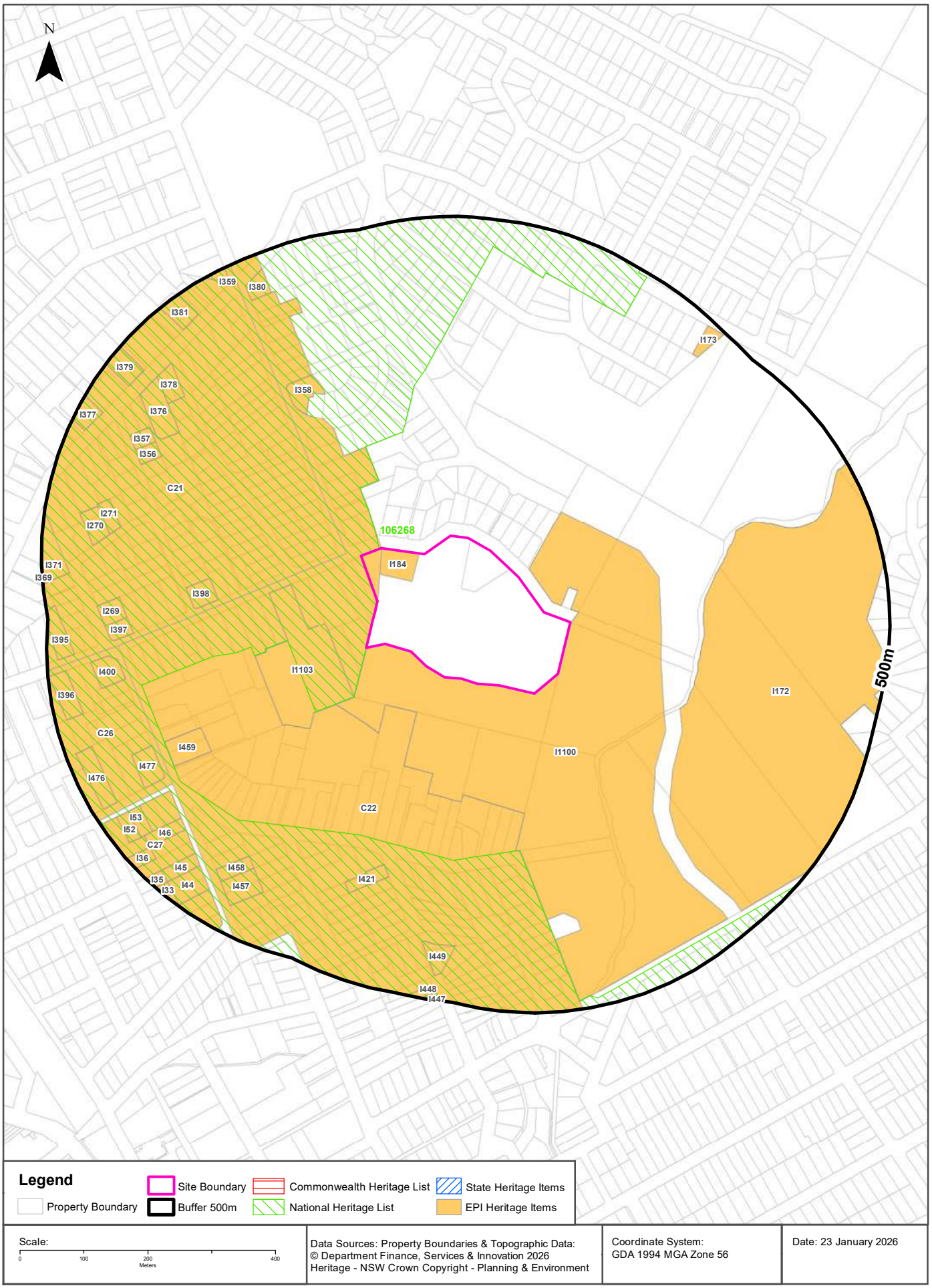
Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
E1	Local Centre		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	915m	South West
CA	Complex Area		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	915m	South West
SP2	Infrastructure	Electricity Transmission and Distribution	Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	924m	South West
CA	Complex Area		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	935m	South West
E1	Local Centre		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	935m	South West
E1	Local Centre		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	938m	West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	939m	North
MU1	Mixed Use		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	942m	South West
MU1	Mixed Use		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	947m	South West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	959m	North
C2	Environmental Conservation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	961m	North West
R2	Low Density Residential		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	961m	South West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	961m	West
R4	High Density Residential		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	975m	South West
C4	Environmental Living		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	979m	North West

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	982m	East
E1	Local Centre		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	986m	South West
CA	Complex Area		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	986m	South West
E1	Local Centre		Ku-ring-gai Local Environmental Plan 2015	14/11/2025	14/11/2025	14/11/2025	State Environmental Planning Policy Amendment (Ku-ring-gai Station Precincts) 2025	989m	West
RE1	Public Recreation		Ku-ring-gai Local Environmental Plan 2015	14/04/2023	26/04/2023	14/11/2025	Map Amendment No 4	996m	North West

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Heritage Items

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Heritage

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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		0m	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
I184	?"Headfort House"? building, interiors and grounds	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	20/01/2023	20/01/2023	12/12/2025	0m	On-site
C22	Crown Blocks Conservation Area	Conservation Area - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	0m	On-site
I1100	Seven Little Australians Park (being the western part of former Lindfield Park)	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	0m	South East
C21	Springdale Conservation Area	Conservation Area - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	23m	North West
I1103	Swain Gardens	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	46m	West
I172	Lindfield Soldiers Memorial Park, the eastern part of former Lindfield Park	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	03/03/2023	03/03/2023	12/12/2025	198m	East

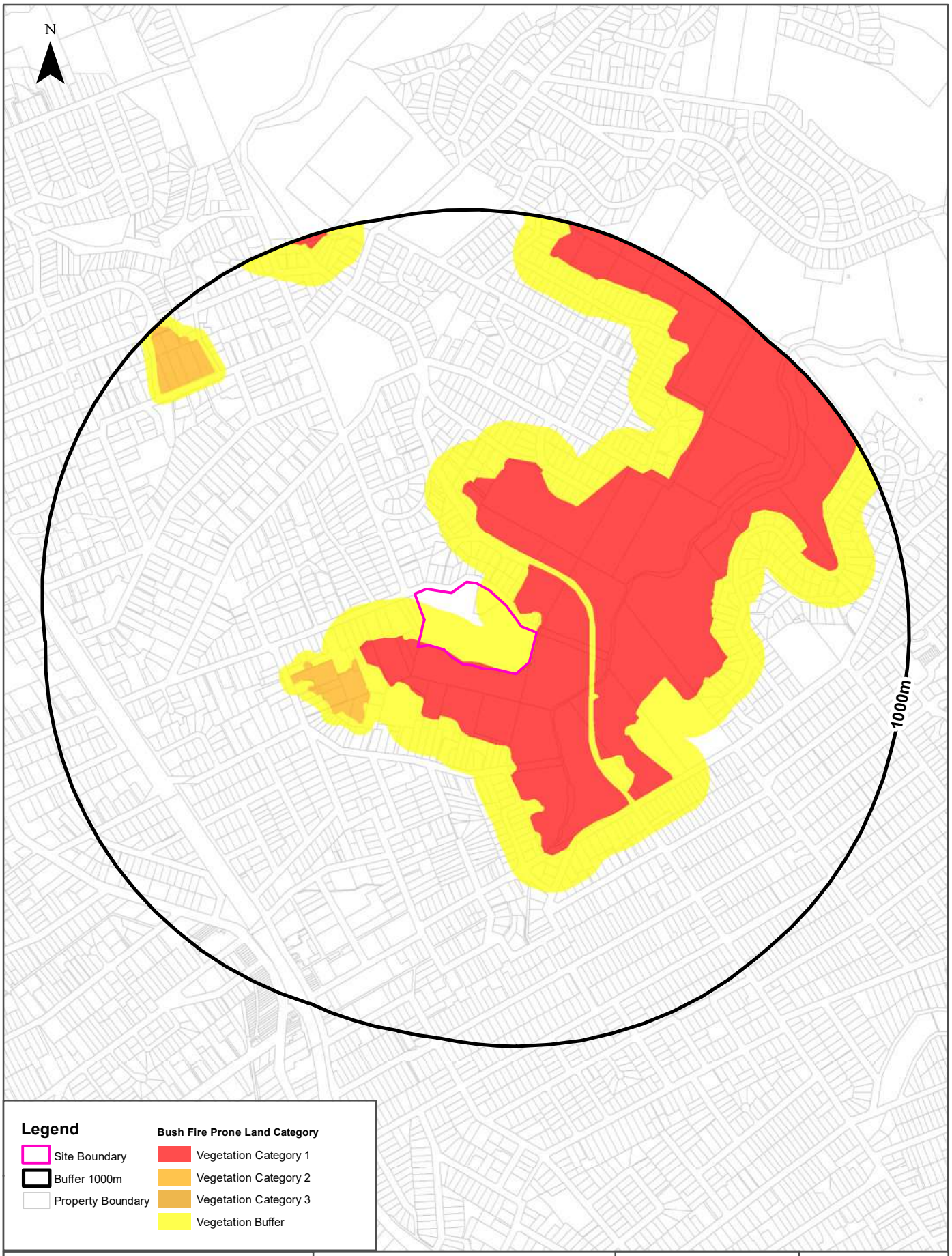
Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I398	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	234m	West
I358	Dwelling House "Lynton Manor"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	238m	North West
I459	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	288m	South West
I421	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	308m	South
I376	Dwelling House "Yoorooga"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	344m	North West
I356	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	350m	North West
C26	Oliver Grant Conservation Area	Conservation Area - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	360m	West
I397	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	365m	West
I357	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	368m	North West
I477	Dwelling house "Brenchley"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	368m	South West
I378	Dwelling House "Lange"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	373m	North West
I458	Federation bungalow	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	374m	South West
I269	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	378m	West
C27	Blenheim Road Conservation Area	Conservation Area - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	379m	South West
I271	Dwelling house "Ainslea"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	379m	West
I400	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	380m	West
I457	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	387m	South West
I46	Dwelliing house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	393m	South West
I270	Dwelling house "Twelve Trees"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	395m	West
I449	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	410m	South
I45	Dwelliing house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	419m	South West
I44	Fieldhead, dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	429m	South West
I53	Coromandel, dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	432m	South West
I380	Dwelling House "Fairlands"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	436m	North West

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I173	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	440m	North East
I379	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	447m	North West
I381	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	450m	North West
I52	Dwelliing house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	452m	South West
I396	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	454m	West
I476	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	455m	South West
I395	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	457m	West
I371	Dwelling House "Deepdene"	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	457m	West
I36	Lochinvar, dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	461m	South West
I377	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	463m	North West
I35	Dwelliing house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	473m	South West
I359	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	475m	North West
I448	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	477m	South
I33	Dwelliing house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	18/06/2021	28/06/2021	12/12/2025	481m	South West
I447	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	487m	South
I369	Dwelling house	Item - General	Local	Ku-ring-gai Local Environmental Plan 2015	05/03/2015	02/04/2015	12/12/2025	495m	West

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Natural Hazards - Bush Fire Prone Land

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Data Sources: Bush Fire Prone Land: © NSW Rural Fire Service 2026. Property Boundaries: © Department Finance, Services & Innovation 2026

Coordinate System: GDA 1994 MGA Zone 56

Date: 23 January 2026

Natural Hazards

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Bush Fire Prone Land

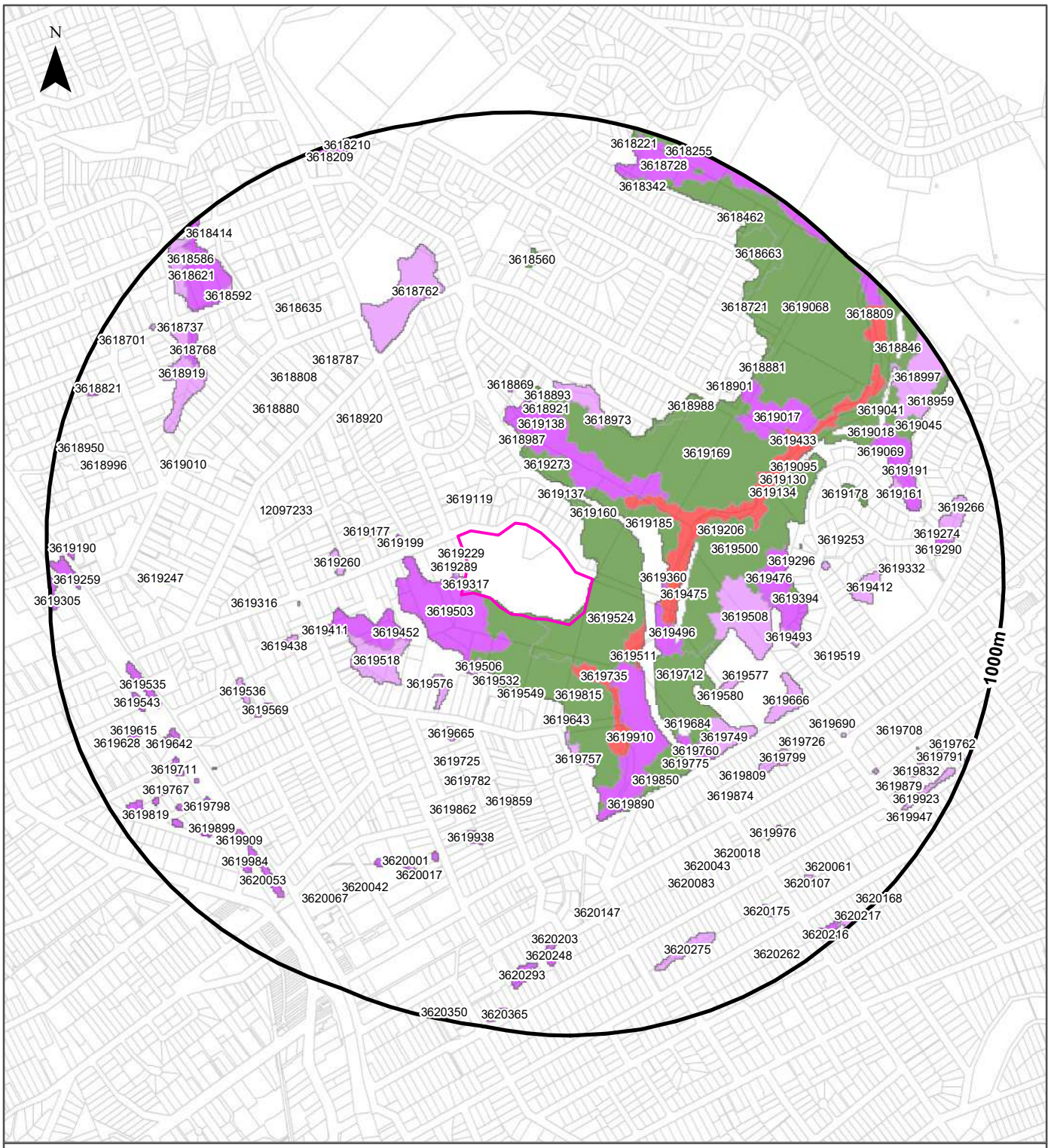
What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Category 1	0m	On-site
Vegetation Buffer	0m	On-site
Vegetation Category 2	166m	South West

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

Ecological Constraints - Vegetation & Ramsar Wetlands

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Site Boundary
ReportBuffer
Property Boundary
Ramsar Wetland

Native Vegetation

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

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2026

Coordinate System: GDA 1994 MGA Zone 56

Date: 23 January 2026

Ecological Constraints

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Native Vegetation

What native vegetation exists within the dataset buffer?

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3619229	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	0m	On-site
3619289	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	0m	On-site
3619317	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	0m	On-site
3619503	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	0m	On-site
3619524	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	0m	On-site
3619815	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	0m	On-site
12097233	Not classified	(Not classified) Not classified	Not classified	0m	On-site
3619119	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	73m	North West
3619735	Rainforests	(Rainforests) Sydney Coastal Coachwood Gallery Rainforest	Northern Warm Temperate Rainforests	96m	South East
3619137	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	100m	North East
3619511	Rainforests	(Rainforests) Sydney Coastal Coachwood Gallery Rainforest	Northern Warm Temperate Rainforests	114m	South East
3619273	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	117m	North East
3619160	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	119m	North East
3619506	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	129m	South West
3619199	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	138m	West
3619138	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	139m	North East
3619910	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	145m	South East
3619452	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	155m	West
3619496	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	160m	South East
3619532	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	161m	South
3619360	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	167m	East
3619433	Rainforests	(Rainforests) Sydney Coastal Coachwood Gallery Rainforest	Northern Warm Temperate Rainforests	168m	East
3619518	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	168m	South West
3619549	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	172m	South

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3619185	Rainforests	(Rainforests) Sydney Coastal Coachwood Gallery Rainforest	Northern Warm Temperate Rainforests	175m	North East
3619576	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	197m	South West
3619177	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	200m	West
3618987	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	201m	North
3619712	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	204m	South East
3619475	Not classified	(Not classified) Not classified	Not classified	209m	East
3619643	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	213m	South
3619169	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	218m	North East
3619500	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	229m	East
3619757	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	257m	South
3618921	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	279m	North
3619260	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	284m	West
3618973	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Coastal Shale-Sandstone Forest	Northern Hinterland Wet Sclerophyll Forests	286m	North
3619508	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	289m	East
3618893	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Coastal Shale-Sandstone Forest	Northern Hinterland Wet Sclerophyll Forests	311m	North
3619665	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	311m	South West
3618869	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	320m	North
3619206	Not classified	(Not classified) Not classified	Not classified	322m	East
3619411	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	330m	West
3619684	Not classified	(Not classified) Not classified	Not classified	339m	South East
3618988	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	355m	North East
3618920	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	366m	North West
3619760	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	371m	South East
3619580	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	372m	South East
3619577	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	374m	South East
3619725	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	376m	South
3619850	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	376m	South East
3619476	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	387m	East
3619323	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	393m	West
3619212	Not classified	(Not classified) Not classified	Not classified	398m	East

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3619749	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	400m	South East
3619782	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	404m	South
3619438	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	410m	West
3619775	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	422m	South East
3619393	Not classified	(Not classified) Not classified	Not classified	432m	East
3619859	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	433m	South
3619883	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	435m	South
3619831	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	442m	South
3619890	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	447m	South East
3619493	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	469m	East
3619394	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	475m	East
3619296	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	477m	East
3619134	Not classified	(Not classified) Not classified	Not classified	484m	East
3618762	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	485m	North West
3619862	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	487m	South
3619316	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	488m	West
3619130	Not classified	(Not classified) Not classified	Not classified	490m	East
3619666	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	499m	South East
3618787	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	507m	North West
3619261	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	509m	East
3619017	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	515m	North East
3619569	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	525m	South West
3619938	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	534m	South
3618880	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	535m	North West
3619946	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	541m	South
3619809	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	546m	South East
3618808	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	553m	North West
3619095	Not classified	(Not classified) Not classified	Not classified	556m	East
3619309	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	557m	East
3618901	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	559m	North East

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3619860	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	560m	South East
3619874	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	561m	South East
3619799	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	563m	South East
3619536	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	568m	West
3619068	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	592m	North East
3619253	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	599m	East
3619985	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	606m	South
3619726	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	609m	South East
3619519	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	619m	East
3618881	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	621m	North East
3618560	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	623m	North
3619412	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	624m	East
3619178	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	641m	East
3620001	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	646m	South
3619690	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	647m	South East
3620017	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	655m	South
3620043	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	661m	South East
3618635	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	667m	North West
3619992	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	669m	South West
3620083	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	677m	South East
3619041	Not classified	(Not classified) Not classified	Not classified	679m	North East
3620018	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	682m	South East
3619010	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	684m	West
3619713	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	690m	South East
3619976	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	694m	South East
3620147	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	697m	South
3618919	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	715m	North West
3619247	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	721m	West
3619332	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	727m	East
3619702	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	728m	South West

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3618721	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	730m	North East
3619191	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	738m	East
3620042	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	746m	South West
3619161	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	749m	East
3618768	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	755m	North West
3619069	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	755m	East
3620204	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	760m	South
3620203	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	761m	South
3618663	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	762m	North East
3619616	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	764m	South West
3619018	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	765m	North East
3619535	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	775m	West
3619741	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	779m	South West
3620248	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	781m	South
3619909	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	783m	South West
3619798	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	785m	South West
3619642	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	787m	South West
3619711	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	794m	South West
3620053	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	794m	South West
3619820	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	798m	South East
3620067	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	799m	South West
3618592	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	803m	North West
3618737	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	805m	North West
3619045	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	805m	North East
3618621	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	806m	North West
3619543	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	813m	West
3620275	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	813m	South East

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3619708	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	814m	South East
3620175	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	827m	South East
3620293	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	827m	South
3619899	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	829m	South West
3619984	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	829m	South West
3618997	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	832m	North East
3619290	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	832m	East
3620107	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	834m	South East
3619615	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	836m	West
3619274	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	838m	East
3619808	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	845m	South West
3619266	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	849m	East
3620061	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	852m	South East
3619767	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	858m	South West
3618342	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	865m	North
3619879	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	865m	South East
3618728	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	871m	North East
3619761	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	871m	South East
3618996	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	872m	West
3619861	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	875m	South West
3619832	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	877m	South East
3618586	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	878m	North West
3618809	Rainforests	(Rainforests) Sydney Coastal Coachwood Gallery Rainforest	Northern Warm Temperate Rainforests	878m	North East
3619790	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	885m	South West
3618669	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	892m	North West
3619628	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	896m	West
3618462	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	902m	North East
3619923	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	905m	South East

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3618846	Not classified	(Not classified) Not classified	Not classified	910m	North East
3619791	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	916m	South East
3618959	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	917m	North East
3619819	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	923m	South West
3619947	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	925m	South East
3619259	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	926m	West
3619190	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	934m	West
3618950	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	937m	West
3618701	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	938m	North West
3618821	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	938m	North West
3619762	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	942m	East
3620262	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	943m	South East
3620365	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	945m	South
3618312	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	946m	North East
3618700	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	949m	North West
3618414	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	950m	North West
3620216	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	953m	South East
3620230	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	954m	South East
3618225	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	957m	North West
3618210	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	958m	North West
3618255	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Gully Forest	Sydney Coastal Dry Sclerophyll Forests	960m	North
3618221	Dry Sclerophyll Forests (Shrubby sub-formation)	(Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Enriched Sandstone Forest	Sydney Coastal Dry Sclerophyll Forests	963m	North
3618209	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Sydney Enriched Sandstone Moist Forest	North Coast Wet Sclerophyll Forests	966m	North West
3620217	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	970m	South East
3619305	Wet Sclerophyll Forests (Shrubby sub-formation)	(Wet Sclerophyll Forests (Shrubby sub-formation)) Blue Gum High Forest	North Coast Wet Sclerophyll Forests	974m	West
3620350	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	978m	South
3619810	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	990m	South East

Map ID	Vegetation Formation	Plant Community Type and Vegetation Formation	Vegetation Class	Dist	Dir
3620168	Wet Sclerophyll Forests (Grassy sub-formation)	(Wet Sclerophyll Forests (Grassy sub-formation)) Sydney Turpentine Ironbark Forest	Northern Hinterland Wet Sclerophyll Forests	995m	South East

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

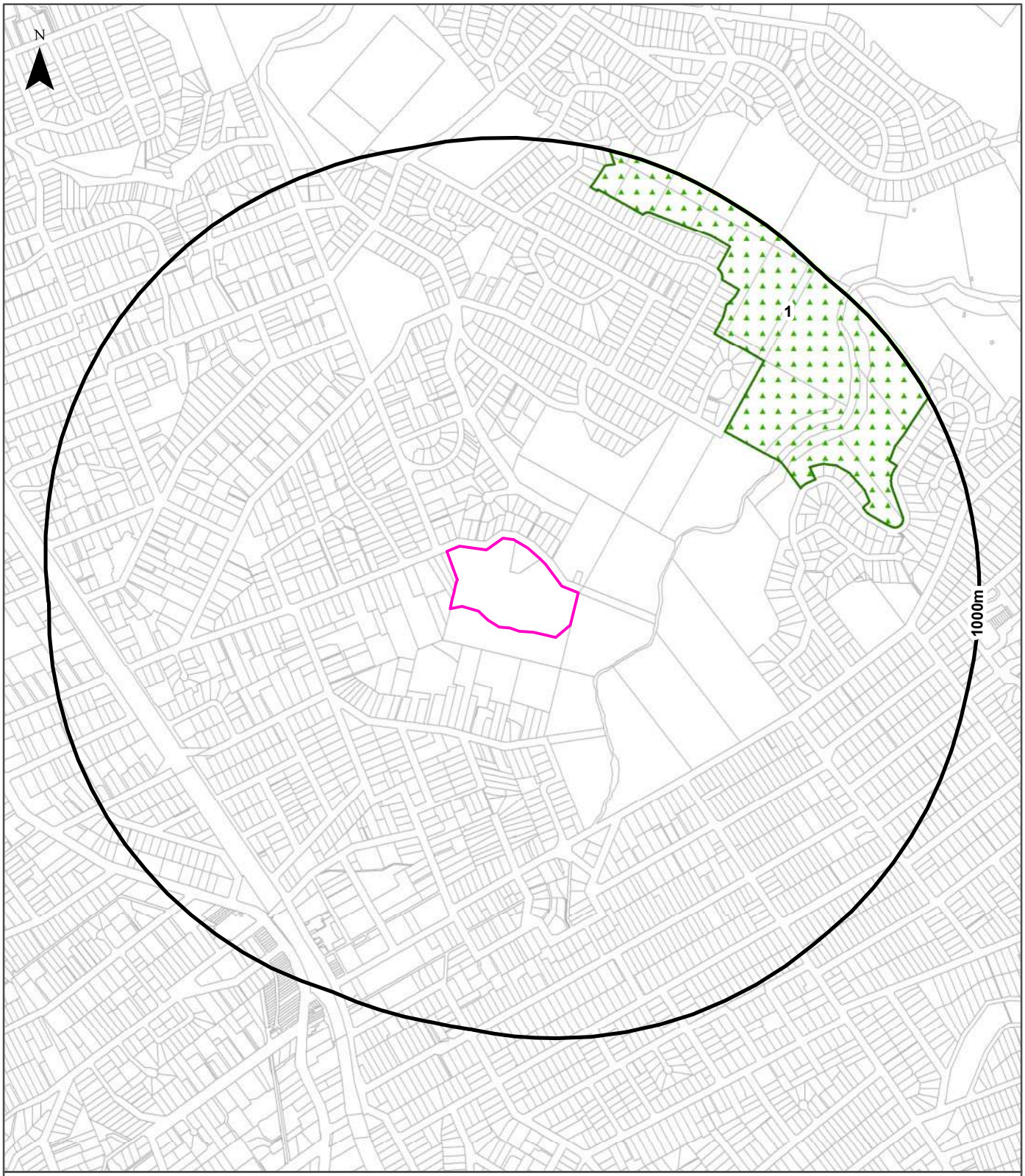
What Ramsar Wetland areas exist within the dataset buffer?

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

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Legend

IUCN category

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

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2026

Coordinate System: GDA 1994 MGA Zone 56

Date: 23 January 2026

Ecological Constraints

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

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	543m	North East

Collaborative Australian Protected Areas Database - Marine

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

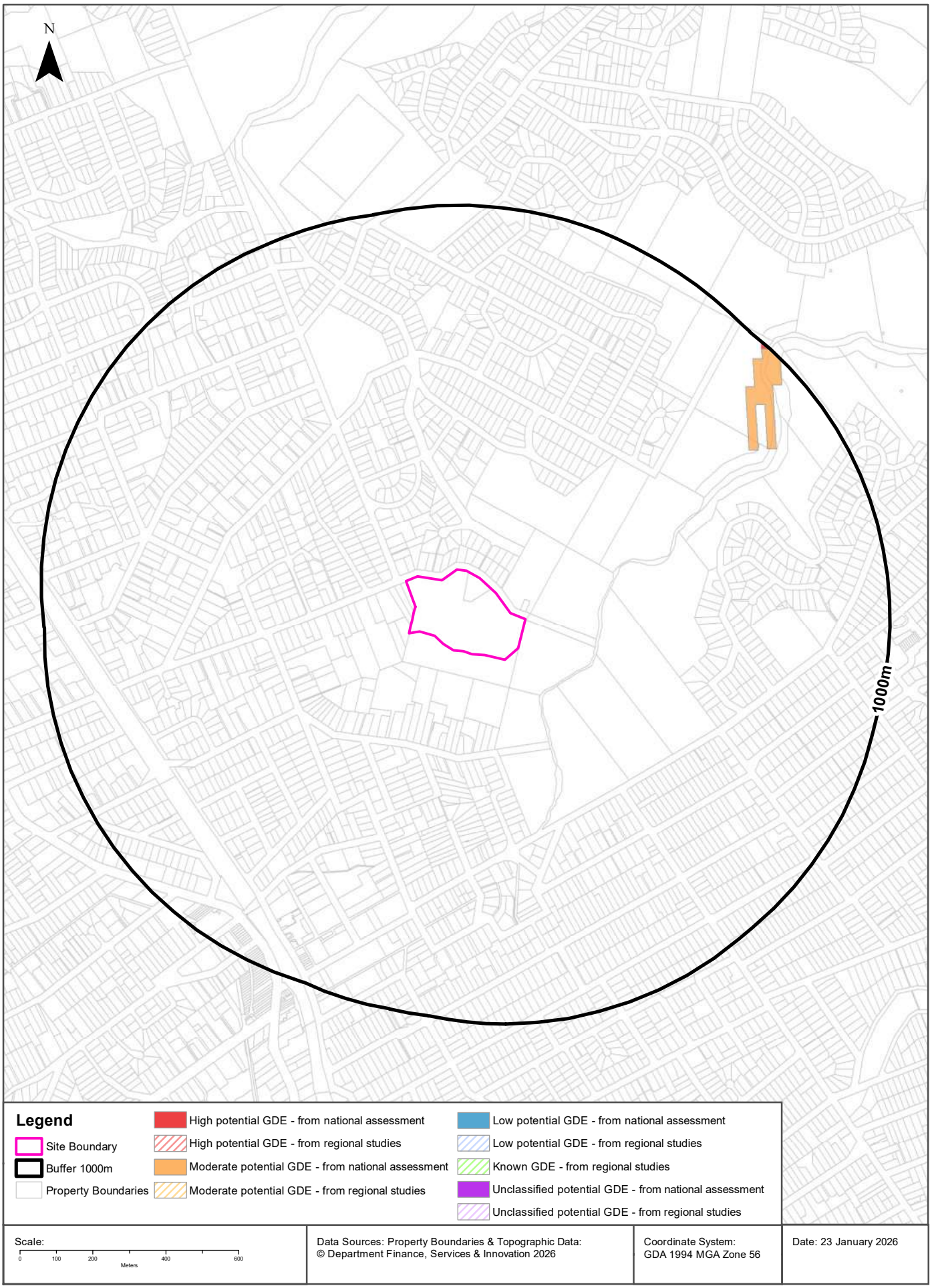
Map ID	Area Name	Area Details	Management Category	Authority	Jurisdiction	Dist	Dir
N/A	No records in buffer						

Source: Collaborative Australian Protected Areas Database (CAPAD) 2022

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Ecological Constraints - Groundwater Dependent Ecosystems Atlas

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Ecological Constraints

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

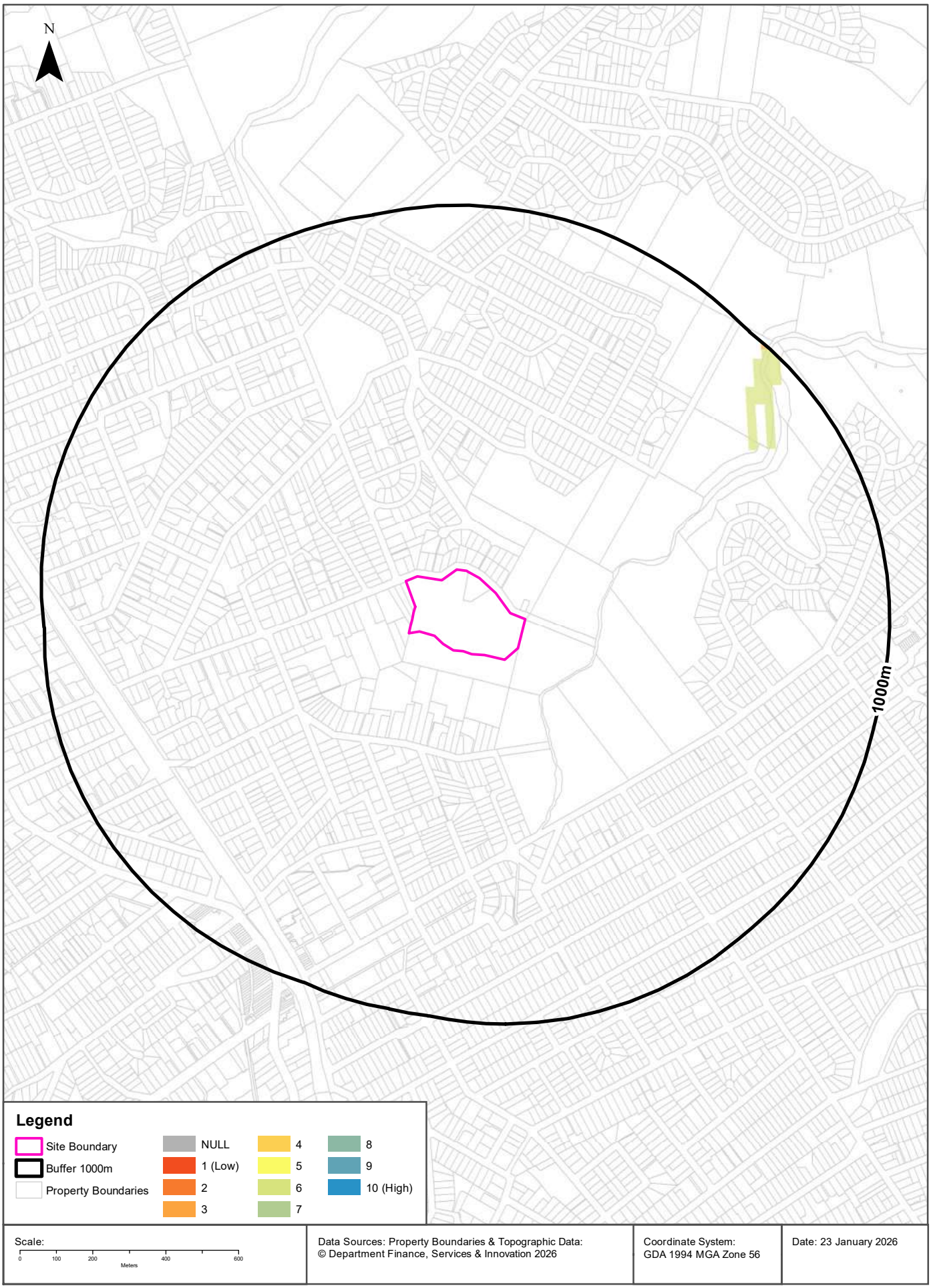
Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	Moderate potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	768m	North East
Terrestrial	High potential GDE - from national assessment	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	983m	North East

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

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071



Ecological Constraints

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial	6	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	768m	North East
Terrestrial	3	Deeply dissected sandstone plateaus.	Vegetation	Consolidated sedimentary	983m	North East

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology

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Ecological Constraints

Lourdes Retirement Village, 95 Stanhope Road, Killara, NSW 2071

NSW BioNet Species Sightings

Species sightings from the NSW BioNet Repository that have either a state or federal conservation status, or a sensitivity status, and are within 10 km of the site:
Note: This data does not include NSW Category 1 sensitive species.

Kingdom	Class	Scientific	Common	Sensitivity Class	State Conservation Status	Federal Conservation Status	Migratory Species Agreements
Animalia	Amphibia	Heleioporus australiacus	Giant Burrowing Frog	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Amphibia	Litoria aurea	Green and Golden Bell Frog	Not Sensitive	Endangered	Vulnerable	
Animalia	Amphibia	Pseudophryne australis	Red-crowned Toadlet	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Actitis hypoleucos	Common Sandpiper	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Amaurornis moluccana	Pale-vented Bush-hen	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Category 2	Critically Endangered	Critically Endangered	
Animalia	Aves	Apus pacificus	Fork-tailed Swift	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Ardenna carneipes	Flesh-footed Shearwater	Not Sensitive	Vulnerable	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Ardenna pacifica	Wedge-tailed Shearwater	Not Sensitive	Not Listed	Not Listed	JAMBA
Animalia	Aves	Ardenna tenuirostris	Short-tailed Shearwater	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Arenaria interpres	Ruddy Turnstone	Not Sensitive	Vulnerable	Vulnerable	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Botaurus poiciloptilus	Australasian Bittern	Not Sensitive	Endangered	Endangered	
Animalia	Aves	Burhinus grallarius	Bush Stone-curlew	Not Sensitive	Endangered	Not Listed	
Animalia	Aves	Calidris acuminata	Sharp-tailed Sandpiper	Not Sensitive	Vulnerable	Vulnerable	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris falcinellus	Broad-billed Sandpiper	Not Sensitive	Vulnerable	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris ferruginea	Curlew Sandpiper	Not Sensitive	Critically Endangered	Critically Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Calidris ruficollis	Red-necked Stint	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Category 3	Endangered	Endangered	
Animalia	Aves	Calyptorhynchus banksii banksii	Red-tailed Black-Cockatoo (coastal subspecies)	Category 2	Critically Endangered	Not Listed	
Animalia	Aves	Calyptorhynchus banksii samueli	Red-tailed Black-Cockatoo (inland subspecies)	Category 2	Vulnerable	Not Listed	
Animalia	Aves	Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	Category 2	Vulnerable	Vulnerable	
Animalia	Aves	Cecropis daurica	Red-rumped Swallow	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Certhionyx variegatus	Pied Honeyeater	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Charadrius mongolus	Lesser Sand-plover	Not Sensitive	Vulnerable	Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Not Sensitive	Vulnerable	Vulnerable	

Kingdom	Class	Scientific	Common	Sensitivity Class	State Conservation Status	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Cuculus optatus	Oriental Cuckoo	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Diomedea exulans	Wandering Albatross	Not Sensitive	Endangered	Vulnerable	
Animalia	Aves	Ephippiorhynchus asiaticus	Black-necked Stork	Not Sensitive	Endangered	Not Listed	
Animalia	Aves	Esacus magnirostris	Beach Stone-curlew	Not Sensitive	Critically Endangered	Not Listed	
Animalia	Aves	Falco hypoleucos	Grey Falcon	Category 2	Vulnerable	Vulnerable	
Animalia	Aves	Falco subniger	Black Falcon	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Gallinago hardwickii	Latham's Snipe	Not Sensitive	Vulnerable	Vulnerable	ROKAMBA;JAMBA
Animalia	Aves	Grantiella picta	Painted Honeyeater	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Aves	Gygis alba	White Tern	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Haematopus fuliginosus	Sooty Oystercatcher	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Haematopus longirostris	Pied Oystercatcher	Not Sensitive	Endangered	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needletail	Not Sensitive	Vulnerable	Vulnerable	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Hydroprogne caspia	Caspian Tern	Not Sensitive	Not Listed	Not Listed	JAMBA
Animalia	Aves	Ixobrychus flavicollis	Black Bittern	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Lathamus discolor	Swift Parrot	Not Sensitive	Endangered	Critically Endangered	
Animalia	Aves	Limosa lapponica	Bar-tailed Godwit	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Limosa limosa	Black-tailed Godwit	Not Sensitive	Endangered	Endangered	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Lophochroa leadbeateri	Pink Cockatoo	Category 2	Vulnerable	Endangered	
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Category 3	Vulnerable	Not Listed	
Animalia	Aves	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Menura alberti	Albert's Lyrebird	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Neophema pulchella	Turquoise Parrot	Category 3	Vulnerable	Not Listed	
Animalia	Aves	Nettapus coromandelianus	Cotton Pygmy-Goose	Not Sensitive	Endangered	Not Listed	
Animalia	Aves	Ninox connivens	Barking Owl	Category 3	Vulnerable	Not Listed	
Animalia	Aves	Ninox strenua	Powerful Owl	Category 3	Vulnerable	Not Listed	
Animalia	Aves	Numenius minutus	Little Curlew	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Onychoprion fuscatus	Sooty Tern	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Oxyura australis	Blue-billed Duck	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Pachycephala olivacea	Olive Whistler	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Pandion cristatus	Eastern Osprey	Category 3	Vulnerable	Not Listed	
Animalia	Aves	Parvipsitta pusilla	Little Lorikeet	Not Sensitive	Vulnerable	Not Listed	

Kingdom	Class	Scientific	Common	Sensitivity Class	State Conservation Status	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Petroica boodang	Scarlet Robin	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Petroica phoenicea	Flame Robin	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Petroica rodinogaster	Pink Robin	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Phaethon lepturus	White-tailed Tropicbird	Not Sensitive	Not Listed	Not Listed	CAMBA;JAMBA
Animalia	Aves	Pluvialis fulva	Pacific Golden Plover	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Pluvialis squatarola	Grey Plover	Not Sensitive	Vulnerable	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies)	Category 3	Endangered	Vulnerable	
Animalia	Aves	Polytelis swainsonii	Superb Parrot	Category 3	Vulnerable	Vulnerable	
Animalia	Aves	Pterodroma leucoptera leucoptera	Gould's Petrel	Not Sensitive	Vulnerable	Endangered	
Animalia	Aves	Pterodroma solandri	Providence Petrel	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Ptilinopus magnificus	Wompoo Fruit-Dove	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Ptilinopus regina	Rose-crowned Fruit-Dove	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Ptilinopus superbus	Superb Fruit-Dove	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Pyrrholaemus sagittatus	Speckled Warbler	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Stercorarius pomarinus	Pomarine Jaeger	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Sterna hirundo	Common Tern	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Sternula albifrons	Little Tern	Not Sensitive	Endangered	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Stictonetta naevosa	Freckled Duck	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Sula dactylatra	Masked Booby	Not Sensitive	Vulnerable	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Thalassarche melanophris	Black-browed Albatross	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Aves	Thalasseus bergii	Crested Tern	Not Sensitive	Not Listed	Not Listed	JAMBA
Animalia	Aves	Thinornis cucullatus cucullatus	Eastern Hooded Dotterel	Not Sensitive	Critically Endangered	Vulnerable	
Animalia	Aves	Todiramphus chloris	Collared Kingfisher	Not Sensitive	Vulnerable	Not Listed	
Animalia	Aves	Tringa brevipes	Grey-tailed Tattler	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Tringa stagnatilis	Marsh Sandpiper	Not Sensitive	Not Listed	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Tyto novaehollandiae	Masked Owl	Category 3	Vulnerable	Not Listed	
Animalia	Aves	Tyto tenebricosa	Sooty Owl	Category 3	Vulnerable	Not Listed	
Animalia	Aves	Xenus cinereus	Terek Sandpiper	Not Sensitive	Vulnerable	Vulnerable	ROKAMBA;CAMBA;JAMBA
Animalia	Gastropoda	Pommerhelix duralensis	Dural Land Snail	Not Sensitive	Endangered	Endangered	
Animalia	Insecta	Petalura gigantea	Giant Dragonfly	Not Sensitive	Endangered	Not Listed	
Animalia	Mammalia	Arctocephalus forsteri	New Zealand Fur-seal	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Arctocephalus pusillus doriferus	Australian Fur-seal	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Balaenoptera musculus	Blue Whale	Not Sensitive	Endangered	Endangered	

Kingdom	Class	Scientific	Common	Sensitivity Class	State Conservation Status	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	Cercartetus nanus	Eastern Pygmy-possum	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Chalinolobus dwyeri	Large-eared Pied Bat	Not Sensitive	Endangered	Endangered	
Animalia	Mammalia	Dasyurus maculatus	Spotted-tailed Quoll	Not Sensitive	Vulnerable	Endangered	
Animalia	Mammalia	Eubalaena australis	Southern Right Whale	Not Sensitive	Endangered	Endangered	
Animalia	Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	Not Sensitive	Endangered	Endangered	
Animalia	Mammalia	Macrotis lagotis	Bilby	Not Sensitive	Extinct	Vulnerable	
Animalia	Mammalia	Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Miniopterus australis	Little Bent-winged Bat	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Miniopterus orianae oceanensis	Large Bent-winged Bat	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Petauroides volans	Southern Greater Glider	Not Sensitive	Endangered	Endangered	
Animalia	Mammalia	Petaurus australis	Yellow-bellied Glider	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Mammalia	Petaurus norfolcensis	Squirrel Glider	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Not Sensitive	Endangered	Endangered	
Animalia	Mammalia	Phoniscus papuensis	Golden-tipped Bat	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Potorous tridactylus tridactylus	Northern long-nosed potoroo	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Mammalia	Pseudomys gracilicaudatus	Eastern Chestnut Mouse	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Pseudomys novaehollandiae	New Holland Mouse	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Mammalia	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	Not Sensitive	Vulnerable	Not Listed	
Animalia	Mammalia	Vespadelus troughtoni	Eastern Cave Bat	Not Sensitive	Vulnerable	Not Listed	
Animalia	Reptilia	Aspidites ramsayi	Woma	Not Sensitive	Vulnerable	Not Listed	
Animalia	Reptilia	Caretta caretta	Loggerhead Turtle	Not Sensitive	Endangered	Endangered	
Animalia	Reptilia	Chelonia mydas	Green Turtle	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Reptilia	Cyclodomorphus melanops elongatus	Mallee Slender Blue-tongue Lizard	Not Sensitive	Endangered	Not Listed	
Animalia	Reptilia	Dermochelys coriacea	Leatherback Turtle	Not Sensitive	Endangered	Endangered	
Animalia	Reptilia	Diplodactylus platyurus	Eastern Fat-tailed Gecko	Not Sensitive	Endangered	Not Listed	
Animalia	Reptilia	Eretmochelys imbricata	Hawksbill Turtle	Not Sensitive	Not Listed	Vulnerable	
Animalia	Reptilia	Eulamprus kosciuskoi	Alpine Water Skink	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Reptilia	Hemiaspis damelii	Grey Snake	Not Sensitive	Endangered	Endangered	

Kingdom	Class	Scientific	Common	Sensitivity Class	State Conservation Status	Federal Conservation Status	Migratory Species Agreements
Animalia	Reptilia	Myuchelys bellii	Western Sawshelled Turtle, Bell's Turtle	Not Sensitive	Endangered	Endangered	
Animalia	Reptilia	Pseudonaja modesta	Ringed Brown Snake	Not Sensitive	Endangered	Not Listed	
Animalia	Reptilia	Tiliqua multifasciata	Centralian Blue-tongued Lizard	Not Sensitive	Vulnerable	Not Listed	
Animalia	Reptilia	Tiliqua occipitalis	Western Blue-tongued Lizard	Not Sensitive	Vulnerable	Not Listed	
Animalia	Reptilia	Uvidicolus sphyrurus	Border Thick-tailed Gecko	Not Sensitive	Vulnerable	Vulnerable	
Animalia	Reptilia	Varanus rosenbergi	Rosenberg's Goanna	Not Sensitive	Vulnerable	Not Listed	
Fungi	Flora	Camarophyllopsis kearneyi		Not Sensitive	Endangered	Not Listed	
Fungi	Flora	Hygrocybe anomala var. ianthinomarginata		Not Sensitive	Vulnerable	Not Listed	
Fungi	Flora	Hygrocybe aurantipes		Not Sensitive	Vulnerable	Not Listed	
Fungi	Flora	Hygrocybe austropratensis		Not Sensitive	Endangered	Not Listed	
Fungi	Flora	Hygrocybe collucera		Not Sensitive	Endangered	Not Listed	
Fungi	Flora	Hygrocybe griseoramosa		Not Sensitive	Endangered	Not Listed	
Fungi	Flora	Hygrocybe lanecovensis		Not Sensitive	Endangered	Not Listed	
Fungi	Flora	Hygrocybe reesiae		Not Sensitive	Vulnerable	Not Listed	
Fungi	Flora	Hygrocybe rubronivea		Not Sensitive	Vulnerable	Not Listed	
Plantae	Flora	Acacia bynoeana	Bynoe's Wattle	Not Sensitive	Endangered	Vulnerable	
Plantae	Flora	Acacia cluniesrossiae	Kanangra Wattle	Not Sensitive	Vulnerable	Not Listed	
Plantae	Flora	Acacia pubescens	Downy Wattle	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Acacia terminalis subsp. Eastern Sydney	Sunshine wattle	Not Sensitive	Endangered	Endangered	
Plantae	Flora	Allocasuarina portuensis	Nielsen Park She-oak	Category 3	Endangered	Endangered	
Plantae	Flora	Caladenia tessellata	Thick Lip Spider Orchid	Category 2	Vulnerable	Vulnerable	
Plantae	Flora	Callistemon linearifolius	Netted Bottle Brush	Category 3	Vulnerable	Not Listed	
Plantae	Flora	Cryptostylis hunteriana	Leafless Tongue Orchid	Category 2	Vulnerable	Vulnerable	
Plantae	Flora	Darwinia biflora		Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Darwinia peduncularis		Not Sensitive	Vulnerable	Not Listed	
Plantae	Flora	Davidsonia jerseyana	Davidson's Plum	Category 2	Endangered	Endangered	
Plantae	Flora	Deyeuxia appressa		Not Sensitive	Endangered	Endangered	
Plantae	Flora	Epacris purpurascens var. purpurascens		Not Sensitive	Vulnerable	Not Listed	
Plantae	Flora	Epacris sparsa	Sparse Heath	Not Sensitive	Vulnerable	Endangered	
Plantae	Flora	Eucalyptus camfieldii	Camfield's Stringybark	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Eucalyptus leucoxylon subsp. pruinosa	Yellow Gum	Not Sensitive	Vulnerable	Not Listed	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Not Sensitive	Vulnerable	Vulnerable	

Kingdom	Class	Scientific	Common	Sensitivity Class	State Conservation Status	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Eucalyptus scoparia	Wallangarra White Gum	Not Sensitive	Endangered	Vulnerable	
Plantae	Flora	Euphorbia psammogeton	Sand spurge	Not Sensitive	Endangered	Not Listed	
Plantae	Flora	Gaudium deanei		Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Genoplesium baueri	Bauer's Midge Orchid	Category 2	Endangered	Endangered	
Plantae	Flora	Genoplesium plumosum	Tallong Midge Orchid	Category 2	Critically Endangered	Endangered	
Plantae	Flora	Grammitis stenophylla	Narrow-leaf Finger Fern	Category 3	Endangered	Not Listed	
Plantae	Flora	Grevillea caleyi	Caley's Grevillea	Category 3	Critically Endangered	Critically Endangered	
Plantae	Flora	Grevillea hilliana	White Yiel Yiel	Not Sensitive	Endangered	Not Listed	
Plantae	Flora	Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	Not Sensitive	Vulnerable	Not Listed	
Plantae	Flora	Haloragodendron lucasii		Not Sensitive	Endangered	Endangered	
Plantae	Flora	Hibbertia puberula		Not Sensitive	Endangered	Not Listed	
Plantae	Flora	Hibbertia spanantha	Julian's Hibbertia	Category 2	Critically Endangered	Critically Endangered	
Plantae	Flora	Hibbertia superans		Not Sensitive	Endangered	Not Listed	
Plantae	Flora	Isotoma fluviatilis subsp. fluviatilis		Category 3	Not Listed	Extinct	
Plantae	Flora	Lasiopetalum joyceae		Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Macadamia integrifolia	Macadamia Nut	Not Sensitive	Not Listed	Vulnerable	
Plantae	Flora	Macadamia tetraphylla	Rough-shelled Bush Nut	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Melaleuca biconvexa	Biconvex Paperbark	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Melaleuca deanei	Deane's Paperbark	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Microtis angusii	Angus's Onion Orchid	Category 2	Endangered	Endangered	
Plantae	Flora	Persoonia hirsuta	Hairy Geebung	Category 3	Endangered	Endangered	
Plantae	Flora	Persoonia laxa		Not Sensitive	Extinct	Extinct	
Plantae	Flora	Persoonia mollis subsp. maxima		Not Sensitive	Endangered	Endangered	
Plantae	Flora	Persoonia pauciflora	North Rothbury Persoonia	Category 3	Critically Endangered	Critically Endangered	
Plantae	Flora	Pimelea curviflora var. curviflora		Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Prostanthera marifolia	Seaforth Mintbush	Category 3	Critically Endangered	Critically Endangered	
Plantae	Flora	Rhizanthella slateri	Eastern Australian Underground Orchid	Category 2	Vulnerable	Endangered	
Plantae	Flora	Rhodamnia rubescens	Scrub Turpentine	Not Sensitive	Critically Endangered	Critically Endangered	
Plantae	Flora	Sarcochilus hartmannii	Hartman's Sarcochilus	Category 2	Vulnerable	Vulnerable	
Plantae	Flora	Syzygium paniculatum	Magenta Lilly Pilly	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Tetratheca glandulosa		Not Sensitive	Vulnerable	Not Listed	
Plantae	Flora	Tetratheca juncea	Black-eyed Susan	Not Sensitive	Vulnerable	Vulnerable	
Plantae	Flora	Thesium australe	Austral Toadflax	Not Sensitive	Vulnerable	Vulnerable	

Kingdom	Class	Scientific	Common	Sensitivity Class	State Conservation Status	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Wilsonia backhousei	Narrow-leafed Wilsonia	Not Sensitive	Vulnerable	Not Listed	

Source: NSW BioNet Species Sightings

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Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

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

Click for Use of Report - Applicable Terms

Appendix G: Report Explanatory Notes

STANDARD SAMPLING PROCEDURE (SSP)

These protocols specify the basic procedures to be used when sampling soils or groundwater for environmental site assessments undertaken by JKE.

The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

A. Groundwater Sampling

Groundwater samples are more sensitive to contamination than soil samples and therefore adhesion to this protocol is particularly important to obtain reliable, reproducible results. The recommendations detailed in AS/NZS 5667.1:1998 are considered to form a minimum standard.

The basis of this protocol is to maintain the security of the borehole and obtain accurate and representative groundwater samples. The following procedure should be used for collection of groundwater samples from previously installed groundwater monitoring wells.

- After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.
- Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling, the condition of each well should observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.
- Take the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.
- Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or other low flow) techniques.
- Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:
  - Micropore filtration system or Stericup single-use filters (for heavy metals samples);
  - Filter paper for Micropore filtration system; Bucket with volume increments;
  - Sample containers: teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles;
  - Bucket with volume increments;
  - Flow cell;
  - pH/EC/Eh/T meters;
  - Plastic drums used for transportation of purged water;
  - Esky and ice;
  - Nitrile gloves;
  - Distilled water (for cleaning);
  - Electronic dip meter;
  - Low flow pump pack and associated tubing; and

- Groundwater sampling forms.

- If single-use stericup filtration is not used, clean the Micropore filtration system thoroughly with distilled water prior to use and between each sample. Filter paper should be changed between samples. 0.45um filter paper should be placed below the glass fibre filter paper in the filtration system.
- Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.
- Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.
- Groundwater samples are obtained from the monitoring wells using low flow/micro-purge sampling equipment to reduce the disturbance of the water column and loss of volatiles.
- During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%.
- All measurements are recorded on specific data sheets.
- Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.
- All samples are preserved in accordance with water sampling requirements detailed in the NEPM 2013 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice as outlined in the report text.
- Record the sample on the appropriate log in accordance with AS1726:1993. At the end of each water sampling complete a chain of custody form.

B. <u>Decontamination Procedures for Groundwater Sampling Equipment</u>

- All equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.
- The following equipment and materials are required for the decontamination procedure:
  - Phosphate free detergent;
  - Potable water;
  - Distilled water; and
  - Plastic Sheets or bulk bags (plastic bags).
- Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.
- Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.
- Flush pump head with distilled water.
- Change water and detergent solution after each sampling location.
- Rinse sampling equipment in the bucket containing distilled water.
- Place cleaned equipment on clean plastic sheets.
- If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned

QA/QC DEFINITIONS

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)[9] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (H. Keith 1991)[10].

A. Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection limit (MDL) for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations.

"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit" Keith 1991.

B. Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD). Acceptable targets for precision in this report will be less than 50% RPD for concentrations greater than ten times the PQL, less than 75% RPD for concentrations between five and ten times the PQL and less than 100% RPD for concentrations that are less than five times the PQL.

C. Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured. The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes.

The proximity of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery. Acceptable limits for accuracy generally lie between 70% to 130% recoveries. Certain laboratory methods may allow for values that lie outside these limits.

D. Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

[9] US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)

[10] Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

E. Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms; Sample receipt form;
- All sample results reported; All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

Comparability is the evaluation of the similarity of conditions (eg. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. Blanks

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling and analysis.

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{\text{(Spike Sample Result – Sample Result) x 100}}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{\text{(D1 – D2) x 100}}{\{(D1 + D2)/2\}}$$