

20 October 2025

By email: [REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
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Victorian Planning Authority

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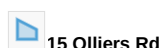
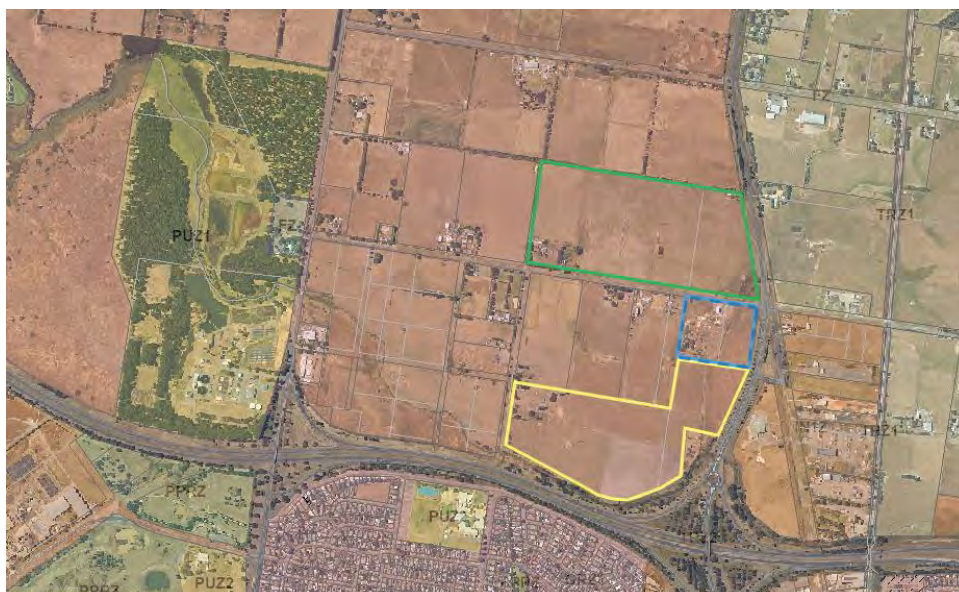
Dear [REDACTED],

Submission to proposed Ballarat Planning Scheme Amendment C256ball
Land: [REDACTED]

1 Introduction

1.1 We act for [REDACTED], landowner and intended developer affected by the proposed *Ballarat Planning Scheme Amendment C256ball (Amendment)*. [REDACTED] is the registered proprietor of land known as [REDACTED] (Land). The Land totals some 60.8ha.

1.2 The Land is identified within the figure below.



APAC-#313811560-v1

- 1.3 The Amendment proposes to incorporate (amongst other matters) the *Ballarat North Precinct Structure Plan (PSP)*, the *Ballarat North Development Contributions Plan (DCP)* and *Ballarat North Native Vegetation Precinct Plan (NVPP)* into the *Ballarat Planning Scheme (Scheme)*.
- 1.4 The matters that [REDACTED] seeks to engage with in these submissions relate to the following topics, which are discussed in greater detail under section 2 of these submissions:
- (1) Traffic engineering;
 - (2) Drainage;
 - (3) Planning;
 - (4) Heritage;
 - (5) Development Contributions Plan;
 - (6) Sensitive-Use Buffers;
 - (7) Contamination; and
 - (8) Bushfire.

2 Outline of submissions

- 2.1 [REDACTED] identifies the following matters which form the basis of its submissions. It would be delighted to discuss these with the VPA further, with a view to further detailing its concerns and working towards resolution of these matters. It reserves its rights to further expand upon the detail of these matters moving forward.

Traffic engineering

- 2.2 [REDACTED] raises the following traffic engineering related issues:

- (1) Midland Highway:

There are several road and intersection infrastructure projects proposed in the DCP and PSP along Midland Highway, being RD-02-1 (duplication of Midland Highway (southern section)), RD-02-2 (duplication of Midland Highway (northern section)) and IN-04 (Midland Highway and Olliers Road intersection).

The Midland Highway services a larger region, not just this PSP precinct, and if such upgrade projects such as duplication are ultimately necessary, they should be delivered by the Head, Transport for Victoria (HTV) within this context. Such an approach is consistent with other PSPs.

These road and intersection infrastructure projects should be removed from the DCP.

In addition, it is not appropriate for the project to include the rebuild of a road. A DCP should not pay towards the rehabilitation of a road due to poor maintenance by the road authority. This principle is set out in the DCP Guidelines.

- (2) Outside In Design for Intersections:

The intersection concept design should be revised to remove the outside in treatment in favour of a more efficient civil design. Retention of the outside in treatment would unreasonably cross subsidise the long-term duplication of the Midland Highway. Such a treatment is inappropriate within this context.

(3) Traffic Modelling:

The traffic modelling undertaken by Jacobs and associated inputs appear inaccurate and based on outdated data.

Inaccurate base data distorts outcomes significantly.

(4) Cross-Section (Local Access Street):

The local access street cross-section as shown on page 61 of the PSP should be reduced from 18m to 16m.

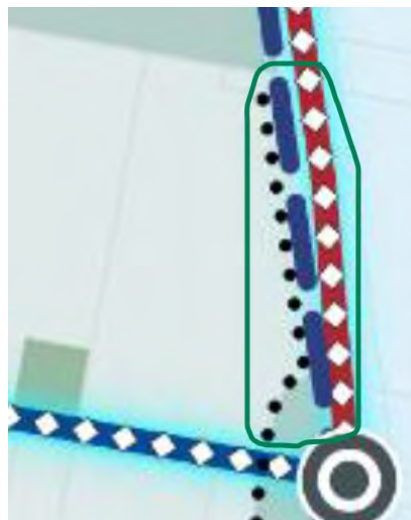
(5) Intersections:

The extent of the intersection projects have not been accurately illustrated in the PSP (Appendix B, Plan 12) and DCP (Plan 3), including IN-04. This could lead to confusion, and it should be correctly drawn to scale.

(6) Shared Path:

A “*shared path / 2-way bike path*” and “*bike lane / path*” is shown along the extent of Midland Highway adjoining 88 Olliers Road (see extract below from Plan 4 of the PSP, with the relevant approximate area outlined in green).

There is no cogent justification for the existence these two paths to the extent that they are shown in parallel.



(7) Staging:

The Staging Plan in the PSP contemplates the Land will be in Stage 1.

It should be made clear in the PSP that any road and intersection upgrades relating to the Land (i.e. RD-02-1, RD-02-2 and IN-04) do not need to be constructed or commenced prior to development. In this respect, it has not been demonstrated why the timing for these items is nominated as “short” in Appendix 1, Table 19 of the PSP.

The primary submission of course is that these road and intersection infrastructure projects should be removed from the DCP.

Drainage

2.3 [REDACTED] raises the following drainage infrastructure issues:

- (1) WL-05 (Wetland and Retained Basin (SES))

The size and location of the drainage asset WL-05 has not been sufficiently justified.

- (2) DR-01 (Construction of Constructed waterway (CW1))

The size, location and alignment of the DR-01 has not been sufficiently justified. Further, the proposed width of the waterway of 60m is unreasonably wide and has no cogent basis.

2.4 In this respect, we **enclose** a memorandum prepared by Spiire dated 2 September 2025: [REDACTED]. In particular, the memorandum identifies that the relevant sizes ought to be considerably less than what is contemplated by SMEC's assessment.

2.5 The comparison table on pages 8 and 9 of the Spiire Memorandum is extracted below, which identifies that WL-05 should be reduced by 2.8ha:

WLRB	Area (ha)	Area (ha) SMEC	Difference (ha)
SES	4.70	7.50	2.80
SEN	3.87	5.27	1.40
CS	5.88	11.34	5.45
NWS	4.40	7.38	2.98
WLRB	Area (ha)	Area (ha) SMEC	Difference (ha)
NWN	8.27	9.75	1.49
TOTAL	25.86	41.24	14.12

As the VPA will be aware, refinements to the sizing of the drainage assets as much as reasonably practicable should be encouraged, noting the residual benefit in reducing the overall costs in the DCP.

Further, the apportionment of CW1 appears inappropriate in circumstances where it may benefit upstream landowners.

Planning

2.6 [REDACTED] raises the following planning issues:

- (1) PSP shape and context:

The PSP shape excludes significant areas of non-urban land, this makes the PSP design inefficient. For example, roads are required to extend past 'dead running' which increases

cost compared to a more integrated urban footprint. This issue may add about 15% to 20% of the underlying Development Infrastructure Levy.

(2) Low developable land:

Within the urban area there are significant areas of undevelopable land, generated by low lying land along Burrembeet Creek, the Ballarat Commons, large drainage areas, an existing non-government school and flood prone land. If the NDA within the PSP area was 65% instead of 47%, then the Development Infrastructure Levy would be reduced notably.

(3) Dwelling density targets and typologies:

The dwelling density targets proposed in the PSP are inappropriate. The PSP presently contemplates the following density targets:

- Area of Increased Density: Average of 25 dwellings or more per Net Development Hectares of area (NDHa).

The PSP identifies that this would apply to land located within 400m walkable catchment of activity centre and 50 walkable catchment of open space and the Principle Public Transport Network or similar.

- Balance Area: Average of 17 dwellings or more per NDHa.

The higher dwelling density target will be (as currently expressed in the PSP) applicable to land that surrounds isolated pockets of open space and the extent of uncredited open space/drainage on the boundary of the Land (along the south and east).

██████████'s concerns are that without a degree of flexibility in the controls, delivery of densities and the types of housing may be significantly delayed, given the market conditions are unlikely to support these requirements for some time.

It is acknowledged that R1 of the PSP provides that densities *“lower than targets specified in Table 3, may be considered if it can be demonstrated that the market for housing at the target density is not sufficiently mature”*. However further revision is sought, to ensure that appropriate outcomes can be delivered without undue delay or future dispute.

It is submitted that the density targets should be revised as follows:

- Area of Increased Density: Average of 20 dwellings / NDHa; and
- Balance Area: Average of 16 dwellings / NDHa.

(4) Local Convenience Centre:

The characterisation of the “local convenience centre” on 88 Olliers Road needs to be consistently applied in the PSP and associated documentation.

The PSP identifies the “local convenience centre” as a “local activity centre” on Plan 9 of the PSP. The inconsistent references have unintended consequences, noting that Table 3 (Housing density and diversity) identifies that an average target density of 25 dwellings or more per NDHa which applies to land within 400m walkable catchment of “activity centres” as shown in the extract below.

Table 3 Housing density and diversity

AREA OF INCREASED DENSITY	
Housing catchment area	Applies to land which is located within 400m walkable catchments of activity centres and 50m walkable catchment of open space and the Principal Public Transport Network or similar.
Target density	Average of 25 dwellings or more per NDHa

In this respect, Table 3 should be revised to make clear that the 50m walkable catchment applies to the “local convenience centre”. This would appear consistent with the legend at Plan 3 as shown in the extract below (highlighting added):



(5) Affordable Housing:

The affordable housing metrics lack sufficient justification and resolution, particularly when combined with the consideration of the Amendment holistically.

Heritage Overlay

2.7 The Amendment seeks to apply the *Heritage Overlay – Schedule HO256 (HO256)* over part of 88 Olliers Road for the Bernera Homestead and a Cypress Tree to the south-east of that dwelling, as shown below.

2.8 The location of the proposed HO256 conflicts with the proposed local convenience centre.



2.9 The application of the HO256, and the extent of its curtilage has not been sufficiently justified, and would significantly restrict development of this part of the Land for a local convenience centre, as nominated by the PSP.

2.10 The statement of significance (exhibited as part of the consultation materials) contemplates the protection of an early Monterey cypress tree to the southeast of the residence (refer to the yellow

arrow in the image above). In this respect, there has not been sufficient justification to support this position.

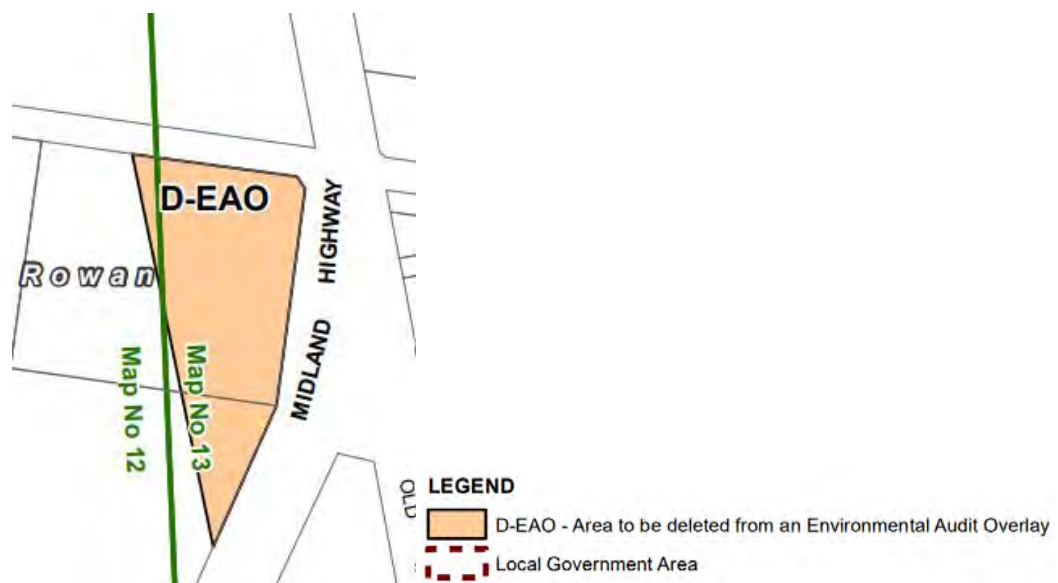
Development Contributions Plan

- 2.11 At present, the DCP proposes a Development Infrastructure Levy of \$672,901 per NDHa, which is a very high DCP levy, combined with a relatively low NDA.
- 2.12 Submissions have been made in respect of road and transport related projects above, as well as the PSP shape and context, and the low developable land. All of these issues contribute significantly to an outsized Development Infrastructure Levy that could be made significantly more equitable and efficient.
- 2.13 The low developable area within the PSP contributes to the high Development Infrastructure Levy. Developable land is a valuable and finite resource. The PSP design and infrastructure should be designed in such a way that developable area is maximised, and levies minimised without compromising the provision of necessary, basic and essential infrastructure. The DCP should identify and fund the most efficient and cost-effective drainage strategy that meets relevant requirements.
- 2.14 The risk with such a high base development contribution levy (noting that DCP levy will also be indexed annually) is that the developability of the Land will be simply unviable.
- 2.15 [REDACTED] submits that a reconsideration of the following matters pertaining to the DCP is necessary:
- (1) PSP shape and context;
 - (2) low developable land;
 - (3) projects to be included; and
 - (4) costings of the DCP items, noting that the costs for the projects are not sufficiently developed.
- 2.16 For instance, as foreshadowed above, the road items RD-02-1 and RD-02-2 should not be included in the DCP. It is further noted that the DCP states the following in relation to the costs for the Midland Highway
- Allowance – Contingency (40% for Midland Highway road upgrade) Complete removal of the existing road pavement and turning lanes.*
- Notwithstanding that this should not be a DCP project as a primary submission, it is further noted that given the Benchmark Costs already have regard to project risk and contingency, it is not appropriate to include a contingency for these costs. In addition, it is not appropriate for the project to include the rebuild of a road. A DCP should not pay towards the rehabilitation of a road due to poor maintenance by the road authority. This principle is set out in the DCP Guidelines.
- 2.17 The intersection concept designs at IN-01c and IN-05c for example should be revised to remove the outside in treatment in favour of a more efficient civil design. Retention of the outside in treatment would unreasonably cross subsidise the long-term duplication of the Midland Highway. Such a treatment is inappropriate within this context. The cost of an outside in intersection treatment is typically significantly greater than the cost of the alternative treatment.
- 2.18 Other road projects within the DCP also appear inappropriate, such as RD-01-2c, RD-03-1c, RD-03-2c, IN-02 and BR-01c.
- 2.19 As aforementioned, significant concerns exist in respect of the drainage asset designs relevant to the Land. A more appropriate and efficient drainage asset design and strategy should be explored and adopted, including efficient reductions in land take.

- 2.20 Further, it is not appropriate to include the cost of a Level 2 Community centre as a Development Infrastructure Levy item. The cost of the Level 2 community centre should be adjusted to a Level 1 cost.
- 2.21 The DCP land valuation rates used at present are unable to be reconciled, including both the current land rate, and why the sports reserve and community facility projects CL-01, CL-02, SR-01 and SR-02 have different land valuation rates compared to the balance of the precinct.
- 2.22 These are critical matters that [REDACTED] will seek to discuss and expand upon further with the VPA.

Contamination

- 2.23 [REDACTED] agrees that the Environmental Audit Overlay should be deleted from 15 Olliers Road and Noble Park, Mount Rowan, and support its removal as shown on the plans 12EAO and 13EAO, as extracted below.



Sensitive Use Buffers

- 2.24 Plan 3 of the PSP (Place Based Plan) identifies the following sensitive use buffers that encroach onto the Land:
- 300m acoustic buffer;
 - 500m landfill gas buffer; and
 - 1000m asphalt plant buffer.
- 2.25 [REDACTED] submits that the extent of these buffers have not been sufficiently justified.
- 2.26 In relation to the landfill gas buffer, we enclose an assessment undertaken by Environmental Site Assessments, dated 4 July 2025: [Landfill Gas Risk Assessment](#). The Assessment concludes as follows in relation to Noble Court, Mount Rowan:

A qualitative risk assessment based on the conceptual site model, and using the CIRIA C665 (2007) methodology, determines the potential for landfill gas migration to the Site to be 'Unlikely', with a potential consequence of 'Minor.' This results in a combined risk magnitude of 'Very Low Risk' [which is the lowest classification].

Semi-qualitative risk assessment undertaken using the CIRIA C665 (2007) GSV methodology is consistent with the qualitative risk assessment and also considers the former Wendouree landfill site to be 'Very Low Risk' based on the maximum reported flows and measured methane and carbon dioxide by Landserv.

On the basis of the above, and consistent with CIRIA C665 (2007), no additional on-site management or monitoring measures are required.

2.27 We are instructed that the VPA has agreed to the removal of [REDACTED]'s Land from the landfill gas buffer, and that it would be explicitly expressed in Schedule 3 to Clause 37.07 (Urban Growth Zone). We request that the VPA confirm it will update the planning controls accordingly. Plan 3 of the PSP (and any other relevant plans) should be revised to illustrate that the Land is not subject to the Landfill gas buffer accordingly.

2.28 In relation to the asphalt plant buffer, we enclose an assessment from Zephyr Environmental dated 20 October 2025: [Odour Risk Assessment](#). The Odour Risk Assessment contains a detailed analysis and has considered the following matters:

- (1) Potential for odour and dust impacts from surrounding existing industries;
- (2) Cumulative odour sources in the area;
- (3) Recommended separation distances;
- (4) A level 1 and level 2 odour risk evaluation.

2.29 The conclusion from the Odour Risk Assessment provides as follows:

In accordance with EPA Publication 1949 which requires a risk-based assessment where a standard separation distance overlies land that is intended to be developed for sensitive use, an odour risk assessment was completed adopting the approach in EPA Publication 1883. The assessment of odour risk has been undertaken to determine whether a variation in the default separation distance is appropriate.

Based on the risk assessment completed under EPA Publication 1883, as required when considering land for sensitive use for which a separation distance exists in EPA Publication 1949, the residual risk of odour impacts to the Site from Boral Asphalt, , [sic] is considered to be low. The findings support the suitability of the Site for residential development in accordance with the PSP's intended land uses.

2.30 In the circumstances, our client submits that the asphalt plant buffer should be varied to exclude the Land, consistent with the detailed analysis and recommendations contained in the Odour Risk Assessment.

Bushfire

2.31 [REDACTED] is concerned with the specific setback distances at the structure planning level. As the VPA will appreciate, the subdivision and development of land, particularly with large precincts such as Ballarat North will take time, in which it is possible that the bushfire threat may change, vegetation levels could be different and policy guidelines might be revised.

2.32 In these circumstances, it is prudent to alter or remove Plan 7 (Bushfire) and allow this to be managed by the existing Australian Standards.

3 Conclusion

3.1 [REDACTED] generally supports the Amendment, subject to appropriate refinements in respect of the aforementioned matters.

3.2 It continues to work through the details of the Amendment and will seek independent expert opinions as appropriate. [REDACTED] will endeavour to raise any additional matters at the earliest, as it continues to review the relevant materials.

3.3 [REDACTED] would be delighted to discuss the aforementioned matters with the VPA further, and work through the resolution of these issues as appropriate.

Please contact the undersigned on [REDACTED] should you have any queries in respect of this submission.

Yours faithfully

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

MEMO

To:	Victorian Planning Authority
From:	[REDACTED]
Date:	2 September 2025
Reference:	306623
Project name:	Ballarat North PSP
Subject:	Ballarat North PSP - Drainage Strategy Review and Amended Asset Configuration

The Victorian Planning Authority (VPA) is undertaking planning for the Ballarat North Precinct Structure Plan (PSP). The VPA is in the final stages of finalising a draft PSP with technical studies being prepared to support the planning.

Spiire represents two major landowners within the PSP, namely [REDACTED] and [REDACTED]. We have been requested to review the recently published (8 July 2025) Final Proof of Concept Ballarat North PSP – Stormwater Drainage report prepared by SMEC. As part of the overall review, we have also been tasked with providing an alternative drainage asset layout and sizing.

The proposed amended strategy is provided in the body of this memo with the Drainage report review provided as Appendix B.

1. EXECUTIVE SUMMARY

- ▶ A review of the SMEC Drainage Strategy shows that the strategy provides overly conservative retardation basin footprints with apparent errors / unsubstantiated anomalies within their modelling. The footprints and associated storage volumes documented appear to significantly over-retard stormwater runoff to rates well below pre-development rates. These include:
 - Developed flowrates retarded to levels significantly below pre-developed (refer Tables 6.1-6.4, 7.8-7.9 and A.1.4, A.1.5, A.1.8, A-1-10 – A1.13 in the SMEC report). For example, Catchment to CS WLRB retards 1% AEP developed peak flowrates to 1.7m³/s whereas pre-development peak flowrates re 10.6m³/s (Table 7.9)
 - Adoption of SSP8.5 for hydrological calculations across the precinct. This scenario represents a 4.5degree temperature increase with increases of rainfall intensity up to 1.85x current. This is extremely conservative and provides a disproportionate risk profile to optimal design outcomes-
 - The SMEC RORB model routes outflow from WLRB SEN through to WLRB SES instead of directly into the tributary of Burrumbeet Creek. This results in flow from part of the SE catchment being retarded twice. This is in conflict with text in the SMEC report, Section 7.2.1.1: “*SEN has been sized for the eastern catchment of the future School (Ballarat Grammar Mount Rowan campus) and northern areas of Sims Road. The retarding basin is sized to attenuate no more than the existing conditions peak flow at the same location. Once the flows have been attenuated, it is intended to convey this flow via underground drainage pipe into the proposed constructed waterway*”

- ▶ Spiire has focused on optimising drainage assets while meeting technical hydrological requirements. We have assessed stormwater retardation requirements using current climate rainfall data with sensitivity tests made on median climate change scenarios.
- ▶ Revised modelling undertaken by Spiire results in an optimisation of drainage assets which results in a total reduction in retardation basin / wetland footprint of 15.4 ha. Refer SMEC vs Spiire comparison below:

WLRB Name	SMEC Storage Volume (m ³)	Spiire Storage Volume (m ³)
SEN	24,200	17,900
SES	45,400	23,000
CS	50,000	29,100
NWS	35,000	29,900
NWN	58,300	38,300

Table 1: Storage Requirements for 1% AEP with Current Climate Rainfall Data

- ▶ We have promoted the use of the DEECA mapped wetland area to include one of the wetland / retardation basins which further optimises the location of drainage assets within suitable topographical environments. This location will be subject to further ecological advice and potentially flood modelling to identify the wetting regime of the mapped wetland.
- ▶ Ecology to be enhanced with incorporation of construction wetland / retardation basins with consideration for ecological ponds within the floodplain to promote biodiversity including rakali and platypus.

2. WETLAND / RETARDATION BASINS

Spiire has undertaken a review of the SMEC Drainage Strategy report prepared in July 2025. Refer to Appendix A for details of the strategy review.

The below extract is Figure 0-1-1 from the SMEC report. This figure shows five proposed wetland / retardation basins (WLRB) located across the PSP. Labels for each WLRB are added for context.

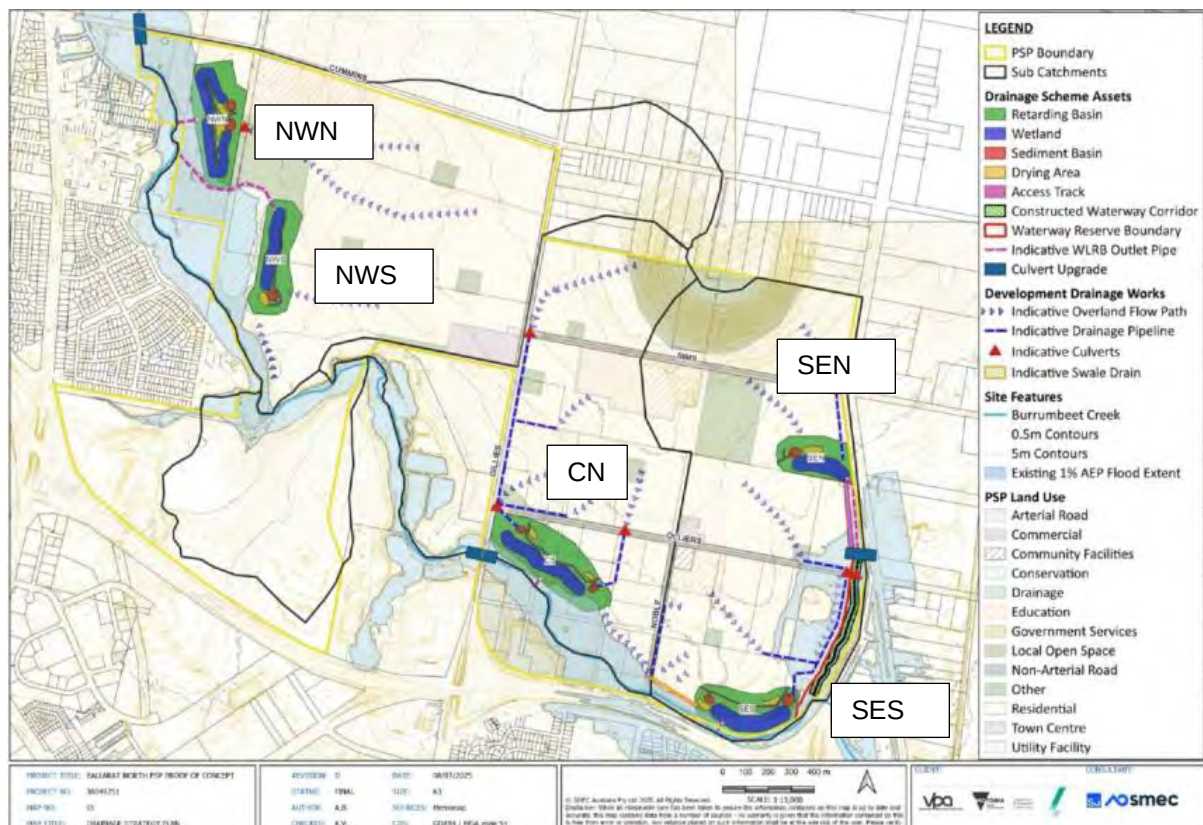


Figure 1: Figure 0-1-1 from the SMEC Drainage Strategy

WLRBs are located within three distinct sub-catchments (refer Figure 6 Appendix A). WLRBs SES and SEN are located in the “Southeast” sub-catchment, CS in the “Central” sub-catchment and NWN and NWS located in the “Northwest” sub-catchment.

2.1 Wetland Sizing

Wetland designs are generally in accordance with the wetland footprints provided in the SMEC Drainage Strategy. We have in some instances adjusted the wetland configurations to account for anticipated velocities and rearranged locations of sediment dry-out areas and access tracks.

There are further opportunities outside of this report to optimise and reduce wetland footprints. These include roadside swales, localised biofiltration, passive irrigation, rainwater tanks, and stormwater harvesting. These have not been presented within this memo but should be investigated further to realise a move away from conventional precinct treatment toward innovative practice (refer Innovation Pathways Pilot Projects).

2.2 RB Sizing

Retardation basin sizing has been revised by Spiire based on the following:

- ▶ Developed scenario to be retarded to pre-development peak flow rates for the 1% AEP and 10% AEP events for current day climatic rainfall data. This includes retardation for each sub-catchment at the outfalls to Burrumbeet Creek and confirmation that the developed peak flow-rate of Burrumbeet Creek at Cummins Road does not exceed pre-development levels.

- ▶ Sensitivity checks using Australian Rainfall and Runoff (ARR) socio-economic pathways (SSP) factor SSP2-4.5 Long-Term (temperature increase of 2.4 degrees Celsius). This scenario provides a sensitivity check that is in line with industry standard. For comparison, SMEC undertook a sensitivity check using SSP5-8.5 (refer Section 4) which we believe is too extreme and if this scenario were to be real would result in greater societal challenges beyond drainage assets within this PSP.

The following revisions have been made to the SMEC RORB model:

2.2.1 Current Day Parameters

- ▶ Initial Loss factors (IL) have been revised to 24.0mm in accordance with the ARR DataHub with Mount Rowan location (SMEC IL 17.25mm).
- ▶ Continuing Loss factors (CL) have been revised to 4.50 mm / hour in accordance with the ARR DataHub with Mount Rowan location. (SMEC CL 5.33mm/hr)

Data

Storm Losses

Note: Burst Loss = Storm Loss - Preburst

Note: These losses are only for rural use and are **NOT FOR DIRECT USE** in urban areas

Note: As this point is in Victoria the advice provided on losses and pre-burst in the VIC specific tab of the ARR Data Hub should be considered.

ID	15736.0
Storm Initial Losses (mm)	24.0
Storm Continuing Losses (mm/h)	4.5

Temporal Patterns | [Download \(.zip\)](#)

Figure 2: ARR DataHub Losses for Miners Rest

2.2.2 SSP2-4.5 Parameters

- ▶ Initial losses factored by 1.1 based on ARR climate change guidance for “Southern Slopes” areas
- ▶ Continuing losses factored by 1.22 based on ARR climate change guidance for “Southern Slopes” areas
- ▶ Rainfall intensity increased by 1.20 – 1.40 dependant on duration in accordance with recommended rates of change for climate change provide by ARR. For comparison, SSP5-8.5 for long term scenarios (modelled by SMEC) applies variable factors of 1.37-1.77. SMEC’s model had higher factors of between 1.40 and 1.85.

2.2.3 Modelling Results

It is noted in the SMEC report that the original Watertech RORB model was adopted and modified to include development sub-catchments throughout the PSP. The updated model was then calibrated (by adjusting kc factor) to try to replicate the flowrates determined in the Watertech model.

The revised modelling that Spiire has undertaken shows a reduction to existing flowrates and this is attributable to the revised initial and continuing losses detailed in Section 2.2.1. Spiire has not attempted to calibrate the revised model.

Based on revised RORB modelling the following pre-development and post-development rates have been calculated. These are based on reporting stations as shown in the figure below:

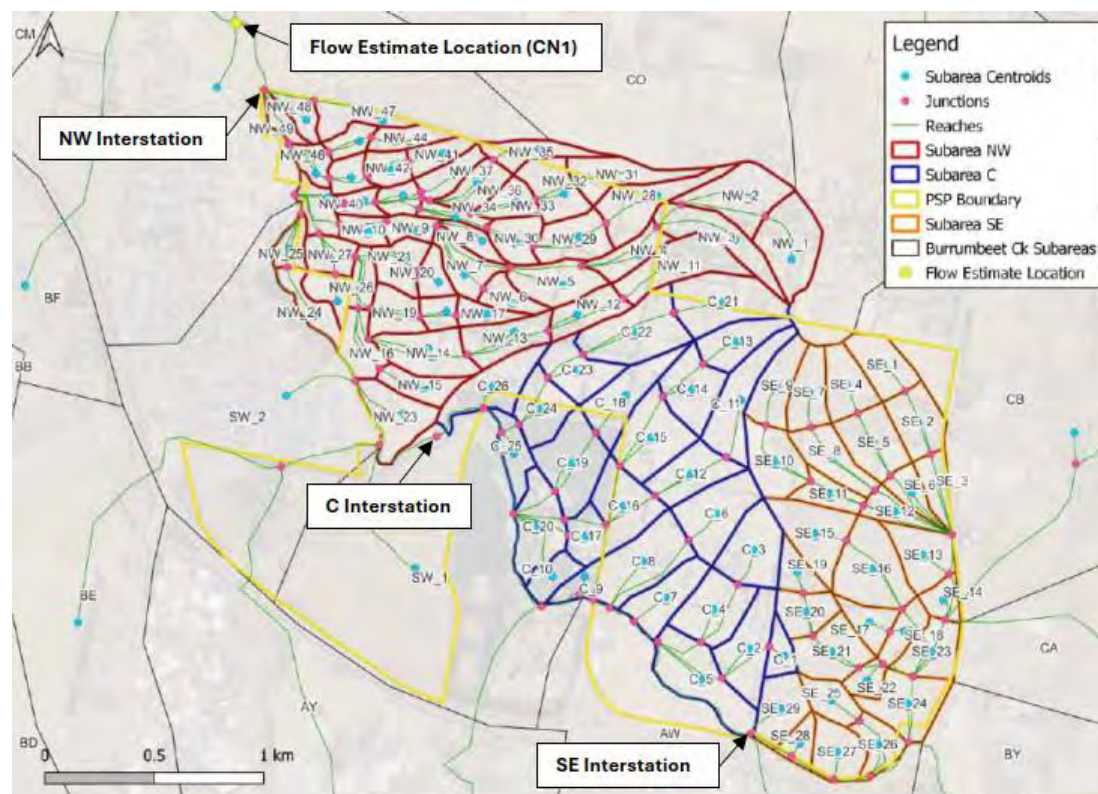


Figure 3: Location Identifiers for Model Outputs

	SMEC Existing Peak Flow (m ³ /s)		Spiire Existing Peak Flow (m ³ /s)	
Sub-catchment	10% AEP	1% AEP	10% AEP	1% AEP
CN	25.6	58.6	19.67	55.22

Table 2: Comparison of Existing Peak Flowrates

As noted earlier, there is an overall reduction in existing flowrates. We expect that this will be reviewed once the revised flood model or Burrumbeet Creek has been completed.

The below tables summarise the RORB modelling that Spiire has undertaken comparing pre-development (existing) and developed peak flow-rates under current day conditions and SSP2-4.5 climate change conditions. Note also that developed catchment contributing to basins has increased and been accounted for.

Time to peak for the CN recording station is significantly longer than the local sub-catchments within the PSP. Retardation is shown to only have a minimal impact on peak flow-rates at this location which is not unexpected.

Sub-catchment	Existing Peak Flow (m ³ /s)		Developed Peak Flow (m ³ /s)	
	10% AEP	1% AEP	10% AEP	1% AEP
SE	2.14	4.76	8.83	15.23
C	3.15	6.81	7.12	13.38
NW	1.41	3.89	7.87	14.43
CN	19.67	55.22	20.45	54.48

Table 3: Current Climate Peak Flowrates (No Retardation)

Sub-catchment	SSP2-4.5 Existing Peak Flow (m ³ /s)		SSP2-4.5 Developed Peak Flow (m ³ /s)	
	10% AEP	1% AEP	10% AEP	1% AEP
SE	3.83	7.11	13.25	23.40
C	5.51	10.03	11.19	20.46
NW	1.41	6.15	12.02	21.48
CN	19.67	82.84	33.93	81.05

Table 4: SSP2-4.5 Climate Change Peak Flowrates (No Retardation)

As noted earlier, retardation basins have been sized to reduce developed peak flow-rates to pre-development rates.

As part of the review, we have modelled the combined WLRBs using an existing surface model created from LiDAR data covering the PSP. Wetland footprints are designed with retardation storage to be provided above the normal water level of the wetlands

Sub-catchment	WLRB	Storage (m ³) Current Day Climate	Storage (m ³) SSP2-4.5
NW	NWS	24,400	46,900
NW	NWN	45,700	55,800
C	CS	27,800	33,900
SE	SES	21,100	29,500
SE	SEN	17,000	24,300

Table 5: Retardation Basin Storage

Sub-catchment	Existing Peak Flow (m ³ /s)		Retarded Peak Flow (m ³ /s)	
	10% AEP	1% AEP	10% AEP	1% AEP
SE	2.14	4.76	1.67	4.22
C	3.15	6.81	3.05	5.91
NW	1.41	3.89	0.89	2.09
CN	19.67	55.22	19.80	54.98

Table 6: Current Climate Peak Flowrates with Retardation

Sub-catchment	SSP2-4.5 Existing Peak Flow (m ³ /s)		SSP2-4.5 Retarded Peak Flow (m ³ /s)	
	10% AEP	1% AEP	10% AEP	1% AEP
SE	3.83	7.11	3.09	6.49
C	5.51	10.03	5.12	8.73
NW	2.79	6.15	1.66	3.30
CN	33.05	82.84	31.96	80.83

Table 7: SSP2-4.5 Climate Change Peak Flowrates with Retardation

2.3 WLRB Reserve Footprints

The below table summarises reserve footprints to be allocated to the WRLB assets with a comparison against reserve sizes denoted in the SMEC Drainage Strategy.

WLRB	Area (ha)	Area (ha) SMEC	Difference (ha)
SES	4.70	7.50	2.80
SEN	3.87	5.27	1.40
CS	5.88	11.34	5.45
NWS	4.40	7.38	2.98

WLRB	Area (ha)	Area (ha) SMEC	Difference (ha)
NWN	8.27	9.75	1.49
TOTAL	25.86	41.24	14.12

Table 8: WLRB Reserve Footprints

2.4 Locations

The location of WLRBs within floodplains is generally permitted provided that:

- ▶ WLRBs need to be designed appropriately to minimise reduction of floodplain storage and to avoid flood level afflux. Designs in this instance will need to be included in modelling of the Burrumbeet Creek to assess any impacts.
- ▶ Assets are located outside of 10% AEP extents as this reduces maintenance challenges.
- ▶ Relevant ecological and CHMP requirements are included within designs.
- ▶ Designs of WLRBs are designed and constructed to be resilient to floodwater inundation.

We have proposed that encumbered floodplain land should be utilised further to optimise / reduce developable land across the PSP. The WLRB locations and proposed amendments are summarised below and further detailed in Appendix A:

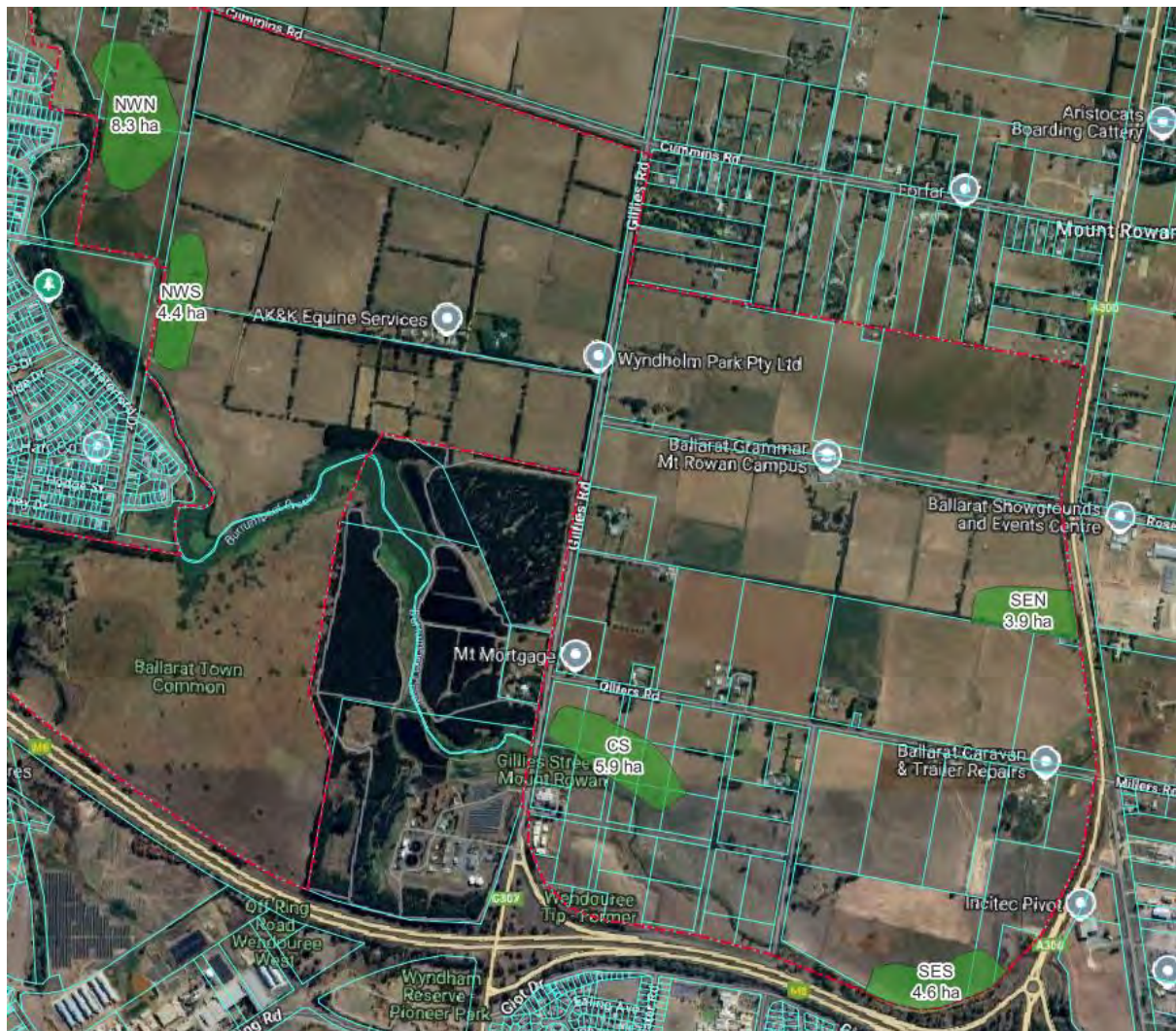


Figure 4: Revised WLRB Footprints Total PSP*

**SMEC footprints shown for comparison*

2.4.1 SEN

This location of the SEN WLRB is located to abut the Midland Highway to the north and upstream of the Burrumbeet Creek tributary. We suggest that this location is to be retained.

2.4.2 SES and CS

Both of these WLRBs are located at the downstream end of their respective sub-catchments adjacent to the Burrumbeet Creek. Locations partially overlap the Burrumbeet Creek and some optimisation should be undertaken during design. We suggest that these locations are to be retained.



Figure 5: Revised WLRB Footprints – East side of PSP

2.4.3 NWN

The location of this WLRB at the downstream end of the NW sub-catchment. Some optimisation is provided in our revised assessment utilising the floodplain area further to the north-west.

2.4.4 NWS

There is a DEECA mapped wetland located within the floodplain of the Burrumbeet Creek and the current location of the NWS RBWL.

Refer to Section 3 for further detail regarding proposed enhancements to the ecology of the Burrumbeet Creek floodplain.



Figure 6: Revised WLRB Footprints – West side of PSP

3. ECOLOGICAL CONSIDERATIONS

We refer to both the Biosis letter dated 4 March 2025 and WSP letter dated 1 April 2025 with respect to the DEECA mapped wetland located in the west of the Ballarat North PSP.

The floodplain area includes a DEECA mapped wetland with an area of approximately 4.64 hectares (citation: Biosis 4 March 2025).

The mapped wetland is located with the mapped 1% AEP flood extents of the Burrumbeet Creek and would be considered part of the creek's floodplain.

Based on contours and aerial imagery, Spiire believes that the mapped wetland is periodically inundated by floodwaters spilling beyond the right bank of the Burrumbeet Creek into the mapped wetland. The mapped wetland is able to maintain a wetted footprint for some time as it is lower than the remainder of the floodplain.

Some runoff would be received from overland flow from catchment area between the mapped wetland area and Gillies Road. This catchment would be cut off from the seasonal herbaceous wetland if a constructed wetland was built to the east of the seasonal herbaceous wetland resulting in less frequent wetting.

Based on site observations and aerial imagery, the wetland is exposed to regular grazing by cattle and horses and cultivated and therefore protection of the mapped wetland is limited.

There is an opportunity to enhance the Burrumbeet Creek floodplain within the vicinity of and including the mapped wetland. We envisage a wetted corridor supportive of habitats for the successful and sustainable presence of native fauna. This would include the following:

- ▶ Constructed WLRB NWS as per Spiire revised drainage asset layout
- ▶ Permanent ponds allowing connectivity between ponds, wetland, creek and dry areas.
- ▶ Appropriate native planting
- ▶ Retention of overall floodplain functionality

Further flood modelling is required to inform the frequency of wetting of the mapped wetland.

APPENDIX A: REVISED WETLAND / RETARDATION BASIN ASSETS

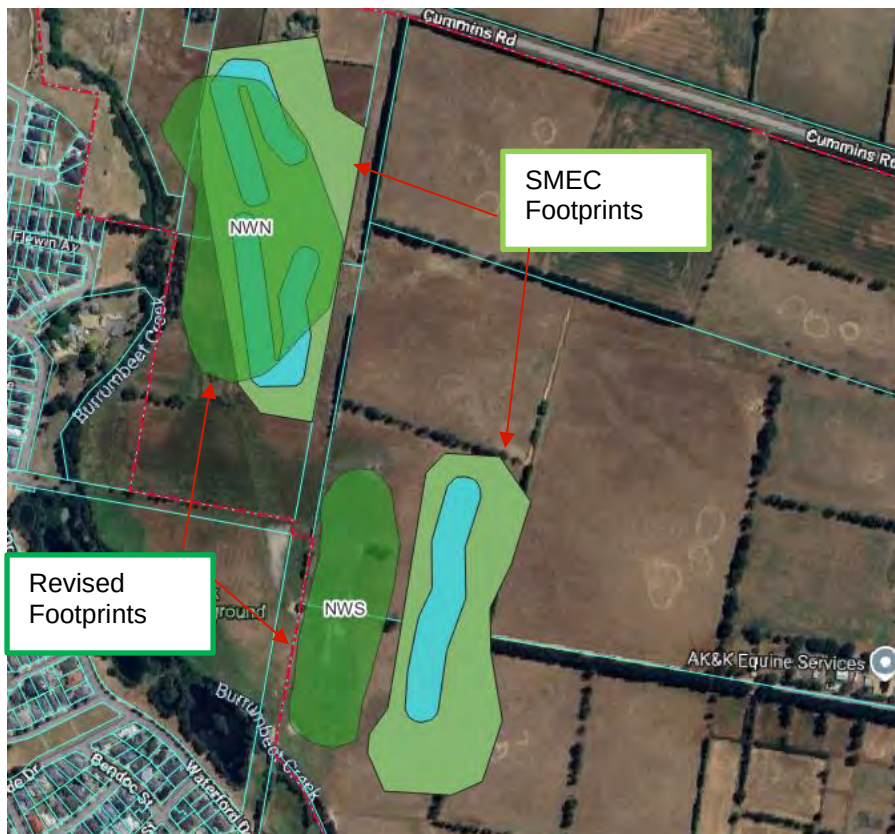


Figure 7: NWN and NWS WLRB Comparison

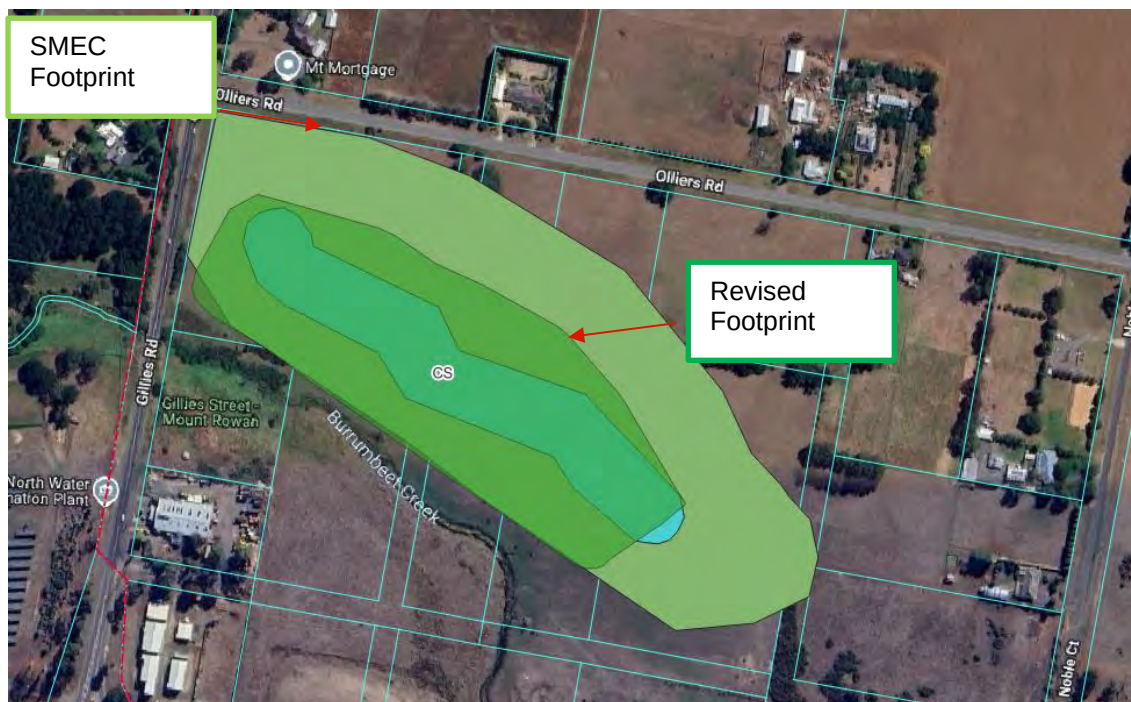


Figure 8: CS WLRB Comparison



Figure 9: SES WLRB Comparison



Figure 10: SEN WLRB Comparison

APPENDIX B: REVIEW OF SMEC REPORT

The Drainage Strategy report prepared by SMEC in July 2025 has been reviewed by Spiire. The review of the Strategy is provided below.

4. SMEC REPORT OVERVIEW

The Drainage Strategy:

- ▶ Summarised work undertaken previously to support progression of the PSP
- ▶ Updated previous background data to include within the strategy such as draft PSP layout
- ▶ Updated stormwater modelling parameters to account for climate change
- ▶ Modified end of line water wetland / retardation basin locations and catchments including location, sizing and layouts
- ▶ Coarsely updated flood modelling of Burrumbeet Creek as an interim step before commissioned flood modelling has been completed (by others)
- ▶ Updated flood impact assessment including proposed diversion of the tributary of Burrumbeet Creek in the eastern extent of the PSP
- ▶ Identified and sized culvert crossings
- ▶ Prescribed drainage / overland flow paths
- ▶ Touched on integrated water management with specific focus on stormwater harvesting and rainwater tanks

4.1 Standards Adopted and Spiire Commentary

The SMEC report has adopted standards nominated both by the VPA and other external authorities.

These include:

- ▶ Innovation Pathway Pilot Project for the VPA's PSP 2.0 Process. The Ballarat North PSP is a chosen VPA pilot project for the implementation of the PSP 2.0 Process and includes a series of key innovations.

While baseline requirements such as appropriate management of flooding is included in the report, sustainability and holistic integrated water management is only really touched on.

- ▶ The EPA Publications - Urban Stormwater Management Guidance (1739.1) (EPA, 2021) provides the guidance on the management of urban stormwater which includes guidelines on volume reduction targets. For Ballarat North PSP, where the average annual rainfall is around 600 mm the target is 29% harvesting and evapotranspiration, and 7% infiltration.

This is only touched on in the report with no detailed investigation into how these targets will be achieved.

- ▶ Integrated Water Management based off the 2023 Arup report for base case and recommended

Preferred portfolio of options	Base case (no IWM approach is taken)	Combined retarding basins and wetland to meet BPEM target and to control post development 1% AEP flows
		Stabilisation of Burrumbeet Creek
	Recommended IWM interventions	Recycled water to homes
		Precinct scale stormwater harvesting for open space irrigation
		Blue-green corridors in PSP
		Provide ecological refuge and resilience for flora and fauna residing within Burrumbeet Creek

Figure 11: Arup Integrated Water Management Framework

There is not a lot of detail in the SMEC Drainage Strategy that hadn't been prepared by Arup previously. Other standards relevant to IWM including the Central Highlands Region Strategic Directions Statement and Wadawurrung Traditional Owners Aboriginal Corporation advice have not been referred to.

- ▶ Retardation – the basis for retardation rates has been predicated on reducing developed peak flow rates to below existing peak flow rates at the sub-catchment boundary at Burrumbeet Creek at Cummins Road (downstream boundary of the PSP).
- ▶ ARR Climate Change: ARR has released a series of climate change scenarios for rainfall intensity. The SMEC Drainage Strategy had adopted the worst case / long term scenario of SSP5 8.5. This has been applied both flood mapping and internal hydrology.

SSP5 8.5 is the directive from Glenelg Hopkins Catchment Management Authority (GHCMA) for flood modelling. An extract from their flood modelling guidelines is provided below.

4. Climate change considerations must be factored into modelling.

Flood risk can no longer be considered as stationary in time. Climate change is increasing the frequency and altering the behaviour of floods. Increasing rainfall intensity and rising sea level are clearly understood as flood risk factors exacerbating flood risk now and are likely to continue worsening flood risk into the future. As a result, the CMA requires a minimum of two increased rainfall intensity scenarios to be modelled as standard. These scenarios should be in line with the worst-case scenario (SSP5 8.5) for both the present-day design flood scenario and design flood scenarios projected for the year 2100. The increased rainfall assumptions - which are tied to Global Warming Level (GWL) – must be consistent with the latest Climate Change assumption recommendations announced by Australian Rainfall and Runoff (ARR). This guidance is ultimately published in ARR Book 1, Chapter 6. However, given the non-stationary nature of flood risk that is now clear, the guidance is subject to review and the availability of guidance that is more recent than that which has been formally published must be checked.

Higher sea level considerations must be considered for coastal locations. Coastal locations may be prone to storm tide (ocean) flooding only, or in the case of estuary floodplains they may be subject to both storm tide or riverine flood events happening at different times or a combination of both types of event happening at the same time. If you are unsure whether a location is considered coastal, please contact Glenelg Hopkins CMA for confirmation.

Figure 12: Extract from GHCMA Flood Modelling Guidelines

The GHCMA guidelines however do not apply to sizing of drainage assets, network modelling, retardation basin sizing, etc. While the Australian Rainfall and Runoff updates refer to climate change scenarios (refer extract below), industry direction has not been prescribed. For other PSPs and large scale development, Victoria's largest drainage authority, Melbourne Water is suggesting that ARR climate change scenarios SSP2-4.5 and SSP3-7.0 are adopted.

Table 1.6.2. Global mean surface temperature projections (ΔT) for four socio-economic pathways relative to 1961-1990. The 90% uncertainty interval is provided in parentheses^a

Climate Scenario	SSP1-2.6	SSP2-4.5	SSP3-7.0	SSP5-8.5
Current and near-term (2021-2040) (°C)	1.2 (0.9-1.5)	1.2 (0.9-1.5)	1.2 (0.9-1.5)	1.3 (1.0-1.6)
Medium-term (2041-2060) (°C)	1.4 (1.0-1.9)	1.7 (1.3-2.2)	1.8 (1.4-2.3)	2.1 (1.6-2.7)
Long-term (2081-2100) (°C)	1.5 (1.0-2.1)	2.4 (1.8-3.2)	3.3 (2.5-4.3)	4.1 (3.0-5.4)

Figure 13: ARR Climate Change Rainfall Intensity Scenarios

The City of Ballarat has not prescribed a climate change scenario to adopt.

We therefore believe that the adoption of the most conservative scenario is not in accordance with other PSPs throughout the state and should be reconsidered. Typically, other authorities are adopting SSP2-4.5 or SSP3-7.0 for modelling of retardation basins

- ▶ Water quality modelling: Melbourne Water MUSIC water quality guidelines have been adopted and this is industry standard. However, City of Ballarat's requirements for water quality infrastructure are not as onerous as Melbourne Water's.

4.2 Flooding

Flood modelling has been updated by SMEC to consider existing and developed conditions with climate change factors applied. As noted earlier in this memo, the modelling is an interim update as the VPA with GHCMa have engaged another consultant to undertake extensive modelling of the Burrumbeet Creek.

SMEC utilised the 2013 Water Technology TUFLOW flood model as basis for flood modelling. Model updates included:

- ▶ Climate change updates per GHCMa requirements with a 100year time frame ('long term') adopted
- ▶ Incorporation of updated Intensity Frequency Duration (IFD) curves
- ▶ Updating of temporal patterns and initial losses
- ▶ Incorporation of draft PSP layout for developed scenario
- ▶ For the developed scenario, a diversion (constructed waterway channel) of the Burrumbeet Creek tributary immediately west / downstream of the Midlands Highway was simulated. Fill adjacent to the constructed waterway is also included
- ▶ Retardation basins prescribed in the Drainage Strategy have been included in post-development modelling

There are only minor changes to the modelled flood extents and we have no further comment on the modelling at this stage.

4.3 Drainage

4.3.1 Catchments

PSP catchments have been logically separated into four distinct sub-catchments with topography noted to radially fall away from Mount Rowan in the north to Burrumbeet Creek to the west and south east (refer below extract of Figure 3-2). The 'SW' Catchment is not referred to further as this has no impact on drainage of the development side of the PSP.

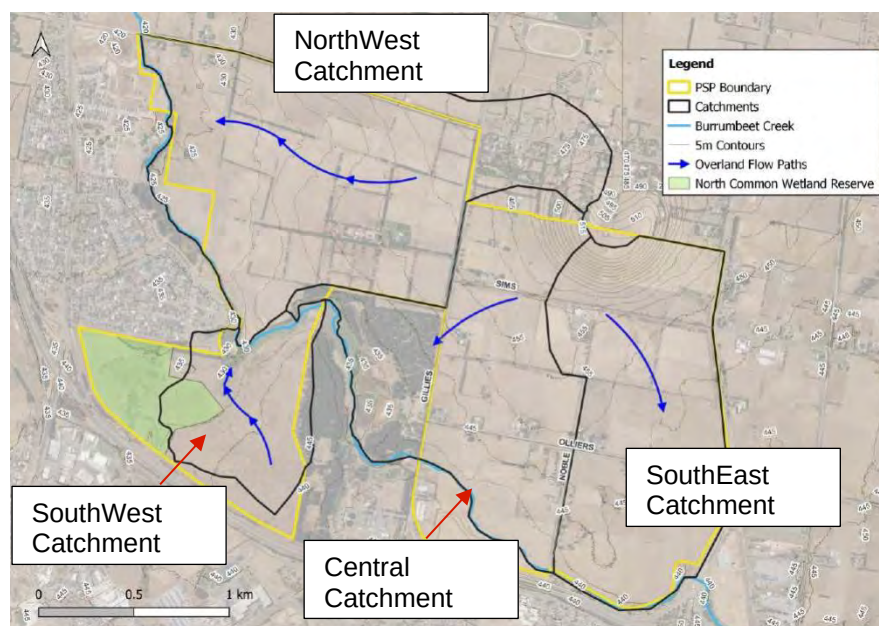


Figure 14: Extract of Figure 3-2 of the Drainage Strategy Showing Catchments of the PSP

There is an external catchment draining through the 'NW' (north west) catchment. This external catchment is located between Gillies Road and Mount Rowan.

Further analysis of this catchment should be made as Gillies Road may form a barrier to overland flow with table drains of Gillies Road taking any overland flow southwards. If the external catchment does drain through the NW catchment, consideration should be made to diverting flow around the NWN wetland / retardation basin.

Within the RORB model the outflows from SEN are directed into the SES wetland / retardation basis. We do not believe this practically mimics the drainage network as SEN should discharge to the Burrumbeet Creek tributary.

4.3.2 Conveyance

4.3.2.1 Flow paths

The active open space area in the NW catchment area is located within the two overland flow paths. See extract below. Flow paths should be ideally directed around the active open space.

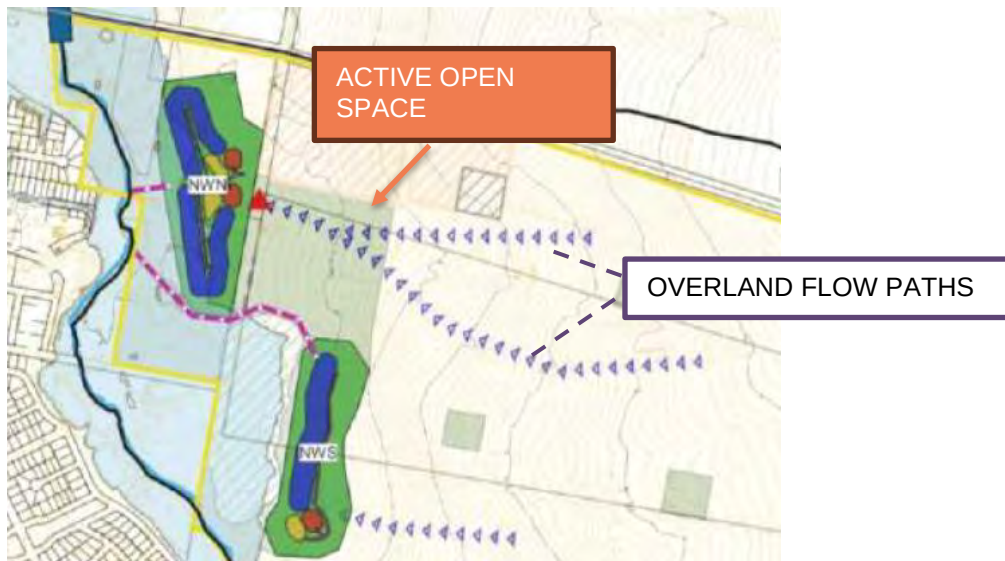
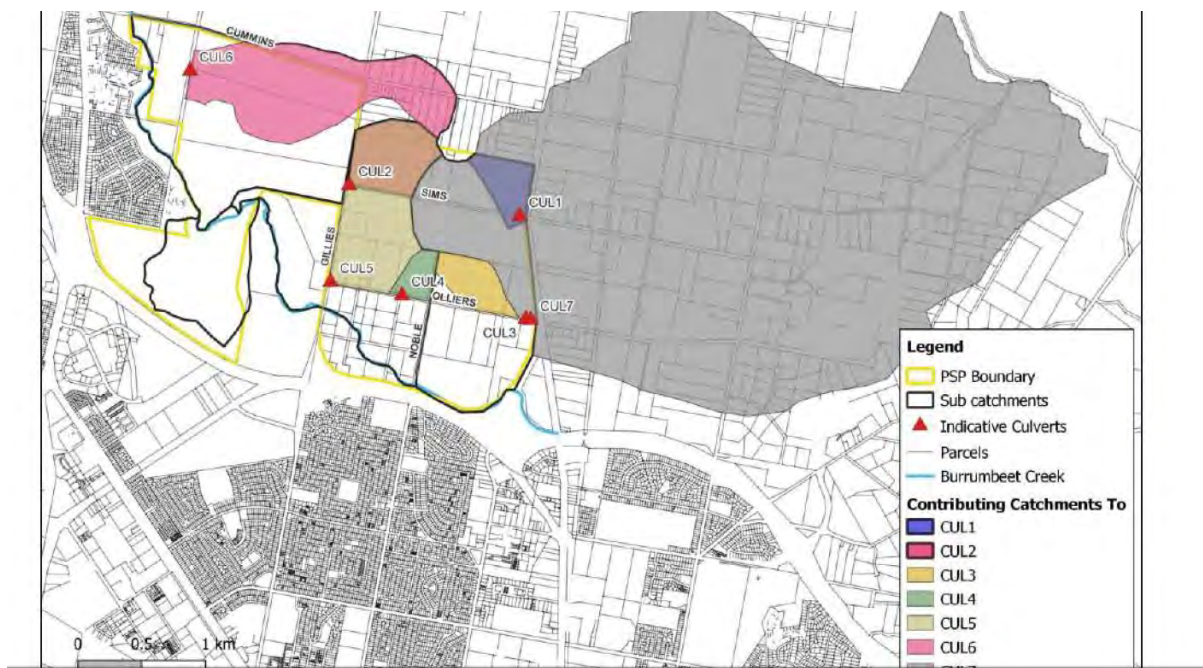


Figure 15: NW Catchment Active Open Space

4.3.2.2 Culverts



We believe that an additional culvert and / or main drain needs to be considered to adequately convey overland flow from the external catchment to the northeast of the NW catchment at Gillies Road.

It is assumed that culverts will need to convey 1% AEP stormwater flow. Road and drainage networks will need to be formed to allow for flow to reach the culverts. It is not clear if the current PSP plan allows for these networks.

Culvert CUL6 is shown immediately west of the active open space and upstream of the NWN wetland / retardation basin. Again, it is not clear that this is a practical location given drainage will need to be diverted around the active open space.

4.3.3 Main Drains

We would like to see clarification if the drain from Sims Road to Olliers Road is included in the Gillies Road road reserve or as a drainage easement in private property as areas encumbered by major drainage lines will need to be included within the PSP. We believe that if the drains can be located within road reserves then this provides a better outcome for the PSP.

4.3.4 Tributary Diversion

The Burrumbeet Creek tributary between the Midland Highway and Burrumbeet Creek confluence is proposed to be diverted and realigned closer to the Midland Highway. Lower lying areas of the tributary floodplain will be filled to provide adequate freeboard to allow for development.

While we agree with this diversion in principle, the Drainage Strategy has not addressed:

- ▶ How this will successfully be implemented including interface with future intersection works with Midland Highway.
- ▶ It is not clear if Olliers Road also needs to be lifted. Filling extents in the report show Olliers Road to be included for filling and it will be important to analyse how this can integrate with future development and the Midland Highway intersection.
- ▶ How costs for the diversion will be assigned. The strategy recommends that the property owner will pay for filling works and this should also be revisited.

4.3.5 Wetlands

Wetlands are co-located within retardation basin footprints. We have reviewed the water quality modelling and note that wetlands are the only prescribed method to treat stormwater runoff. Supplementary methods should be explored further to reduce footprints.

A comparison with raingarden treatment should also be made as these provide a smaller working footprint and may be more resilient to long term dry periods.

We have no comment to make on the modelling as models have not been provided.

4.3.6 Retardation Basins

4.3.6.1 Locations

Locations of retardation basins are generally in accordance with what would be expected with basins located at the bottom of the catchments and close to the Burrumbeet Creek for outfall connections.

Locations are generally outside of the modelled floodplains in an attempt to avoid the basins encumbering floodplain storage. This should be explored further with attempts to further co-located basins within the floodplains to assess if there is any negative impact. It also needs to be ensured that retardation basins have free draining outfalls and this does not appear to have been assessed or at least documented.

Internal drainage will need to be modelled to ensure piped drainage and overland flow can actually get to the basins. We are not seeing any major issues with this based on current level of detail.

The location of the NWN wetland / retardation basin is likely to present some challenges to the upstream catchment given the location of the active open space and location adjacent to the north-south road.

We are also not clear why a 50m buffer between the NWS wetland and herbaceous seasonal wetland is required.

4.3.6.2 Sizing

We have noted earlier the concerns regarding adoption of the SSP5-8.5 scenario.

Further to these concerns, the retardation basins appear to have been significantly oversized even taking into account the SSP5-8.5 scenario. Please refer to extracts below.

The tables for retardation basin sizing show the basins retarding developed flow to significantly below pre-development levels for all scenarios. Inflow and outflow comparisons are made for each retardation basin however it is more relevant to make the comparison on a per sub-catchment basin given this mimics catchments before and after development.

As an example, NWS retards 1% AEP post-development flowrates to 1.0m³/s for whereby the pre-development flowrate is 6.7m³/s under the climate change scenario. It is unclear why this approach has been made as it is a significant over-retardation of pre-development rates.

Table 7-8 Retarding Basin Outcomes (1% AEP)

Asset ID	Existing Condition Peak Flow (m ³ /s)	Inflow (m ³ /s)	Outflow (m ³ /s) (Duration)	Storage (m ³)	Outlet Configuration	Drainage Reserve Area (ha)
SEN	1.8	8.2	0.6 (9hr)	24,200	1 Ø 1050mm	5.4
SES	4.7	10.3	1.4 (9hr)	45,400	1 Ø 1350mm	7.6
CS	6.8	11.1	1.1 (9hr)	50,000	1 Ø 1350mm	11.4
NWN	3.9	8.4	0.4 (9hr)	58,300	1 Ø 600mm	9.8
NWS	1.4	6.3	0.6 (9hr)	35,000	1 Ø 900mm	7.4

The assessment was repeated for the climate change scenario as shown in **Table 7-9**.

Table 7-9 Climate Change Results (1% AEP)

Asset ID	Existing Conditions Peak Flow (m ³ /s)	Inflow (m ³ /s)	Outflow (m ³ /s) (Duration)	Storage (m ³)
SEN	3.7	16.1	1.1 (4.5hr)	33,700
SES	8.7	21.2	2.4 (9hr)	66,600
CS	10.6	22.9	1.7 (9hr)	70,900
NWN	7.5	17.7	0.5 (9hr)	89,300
NWS	6.7	12.7	1.0 (9hr)	50,200

We would expect spillways to have minimal freeboard (~300mm) to stored 1% AEP levels within retardation basins, particularly given the conservative climate change scenario adopted. However spillways are set well above this freeboard level further increasing basin footprints.

Table A-1-9 Details of the Retarding Basins within the Ballarat north PSP

RB Name	1% AEP Flood Level (m AHD)	Spillway Level (m AHD)	Storage (m ³)
SEN	443.5	444.3	24,200
SES	441.0	441.5	45,400
CS	436.6	437.2	50,000
NWN	423.8	424.5	58,300
NWS	427.5	428.3	35,000

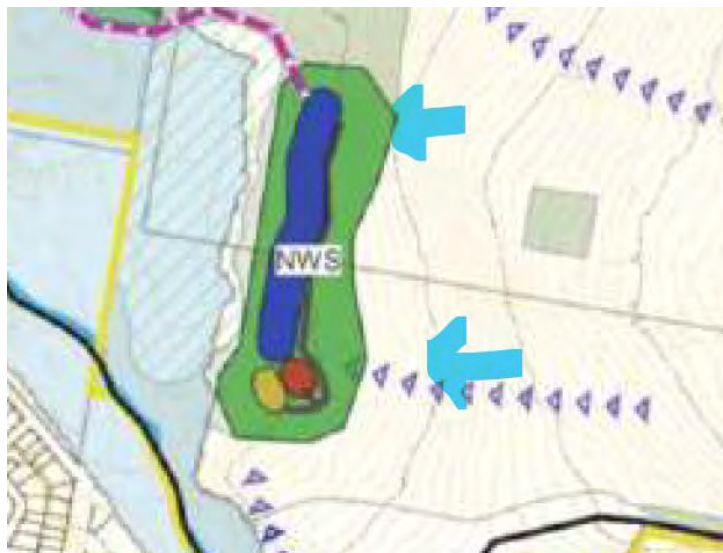
Figure 16: Extract from SMEC Drainage Strategy Showing Retardation Basin Spillway Levels

4.3.6.3 Footprints

It is acknowledged that comprehensive 3d modelling of the retardation basins is to be undertaken at a later date. Footprints of the retardation basins have been plotted.

We query the footprints of the basins for the following reasons:

- ▶ Basin reserves do not seem to align with existing contours. See example below of NWS where there is a significant misalignment (up to 2.5m) with existing contours.
- ▶ Basin reserves as a ratio of area to volume to not appear to optimise the area available. We would expect at least an average retardation depth of 1m but the Drainage Strategy shows a much lower average depth. As an example, NWN has an allocated drainage reserve area of 9.8ha and storage volume of 89,300m³ (average depth of 0.91m)



4.3.6.4 Requirements For Retardation

It is noted that throughout flood modelling of the Burrumbeet Creek and retardation basins that peak flow in the Burrumbeet Creek is actually reduced following implementation of the retardation basins. This suggests that the retardation basins are potentially significantly over-retarding development flow.

It is also noted that the critical storm events and times to peak for each of the retardation basin catchments for both existing and climate change scenarios is less than that of the Burrumbeet Creek.

There are numerous instances where developments with short time of concentrations do not require retardation as the body the developments discharge to are influenced mainly by a significant catchment beyond the development

We query whether full retardation to pre-development flowrates is required for the PSP.

Table 6-1 Existing Condition 10% AEP Results

Flow Estimate Location	Peak Flow (m ³ /s)	Critical Duration (hrs)
SE Interstation	2.5	1.5
C Interstation	3.6	1.5
NW Interstation	1.8	4.5
CN1	25.6	4.5

Table 6-2 Existing Condition 1% AEP Results

Flow Estimate Location	Peak Flow (m ³ /s)	Critical Duration (hrs)
SE Interstation	4.7	2
C Interstation	6.8	1.5
NW Interstation	4.1	4.5
CN1	58.6	9

Figure 17: Existing Conditions Peak Flow Events

Table 6-4 10% AEP Existing Flow Estimates Comparison with the Impact of Climate Change

Flow Estimate Location	Peak Flow (m ³ /s)	Critical Duration (hrs)
SE Interstation	4.6	1.5
C Interstation	6.8	1.5
NW Interstation	3.2	1.5
CN1	40.1	4.5

Table 6-5 1% AEP Existing Flow Estimates Comparison with the Impact of Climate Change

Flow Estimate Location	Peak Flow (m ³ /s)	Critical Duration (hrs)
SE Interstation	9.8	1
C Interstation	14.4	1
NW Interstation	7.8	2
CN1	107.6	4.5

Figure 18: Existing Conditions with Climate Change Factors Peak Flow Events

The above figures are extracts from the Drainage Strategy. As noted, in most instances the critical durations for the PSP catchments differ significantly from the Burrumbeet Creek (CS1) duration.

4.4 Integrated Water Management

An extract from the Stantec Utilities Assessment dated March 2025 is below. We understand that Central Highlands Water is keen to enable a recycled water network / dual reticulation, and this has not been explored further in the Drainage Strategy.

CHW have a Class A recycled water plant at the WRP. CHW is investigating the potential for a range of Integrated Water Management to be implemented within the precinct, including expanding the use of Class A water. CHW has also advised that the other IWM measures being considered include, tanks, passive irrigation of street trees, impervious surfaces and 'leaky wetlands', with the aim of reducing demand which aligns with the objective of the "Ballarat City Integrated Water Management Plan (2018)". The target for new urban development that CHW has set is a water use of 124 l/p/day.

The recycled water network would be similar to the water network and being developer led projects. Refer to Figure 9 below with a proposed recycled water network.

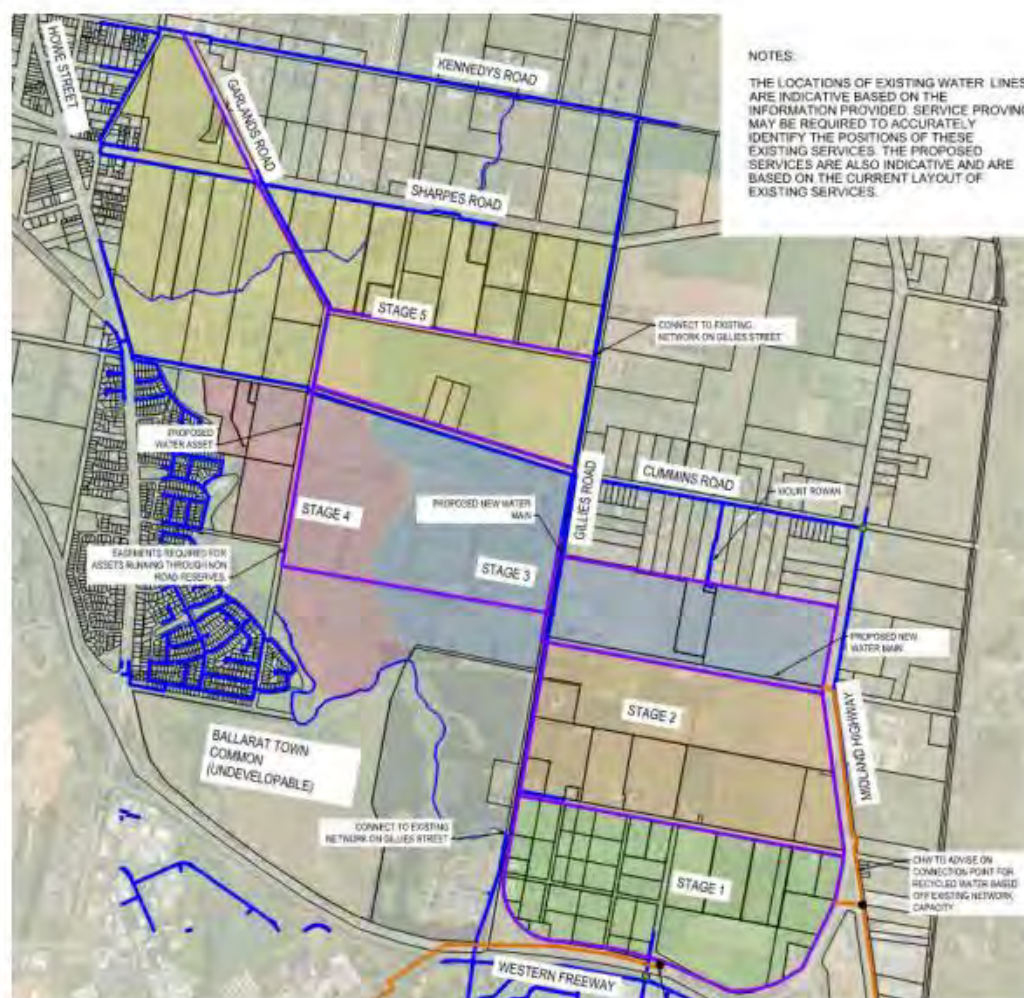


Figure 9 - Proposed Recycled Water Network

Figure 19: Extract from Stantec Utilities Assessment (March 2025)

Leaky wetlands, pervious paving, on-site detention, passive irrigation are other integrated water measures which do not appear to have been addressed in the Drainage Strategy. Environmental flows from stormwater harvesting to CHW reservoir outfalls has also not been explored.

Other options for integrated water measures that could be considered are summarised below.

Option	Targets	Value	Technical	Policy / Regulation	Risk	Recommendation	Discussion
1. Rainwater tanks for toilet flushing, laundry and irrigation							Explore. Potential conflict with dual reticulation.
2. Class A recycled water for toilet flushing, laundry and irrigation							Explore. Potential conflict with rainwater tanks and stormwater harvesting
3. Digital meters, with an app for real time water usage monitoring							Explore. Digital meter are BAU, app might be extra.
4. Smart control systems on rainwater tanks							Explore. Dependant on digital meters and rainwater tanks.
5. Passively irrigated street trees – roof catchment							Explore. Could be enhanced through smart control systems.
6. Passively irrigated street trees – road catchment							Explore.
7. Leaky Wetlands							Explore.
8. Class A recycled water for active and passive open space irrigation							Explore.
9. Stormwater for active and passive open space irrigation							Explore.
10. Kerb-cut outs disconnecting road imperviousness to open space							Explore. Will need council approved designs.
11. Class A recycled water supply for agriculture and horse industry							Explore with CHW and farming community
12. Stormwater harvesting to White Swan Res for Passing Flows/Env/TOs							Explore.

Option	Targets	Value	Technical	Policy / Regulation	Risk	Recommendation	Discussion
13. Biosolids Reuse for agriculture							Explore.

It is unclear what mechanisms could be adopted for supplying the seasonal herbaceous wetland with environmental flow. The NWS wetland / retardation basin essentially cuts off the overland flow catchment to this wetland. Further analysis is required.

4.5 Cultural Heritage

No meaningful reference or collaboration with the WTOAC.

WTOAC has provided an IWM to be applied by stakeholders to all water projects across Wadawurrung Country (refer Attachment).

4.6 Recommendations

Subject	Issue	Action
Retardation Basin Sizing	Adoption of SSP5 8.5 is not appropriate and results in oversized retardation basin assets	Revise retardation basin sizing on industry adopted climate change scenarios
Retardation Basin Sizing	Over-retardation reducing post-development flowrates to rates significantly below pre-development	Analysis to be re-undertaken and basin sizes revised down if level of retardation not required
SEN Retardation Basin Routing	The RORB model shows outflow from RB SEN being directed through to RB SES. This is unlikely to practically occur and these should become independent.	Amend RORB Model to divert SEN outflow away from SES
Road Reserve Sizing	Will road reserves have capacity for main drains	To be assessed
Olliers Road Culvert	Can lifting of Olliers Road and culvert interface with development and Midway	Review intersection requirements

Subject	Issue	Action
	Highway Intersection to allow for diversion of Burrumbeet Creek Tributary?	
Active Open Space Proximity to NWN wetland / retardation basin	Overland flows / major drainage is unlikely to be permitted to pass through active open space and reaching RB.	Review how drainage in this area will be managed
External Catchment to NW	We are not clear if the external catchment to the east of the NW catchment actually contributes to the NW catchment or if it is directed along Gillies Street somewhere else	Review impacts of external catchment on modelling and where this catchment drains to. Consider diverting flow from this catchment around treatment assets.
IWM	Volume reduction targets are not addressed. Infrastructure requirements for these will be included in a DCP with financial impacts to the PSP	To be addressed
IWM	It isn't clear if both stormwater harvesting and recycled water will be implemented.	To be advised
IWM	Consideration of sustainable initiatives is not adequately documented in the Drainage Strategy. How will initiatives be implemented at a site level if no framework is established at a PSP level	Formalise IWM guidance

APPENDIX C WADAWURRUNG TRADITIONAL OWNERS IWM STATEMENT

Dear IWM project leads,

Please see below Wadawurrung Traditional Owners Aboriginal Corporation statement and position on IWM projects and stormwater, recycled water and new water sources.

Wadawurrung people recognize the rivers and waterways on our Country as living entities and we, the Traditional Owners are the voices that speak for their health and well-being.

When we talk about Cultural water and Cultural flows, we are talking about all water that exists on country - because Water is life. Without water, life suffers and ultimately cannot exist.

Cultural flows are Water entitlements that are legally and beneficially owned by volume or by having agency over decisions made, by Indigenous Nations, of a sufficient and adequate quantity and quality to improve spiritual, cultural, environmental, social, and economic conditions of those Nations. Inherently, Cultural flows are for us to Heal Country and to enable us to undertake our obligations to care for country and to bring our lifeblood, water, back to its natural flowing state, so that it can continue to support Country, Culture & Community.

While treated storm water can be used to support environmental flows and systems, treated storm water must not be used as Cultural Water - it should be used as the re-allocation source for systems in place, freeing up licenses and reducing extraction from natural systems, allowing passing flow management and future water entitlements to be handed back to Traditional Owners.

Two years ago, Wadawurrung released "Paleert Tjaara Dja - Lets make country good together", 10-year Healthy Country Plan. Within this we have built our objectives, aspirations, and obligations for water on Wadawurrung Country.

Our role within the Gobata Dja - Caring for Country team as Aboriginal Water Officers, amongst tangible projects, is paramount to educating the importance of waters connection to Country, and why we must change the western understanding of water management.

Our Rivers and our water bodies are now highly modified and under threat from increased and incorrect usage. They are heavily over allocated and are suffering from everlasting extraction for irrigation, industry, and potable assets.

On Wadawurrung Country, there are no remaining water allocations within our systems. So, what does that leave for Wadawurrung People, our access and agency over Cultural Water?

Zero. Zero litres. Here in lies the challenge for Wadawurrung.

The majority of rivers on Wadawurrung Country are extensively licensed and over sold, while only receiving very small environmental entitlements and very limited passing flows, as a direct result of the building of weirs and barriers harvesting the natural flows and selling to industry.

From Wadawurrungs perspective, rather than continually extract and license water from natural flowing systems, new sources of water like storm water and recycled water, through IWM projects can be used as the asset for sale, on selling it to users like irrigators, golf courses and other major industry.

There is great need for investment into new water sources as we face increased pressure from urbanization, population growth and climate change. Our Rivers cannot support any further take.

We need to increase the confidence of users for alternative water sources so that our waterways can begin to heal, and our Mobs can regain agency over what has always been theirs. There was never Aqua Nullius and it was never an asset for sale.

People must understand that water that exists on Wadawurrung Country, must stay on Country as it is part of the holistic wellbeing of that landscape. It supports all aspects of life, from the deep water and the life within, to the banks with the river red gums, to the grass lands and bushland surrounding, the canopies and the birds that live above right through to the sky country that feeds the water back into the landscape.

When you turn your tap on in your kitchens, or you water your vegie gardens, or when the irrigators turn their sprinklers on, I want you to imagine the word, Wadawurrung, pouring from the taps and remember, that water is not just an asset for sale, water has its own spirit and its own connection to Country, it needs to be healthy to be able to support Country. Our water is our lifeblood of Country, without water life within Country cannot be.

Please take this statement as our formal and strategic direction with IWM related projects. If opportunities for water to be returned to Country and Wadawurrung are identified, we ask to be kept informed where needed and will engage further when required.

Please use this as a tool to help us mitigate resourcing requirements as we commit to other initiatives.

Thank you and take care.

Environmental Site Assessments Pty Ltd

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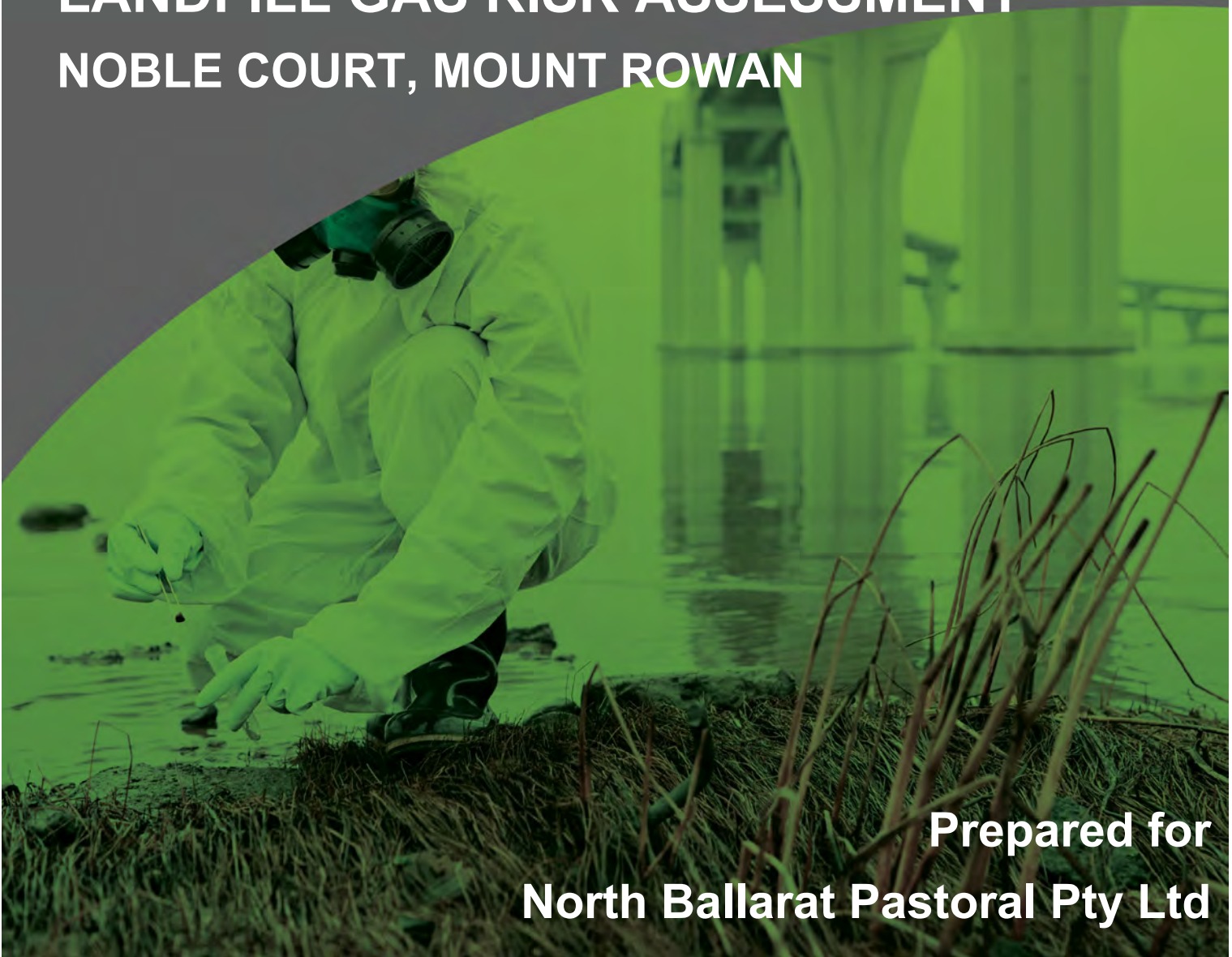
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Environmental
SITE ASSESMENTS

LANDFILL GAS RISK ASSESSMENT

NOBLE COURT, MOUNT ROWAN



Prepared for
North Ballarat Pastoral Pty Ltd

Document Control

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Report Title:	Landfill Gas Risk Assessment – Noble Court, Mount Rowan
Doc. Ref:	ESA2025163
Client:	North Ballarat Pastoral Pty Ltd
Signatures:	Authorised by:

Revision Status

Revision #	Status	Date	Authorised By
1	Final	4 July 2025	

Documents Distribution

Revision #	Number of copies	Type	Recipient	Company
1	1	Email		

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Acronym	Definition
ACM	Asbestos Containing Material
ANZECC	Australian and New Zealand Environment Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS	Australian Standard
B(a)P	Benzo(a)pyrene
BGL	Below Ground Level
BTOC	Below Top of Casing
CIRIA	Construction Industry Research and Information Association
COC	Chain of Custody
CSM	Conceptual Site Model
DBYD	Dial Before You Dig
EA	Environmental Assessment
ESA	Environmental Site Assessments Pty Ltd
EPA	Environment Protection Authority
km	Kilometre
L	Litre
LFG	Landfill Gas
LFG RA	Landfill Gas Risk Assessment
LOR	Limit of Reporting
m	Metre
MGA	Map Grid of Australia
mm	Millimetre
MMBW	Melbourne Metropolitan Board of Works
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
PAHs	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soils
PFOA	Perfluorooctanoate
PFHxS	Perfluorohexanesulfonate
PFOS	Perfluorooctanesulfonate
PID	Photoionisation Detector
ppm	Parts Per Million
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percentage Difference
SAQP	Sampling Analysis Quality Plan
SP	Sample Point
TRHs	Total Recoverable Hydrocarbons
UST	Underground Service Tank
VOCs	Volatile Organic Compounds

Executive Summary

Environmental Site Assessments Pty Ltd (ESA) has been engaged by [REDACTED] (NBP) to conduct a Landfill Gas (LFG) Risk Assessment (LFG RA) for Noble Court, Mount Rowan, VIC (the Site).

The Site is intended for development for ongoing residential use as part of the wider Ballarat North Precinct Structure Plan (PSP).

The LFG RA is required as landfilling activities are known to have previously occurred at the former Wendouree landfill approximately 380m to the west of the Site. As such, the [REDACTED] of the Site is within the 500m buffer assessment zone of the former Wendouree landfill. The specific objectives of the assessment were to:

- conduct an assessment of the potential presence of landfill generated methane beneath the land;
- provide an opinion as to any potential hazard associated with methane beneath the land and any recommendations for the management or monitoring of methane gas; and
- an opinion on whether an Environmental Audit is required under the Environment Protection Act 2017.

Through the assessment of historical aerial photographs, available previous environmental assessments and a search of relevant public databases, the Site has been identified within a 500 m buffer zone from the former Wendouree Landfilling activities at Lot 1 on Title Plan TP846568.

The landfilling activities are at least 380 m from the Site. Landfilling activities were considered to have likely occurred between the 1964 and 1983 with no observable landfilling since. As such any landfilling activities are considered to have ceased at least 42 years ago, well past the typical aftercare period stated in EPA Victoria Publication 788 of 30 years.

A review of regional environmental setting indicated that the geological setting between the Site and landfilling activities is underlain with Quaternary aged alluvial floodplain deposits consisting of clay (Qa1). Low permeability clays are likely to further reduce the likelihood of sub-surface landfill gas migration as far as the Site. Further, Burrumbeet Creek and associated shallow groundwater are present between the Site and the former landfill and are likely to prevent landfill gas migration to the north and east towards the Site.

Previous environmental assessments indicate that the capping of the former landfill is non-uniform, likely to be non-engineered (given the age of the landfill) and unlikely to be lined. The status of the capping and lining increases the likelihood that the migration of landfill gas would be vertical to atmosphere as opposed to lateral migration to the Site.

Given the age and operating timeframe of the landfill it is likely that any engineered capping or lining, if present, would be of a low quality compared with current EPA Victoria capping requirements.

The conceptual site model indicates that any potential landfill gas would be unlikely to migrate laterally through the sub-surface and would preferentially migrate vertically to atmosphere before reaching the Site through the multitude of uncapped, unsealed areas between the former landfilling activities and the Site.

A qualitative risk assessment based on the conceptual site model, and using the CIRIA C665 (2007) methodology, determines the potential for landfill gas migration to the Site to be 'Unlikely', with a potential consequence of 'Minor.' This results in a combined risk magnitude of 'Very Low Risk'.

Semi-qualitative risk assessment undertaken using the CIRIA C665 (2007) GSV methodology is consistent with the qualitative risk assessment and also considers the former Wendouree landfill site to be 'Very Low Risk' based on the maximum reported flows and measured methane and carbon dioxide by Landserv.

On the basis of the above, and consistent with CIRIA C665 (2007), no additional on-site management or monitoring measures are required.

Based on Section 5 and consistent with EPA Victoria, Landfill Buffer Guideline, August 2024, an Environmental Audit is not considered to be required based on landfill gas risk posed to the Site from the former Wendouree landfill.

1.0 INTRODUCTION

1.1 Background

██████████ Assessments Pty Ltd (ESA) has been engaged by ██████████ (NBP) to undertake a Desktop based Landfill Gas Risk Assessment (LFG RA) for Noble Court, Mount Rowan, VIC (the Site).

The LFG RA is required as landfilling activities are known to have previously occurred at the former Wendouree landfill approximately 380m to the west of the Site. As such, the ██████████ of the Site is within the 500m buffer assessment zone of the former Wendouree landfill.

The inferred location of the nearby landfilling activities in relation to the Site is presented in *Attached Figure 1*.

1.2 Objectives

The overarching project objective was to prepare a Landfill Gas Risk Assessment to:

- Assess the potential presence of landfill generated gas beneath the land;
- Provide an opinion as to any potential hazard associated with landfill gas beneath the land and any recommendations for further management or monitoring works; and
- Provide an opinion on whether an Environmental Audit is required under the Environment Protection Act 2017.

1.3 Scope of Works

To achieve the project objectives, the assessment was undertaken in general accordance with the requirements of the EPA Victoria Landfill buffer guideline (August 2024), EPA Victoria landfill publications (1684, 1642, 1490 and 788) and UK Construction Industry Research and Information Association (CIRIA) Publication C665 *Assessing risks posed by hazardous ground gases to buildings*, 2007, with the following scope of work:

- Review of environmental setting;
- Geological and hydrogeological information;
- Review of nearby land uses, environmentally sensitive areas, and buffer zones;
- Review historical data to identify the nature and location of any potential landfill gas generation arising from current and past landfilling activities on-site or within 500m;
- Review current and historical aerial photographs supplied by LANDATA;
- Review of available previously completed environmental audits/ investigations relating to landfills within the 500m buffer of the Site; and
- Preparation of a Desktop LFG RA report.

2.0 SITE INFORMATION

2.1 Site Identification

Table 2.1 Site Identification Summary

Site Information	Details
Lot Details	
Current Site Use	Agricultural
Site Area	251,995 m ²
Elevation	438 to 446m AHD
Zoning	Urban Growth Zone (UGZ)
Overlays	Floodway Overlay (FO), Land Subject to Inundation Overlay (LISO), Environmental Audit Overlay (EAO)
Source: Details of the varying sources are included in the Lotsearch Report, presented in Appendix A	

2.1.1 Future Site Use

The future use of the Site will be residential land use.

For the purposes of this assessment, it has been assumed that the future use includes buildings and structures that exclude below ground structures such as basements or lift shafts given the location and likelihood of lower density residential development compared with more urban areas.

2.1.2 Current Surrounding Site Use

The Site is surrounded by land uses as presented in *Table 2.2* below.

Table 2.2 Surrounding Site Uses

Direction	Land Use
North	Agricultural land use
South	Burrumbeet Creek, then the Western Freeway followed by residential housing
East	Midland highway followed by industrial land use.
West	Agricultural land use, Burrumbeet Creek and the former Wendouree Landfill

2.2 Identified Nearby Landfilling Activities

The following information sources were reviewed to locate the nearby landfilling activities where the Site is located within the buffer zone requiring assessment:

- Victoria Unearthed:
 - o Victorian Landfill Register (VLR);
 - o EPA Victoria Priority Sites Register;
 - o EPA Victoria Licenced Sites;
 - o Groundwater Quality Restricted Use Zones; and
 - o EPA Victoria Environmental Audit Register.
- EPA Site Management Orders
- EPA Register of Permissions
- Legacy EPA Works Approvals
- National Waste Management Facilities Database
- Statewide Waste and Resource Recovery Infrastructure Plan Facilities
- Legacy EPA Prescribed Industrial Waste
- Hardie Grant; Sands & McDougall, State Library Victoria Historical business directories
- Available previous environmental assessments:

- o Landserv, Landfill Gas Assessment - Former Wendouree Landfill, Mount Rowan, Victoria, April 2025 (Landserv, 2025);
- o Jacobs, Land Capability Assessment, Ballarat North Precinct Structure Plan, October 2024 (Jacobs, 2025).

information on the landfilling activities is summarised in **Table 2.3**

Table 2.3 Nearby Landfilling Activities – Identifying Information

Particular	Comment
Street Address	Lot 1 on Title Plan TP846568
Latitude	-37.5161
Longitude	143.8297
Landfill Name	Wendouree Landfill
VLR Register Number	10038
VLR Reference Number	-
Historical Licence Number	HS000542/3
Elevation	444 - 448m AHD

Based on the summarised information in the table above, the former landfilling activities within the vicinity of the Site are located at Lot 1 on Title Plan TP846568, approximately 380m west of the Site.

2.3 Environmental Setting

This section details the environmental setting in the vicinity of the Site and the identified landfilling activities, where relevant, to understanding the conceptual site model in relation to the risk of landfill gas impacting the proposed Site development.

2.3.1 Topography

The topography between the former landfill and the Site is generally flat and approximately 440m AHD.

2.3.2 Regional Geology

Based on data sourced from the State Government Victoria – Department of Economic Development, Jobs, Transport and Resources Geological Units 1:50,000 dataset, the geology between the Site and the landfilling activities consists of:

- Tertiary (Pleistocene to Pliocene) aged Newer Volcanics basalt consisting of sheet basalt flows of dominantly fresh alkalic olivine-basalt (Neo); and
- Nearer to Burrumbeet Creek the area is underlain by Quaternary aged alluvial floodplain deposits consisting of gravel, sand, silt and clay (Qa1).

Bore information presented in **Appendix B** is consistent with the regional geology above, with clays encountered in landfill gas bore, GB1 between the former landfill and the Site.

2.3.3 Regional Hydrogeology

The Victorian Department of Environment, Land, Water and Planning (DELWP) Groundwater Resource Report, identifies groundwater beneath the Site as being less than 5 metres below ground level (m BGL) beneath the Site and identified landfilling activities.

This is consistent with groundwater levels reported by Landserv, who reported that groundwater was encountered between 1-2m BGL during the installation of the landfill gas bores (Landserv, 2025).

2.3.4 Nearby Surface Water

There is a surface water body, Burrumbeet Creek, between the Site and the landfilling activities. Therefore, consistent with the views of the Landserv, 2025 report, there is a very low likelihood of a complete pollutant linkage for landfill gas migrating to the Site.

“Given shallow groundwater was identified on site (SMEC 2024), and during installation of LFG bore (GB1 - GB5), it was hypothesized that there is a likely direct connection between Burrumbeet Creek and the local water table. This saturation of the subsurface profile may be acting as a potential barrier to lateral landfill gas migration to the north of Burrumbeet Creek.” Landserv, 2025.

2.4 Historical Review

A review of the following databases was undertaken for further information on the identified landfilling activities:

- Council provided information;
- Victoria Unearthed:
 - o VLR;
 - o EPA Victoria Priority Sites Register;
 - o EPA Victoria Licenced Sites;
 - o Groundwater Quality Restricted Use Zones; and
 - o EPA Victoria Environmental Audit Register.
- EPA Site Management Orders
- EPA Register of Permissions
- Legacy EPA Works Approvals
- National Waste Management Facilities Database
- Statewide Waste and Resource Recovery Infrastructure Plan Facilities
- Legacy EPA Prescribed Industrial Waste
- Hardie Grant; Sands & McDougall, State Library Victoria Historical business directories

Sub-Sections 2.4.1 to Sub-Sections 2.4.5 below establish if landfilling information is present or absent within the specific data sources. Available information relevant to this assessment from the data sources is summarised in *Table 2.5*.

2.4.1 EPA Priority Sites and Remedial Notices Register

- The PSR did not include the former Wendouree landfill.
- The EPA Victoria Remedial Notices Register did not include the former Wendouree landfill.

2.4.2 Waste Management Sites and Legacy Landfills

A search was undertaken of the following waste management facility databases:

- National Waste Management Site Database;
- State-wide Waste and Resource Recovery Infrastructure Plan Facilities;
- VLR;
- Former Waste Disposal Sites; and
- EPA Prescribed Industrial Waste.

The former Wendouree landfill is present on the following above databases:

- EPA VLR

2.4.3 EPA Victoria Permissioning Decisions Register

The former Wendouree landfill is not included on the EPA Victoria Permissioning Decision Register.

2.4.4 Previous Environmental Investigations

The following previous environmental investigations were available for the identified landfilling activities and have been reviewed as part of this assessment:

- Landserv, *Landfill Gas Assessment Former Wendouree Landfill*, Mount Rowan, Victoria, 17 April 2025 (Landserv, 2025); and
- Jacobs, *Land Capability Assessment, Ballarat North Precinct Structure Plan*, October 2024 (Jacobs, 2025).

2.4.5 Nearby Environmental Audits

A search of the EPA Victoria Environmental Audit Database did not identify the former Wendouree landfilling activities.

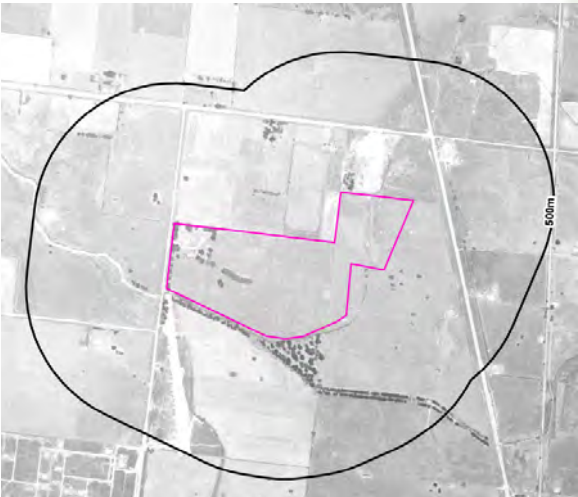
2.4.6 Historical Aerial Photographs

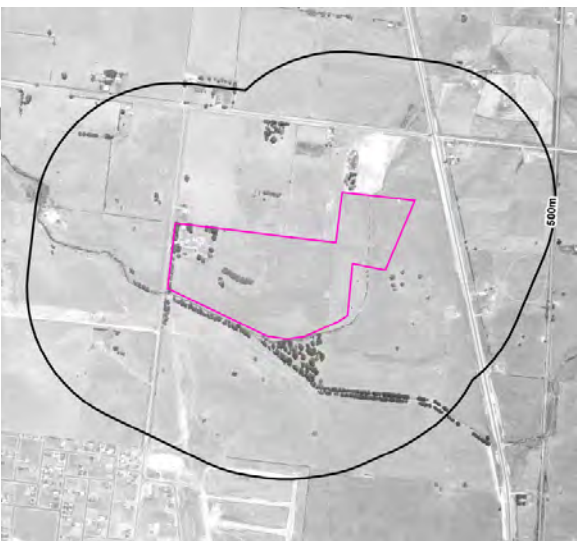
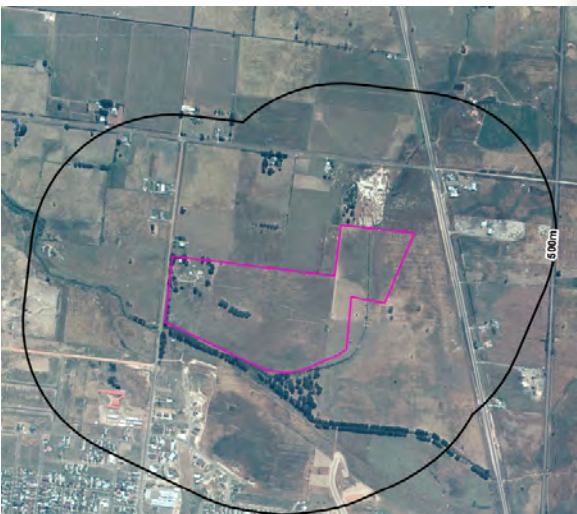
A review of historical aerial photographs from the LANDATA database was undertaken for both the Site and for the identified landfilling activities.

A summary of selected photos is provided in *Table 2.4* below with descriptions relating to observable land use provided.

All historical aerial photographs from the LANDATA database are presented in the Lotsearch report in **Appendix A**.

Table 2.4 Historical Aerial Photographs

Year	Image	Description
1984		The Site appears to be in use as agricultural land with rural residential housing present. Former Landfill There are no observable landfilling activities in the location of the former Wendouree Landfill 380m to the west of the Site.
1957		Site The Site appears to be in use as agricultural land. Former Landfill There are no observable landfilling activities in the location of the former Wendouree Landfill 380m to the west of the Site.
1961		Site The Site appears to be in use for agricultural purposes. Former Landfill There are no observable landfilling activities in the location of the former Wendouree Landfill 380m to the west of the Site.

1970		Site The Site appears to be in use for agricultural purposes. Former Landfill There are no observable landfilling activities in the location of the former Wendouree Landfill 380m to the west of the Site.
1979		Site The Site appears to be in use for agricultural purposes. Former Landfill There are observable landfilling activities in the location of the former Wendouree Landfill. The extent of waste deposition to the north is limited by Burrumbeet Creek and extends east approximately 380m west of the Site.
1985		Site The Site and immediately surrounding properties remain as agricultural land use. Former Landfill There are observable landfilling activities in the location of the former Wendouree Landfill 380m to the west of the Site. The extent of waste deposition in the direction of this Site has not increased. Capping activities appear to be occurring.

1990		Site The Site and immediately surrounding properties remain as agricultural land use. The high construction. Former Landfill There are observable landfilling activities in the location of the former Wendouree Landfill 380m to the west of the Site. The extent of waste deposition in the direction of this Site has not increased. Capping activities appear to be occurring. Highway construction activities appear to intersect with the landfill footprint.
2004		Site The Site and immediately surrounding properties remain as agricultural land use. Former Landfill There are no observable landfilling activities in the location of the former Wendouree Landfill to the west of the Site and the Site appears to be fully capped and vegetated.
2013		Site The Site and immediately surrounding properties remain as agricultural land use. Former Landfill There are no observable landfilling activities in the location of the former Wendouree Landfill to the west of the Site and the Site appears to be fully capped and vegetated.

2024		Site The Site and immediately surrounding properties remain as residential land use. Former Landfill There are no observable landfilling activities in the location of the former Wendouree Landfill to the west of the Site and the Site appears to be fully capped and vegetated.
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2.4.7 Historical Review Summary

Available information on the identified landfilling activities is summarised in [Table 2.5](#) below and provided in more depth in **Appendix A** and **Appendix B**.

Table 2.5 Nearby Landfilling Activities – Summary of Available Information

Particular	Comment
Waste Type	Putrescible or unknown waste type
Filling Area	76,000m ²
Waste Depth	Estimated 11m based on the construction of leachate bore, LB02.
Waste Quantity	More than 5,000,000m ³ or unknown
Operating Status	Closed
Operating Period	1964 - 1983
Estimated Age of Waste	42 years
Capping of Landfilled Area	Non-uniform, likely to be non-engineered given the age of the landfill.
Lining of Landfilled Area	Given the age of the landfill it is considered unlikely that it has an engineered liner.
Existing Landfill Gas Monitoring Data	Five discrete landfill gas monitoring events and continuous gas monitoring was completed on gas bores over the course of a four-week period in Oct - Nov 2024 (Landserv, 2025).
Exceedances of Environment Protection Regulation 2021 Action Levels	<u>Sampling results from the discrete landfill gas monitoring reported:</u> - No concentration of methane above BPEM action level of 1.0% v/v; - Thirteen (13) exceedances of the BPEM action level for carbon dioxide 1.5% v/v; - Limited to negligible flow rates (0 - 0.4 l/hr). <u>Sampling results from the continuous landfill gas monitoring reported:</u> - Methane concentrations of between 0 - 1.8% v/v in GB1 - GB3. - Methane concentrations of 0 - 1.6% v/v in GB5. - Carbon dioxide concentration between 2.7 – 6.6 %v/v in GB1-GB3. All concentrations above 1.0% v/v for methane and 1.5% v/v for carbon dioxide are exceedances of BPEM action levels.

	GB01 is located between the former landfilling activities and the Site. Locations of each of the landfill gas monitoring bores are presented in <i>Attached Figure 1.</i>
ent of Risk for migration of landfill gas off-site	None, the Landserv, 2025 assessment of risk posed by landfill gas to surrounding properties.

3.0 CONCEPTUAL SITE MODEL

Based on the desktop study undertaken, a conceptual model of the Site and likelihood of migration of landfill gas (LFG) from the identified landfilling areas has been developed in terms of the following four key elements:

- sources;
- transport mechanisms;
- transport pathways; and
- receptors/exposure pathways.

3.1 Sources

Based on desktop information compiled from various sources, landfilling within the 500m buffer in the vicinity of the Site has been identified at the former Wendouree Landfill, Lot 1 on Title Plan TP846568, approximately 380m west of the Site.

The inferred location of the identified landfilling activities in relation to the Site is presented in *Attached Figure 1*.

Historical aerial photographs, the VLR and available previous reports indicate that landfilling activities occurred from 1964 - 1983. No significant landfilling activities have been observed at the landfill since that time.

Landfill gas generation is a function of decay of organic matter within a landfill over time. Landfill gas continues to generate within a landfill for many years after the landfill stops accepting waste. Peak production of landfill gas generally occurs one to two years after waste is last placed, but production can continue for over 30 years (EPA Publication 788) as presented in *Figure 1*.

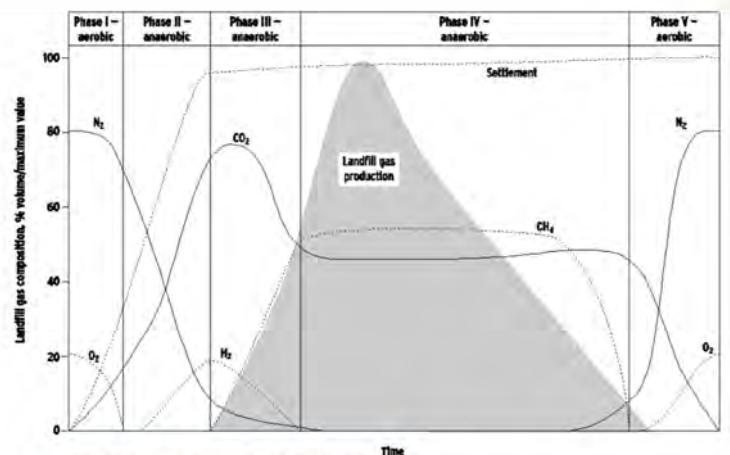


Figure 1 Idealised Representation of Landfill Gas Generation (EPA Publication 788)

Landfill gas results reported by Landserv from leachate bore LB02 within the waste mass indicate that waste decomposition is still occurring and both methane and carbon dioxide are still being generated. However, landfilling activities at the former Wendouree landfill likely ceased at least 42 years ago, well past the typical landfill aftercare period stated in EPA Publication 788 of 30 years. As such, it is considered likely that landfill gas production would have long since peaked and would now likely be declining.

3.2 Transport Mechanisms

Landfill gas migration typically occurs via pressure gradients or diffusion.

Given the landfill's age and expected low gas generation, significant pressure-driven migration is unlikely. Any residual migration is expected to occur primarily by diffusion, driven by concentration gradients, and would therefore be limited to much smaller distances over longer timescales.

Therefore, external factors such as groundwater fluctuations, weather conditions, and landfill cover quality are considered unlikely to materially impact gas movement toward the Site.

3.3 Potential Transport Pathways

Potential transport pathways of landfill gas from the closed landfill to the Site are detailed in the following sections.

3.3.1 Surrounding Geology

The geology, between the former landfill and the Site, is underlain by Quaternary aged alluvial floodplain deposits consisting of clays (Qa1). Clays, due to their low porosity, are not conducive to lateral lan[REDACTED] [REDACTED] geology of clay provides a further line of evidence [REDACTED] of lateral gas migration from the identified former landfilling activities to the Site.

3.3.2 Man-Made Features

Underground features, such as stormwater and electrical cabling or the backfill material that surrounds this infrastructure, may act as preferential pathways for generated gas. Gravel under bitumen roadways may also act as a preferential pathway for the gas.

A Before You Dig (BYD) search was undertaken to investigate any potential for underground services to link between the identified landfilling activities and the Site. A review of the services plans did not identify any services with a medium-high likelihood of providing a preferential pathway for landfill gas migration.

Copies of the BYD plans are presented in **Appendix C**.

3.3.3 Landfill Liner and Cover Systems

Landfill cover generally comprises of a vegetated surface component, a drainage layer and a low permeability layer which consists of either geomembrane, geosynthetic clay liner or compacted clay. Landfill liner systems can consist of low permeability layers and collection layers which prevent the migration of landfill gas, such as methane which is lighter than air, to the surrounding areas and the surrounding stratigraphy.

Landserv, 2025 reported the capping of the former Wendouree landfill as non-uniform and likely to be non-engineered given the age of the landfill. Further, given the age of the landfill it was considered unlikely that the landfill was lined.

Given the age and operating timeframe of the landfill it is likely that any engineered capping or lining, if present, would be of a low quality compared with current EPA Victoria capping requirements.

As such, gas generated from the former landfilling activities would likely have a bias towards vertical migration through the capping.

4.0 RISK ASSESSMENT

4.1 Risk Assessment Methodology

The landfill gas risks has been based on the risk assessment methodology in the UK Construction Industry Research and Information Association (CIRIA) *Publication C665 Assessing risks posed by hazardous ground gases to buildings*, 2007.

The specific landfill gas risk rankings are included in the following table.

Table 4.1 Classification of Probability Matrix

Classification	Definition
High Likelihood	There is a pollution linkage and an event that either appears very likely in the short-term and almost inevitable in the long-term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage, and all the elements are present and in the right place, which mean that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low Likelihood	There is a pollution linkage, and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the short-term.
Unlikely	There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term.

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Significant term risk of pollution of sensitive water resource. (Note: Water Resources Act contains no scope for considering significance of pollution). Catastrophic damage to buildings/property or short-term risk to a particular ecosystem, or organisation forming part of such ecosystem (note: the definitions of ecological systems within the draft circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to human health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources. (Note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem, (note: the definitions of ecological systems within draft circular on Contaminated Land, DETR, 2000).	Concentration of a contaminant from site exceed the generic, or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures, and services ("significant harm" as defined in the draft circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.), easily repairable effects of damage to buildings, structures, and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

Using the above landfill gas risk assessment tables landfill gas risks can be assessed as either very high risk, high risk, moderate risk, low risk or very low risk.

4.2 Risk of Landfill Gas Migration from the Former Wendouree Landfill

The conceptual site model, historical evidence and existing landfill gas monitoring indicate that the Former Wendouree Landfill's age, distance from the Site, decreasing gas production, low gas flow, low permeability clay geology and location of the Burrumbeet Creek

make landfill gas migration to the Site, an **'Unlikely'** likelihood with a potential consequence of **'Minor'**. Using the CIRIA C665 (2007) methodology, this results in a combined risk ranking of **'Very Low Risk'** and based on BS8485:2015 a classification as **Characteristic Situation 1**.

Using the CIRIA C665 (2007) and BS8485:2015 methodologies, based on a risk ranking of **'Very Low Risk'** and **'Characteristic Situation 1'**, no further site-specific investigation of landfill gas recommended to clarify the risk, and no installation of gas protection measures considered required.

4.3 Risk of Landfill Gas Migration Using the Gas Screening Value Methodology

In addition to the above methodology for assessing risk posed by landfill gas, a semi-quantitative risk assessment utilising guidance provided in CIRIA C665 'Assessing Risks Posed by Hazardous Ground Gases to Building' and calculating worst case gas screening values (GSVs) from the landfill gas monitoring results reported by Landserv has been undertaken.

GSV's are calculated by taking the worst-case gas concentrations and highest flow rates from the reported monitoring results over the monitoring period. GSV's calculated from the landfill gas monitoring results (both discrete and continuous) undertaken by Landserv in 2025 are presented in [Table 4.2](#) below along with the corresponding risk rating from CIRIA C665.

Table 4.2 Peak Concentration and Flow Data - Former Wendouree Landfill

CH4 %v/v	CO2 %v/v	Flow Rate	GSV* - Methane	GSV* - Carbon Dioxide	GSV Risk Rating
1.8	6.6	0.4 ¹	0.0072	0.0264	Very Low Risk
* Peak reported flow x peak concentration ¹ Monitoring results for flow were only reported for the discrete monitoring events. <u>GSVs</u> <0.07 - Very low risk <0.7- Low risk <3.5 –Moderate risk <15 – Moderate to high risk <70 – High risk >70 – Very high risk					

Consistent with the results of the qualitative risk assessment methodology, the reported GSVs for the worst-case scenario indicate that there is very low risk presented by landfill gas generated from the former Wendouree Landfill.

5.0 Assessment of Audit Requirement

To meet the objective of recommending whether an Environmental Audit is considered required or not, ESA have considered the framework presented in Section 9 of EPA Victoria, *Landfill Buffer Guideline*, August 2024.

Based on the above Guideline, a landfill score to characterise the gas source is the sum of the scores for landfill aspects: size, waste type and age of the waste. The score is multiplied by a proposal type score as follows:

1. Alterations to an existing building using a similar construction style and standards (excluding below ground structures).
2. Buildings and structures that exclude structures such as basements or lift shafts.
3. Buildings and structures that include below ground structures such as basements or lift shafts.

Based on the assumed likely future rural residential development the proposal is considered to have a score of 2.

The landfill score based on the identified landfilling activities within 500 m is as follows:

Table 5.1 EPA Victoria Landfill Buffer Guideline – Landfill Score Framework

Aspect	Landfill Buffer Guideline, August 2024	Score	Justification
Size	1. Less than 50 m ³ 2. 51 to 500,000 m ³ 3. 500,001 to 2,000,000 m ³ 4. 2,000,001 to 5,000,000 m ³ 5. More than 5,000,000 m ³ or unknown.	Score 5 - More than 5,000,000 m ³ or unknown	While an estimate of the waste volume based on area (76,000 m ²) and estimated depth of waste (11m) would equate to 836,000m ³ , as it is unknown a score of 5 has been conservatively given.
Waste Type	1. Soil. 2. Solid inert waste. 3. Putrescible or unknown waste type.	Score 3 - Putrescible or unknown waste type.	The type of waste deposited at the former landfill is reported as Putrescible waste and Solid inert waste (Landserv, 2025)
Age of Waste Mass	1. More than 50 years since waste last placed. 2. 30 to 50 years. 3. 10 to 30 years. 4. Less than 10 years. 5. Operating Landfill or unknown.	Score 2 - 30 to 50 years.	The landfill is reported to have ceased receiving waste in 1983, 42 years ago.

Using the EPA Victoria Landfill Buffer Guideline framework, the landfill score, based on size, waste type, and waste age, totals 10. Combined with a proposal score of 2, the overall score is 20. This score confirms the requirement for a landfill gas risk assessment (this assessment) but does not trigger the need for an Environmental Audit as stated in EPA Victoria, *Landfill Buffer Guideline*, August 2024:

Table 5.2 Further Assessment Recommendations

Overall Score	Assessment Required
1-8	No further assessment required
9-25	Require a landfill gas risk assessment
26-45	Require an Environmental Audit.

6.0 Conclusions and Recommendations

Through the assessment of historical aerial photographs, available previous environmental assessments and a search of relevant public databases, the Site has been identified within a 500m buffer zone from the former Wendouree Landfilling activities at [REDACTED].

The landfilling activities are at least 380m from the Site. Landfilling activities were considered to have likely occurred between the 1964 and 1983 with no observable landfilling since. As such any landfilling activities are considered to have ceased at least 42 years ago, well past the typical aftercare period stated in EPA Victoria Publication 788 of 30 years.

A review of regional environmental setting indicated that the geological setting between the Site and landfilling activities is underlain with Quaternary aged alluvial floodplain deposits consisting of clay (Qa1). Low permeability clays are likely to further reduce the likelihood of sub-surface landfill gas migration as far as the Site. Further, Burrumbeet Creek and associated shallow groundwater are present between the Site and the former landfill and are likely to prevent landfill gas migration to the north and east towards the Site.

Previous environmental assessments indicate that the capping of the former landfill is non-uniform, likely to be non-engineered given the age and the landfill it is considered unlikely to be lined. The status of the capping and lining increases the likelihood that the migration of landfill gas would be vertical to atmosphere over lateral migration to the Site.

Given the age and operating timeframe of the landfill it is likely that any engineered capping or lining, if present, would be of a low quality compared with current EPA Victoria capping requirements.

The conceptual site model indicates that any potential landfill gas would be unlikely to migrate laterally through the sub-surface and would preferentially migrate vertically to atmosphere before reaching the Site through the multitude of uncapped, unsealed areas between the former landfilling activities and the Site.

A qualitative risk assessment based on the conceptual site model, and using the CIRIA C665 (2007) methodology, determines the potential for landfill gas migration to the Site to be 'Unlikely', with a potential consequence of 'Minor.' This results in a combined risk magnitude of 'Very Low Risk'.

Semi-qualitative risk assessment undertaken using the CIRIA C665 (2007) GSV methodology is consistent with the qualitative risk assessment and considers the former Wendouree landfill site to be 'Very Low Risk' based on the maximum reported flows and measured methane and carbon dioxide by Landserv.

On the basis of the above, and consistent with CIRIA C665 (2007), no additional on-site management or monitoring measures are required.

Based on Section 5 and consistent with EPA Victoria, Landfill Buffer Guideline, August 2024, an Environmental Audit is not considered to be required based on landfill gas risk posed to the Site from the former Wendouree landfill.

7.0 References

Technical

- [REDACTED] (2007), Assessing Risks Posed by Hazardous Groundwater Contamination [REDACTED]
- EPA Victoria, Landfill Buffer Guideline, August 2024.
 - Victorian EPA Publication 1490 (2018) Closed Landfill Guidelines.
 - Victorian EPA Publication 788 (2015) Siting, design, operation and rehabilitation of landfills.
 - Victorian EPA Publication 1642 (20[REDACTED]) Planning Proposals within the buffer of a landfill.
 - United Kingdom (UK) Environment Agency (2004), Guidance on the management of landfill gas (LFTGN 03).

Previous Environmental Assessment Reports

- Landserv, *Landfill Gas Assessment Former Wendouree Landfill*, Mount Rowan, Victoria, 17 April 2025 (Landserv, 2025)
- Jacobs, *Land Capability Assessment, Ballarat North Precinct Structure Plan*, October 2024 (Jacobs, 2025).

DISCLAIMER

This disclaimer, together with any limitations specified in the report, applies to use of this report.

This report was prepared in accordance with a contracted scope of services. There are [REDACTED] and other constraints which have affected the accuracy and completeness of investigations undertaken.

This report has been prepared solely for use by, and is confidential to, the client who contracted the scope of services and Environmental Site Assessments accepts no responsibility for its use by other persons.

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This report must be read in conjunction with the Statement of Qualifications and Limitations contained within it.

STATEMENT OF QUALIFICATIONS AND LIMITATIONS

It is not possible to identify all contamination or potential contaminants in or under the surface of the site. This is an intrinsic risk when investigating potentially and contaminated sites. As such, Environmental Site Assessments has prepared the following information which details the limitations of this environmental report.

In preparing this report, Environmental Site Assessments has relied on client/ third party information which was not verified by Environmental Site Assessments and Environmental Site Assessments does not accept responsibility for omissions or inaccuracies in the client/ third party information.

This report is based solely on the specific instructions received from its client and/or the scope of work agreed between Environmental Site Assessments and its client. Those instructions and/or scope of work may not be fully described in this report.

This report is based on the site conditions identified at the time of inspection. It is not possible to identify all contamination or potential contaminants in or under the surface of the site.

Investigations undertaken in respect of this report may have been constrained by the particular site conditions, such as the location of buildings, services and vegetation. Further, changes that may have occurred after inspection.

As a result of these matters, not all relevant site history, contaminants or potential for contamination may have been identified in this report.

No warranties express or implied, as to the accuracy or completeness of the matters contained within it are made.

To the maximum extent permitted by law, all terms, conditions or warranties that would be implied into the Contract or in connection with the supply of the Services under statute or common law are excluded.

To the maximum extent permitted by law, Environmental Site Assessments total liability to the Client arising out of or in connection with its performance of its obligations pursuant to the Contract or arising out of or in connection with the supply of the Services (including in contract, under statute, in equity or tort) is limited as follows:

- (i) Environmental Site Assessments shall have no liability to the Client for any Consequential Loss;
- (ii) Environmental Site Assessments total aggregate liability to the Client, however arising, shall not exceed the greater of:
 - (A) two (2) times the GST exclusive aggregate price paid by the Client to Environmental Site Assessments for the Services (except in the case of personal injury or death caused by Environmental Site Assessments' negligence and/or fraud by Environmental Site Assessments); and
 - (B) the proceeds of any claim made on the Insurance Policies to be paid to the Client (if any).

(a) The Client indemnifies Environmental Site Assessments from and against any:

- (i) claim made against Environmental Site Assessments by any third party;
- (ii) liability incurred by Environmental Site Assessments to a third party; and

[REDACTED] al Site Assessments, [REDACTED] arising from, associated with or connected [REDACTED] provision of the Services and the Land.

Although normal standards of professional practice have been applied, the absence of any identified potential for air, soil or groundwater impacts on the subject property should not be interpreted as a conclusion that impacts do not exist on the site.

Subsurface conditions can vary across a particular site, which cannot be wholly defined by investigation.

As a result, it is unlikely that the results and estimations presented in this report will reflect the extremes of conditions within the site. Subsurface conditions including impact concentrations can change in a limited period of time.

Any information provided may be based on "spot" tests. Conditions may vary between or beyond those locations from the interpreted conditions based on the actual data.

The analyses, evaluations, opinions and conclusions presented in this report are based on the information provided, and they could change if the information is in fact found to be unrepresentative of conditions between sampling and analysis locations.

If you, or your agents or servants provide materially inaccurate, misleading or deficient information or samples, you acknowledge that this may void or negate any analyses, evaluations, opinions or conclusions presented in this report.

The assessment and remediation of contamination is a developing science. Clean Up technology is constantly changing as scientific information on data collection, risk assessment, toxicology and remediation technologies are published.

Further, opinions can vary as to the criterion for whether particular conditions constitute contamination, and if so how that contamination should be addressed or remediated.

Different persons might reasonably or otherwise form opinions different to those of Environmental Site Assessments.

Use of the site for any purpose may require planning and other approvals and, in some cases, EPA and accredited site auditor approvals.

Environmental Site Assessments offers no opinion as to the likelihood of obtaining any such approvals, or the conditions and obligations which such approvals may impose, which may include the requirement for significant environment works.

The ongoing use of the site or use of the site for a different purpose may require the owner/ user to manage and/ or remediate site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this report.

This report is not intended to be used for the purposes of tendering, programming of works, refurbishment works or demolition works unless used in conjunction with a specification detailing the extent of the works.

To ensure its contextual integrity, the report must be read in its entirety and should not be copied, distributed or referred to in part only.

Environmental Site Assessments makes no determination or recommendation regarding a decision whether to acquire or provide financing with respect to the site.

Figure 1





Legend

- Leachate Bore
- Subsurface Landfill Gas Monitoring Bores
- Former Wendouree Landfill - Inferred Extent of Waste
- Site Boundary

0 50 m 100 m
© Mapbox

Produced by **Datanest.earth**

Title:
Site and Landfill Location and Surrounding
Features

Client:
North Ballarat Pastoral Pty Ltd

Size: A3

Project:
Landfill Gas Risk
Assessment
Ballarat

Drawn: CKF

Figure No.: 1

Date:
03-07-2025

Checked:
CKF

Proj No: AE25043

Scale: 1:4930

Version:
Final



Appendix A: Lotsearch Report



LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 30 Jun 2025 12:24:49

Reference: LS086344 EP

Address: Noble Court, Mount Rowan, VIC 3352

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:

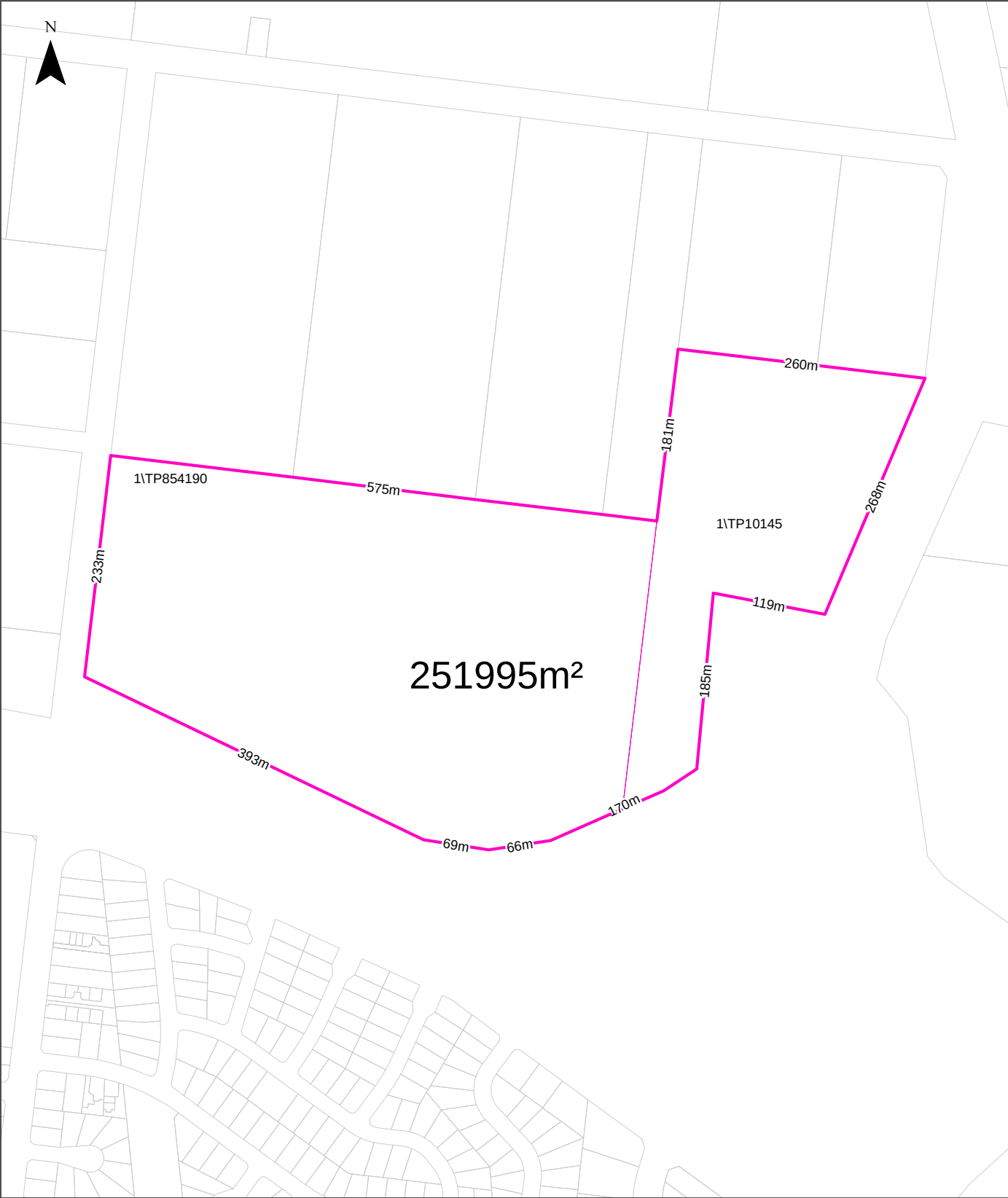
Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Topographic and Cadastre data	VIC Department of Energy, Environment and Climate Action	24/06/2025	24/06/2025	Monthly	-	-	-	-
Current EPA Priority Sites	Environment Protection Authority Victoria	23/06/2025	23/06/2025	Weekly	1000m	0	0	0
EPA Site Management Orders	Environment Protection Authority Victoria	27/06/2025	27/06/2025	Monthly	1000m	0	0	0
Former EPA Priority Sites & other Remedial Notices	Environment Protection Authority Victoria	25/10/2024	01/07/2024	Quarterly	1000m	0	0	2
EPA PFAS Site Investigations	Environment Protection Authority Victoria	28/05/2025	30/05/2023	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Australian Department of Defence	11/06/2025	11/06/2025	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Australian Department of Defence	11/06/2025	11/06/2025	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	11/06/2025	21/05/2025	Monthly	2000m	0	0	0
Defence Controlled Areas	Australian Department of Defence	10/04/2025	10/04/2025	Quarterly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Australian Department of Defence	11/06/2025	02/09/2022	Quarterly	2000m	0	0	0
National Unexploded Ordnance (UXO)	Australian Department of Defence	10/04/2025	10/04/2025	Quarterly	2000m	0	0	0
EPA Preliminary Risk Screening Assessments	Environment Protection Authority Victoria	06/06/2025	06/06/2025	Monthly	1000m	0	0	0
EPA Environmental Audit Reports	Environment Protection Authority Victoria	27/06/2025	27/06/2025	Monthly	1000m	0	0	1
EPA Groundwater Zones with Restricted Uses	Environment Protection Authority Victoria	23/06/2025	23/06/2025	Monthly	1000m	0	0	0
EPA Register of Permissions	Environment Protection Authority Victoria	07/05/2025	07/05/2025	Monthly	1000m	1	2	13
Legacy EPA Licensed Activities	Environment Protection Authority Victoria	19/07/2022	22/07/2021	Not required	1000m	0	0	2
Legacy EPA Works Approvals	Environment Protection Authority Victoria	13/12/2022	13/12/2022	Not Required	1000m	0	0	0
National Waste Management Facilities Database	Geoscience Australia	30/05/2025	19/01/2023	Annually	1000m	0	0	2
Statewide Waste and Resource Recovery Infrastructure Plan Facilities	Sustainability Victoria	30/04/2024	31/12/2012	None Planned	1000m	0	0	1
Legacy EPA Prescribed Industrial Waste	Environment Protection Authority Victoria	12/08/2020	12/08/2020	Not Required	1000m	0	0	1
EPA Victorian Landfill Register	Environment Protection Authority Victoria	20/05/2025	19/05/2025	Quarterly	1000m	0	0	1
Former Gasworks	Various historical sources collated by Lotsearch	15/08/2017	15/08/2017	Not required	1000m	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	16/10/2024	19/01/2023	Annually	1000m	0	0	0
Historical Business Directories (Premise & Intersection Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	150m	0	0	0
Historical Business Directories (Road & Area Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	150m	-	3	3
Historical Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	500m	0	0	0
Historical Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	500m	-	0	2
Features of Interest	VIC Department of Energy, Environment and Climate Action	20/05/2025	20/05/2025	Quarterly	1000m	0	0	33

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Hydrogeology Map of Australia	Geoscience Australia	22/04/2025	19/08/2019	Annually	1000m	1	1	1
Watertable Salinity	VIC Department of Energy, Environment and Climate Action	15/05/2025	15/05/2025	Quarterly	1000m	1	1	2
Depth to Watertable	VIC Department of Energy, Environment and Climate Action	20/09/2024	05/12/2014	Annually	0m	2	-	-
Surface Elevation	Centre for eResearch and Digital Innovation (CeRDI), Federation University	25/06/2024	23/09/2013	Annually	0m	1	-	-
Basement Elevation	VIC Department of Energy, Environment and Climate Action	09/08/2024	23/09/2013	Annually	0m	1	-	-
Groundwater Boreholes WMIS	VIC Department of Energy, Environment and Climate Action	23/04/2024	23/04/2024	Quarterly	2000m	0	0	21
Groundwater Boreholes Earth Resources Database	VIC Department of Jobs, Skills, Industry and Regions	30/01/2025	17/02/2010	Annually	2000m	0	0	5
Groundwater Boreholes Fed Uni	Federation University Australia	21/12/2017	07/01/2014	Annually	2000m	0	0	17
Historical Mining Activity - Shafts	VIC Department of Jobs, Skills, Industry and Regions	10/09/2024	10/09/2024	Annually	1000m	0	0	13
Geological Units 1:50,000	VIC Department of Energy, Environment and Climate Action	30/04/2025	24/06/2014	Annually	1000m	3	3	5
Geological Structures 1:50,000	VIC Department of Energy, Environment and Climate Action	30/04/2025	24/06/2014	Annually	1000m	0	0	0
Dykes and Marker Beds 50k	VIC Department of Energy, Environment and Climate Action	30/04/2025	24/06/2014	Annually	1000m	0	0	0
Shear zones 250k	VIC Department of Energy, Environment and Climate Action	30/04/2025	24/06/2014	Annually	1000m	0	0	0
Atlas of Australian Soils	Australian Bureau of Agricultural and Resource Economics and Sciences	15/01/2025	17/02/2011	Annually	1000m	1	1	3
Victorian Soil Type Mapping	VIC Department of Jobs, Skills, Industry and Regions	20/05/2025	24/09/2024	Annually	1000m	3	4	5
Atlas of Australian Acid Sulfate Soils	CSIRO	15/01/2025	21/02/2013	Annually	1000m	1	1	1
Coastal Acid Sulfate Soils	VIC Department of Jobs, Skills, Industry and Regions	29/04/2025	22/04/2025	Annually	1000m	0	0	0
Planning Scheme Zones	VIC Department of Energy, Environment and Climate Action	23/06/2025	23/06/2025	Monthly	1000m	1	3	25
Planning Scheme Overlay	VIC Department of Energy, Environment and Climate Action	23/06/2025	23/06/2025	Monthly	1000m	3	6	17
Commonwealth Heritage List	Australian Department of Climate Change, Energy, the Environment and Water	23/10/2024	13/04/2022	Annually	1000m	0	0	0
National Heritage List	Australian Department of Climate Change, Energy, the Environment and Water	23/10/2024	13/04/2022	Annually	1000m	0	0	0
Victorian Heritage Register	VIC Department of Energy, Environment and Climate Action	20/05/2025	20/05/2025	Quarterly	1000m	0	0	0
Cultural Heritage Sensitivity	State Government Victoria - Department of Premier and Cabinet	20/05/2025	20/05/2025	Quarterly	1000m	2	3	8
Bushfire Prone Area	VIC Department of Energy, Environment and Climate Action	29/05/2025	10/09/2024	Monthly	1000m	1	1	1
Fire History	State Government Victoria - Department of Energy, Environment and Climate Action	30/05/2025	28/01/2025	Monthly	1000m	1	1	2
Victorian Coastal Inundation Sea Level Rise	VIC Department of Energy, Environment and Climate Action	06/02/2025	16/11/2024	Annually	1000m	0	0	0
Native Vegetation (Modelled 2005 Ecological Vegetation Classes)	VIC Department of Energy, Environment and Climate Action	11/06/2025	11/06/2025	Annually	1000m	1	1	2
Ramsar Wetland Areas in Victoria	VIC Department of Energy, Environment and Climate Action	19/05/2025	05/03/2025	Annually	1000m	0	0	0
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	0
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 Atlas	Bureau of Meteorology	30/05/2025	07/05/2020	Annually	1000m	3	3	6

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features On-site	No. Features within 100m	No. Features within Buffer
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	30/05/2025	07/05/2020	Annually	1000m	4	5	16

Site Diagram

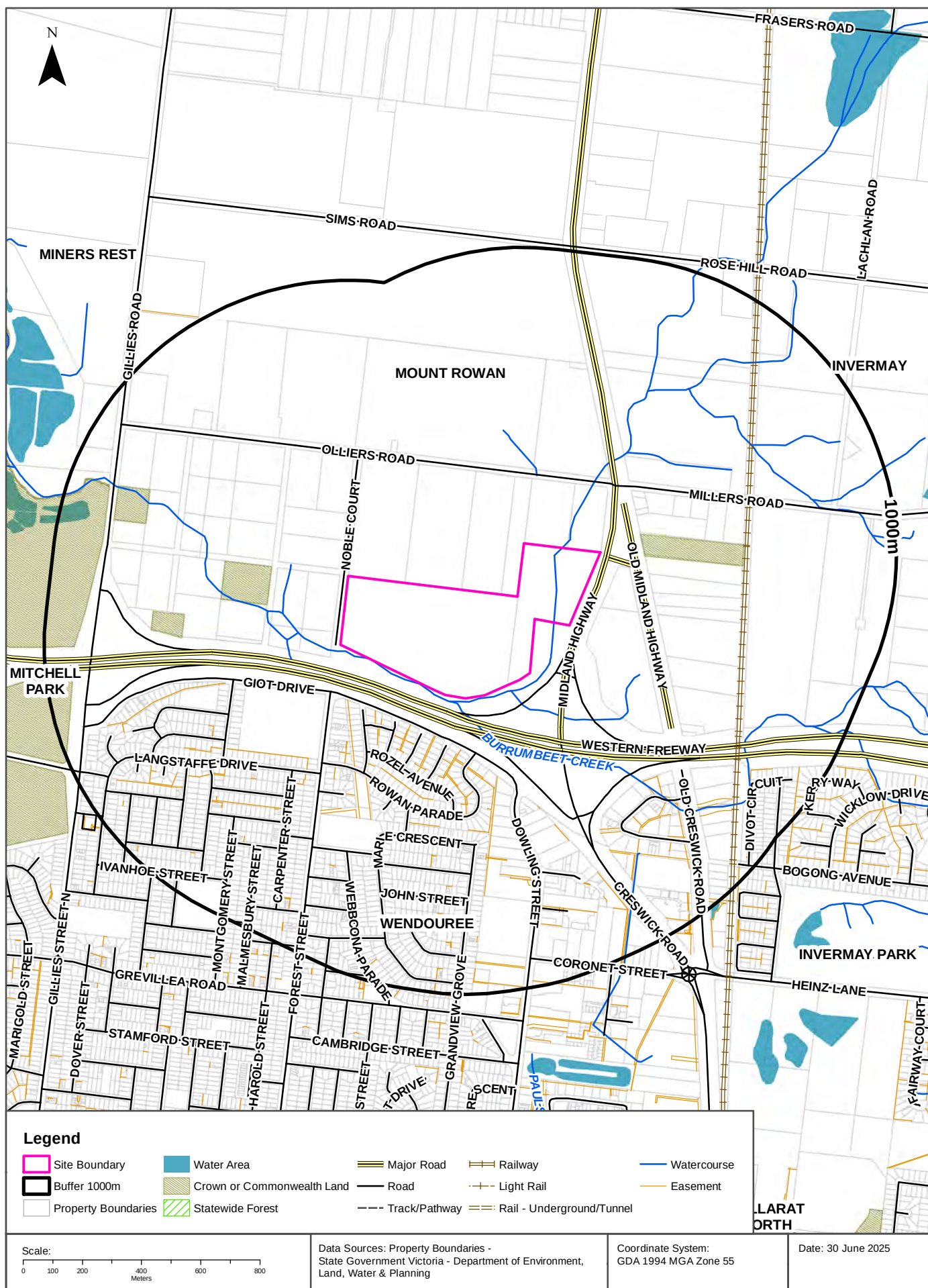
Noble Court, Mount Rowan, VIC 3352



Legend Site Boundary Internal Parcel Boundaries	Total Area: 251995m ² Total Perimeter: 2.52km 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 50 100 150 200 250 Meters Data Sources: Property Boundaries - State Government Victoria - Department of Environment, Land, Water & Planning Coordinate System: GDA 1994 MGA Zone 55 Date: 30 June 2025
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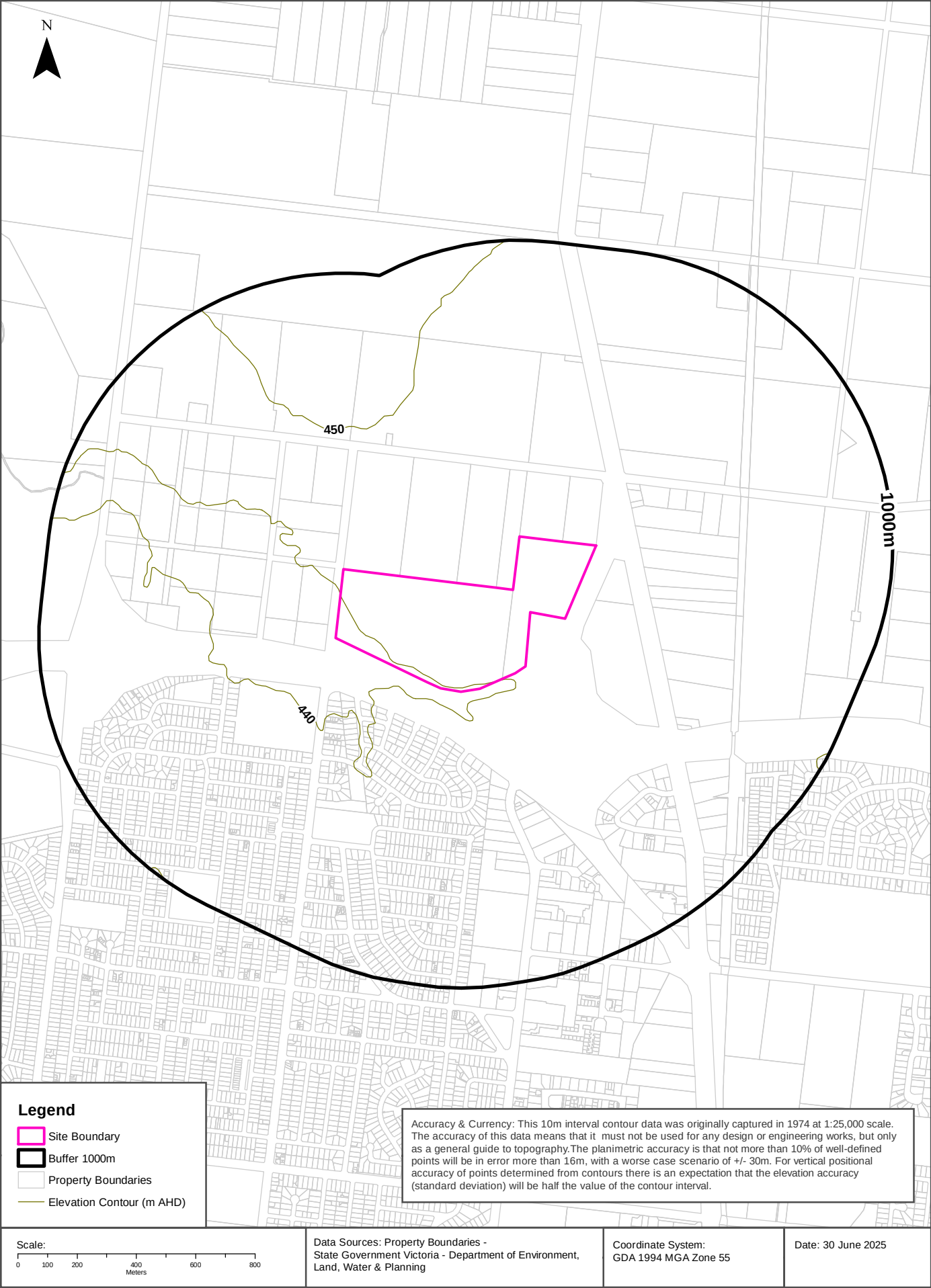
Topographic Data

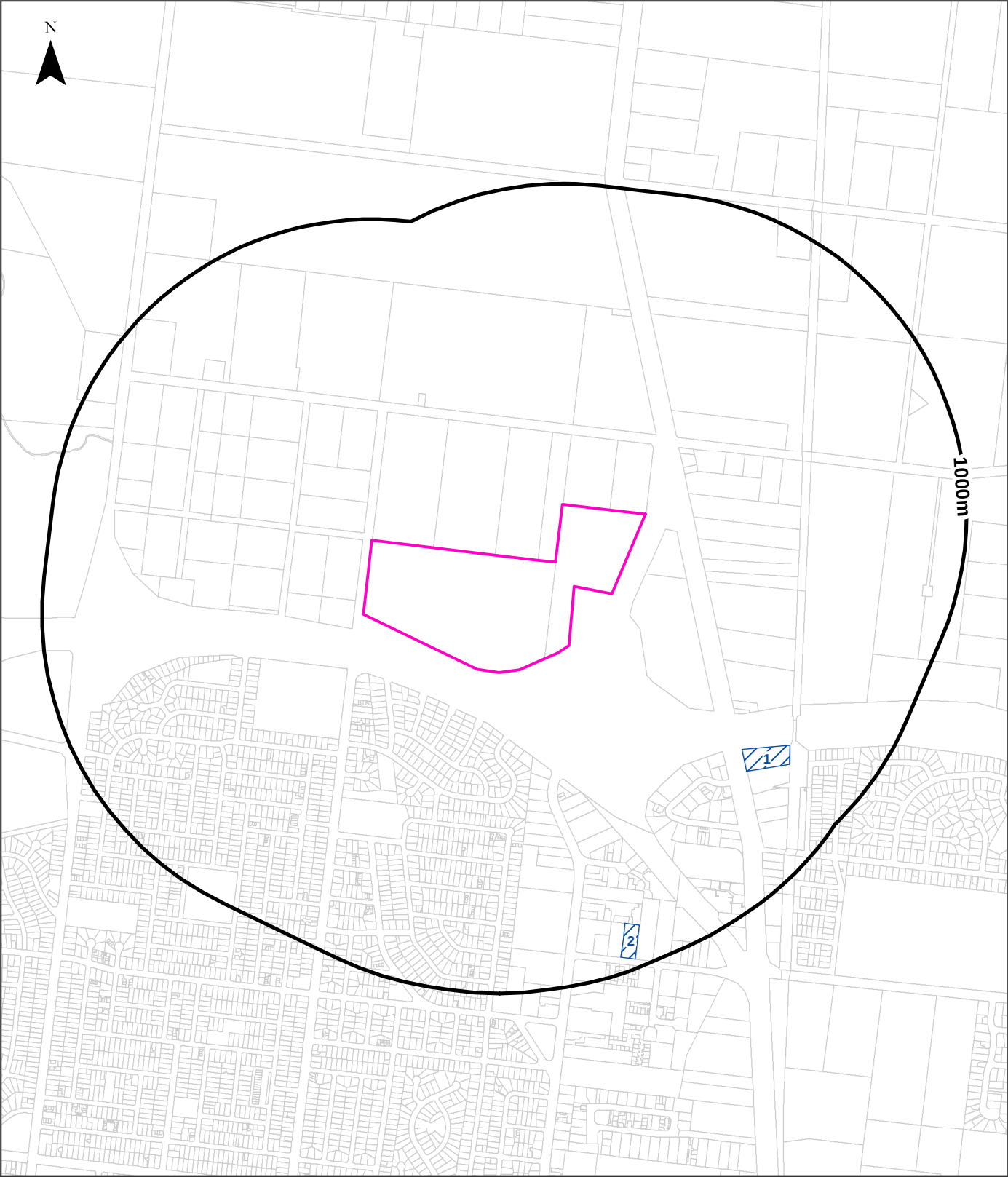
Noble Court, Mount Rowan, VIC 3352



Elevation Contours (m AHD)

Noble Court, Mount Rowan, VIC 3352





Legend

- Site Boundary
- Buffer 1000m
- Property Boundaries
- Former Priority Sites & Other Pollution Notices
- Site Management Orders
- Priority Sites

Scale:

0 100 200 400 600 800 Meters

Data Sources: Property Boundaries - State Government Victoria - Department of Environment, Land, Water & Planning

Coordinate System: GDA 1994 MGA Zone 55

Date: 30 June 2025

EPA Priority Sites, Site Management Orders & Pollution Notices

Noble Court, Mount Rowan, VIC 3352

Current EPA Priority Sites Register

Sites on the current EPA priority sites register that exist within the dataset buffer:

Notice No	Address	Suburb	Issue	Loc Conf	Dist (m)	Direction
N/A	No records in buffer					

Priority Sites Register Custodian: State Government Victoria - Environment Protection Authority (EPA)

Site Management Orders

Sites within the dataset buffer that have been issued a Site Management Orders:

Site Management Order ID	Issue Date	Address	Status	Loc Conf	Dist (m)	Direction
N/A	No records in buffer					

Site Management Orders Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Former EPA Priority Sites & Other Pollution Notices

Sites within the dataset buffer that have been issued a Pollution Notice:

Note. Due to pollution notices being revoked and removed from published lists this is not an exhaustive list of all past pollution notices.

Map ID	Notice No	Notice Type	Company	Address	Suburb	Status	Issue	Date Issued	Loc Conf	Dist	Dir
1	REV-IGN-00006601	Information Gathering Notice	G.R. & D.M. WILKIE PTY. LTD.	32 Old Creswick Road, Wendouree, Victoria, 3355, Australia	Wendouree	Inactive		05/04/2024	Premise Match	629m	South East
2	90003757	Pollution Abatement Notice	Coronet laundry	21 CORONET ST	WENDOUREE	Previous Pollution Notice		13/06/2013	Premise Match	856m	South

Pollution Notice Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

PFAS Investigation & Management Programs

Noble Court, Mount Rowan, VIC 3352

EPA PFAS Site Investigations

Sites being investigated by the EPA for PFAS contamination within the dataset buffer:

Map ID	Site Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Site Investigations Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Defence PFAS Investigation & Management Program Investigation Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

Defence PFAS Investigation & Management Program Management Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

Defence PFAS Investigation & 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	Location Confidence	Distance	Direction
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites and Unexploded Ordnance

Noble Court, Mount Rowan, VIC 3352

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					

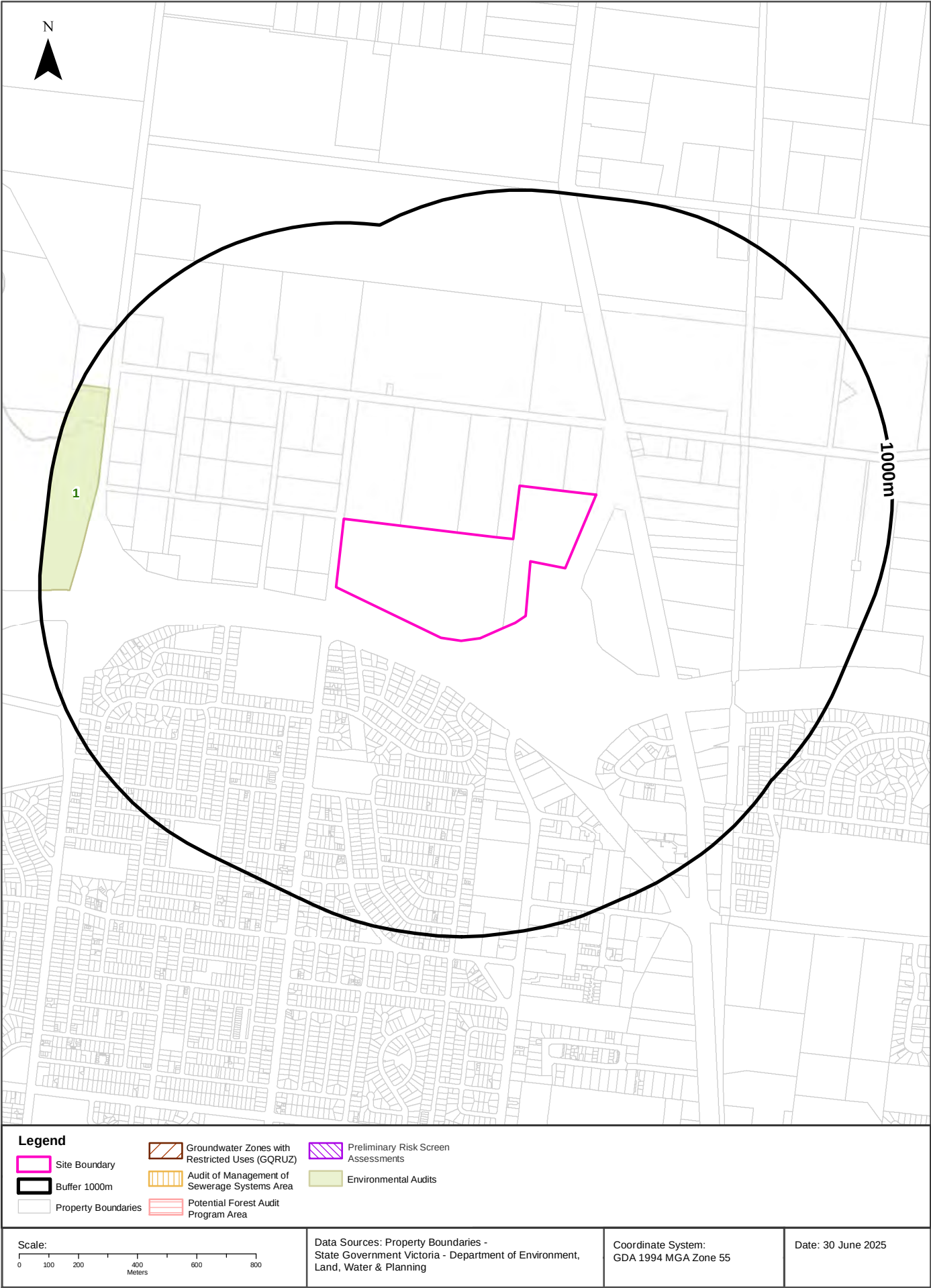
Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

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 Records

Noble Court, Mount Rowan, VIC 3352

EPA Preliminary Risk Screen Assessments

EPA Preliminary Risk Screen Assessment records that exist within the dataset buffer:

PRSA ID	Site Address	Completion Date	Attachment A	Attachment B	Attachment C	Loc Conf	Distance	Direction
N/A		No records in buffer						

Preliminary Risk Screen Assessments Audit Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Environmental Audits

EPA environmental audit records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation. If link does not work, documentation may still be accessible via the EPA Interaction Portal.

Map ID	Transaction No	CARMS No	Site	Address	Suburb	Date Complete	Audit Category	Loc Conf	Dist	Dir
1	0008006904	78778-1	SEWERAGE FARM 29 GILLIES RD	29 Gillies Road, Miners Rest	MINERS REST	15/08/2021 12:00:00 AM	53V Audit recommendations	Premise Match	838m	West

Environmental Audit Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Records

Noble Court, Mount Rowan, VIC 3352

EPA Groundwater Zones with Restricted Uses (GQRUZ)

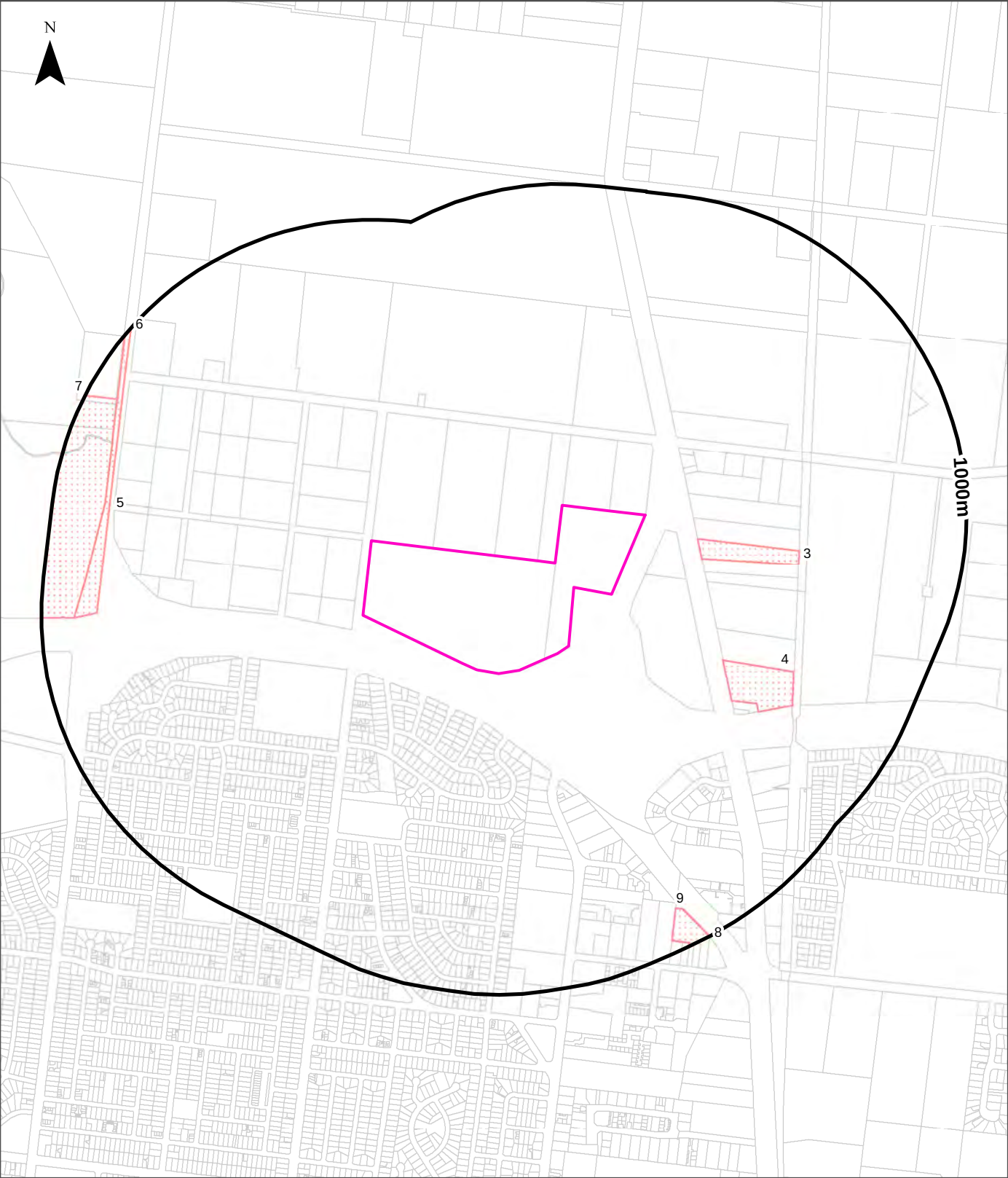
EPA Groundwater Zones with Restricted Uses (GQRUZ) records that exist within the dataset buffer:

Map ID	File No	Reference No	Site History	Site Address	Restricted Uses	Status	Loc Conf	Dist	Dir
N/A		No records in buffer							

Environmental GQRUZ Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

EPA Activities - Register of Permissions

Noble Court, Mount Rowan, VIC 3352



Legend			
	Site Boundary		Register of Permissions Record
	Buffer 1000m		
	Property Boundaries		
Scale: 0 100 200 400 600 800 Meters		Data Sources: Property Boundaries - State Government Victoria - Department of Environment, Land, Water & Planning	
		Coordinate System: GDA 1994 MGA Zone 55	Date: 30 June 2025

EPA Activities

Noble Court, Mount Rowan, VIC 3352

EPA Activities - Register of Permissions

EPA Register of Permissions records that exist within the dataset buffer:

Note - Records with the following activities have been excluded:

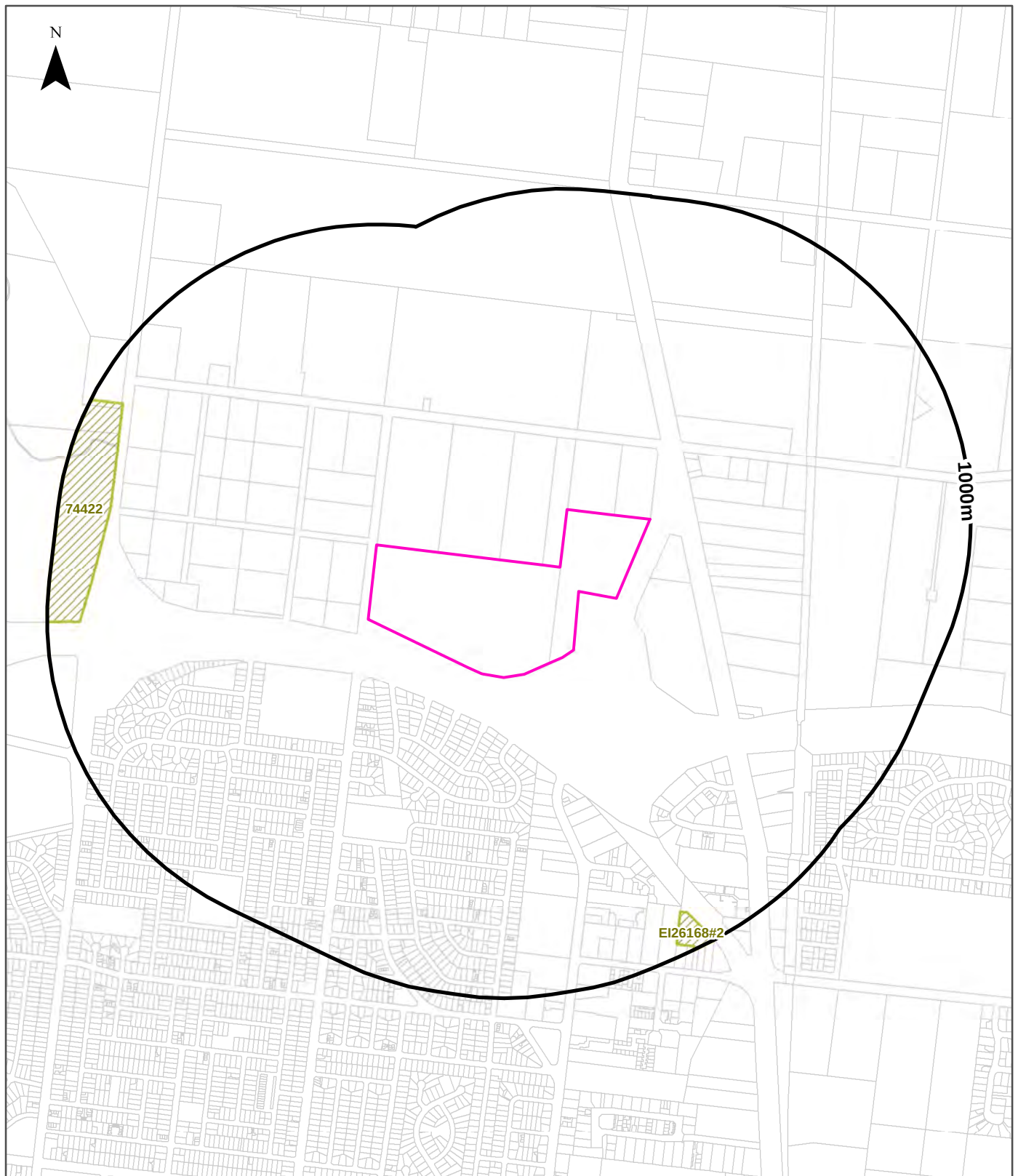
- L05 (Operation of events outside of hours or extended operations)
- L06 (Conducting more than six outdoor concerts)

Map ID	Permission ID	Permission Type	Activity	Premise Address	Status	Issue Date	Expiry Date	Doc Link	Loc Conf	Dist (m)	Dir
3	R000311292	Registration	A13c (Waste and resource recovery - small)	31 Old Midland Highway, Mount Rowan, Victoria, 3352, Australia	Active	23/01/2025	23/01/2030	Link	Premise Match	178m	East
	R000311293	Registration	A02c (Other waste treatment – e-waste 500 tonnes or less)	31 Old Midland Highway, Mount Rowan, Victoria, 3352, Australia	Active	23/01/2025	23/01/2030	Link	Premise Match	178m	East
4	R000302506	Registration	A13c (Waste and resource recovery - small)	67 Old Midland Highway, Mount Rowan, Victoria, 3352, Australia	Active	02/01/2022	01/01/2027	Link	Premise Match	400m	East
5	EXM000200857	Exemption (Development Licence)	A03 (Sewage treatment)	Gillies Rd, BALLARAT NORTH, VIC, 3352, AU	Expired	26/10/2011	25/10/2013		Road Match	823m	West
	P000088997	Permit	A15 (Biosolids supply or use)	Gillies Rd, BALLARAT NORTH, VIC, 3352, AU	Active	27/03/2014	31/12/9999		Road Match	823m	West
	PRM001001	Development Licence	A03 (Sewage treatment)	Gillies Rd, BALLARAT NORTH, VIC, 3352, AU	Active				Road Match	823m	West
6	P000208995	Permit	A14 (Wastewater supply or use)	Gillies Rd, BALLARAT NORTH, VIC, 3352, AU	Active	10/10/2019	31/12/9999		Road Match	823m	West
7	OL000071980	Operating Licence (any other case)	A03 (Sewage treatment)	Gillies Rd, BALLARAT NORTH, VIC, 3352, AU	Active	01/07/2008	31/12/9999	Link	Premise Match	838m	West
8	R000301319	Registration	A13c (Waste and resource recovery - small)	5 Coronet Street Wendouree 3355	Active	27/09/2021	27/09/2026	Link	Premise Match	873m	South East
	R000309143	Registration	A13c (Waste and resource recovery - small)	5 Coronet Street Wendouree 3355	Active	29/04/2024	28/04/2029	Link	Premise Match	873m	South East
9	R000300667	Registration	A13c (Waste and resource recovery - small)	5 Coronet Street Wendouree 3355	Active	03/08/2021	03/08/2026	Link	Premise Match	873m	South East
	R000310664	Registration	A09b (Waste tyre storage - small)	Mount Rowan, Ballarat, Victoria	Active	07/10/2024	07/10/2029	Link	Suburb Match		
	R000303566	Registration	A07b (Organic waste processing - small)	3355, Australia	Active	27/05/2022	26/05/2027	Link	Suburb Match		

EPA Register of Permissions Custodian: State Government Victoria - Environment Protection Authority (EPA)
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EPA Records - Legacy Licensed Activities & Works Approvals

Noble Court, Mount Rowan, VIC 3352



Legend

- Site Boundary
- Buffer 1000m
- Property Boundaries
- Legacy Licensed Activities
- Legacy Works Approvals

Scale:
0 100 200 400 600 800
Meters

Data Sources: Property Boundaries -
State Government Victoria - Department of Environment,
Land, Water & Planning

Coordinate System:
GDA 1994 MGA Zone 55

Date: 30 June 2025

EPA Activities

Noble Court, Mount Rowan, VIC 3352

Legacy EPA Licensed Activities

Activities licensed under the repealed *Environment Protection Act 1970 (Vic.)* within the dataset buffer:

Trans No	Licence No	Licence Type	Organisation	Premise Ref	Premise Address 1	Premise Address 2	Activities	Loc Conf	Dist (m)	Direction
3032904	74422	Amalgamated licence	CENTRAL HIGHLANDS REGION WATER CORPORATION	71980	GILLIES ST	BALLARAT NORTH VIC 3352	A03 Sewage Treatment	Premise Match	838m	West
	EI26168#2		ACE SCRAP METAL & STEEL CO PTY LTD		5-7 CORONET ST	WENDOUREE VIC 3355	A01 Prescribed Industrial Waste Management	Premise Match	873m	South East

Legacy Activity Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Legacy EPA Works Approvals

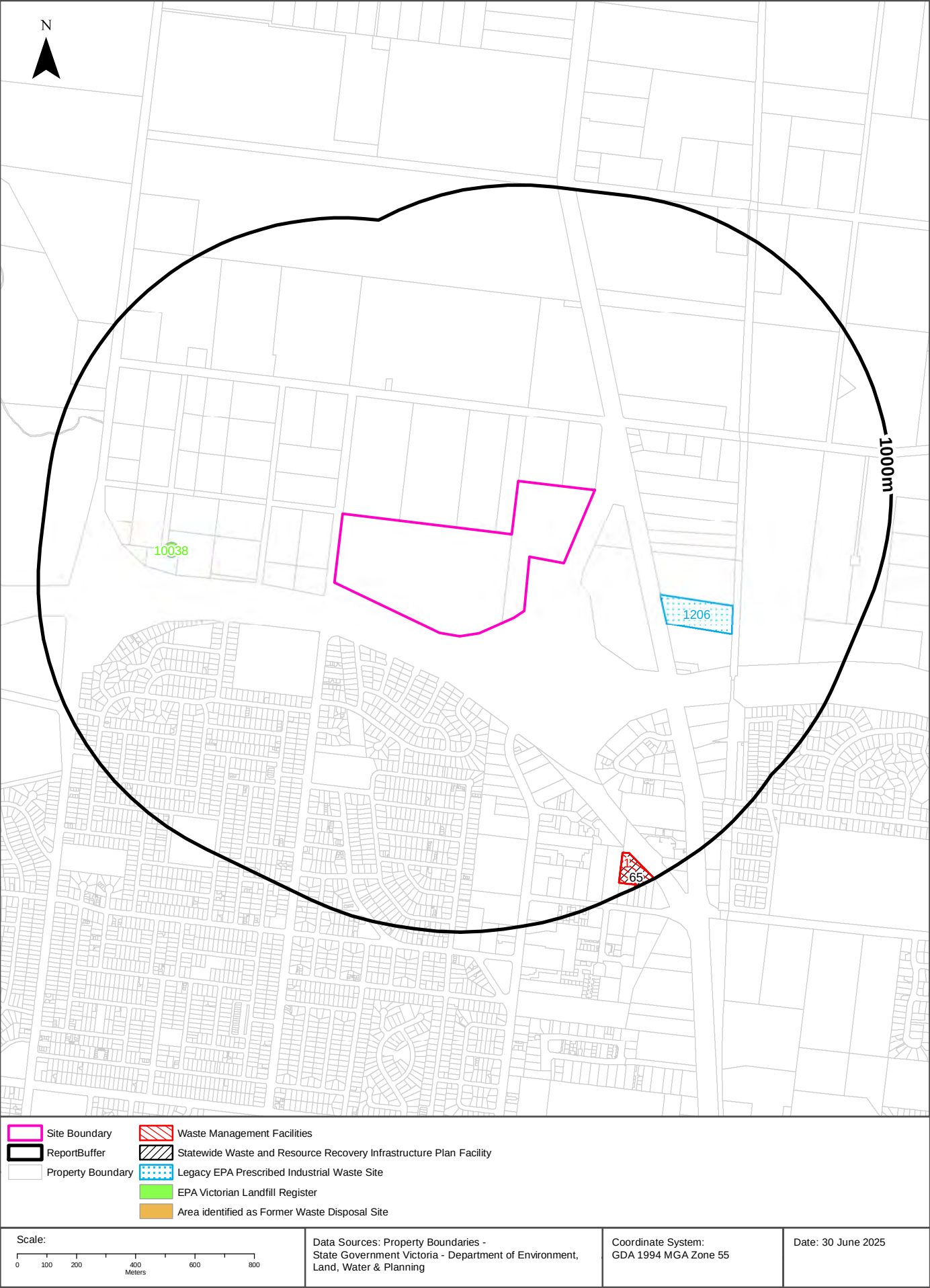
Works approvals licensed under the repealed *Environment Protection Act 1970 (Vic.)* within the dataset buffer:

Transaction No	Status	Approval No	Organisation	Premise Address	Suburb	Scheduled Categories	Loc Conf	Dist (m)	Direction
N/A	No records in buffer								

Legacy Works Approvals Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

Waste Management Facilities and Landfills

Noble Court, Mount Rowan, VIC 3352



Waste Management Facilities and Landfills

Noble Court, Mount Rowan, VIC 3352

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	ACE METALS	ACE RECYCLING INTERCHANGE FACILITY	5-7 CORONET STREET, WENDOUREE	RECYCLING	METALS RECOVERY FACILITY	OPERATIONAL	Premise Match	873m	South East
	INFRABUILD RECYCLING	INFRABUILD RECYCLING	5-7 CORONET STREET, WENDOUREE	RECYCLING	METALS RECOVERY FACILITY	OPERATIONAL	Premise Match	873m	South East

Source: Waste Management Facilities Database

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Statewide Waste and Resource Recovery Infrastructure Plan Facilities

Statewide Waste and Resource Recovery Infrastructure Plan Facilities within the dataset buffer:

Map Id	Owner	Site Name	Address	Suburb	Category	Sub Category	Loc Conf	Distance	Direction
65		Onesteel Recycling (trading as Ace Scrap metal & Steel)	7 Coronet St	Wendouree	Commercial & Industrial	C&I Recovery	Premise Match	873m	South East

SWRRIPF Data Source: State Government Victoria - Department of Sustainability

Legacy EPA Prescribed Industrial Waste

EPA Prescribed Industrial Waste treaters, disposers and permitted transporters under the repealed *Environment Protection Act 1970 (Vic.)* within the dataset buffer:

Map Id	Company Name	Address	Suburb	Treatment /Disposal	Transport	Accredited Agent	EPA List Status	Loc Conf	Dist (m)	Dir
1206	HENDERSON HAULAGE PTY LTD	61 OLD MIDLAND HWY	MOUNT ROWAN VIC 3352	No	Yes	No	Former EPA Register Record	Premise Match	339m	East

Legacy Prescribed Industrial Waste Data Source: State Government Victoria - Environment Protection Authority (EPA)

Waste Management Facilities & Landfills

Noble Court, Mount Rowan, VIC 3352

EPA Victorian Landfill Register

EPA Victorian Landfill Register sites within the dataset buffer:

Landfill Register No.	Site	Address	Operating Status	Est. Year Of Closure	Waste type	Loc Conf	Dist (m)	Direction
10038	Cnr Gilles Road North and Western Freeway	Lot 1 Noble Court, Mount Rowan, VIC, 3352	Closed	1983	Putrescible waste, Solid inert waste	As Supplied	535m	West

EPA Victorian Landfill Register Data Source: State Government Victoria - Environment Protection Authority (EPA)

Former Gasworks and Liquid Fuel Facilities

Noble Court, Mount Rowan, VIC 3352

Former Gasworks

Former Gasworks identified from various historical sources within the dataset buffer:

Note - As this is a dataset collated from various historical sources, it is not an exhaustive list of all former Gasworks

Map Id	Site Name	Date Opened	Year Closed	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Collated from various historical sources

National Liquid Fuel Facilities

National Liquid Fuel Facilities within the dataset buffer:

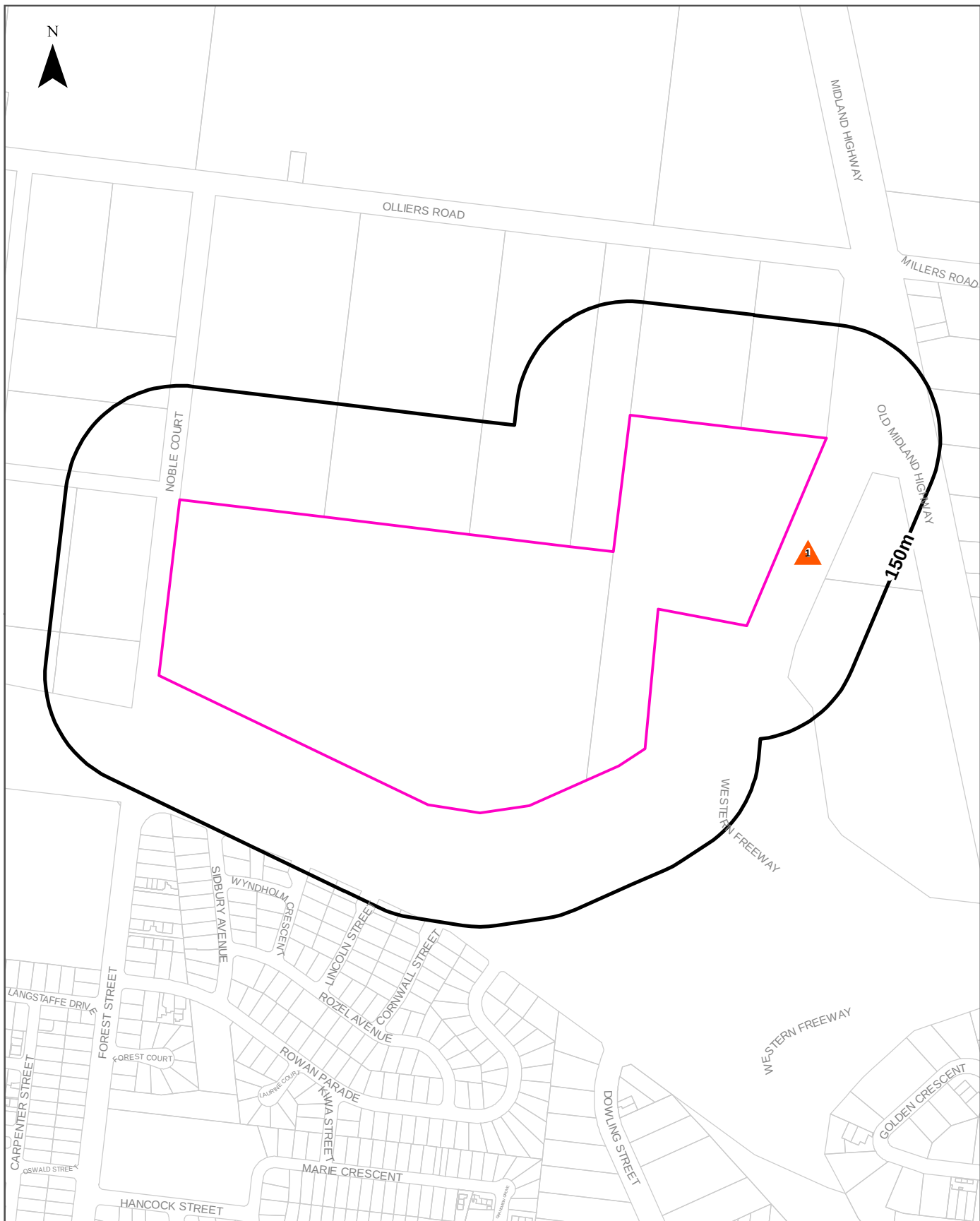
Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist (m)	Direction
N/A	No records in buffer										

Source: Waste Management Facilities Database

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Historical Business Directories

Noble Court, Mount Rowan, VIC 3352



Legend		Scale: 0 90 180 270 360 Meters	Coordinate System: GDA 1994 MGA Zone 55
Site Boundary	Business directory records mapped to a specific premise		Date: 30 June 2025
Buffer 150m	Business directory records mapped to a road intersection		
Property Boundary	Business directory records mapped to a road corridor		
	Business directory records mapped to a general area		

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018
Sands & McDougall's Directory - Digitised by State Library Victoria
Property Boundaries © State Government Victoria - Dept. of Environment, Land, Water & Planning 2025

Historical Business Directories

Noble Court, Mount Rowan, VIC 3352

Business Directory Records 1905-1991 Premise or Road Intersection Matches

Potentially contaminative business activities extracted from Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, mapped to a premise or road intersection within the dataset buffer:

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

Business Directory Content reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018 and Sands & McDougall's Directory of Victoria (Digitised by State Library Victoria)

Business Directory Records 1905-1991

Road or Area Matches

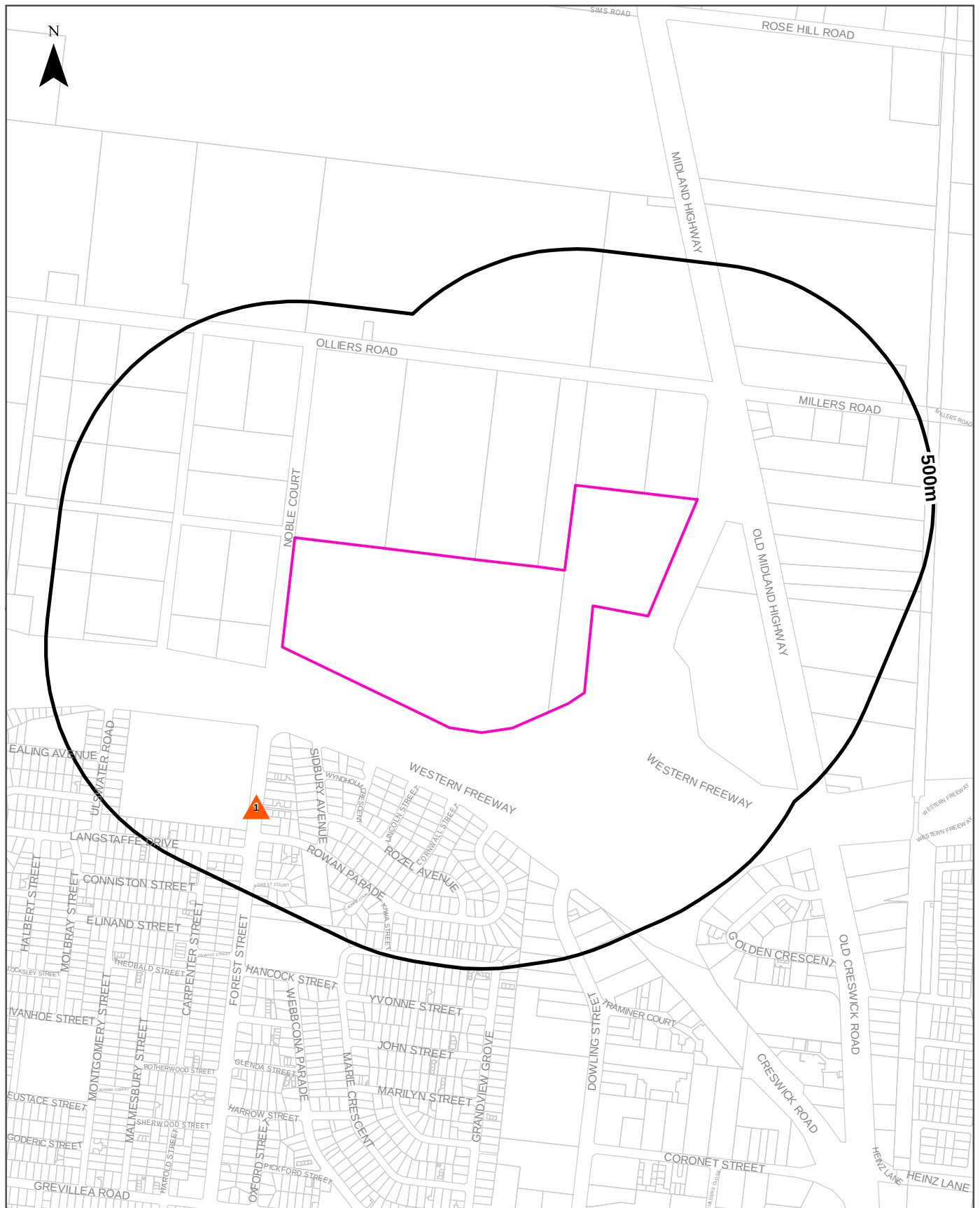
Potentially contaminative business activities extracted from Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	Fork Lift Truck Hirers	Vagg. K. R. & K. J. Forklifts., Creswick Rd. Mount Rowan. 3352	75855	1991	Road Match	0m
	Fork Lift Truck Mfrs. &/Or Imps. &/Or Dists.	Vagg. K. R. & K. J. Forklifts., Creswick Rd. Mount Rowan. 3352	75857	1991	Road Match	0m
	Fork Lift Truck Service, Maintenance &/Or Repairs	Vagg. K. R. & K. J. Forklifts., Creswick Rd. Mount Rowan. 3352	75860	1991	Road Match	0m

Business Directory Content reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018 and Sands & McDougall's Directory of Victoria (Digitised by State Library Victoria)

Dry Cleaners, Motor Garages & Service Stations

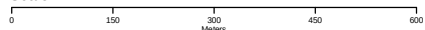
Noble Court, Mount Rowan, VIC 3352



Legend

- Site Boundary
- Buffer 500m
- 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:



Coordinate System:
GDA 1994 MGA Zone 55

Date: 30 June 2025

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018
Sands & McDougall's Directory - Digitised by State Library Victoria
Property Boundaries © State Government Victoria - Dept. of Environment, Land, Water & Planning 2025

Historical Business Directories

Noble Court, Mount Rowan, VIC 3352

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

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

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

Business Directory Content reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018 and Sands & McDougall's Directory of Victoria (Digitised by State Library Victoria)

Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

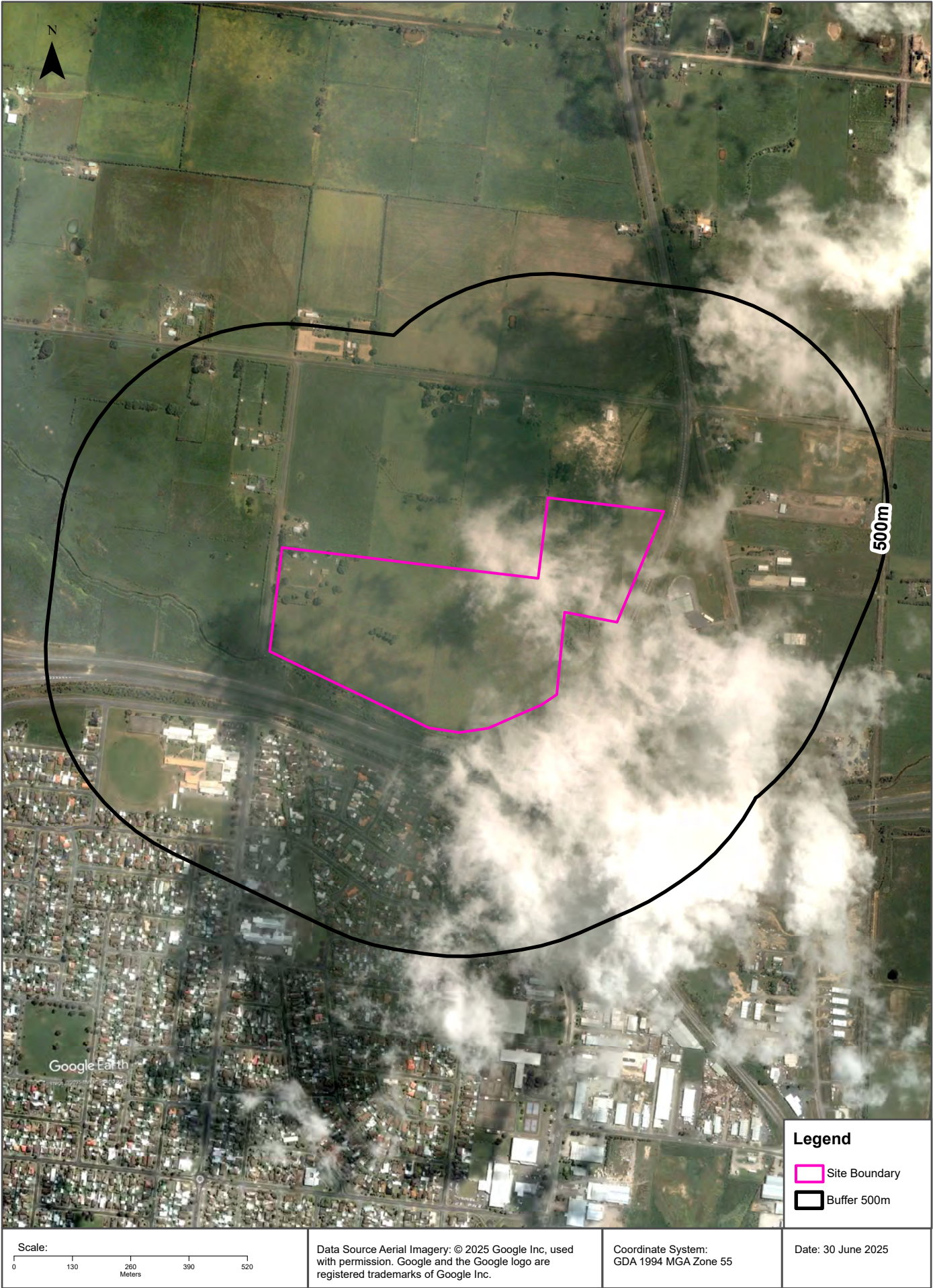
Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories and Sands & McDougall's Directories, mapped to a road or an area within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory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

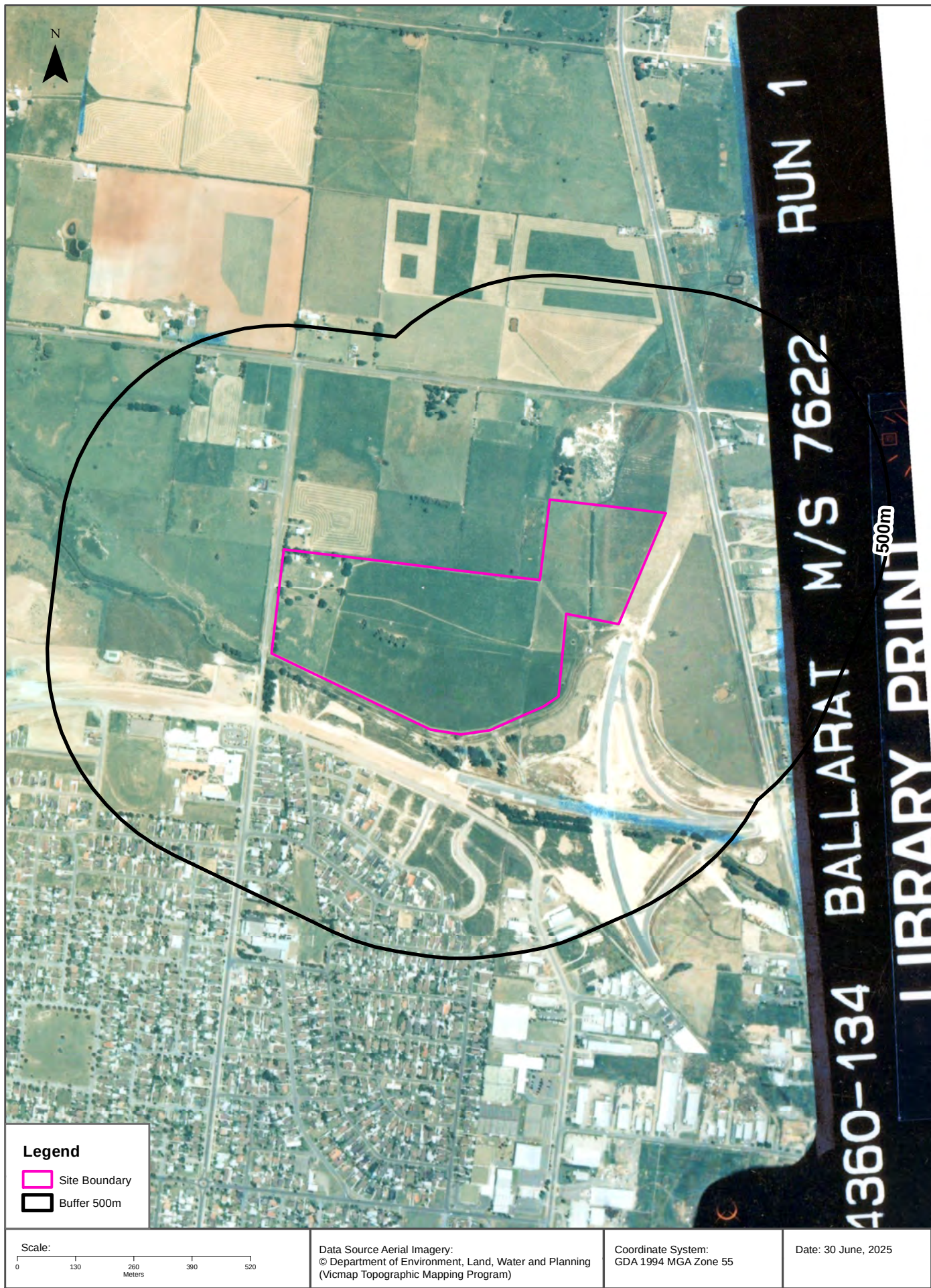
Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	Motor Garages &/Or Engineers &/Or Service Stations	Wendouree Motors Pty.Ltd. Forest St. Ballarat, 3350	67880	1980	Road Match	159m
	Motor Garages &/Or Engineers &/Or Service Stations	Wendouree Motors. Forest St. Ballarat, 3350	67881	1980	Road Match	159m

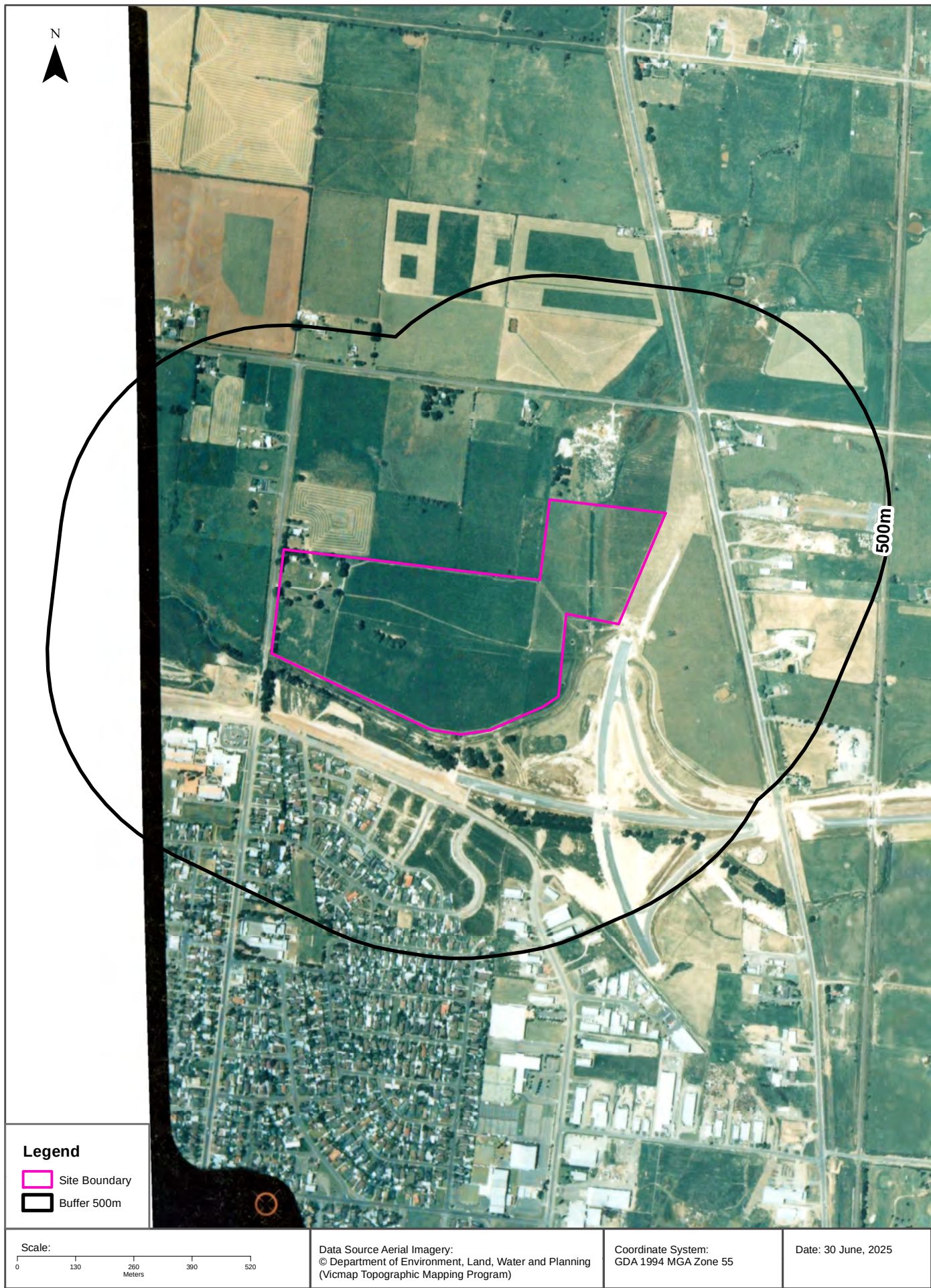
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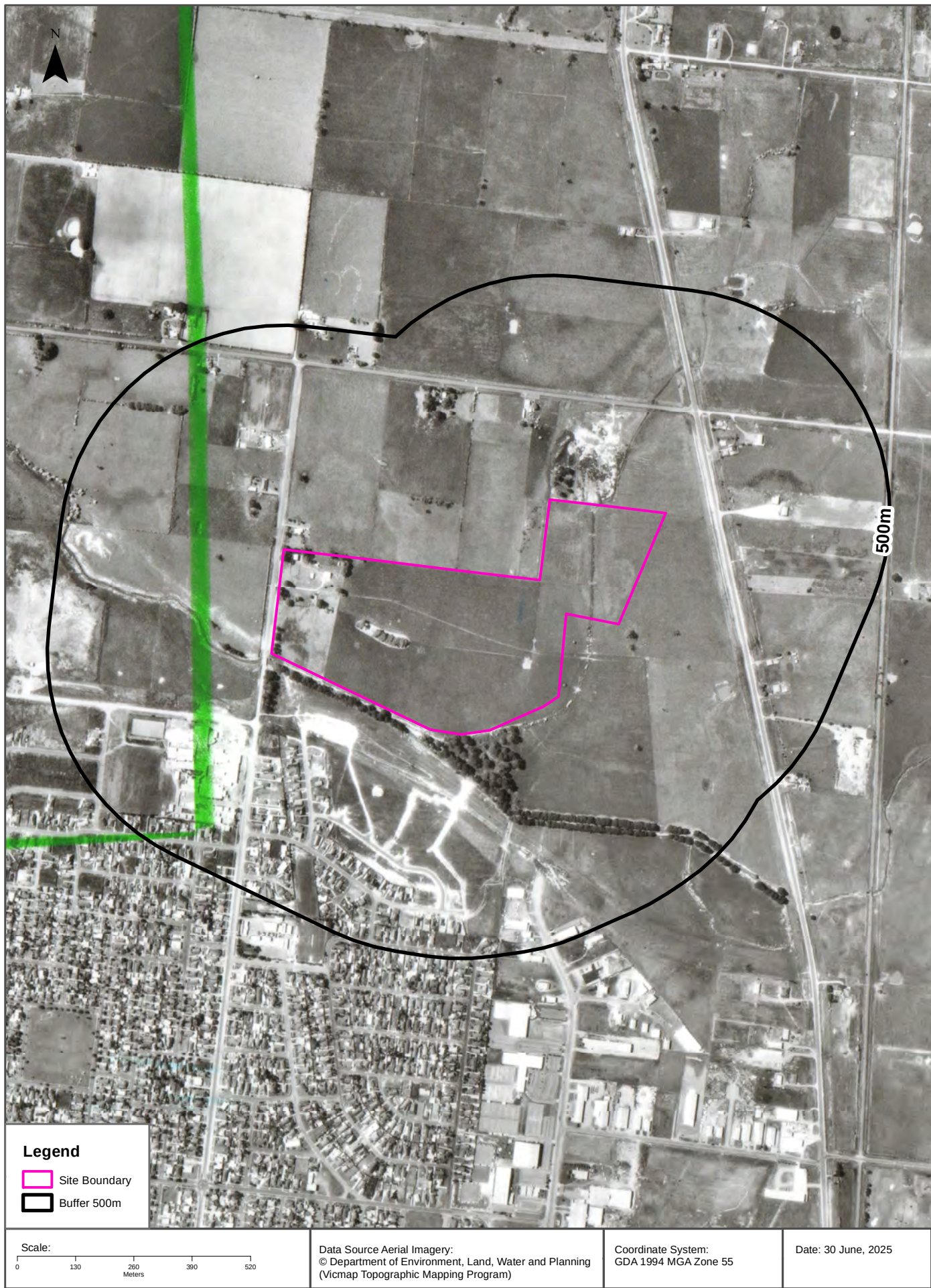


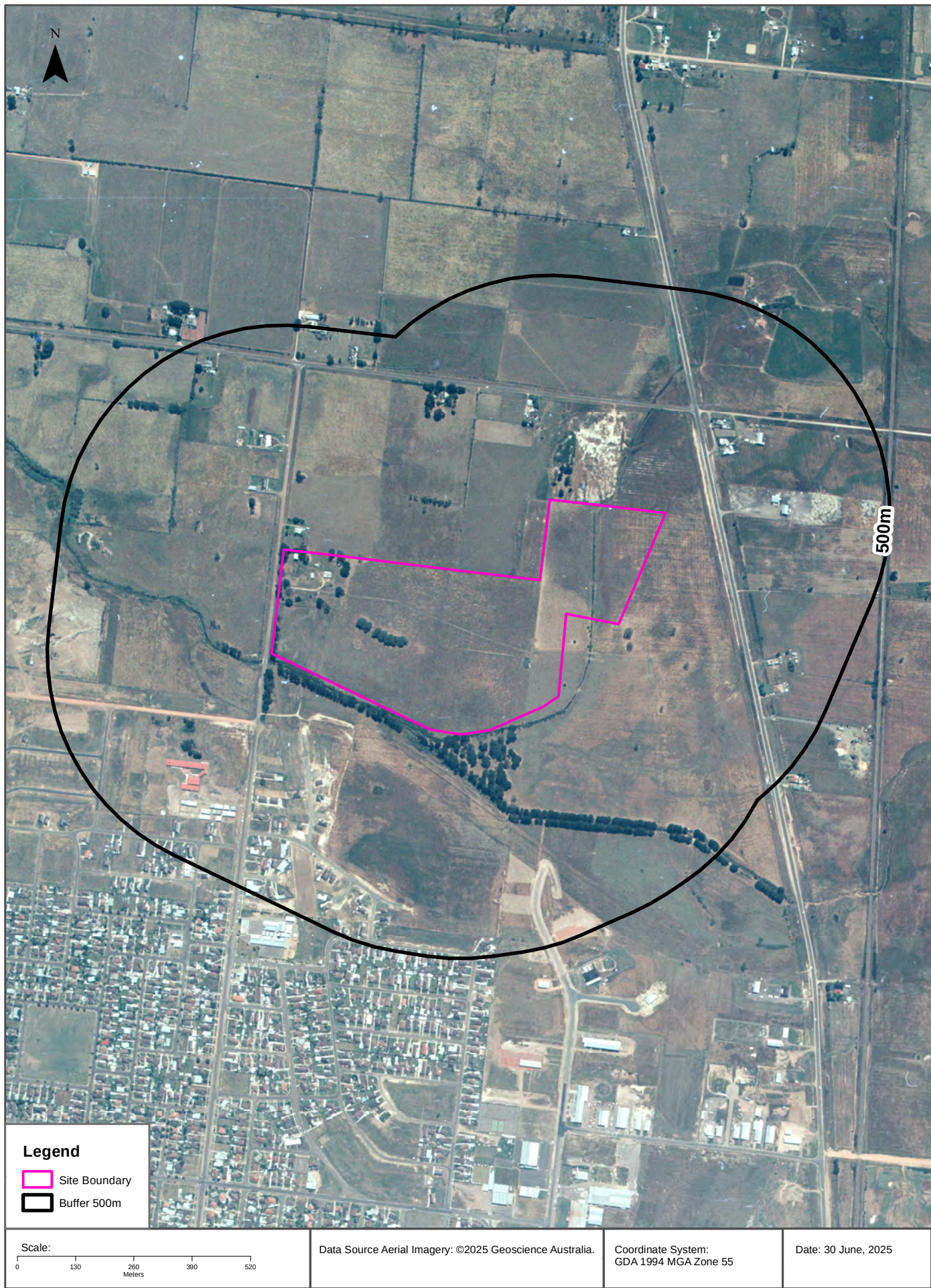


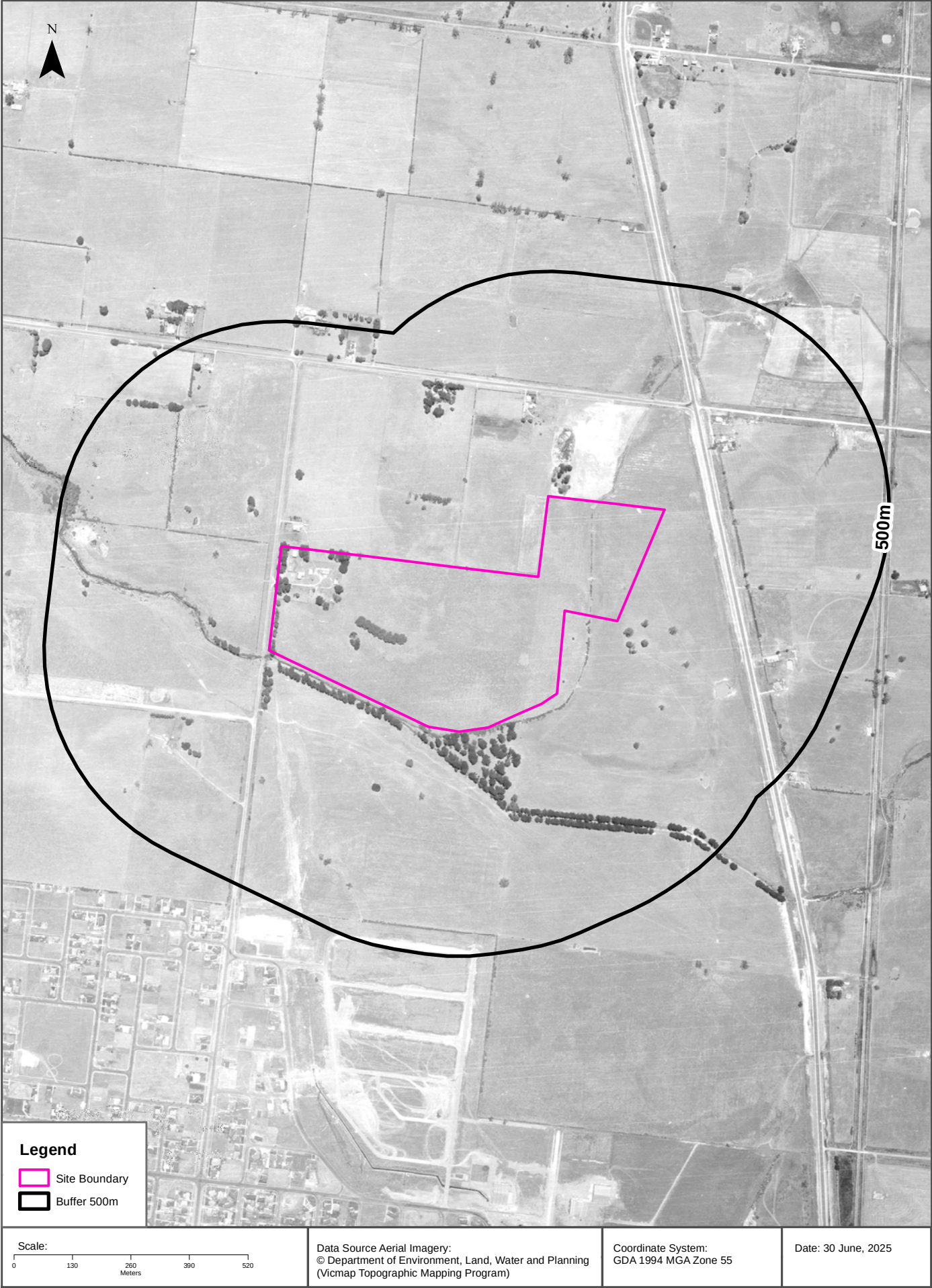


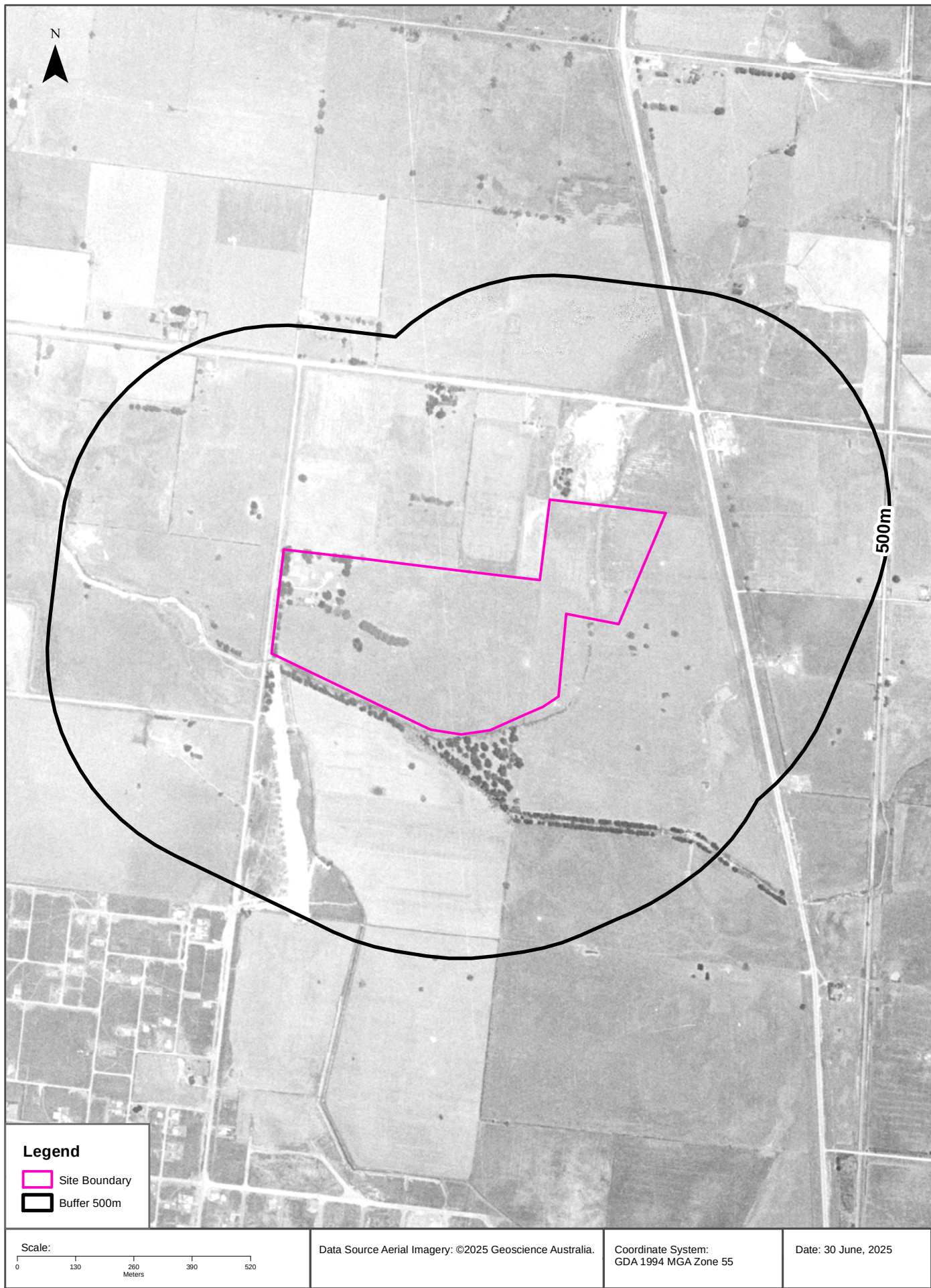




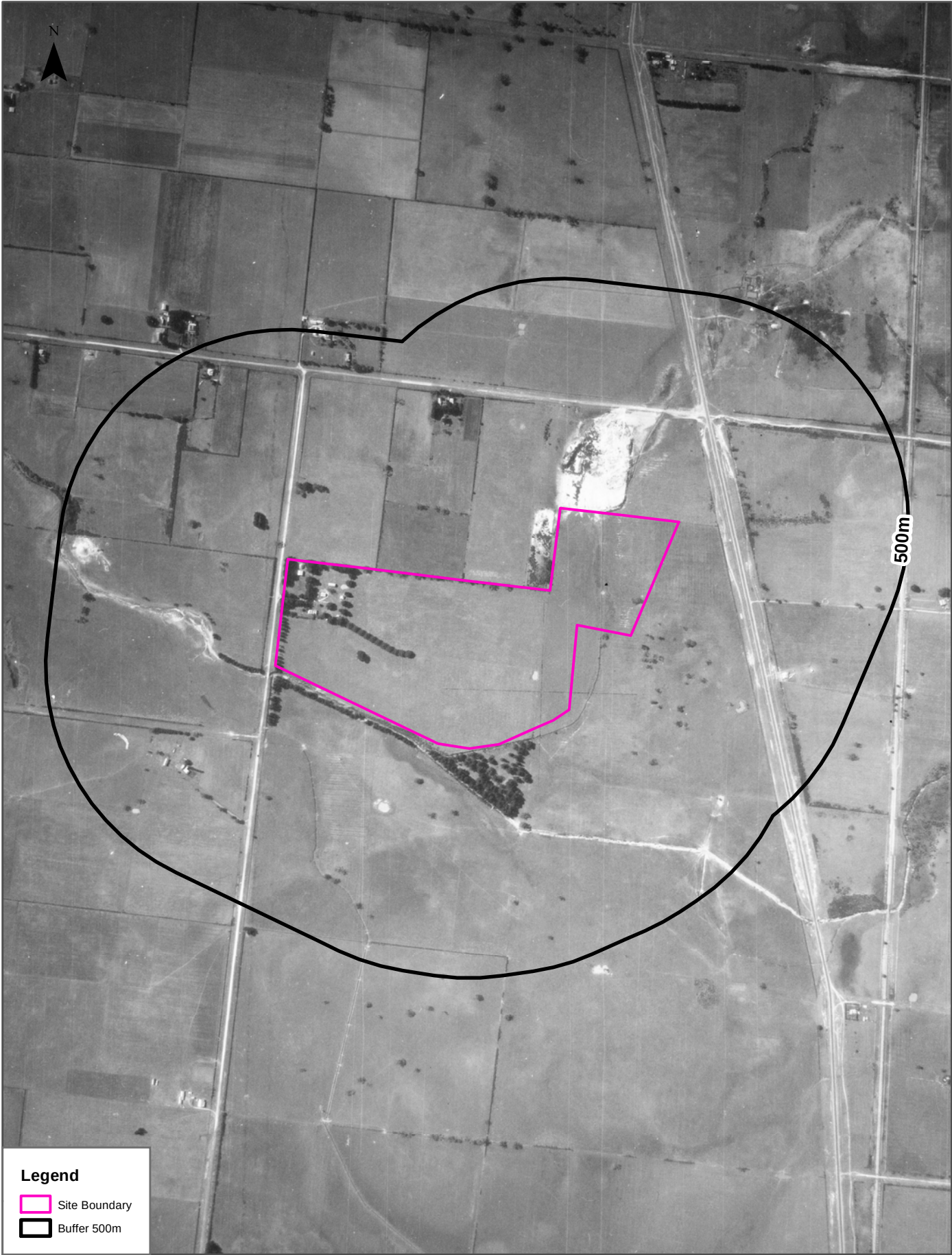




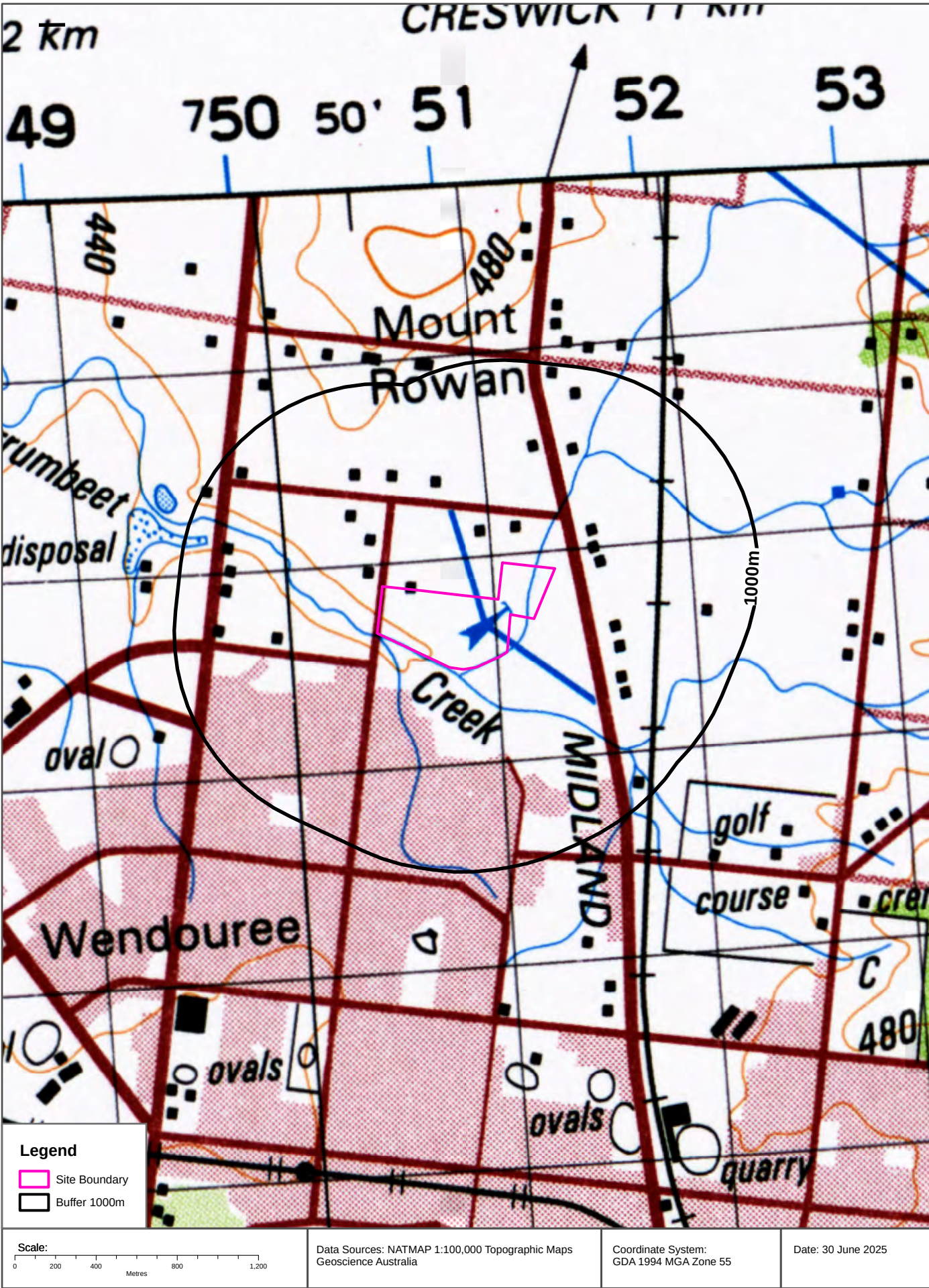






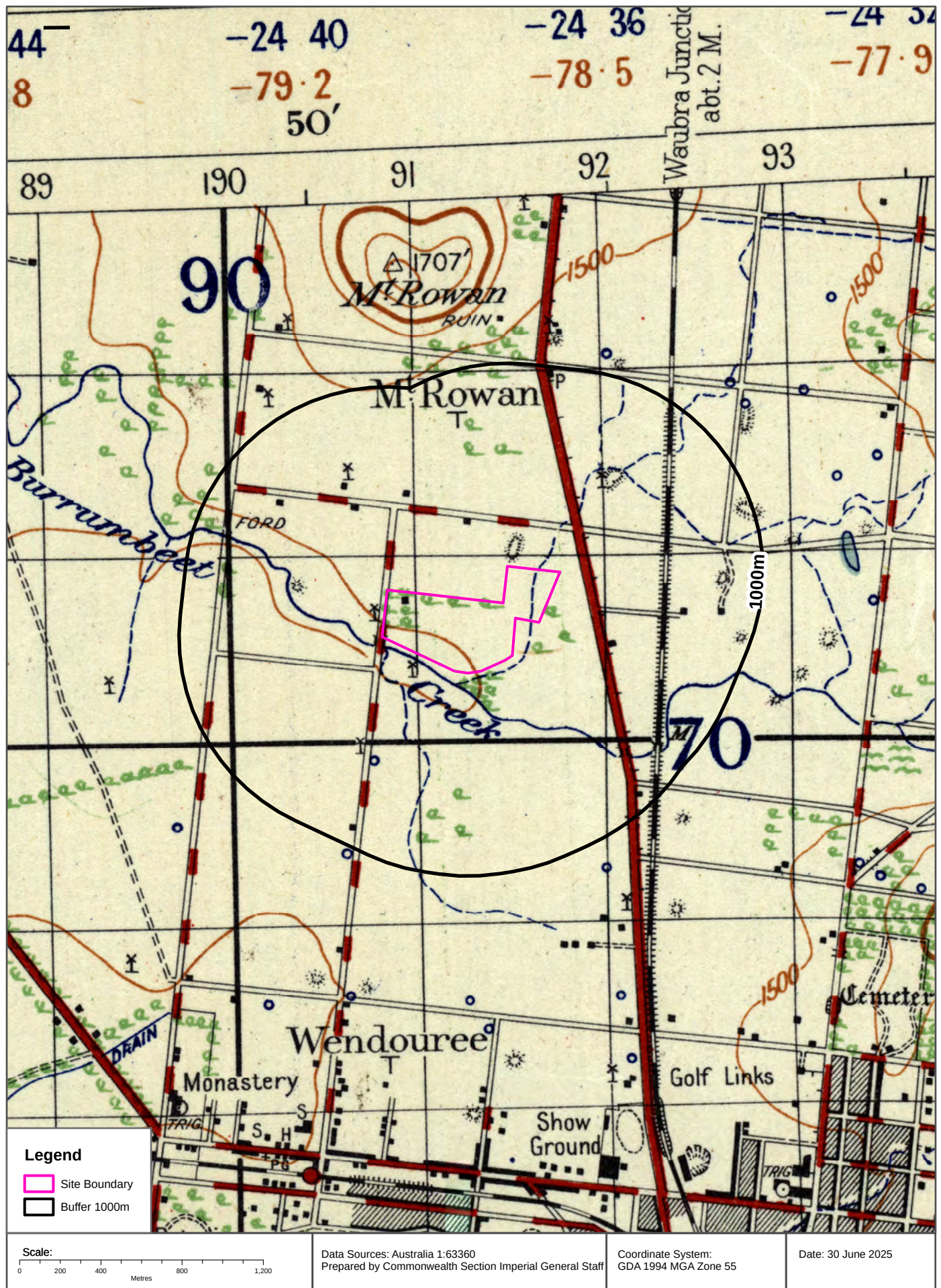


Scale: 0 130 260 390 520 Meters	Data Source Aerial Imagery: ©2025 Geoscience Australia.	Coordinate System: GDA 1994 MGA Zone 55	Date: 30 June, 2025
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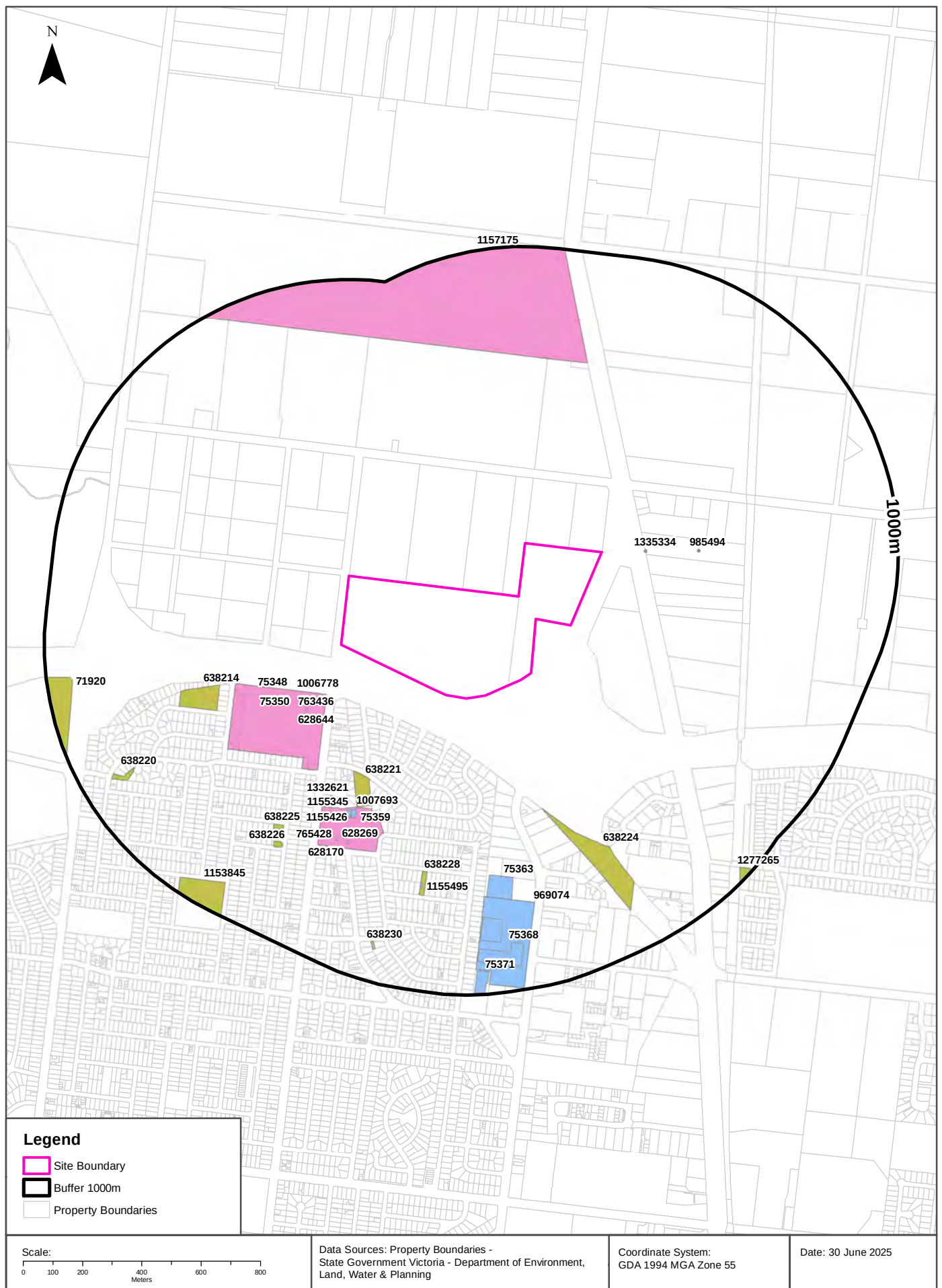
Historical Map c.1936

Noble Court, Mount Rowan, VIC 3352



Features of Interest

Noble Court, Mount Rowan, VIC 3352



Features of Interest

Noble Court, Mount Rowan, VIC 3352

Features of Interest

Features of Interest within the dataset buffer:

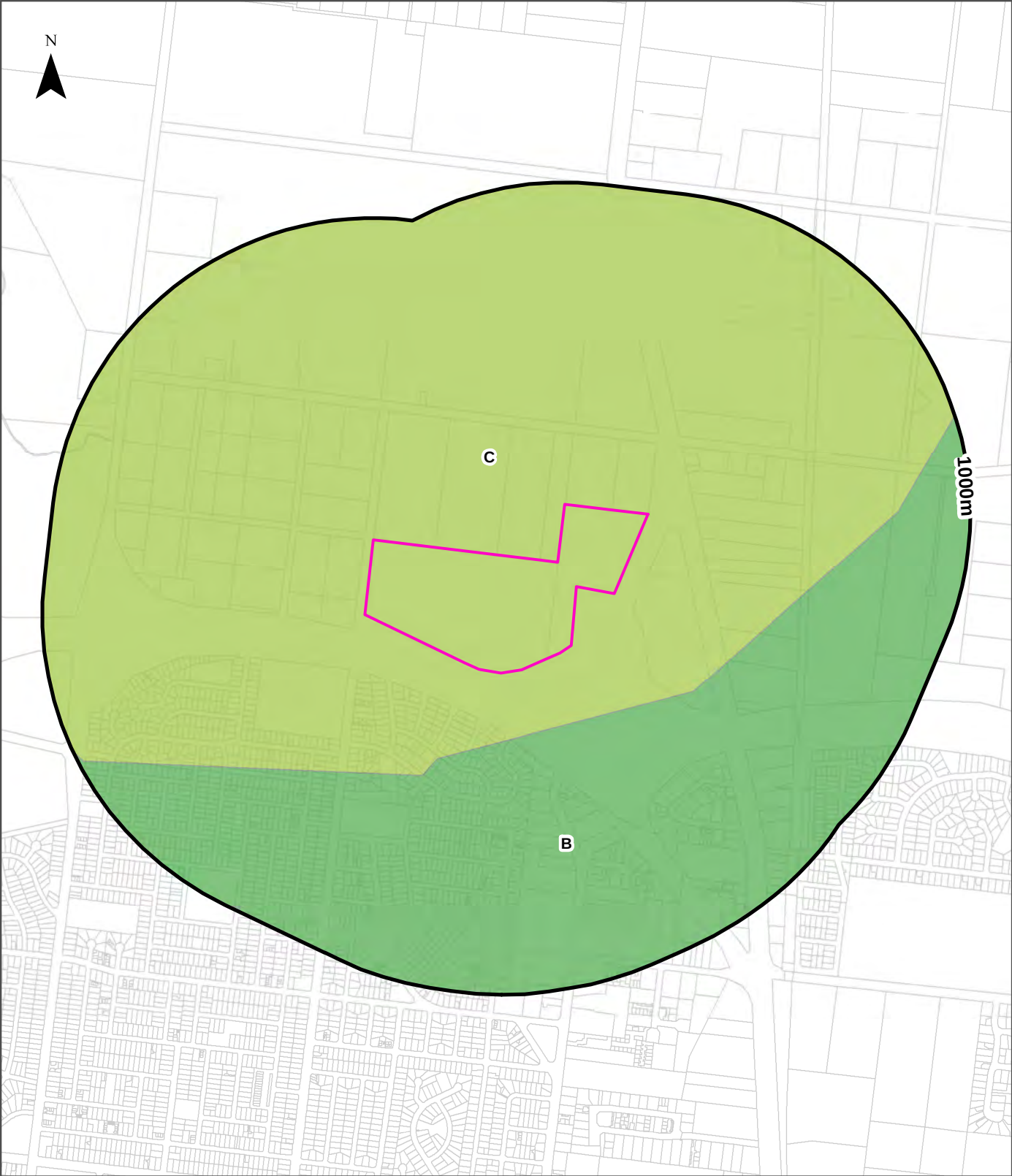
Feature Id	Feature Type	Feature Sub Type	Name	Distance	Direction
1335334	admin facility	office	Mount Rowan Office/Depot	141m	East
1006778	education centre	education complex		174m	South West
628644	education centre	secondary school	Mount Rowan Secondary College - Mount Rowan Campus	242m	South West
763436	education centre	secondary school	Mount Rowan Secondary College	242m	South West
75348	sport facility	basketball court		284m	West
985494	emergency facility	emergency coordination centre	Ballarat Incident Control Centre	321m	East
75350	sport facility	sports ground		349m	South West
638221	reserve	park	Rowan View Park	365m	South West
638224	reserve	park		424m	South East
638214	reserve	park	Ealing Avenue Reserve	431m	West
1007693	education centre	education complex		453m	South West
1332621	care facility	child care	Rowan View Childrens Centre	474m	South West
1155426	sport facility	sports ground		478m	South West
1155345	sport facility	sports ground		487m	South West
75359	sport facility	sports complex		503m	South West
1155493	recreational resource	playground		529m	South West
628170	education centre	special school	Forest Street Primary School - Forest Street Deaf Facility	586m	South West
628269	education centre	primary school	Forest Street Primary School	586m	South West
765428	education centre	primary school	Forest Street Primary School	593m	South West
638228	reserve	park	John Street Reserve	598m	South
75363	sport facility	tennis court		600m	South
1157175	education centre	education complex		626m	North
638225	reserve	park	Carpenter Street Reserve	633m	South West
1155495	recreational resource	playground		642m	South
969074	sport facility	sports complex	Hollioake Park	669m	South
638226	reserve	park	Carpenter Street Playground	687m	South West
75368	sport facility	tennis court		739m	South
638220	reserve	park	Langstaffe Drive Reserve	809m	South West
638230	reserve	park	Harrow Street Reserve	866m	South
1153845	reserve	park	Montgomery Street Reserve	893m	South West
71920	reserve	park	Pioneer Park	913m	West
75371	sport facility	bowling green	Webbcona Bowls Club	919m	South

Feature Id	Feature Type	Feature Sub Type	Name	Distance	Direction
1277265	reserve	park		961m	South East

Features of Interest Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Watertable Salinity

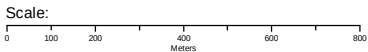
Noble Court, Mount Rowan, VIC 3352



Legend

- Site Boundary
- Buffer 1000m
- Property Boundaries

Groundwater Segment (TDS mg/L)	
A1 (0-600)	D (5401 - 7100)
A2 (601-1200)	E (7101 - 10000)
B (1201-3100)	F (>10000)
C (3101 - 5400)	



Data Sources: Property Boundaries -
State Government Victoria - Department of Environment,
Land, Water & Planning

Coordinate System:
GDA 1994 MGA Zone 55

Date: 30 June 2025

Hydrogeology & Groundwater

Noble Court, Mount Rowan, VIC 3352

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Dist(m)	Dir
Fractured or fissured, extensive highly productive aquifers	0	On-site

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

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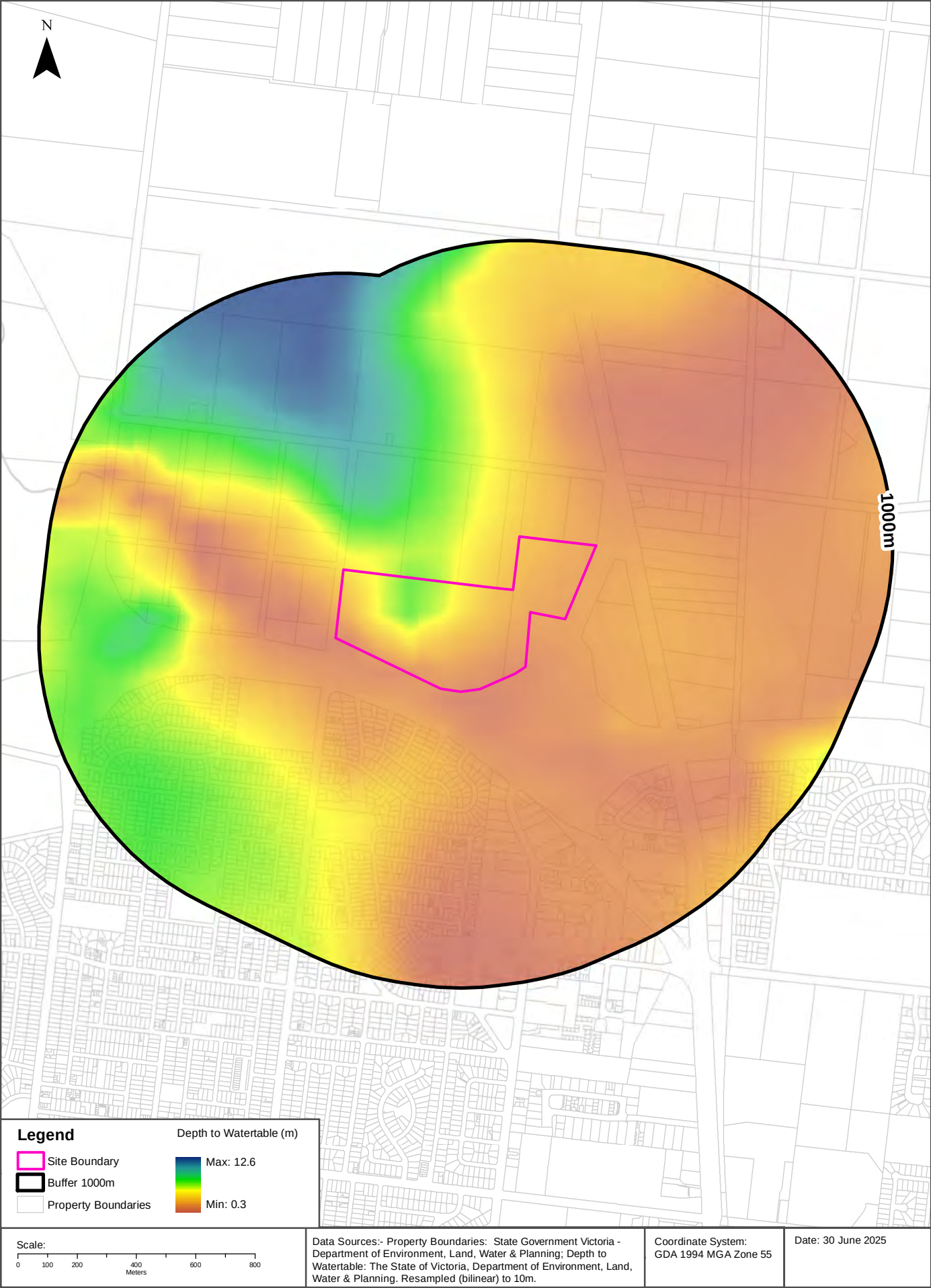
Watertable Salinity

Watertable Salinity concentrations within the dataset buffer:

Groundwater Segment	Total Dissolved Solids (mg/L)	Dist(m)	Dir
C	3101 - 5400	0	On-site
B	1201 - 3100	200	South East

Source: Watertable Salinity

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Hydrogeology & Groundwater

Noble Court, Mount Rowan, VIC 3352

Depth to Watertable

On-site Depth to Watertable:

Depth to Watertable	Percent Of Site Area
Less than 5 metres	80
5 to 10 metres	20

Surface Elevation

Approximate on-site Surface Elevation:

Surface Elevation
438 AHDm to 446 AHDm

Basement Elevation

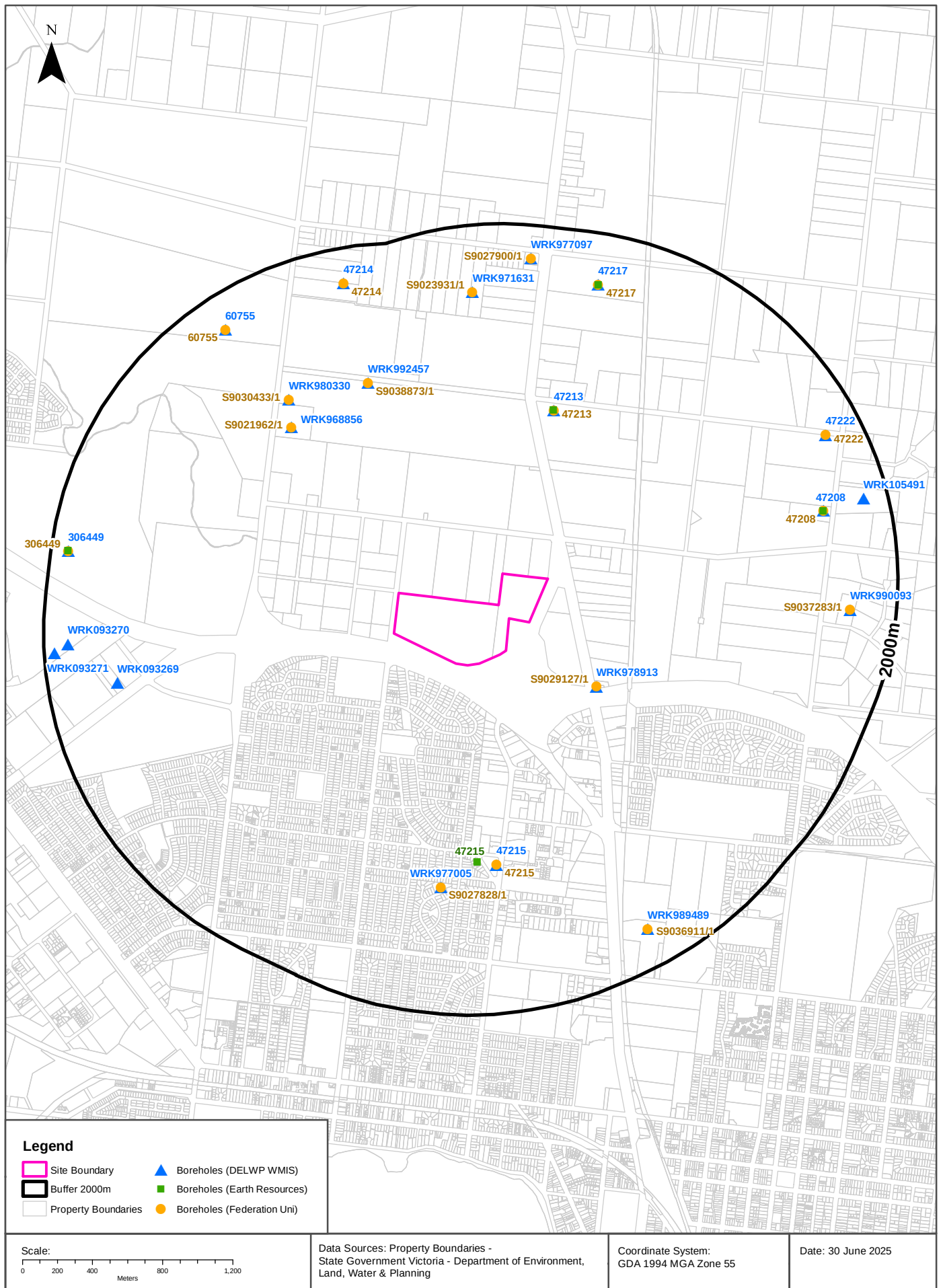
Approximate on-site Basement Elevation:

Basement Elevation - Basement Rocks comprise Lower Palaeozoic basement rocks that form the highlands and the crystalline basement; and Mesozoic rocks of the Otway and Gippsland basins both outcropping and subsurface
423 AHDm to 434 AHDm

Groundwater Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Noble Court, Mount Rowan, VIC 3352



Groundwater Boreholes

Noble Court, Mount Rowan, VIC 3352

Boreholes (DELWP WMIS)

Boreholes from the Department of Environment, Land, Water & Planning's Water Measurement Information System, within the dataset buffer:

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
WRK978913							530m	South East
47213	Domestic, Stock	0.00m-0.30m GREY LOAM AND BUCKSHOT 0.30m-3.50m STIFF GREY AND ORANGE CLAY 3.50m-6.90m LOOSE GRANULAR CREAM CLAY 6.90m-10.50m YELLOW AND GREY CLAY 10.50m-13.50m BROWN DECAYED BASALT 13.50m-27.00m HARD BLUE BASALT 27.00m-0.00m LIGHT BLUE CLAY	0.00m-8.00m INNER LINING - CASING = Pvc 8.00m-27.00m INNER LINING - SCREEN = Pvc		8.00m-27.00m	29/11/1982	961m	North
WRK968856							1129 m	North West
47215	Irrigation	0.00m-1.00m TOP SOIL 1.00m-7.00m CLAY AND BASALT 7.00m-9.00m VOLCANIC ASH 9.00m-12.00m BASALT	0.00m-9.00m INNER LINING - CASING = Pvc 9.00m-11.50m INNER LINING - SCREEN = Pvc 11.50m-12.00m INNER LINING - CASING = Pvc		9.00m-11.50m Basalt	30/06/1984	1151 m	South
WRK992457							1214 m	North West
WRK980330							1270 m	North West
WRK977005							1278 m	South
WRK093269	Observation	0.00m-7.50m CLAY 7.50m-10.00m ROCK/WEATHERED	0.00m-8.00m INNER LINING - CASING = Pvc 8.00m-10.00m INNER LINING - SCREEN = Pvc 0.00m-6.50m OUTER LINING - GRAVEL = Cement 6.50m-7.50m OUTER LINING - GRAVEL = Bentonite 7.50m-10.00m OUTER LINING - GRAVEL = Gravel			11/04/2016	1604 m	West
WRK971631							1618 m	North
47208	Domestic	0.00m-1.00m TOP GREY SOIL 1.00m-17.00m MOTTLE CLAY 17.00m-31.00m SOFT SANDSTONE 31.00m-39.00m HARD SANDSTONE AND QUARTZ	0.00m-20.00m INNER LINING - CASING = Pvc 20.00m-39.00m INNER LINING - SCREEN = Pvc		20.00m-39.00m Sandstone	01/04/1978	1622 m	East
47217	Domestic	0.00m-1.00m TOP SOIL 1.00m-2.00m CLAY 2.00m-18.00m SCORIA AND CLAY 18.00m-49.00m BASALT	0.00m-33.00m INNER LINING - CASING = Pvc 33.00m-36.00m INNER LINING - SCREEN = Pvc		33.00m-36.00m Basalt	01/10/1984	1706 m	North
WRK990093							1737 m	East
WRK989489							1782 m	South East
47222	Domestic, Stock					01/01/1988	1787 m	North East
47214	Domestic	0.00m-4.50m BROWN EARTH AND STIFF BROWN CLAY 4.50m-21.00m FRACTURED AND BRITTLE BLUE BASALT 21.00m-30.00m HARD BLUE BASALT 30.00m-33.00m STIFF BLUE CLAY 33.00m-39.00m HARD BLUE BASALT 39.00m-45.00m FRACTURED BLUE BASALT 45.00m-55.00m MEDIUM-HARD BLUE BASALT 55.00m-56.00m VERY SOFT BRITTLE BLACK BASALT 56.00m-60.00m SANDY YELLOW MUDSTONE	0.00m-38.00m INNER LINING - CASING = Pvc 38.00m-40.00m INNER LINING - SCREEN = Pvc 40.00m-56.00m INNER LINING - CASING = Pvc 56.00m-58.00m INNER LINING - SCREEN = Pvc		38.00m-40.00m Basalt 56.00m-58.00m Mudstone	11/03/1986	1797 m	North

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
60755	Domestic, Stock	0.00m-1.00m TOP SOIL 1.00m-30.00m CLAY 30.00m-36.00m BASALT 36.00m-40.00m CLAY 40.00m-60.00m LOOSE ROCK	-0.30m-49.00m INNER LINING - CASING = Pvc 49.00m-52.00m INNER LINING - SCREEN = Pvc 52.00m-60.00m INNER LINING - CASING = Pvc		49.00m-52.00m Basalt	10/01/1991	1801 m	North West
WRK977097							1808 m	North
WRK105491	Domestic & Stock	0.00m-1.00m Top Soil 1.00m-32.00m CLAYSTONE 32.00m-56.00m Yellow 56.00m-92.00m GREY	0.00m-36.00m INNER LINING - CASING = UPVC class 12 36.00m-70.00m INNER LINING - CASING = UPVC class 12 70.00m-90.00m INNER LINING - SLOT = UPVC class 12 90.00m-92.00m INNER LINING - CASING = UPVC class 12 0.10m-6.00m OUTER LINING - GRAVEL = Cement 6.00m-9.50m OUTER LINING - GRAVEL = Bentonite 9.50m-10.00m OUTER LINING - GRAVEL = Seal			01/05/2018	1861 m	East
WRK093270	Observation	0.00m-1.00m FILL 1.00m-1.60m CLAY 1.60m-13.50m ROCK/WEATHERED	0.00m-12.00m INNER LINING - CASING = Pvc 12.00m-13.50m INNER LINING - SCREEN = Pvc 0.00m-10.00m OUTER LINING - GRAVEL = Cement 10.00m-10.50m OUTER LINING - GRAVEL = Bentonite 10.50m-13.50m OUTER LINING - GRAVEL = Gravel			11/04/2016	1863 m	West
306449	Non Groundwater					31/12/1890	1902 m	West
WRK093271	Observation	0.00m-5.00m CLAY 5.00m-15.00m ROCK/WEATHERED	0.00m-13.00m INNER LINING - CASING = Pvc 13.00m-15.00m INNER LINING - SCREEN = Pvc 0.00m-12.00m OUTER LINING - GRAVEL = Cement 12.00m-12.50m OUTER LINING - GRAVEL = Bentonite 12.50m-15.00m OUTER LINING - GRAVEL = Gravel			11/04/2016	1940 m	West

Boreholes WMIS Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Groundwater Boreholes

Noble Court, Mount Rowan, VIC 3352

Boreholes (Earth Resources Database)

Boreholes from the Earth Resources dataset, within the dataset buffer:

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Dir
47213		Private Individual/Corporation		Percussion (cable)	Abandoned	29/11/1982	27.00		100	962m	North
47215		Private Individual/Corporation	Public/town water supply	Air Percussion/Air Rotary		30/06/1984	12.00		100	1127m	South
47208		Private Individual/Corporation	Domestic water supply	Air Percussion/Air Rotary		30/04/1978	39.00		300	1621m	East
47217		Private Individual/Corporation	Domestic water supply	Air Percussion/Air Rotary		01/10/1984	49.00		100	1706m	North
306449		Department of Manufacturing & Industry Development				31/12/1890	65.84		300	1903m	West

Boreholes Earth Resources Data Source: © The State of Victoria, Department of Economic Development, Jobs, Transport and Resources 2015. Creative Commons Attribution 3.0 Australia

Boreholes (Federation University)

Boreholes from the Federation University Australia dataset, within the dataset buffer:

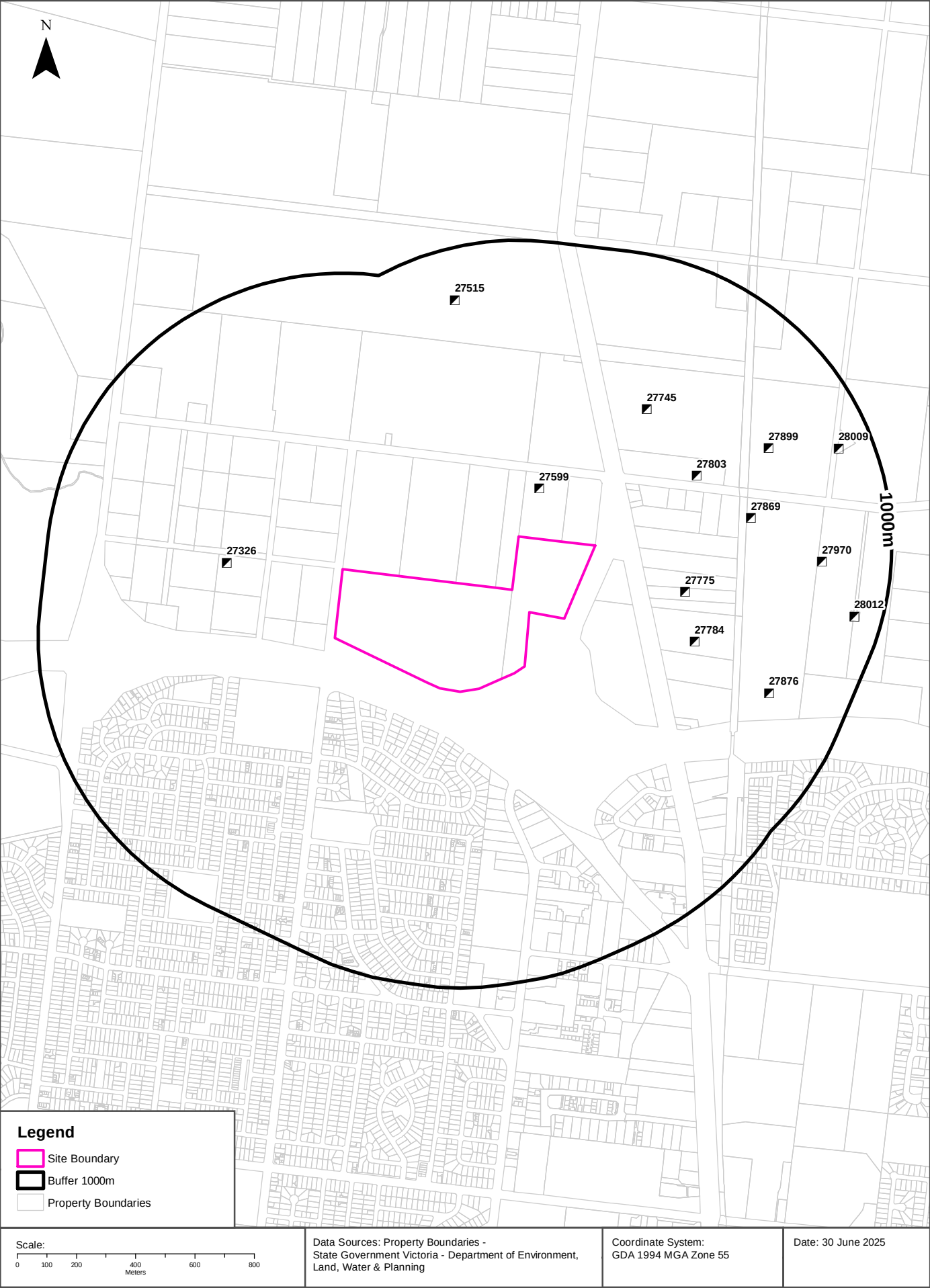
Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Dir
S9029127/1		Groundwater				530m	South East
47213		Groundwater	Domestic Stock		D: 0.000m-0.300m Grey Loam And Buckshot D: 0.300m-3.500m Stiff Grey And Orange Clay D: 3.500m-6.900m Loose Granular Cream Clay D: 6.900m-10.500m Yellow And Grey Clay D: 10.500m-13.500m Brown Decayed Basalt D: 13.500m-27.000m Hard Blue Basalt D: 27.000m-0.000m Light Blue Clay	961m	North
S9021962/1		Groundwater				1129m	North West
47215		Groundwater	Irrigation		D: 0.000m-1.000m Top Soil D: 1.000m-7.000m Clay And Basalt D: 7.000m-9.000m Volcanic Ash D: 9.000m-12.000m Basalt	1151m	South
S9038873/1		Groundwater				1214m	North West
S9030433/1		Groundwater				1270m	North West
S9027828/1		Groundwater				1278m	South
S9023931/1		Groundwater				1618m	North
47208		Groundwater	Domestic		D: 0.000m-1.000m Top Grey Soil D: 1.000m-17.000m Mottle Clay D: 17.000m-31.000m Soft Sandstone D: 31.000m-39.000m Hard Sandstoneand Quartz	1622m	East
47217		Groundwater	Domestic		D: 0.000m-1.000m Top Soil D: 1.000m-2.000m Clay D: 2.000m-18.000m Scoria And Clay D: 18.000m-49.000m Basalt	1706m	North
S9037283/1		Groundwater				1737m	East
S9036911/1		Groundwater				1782m	South East

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Dir
47222	Rural Water Commission / Corporation (1984 - 1995)	Groundwater	Domestic Stock			1787 m	North East
47214	Rural Water Commission / Corporation (1984 - 1995)	Groundwater	Domestic		D: 0.000m-4.500m Brown Earth And Stiff Brown Clay D: 4.500m-21.000m Fractured And Brittle Blue Basalt D: 21.000m-30.000m Hard Blue Basalt D: 30.000m-33.000m Stiff Blue Clay D: 33.000m-39.000m Hard Blue Basalt D: 39.000m-45.000m Fractured Blue Basalt D: 45.000m-55.000m Medium-Hard Blue Basalt D: 55.000m-56.000m Very Soft Brittle Black Basalt D: 56.000m-60.000m Sandy Yellow Mudstone	1797 m	North
60755		Groundwater	Domestic Stock		D: 0.000m-1.000m Top Soil D: 1.000m-30.000m Clay D: 30.000m-36.000m Basalt D: 36.000m-40.000m Clay D: 40.000m-60.000m Loose Rock	1801 m	North West
S9027900/1		Groundwater				1807 m	North
306449			Non Groundwater		D: 0.000m-1.100m Surface Soil D: 1.100m-2.100m Rock Boulders D: 2.100m-4.900m Clay D: 4.900m-13.000m Grey Honeycomb Rock D: 13.000m-27.500m Blue Rock D: 27.500m-51.200m Very Hard Blue Rock D: 51.200m-57.900m Various Coloured Clays D: 57.900m-65.800m Brown Sandstone-Bottom	1902 m	West

Boreholes FedUni Data Source: © Federation University Australia

Historical Mining Activity - Shafts

Noble Court, Mount Rowan, VIC 3352



Historical Mining Activity - Shafts

Noble Court, Mount Rowan, VIC 3352

Historical Mining Activity - Shafts

Mine Shaft Locations were collected by a variety of methods from 1869 in some areas of the state, mainly concentrating in Ballarat and Bendigo. In places a shaft may be recorded multiple times with a different source. In cases where several shaft locations are shown close together (generally with separations less than stated position errors) and they have different sources, it is possible that one shaft has been mapped several times. In cases where several shaft locations are shown close together but they have the same information source, it is possible that each shaft location represents a different shaft on the ground.

Historical Mine Shafts within the dataset buffer:

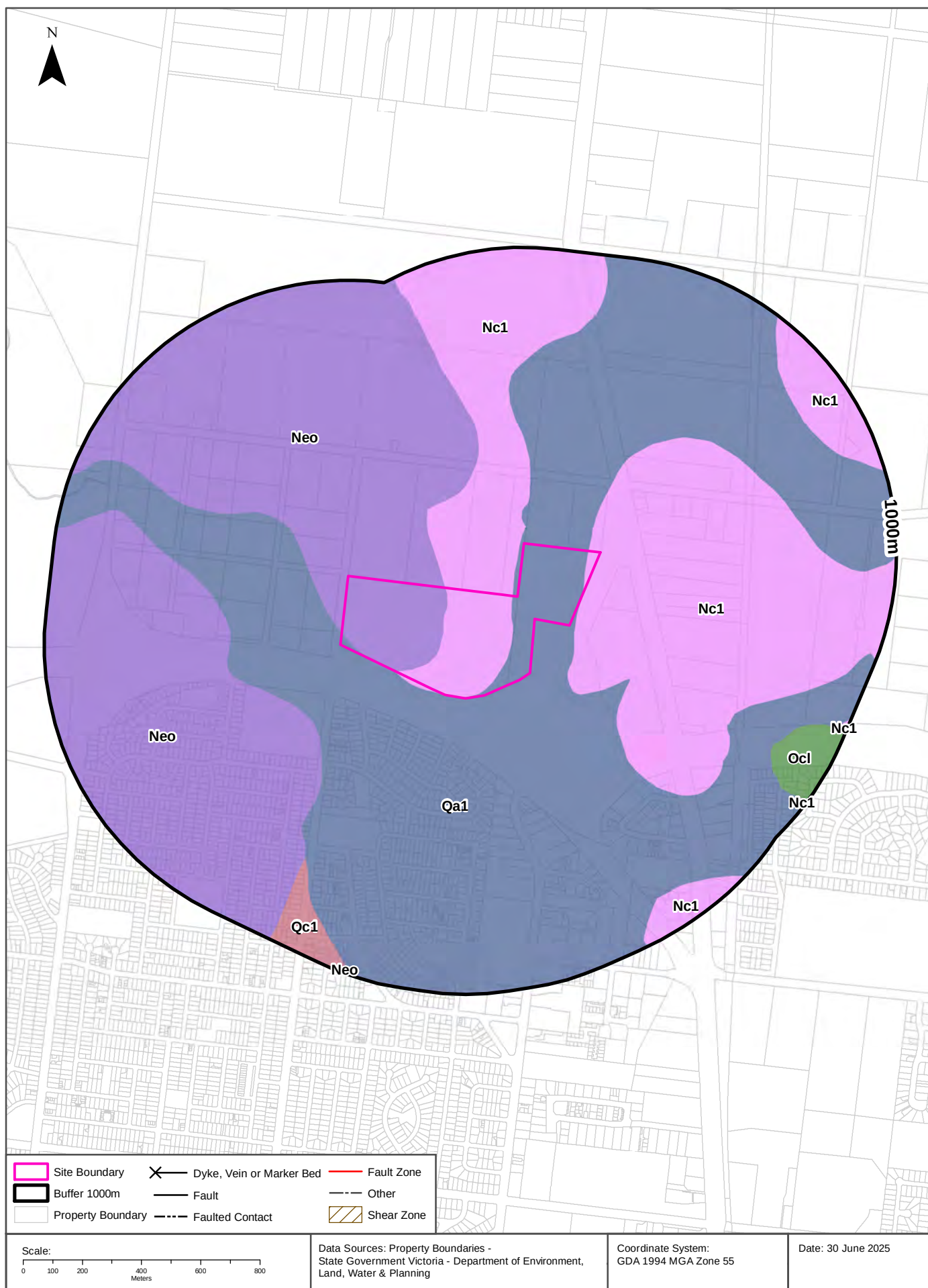
Map Id	Name	Source	Depth (m)	Collar (ft)	Fill/Cap Method	Location Desc	Location Accuracy	Distance	Direction
27599	NORTHERN JUNCTION CO.	Digitized for Ginger					30	169m	North East
27775	ROYAL MINT CO.	Digitized for Ginger					30	340m	East
27326	United Suburban Co.	Digitized for Ginger					30	391m	West
27803	North Star Freehold G.M. Co.	Digitized for Ginger					30	415m	North East
27784	ROYAL MINT CO.	Digitized for Ginger					30	436m	East
27745	ROSE HILL G.M.CO.	Digitized for Ginger					30	492m	North East
27869	Hero Co.	Digitized for Ginger					30	534m	East
27899	New Rose Hill Co.	Digitized for Ginger					30	671m	North East
27876	Conqueror Co.	Digitized for Ginger					30	735m	East
27970	BALLARAT EXTENSION G.M.CO.	Digitized for Ginger					30	766m	East
27515	Quick and Co.	Digitized for Ginger					30	826m	North
28009	ROSE HILL G.M.CO.	Digitized for Ginger					30	885m	North East
28012	James Baines Co.	Digitized for Ginger					30	906m	East

Historical Mining Activity Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources

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Geology

Noble Court, Mount Rowan, VIC 3352



Geology

Noble Court, Mount Rowan, VIC 3352

Geological Units 1:50,000

What are the Geological Units within the dataset buffer?

Symbol	Name	Description	Geological Age	Lithology	Distance	Direction
Neo	Newer Volcanic Group - basalt flows (Neo): generic	Olivine tholeiite, quartz tholeiite, basanite, basaltic icelandite, hawaiiite, mugearite, minor scoria and ash, fluvial sediments: tholeiitic to alkaline; includes sheet flows and valley flows and intercalated gravel, sand, clay	Miocene to Holocene	alkali basalt (major proportion); tholeiitic basalt (major proportion); alluvium (minor proportion); tuff (minor proportion)	0m	On-site
Qa1	alluvium(Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	0m	On-site
Nc1	incised colluvium (Nc1): generic	Silt, sand, gravel: generally poorly sorted and poorly rounded except within channels cut into colluvial material; dissected to variable degrees	Pliocene to Holocene	silt material (significant); sand (significant); gravel material (significant)	0m	On-site
Qc1	colluvium(Qc1): generic	Diamictite, gravel, sand, silt, clay, rubble: sorting variable, usually poor; generally poorly rounded; clasts locally sourced; includes channel deposits with better rounding and sorting	Pliocene to Holocene	diamictite (dominant); gravel material (significant); sand (significant); silt material (significant)	702m	South West
Ocl	Castlemaine Group - Lancefieldian(Ocl): generic	Sandstone, mudstone, black shale and minor granule quartz conglomerate: mostly thick-bedded sandstone, coarse- to fine-grained, often graded, diffusely stratified to cross laminated, moderately to well sorted; sparsely fossiliferous with graptolites and phyllocarids; deep marine turbidites and hemipelagic sediments	Lancefieldian to Lancefieldian	sandstone (significant); mudstone (significant); shale (significant); conglomerate (minor proportion)	796m	East

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Geology

Noble Court, Mount Rowan, VIC 3352

Geological Structures 1:50,000

What are the Geological Faults or Faulted Contacts within the dataset buffer?

Map Id	Type	Name	Contact	Positional Accuracy	Distance	Direction
N/A	No records in buffer					

What are the Dykes, Marker Beds and Veins within the dataset buffer?

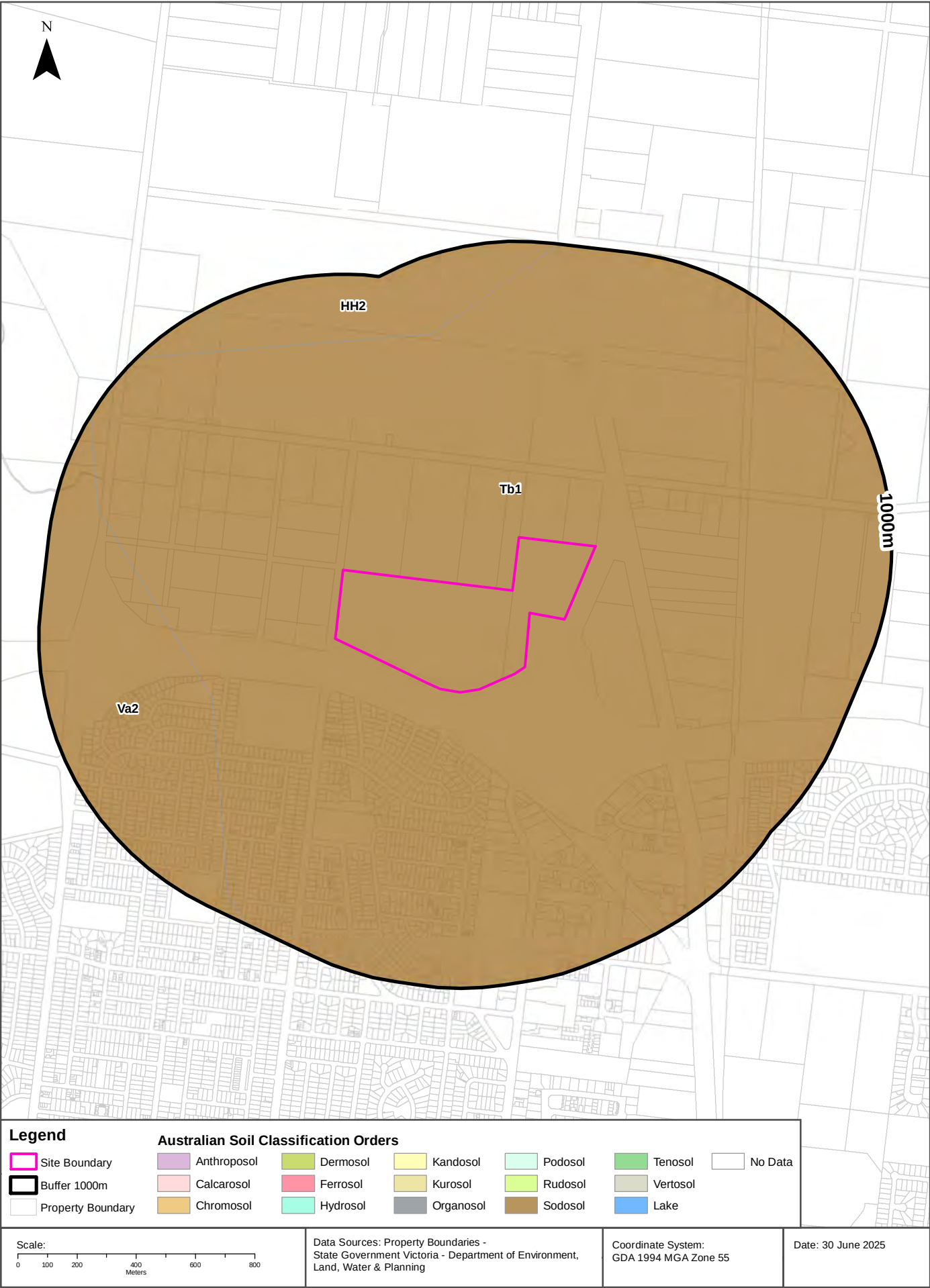
Map Id	Type	Name	Description	Positional Accuracy	Distance	Direction
N/A	No records in buffer					

Geological Structures 1:250,000

What are the Shear Zones within the dataset buffer?

Map Id	Type	Name	Description	Positional Accuracy	Distance	Direction
N/A	No records in buffer					

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources
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Soils

Noble Court, Mount Rowan, VIC 3352

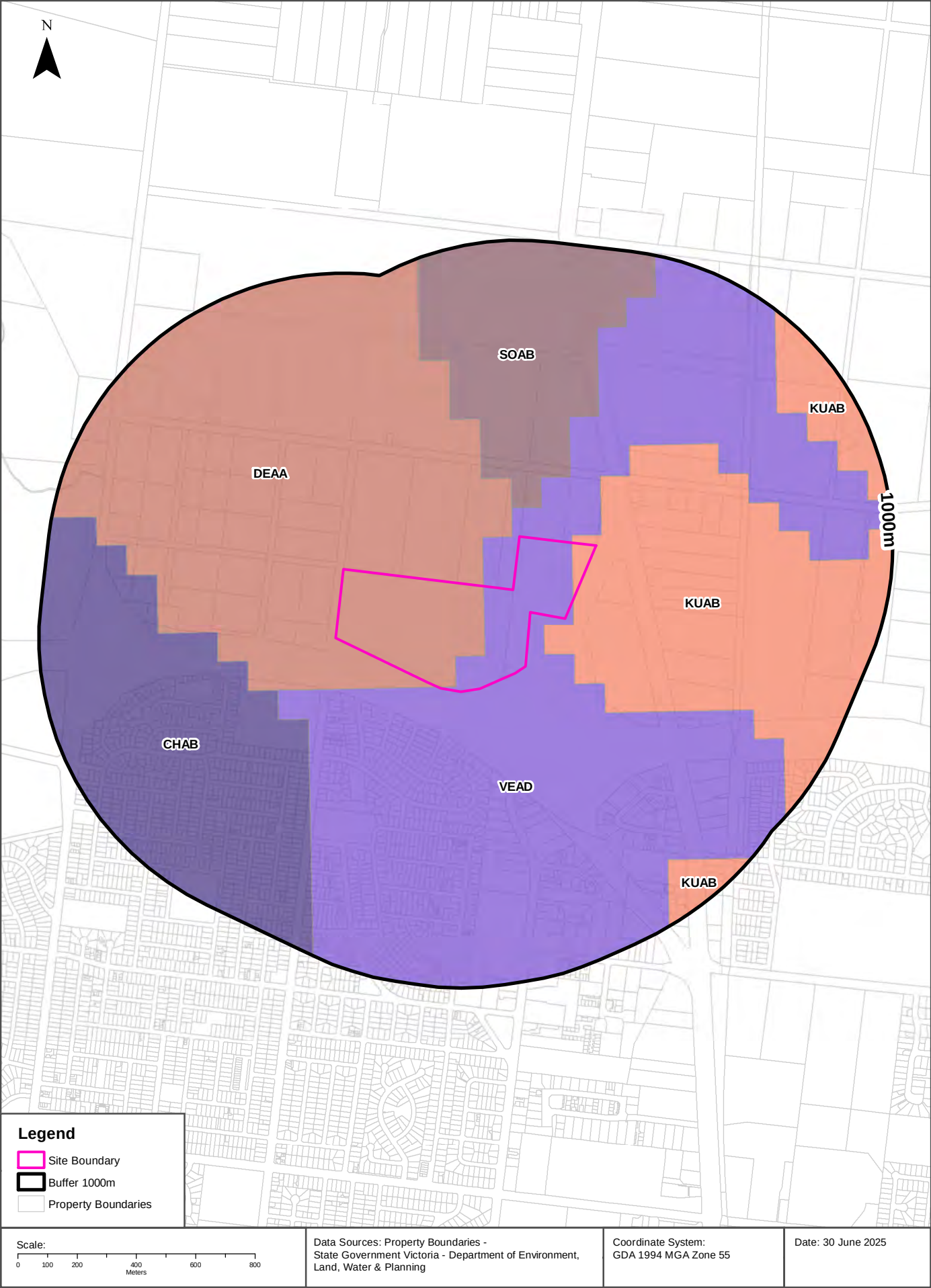
Atlas of Australian Soils

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

Map Unit Code	Soil Order	Map Unit Description	Distance	Direction
Tb1	Sodosol	Hills and valley plains: hills and hill slopes of hard acidic yellow mottled soils (Dy3.41 and Dy3.42) in association with hard neutral red soils (Dr2.22 and Dr2.32), shallow grey-brown sandy soils (Uc6.11), and rock outcrops; smaller localized areas of (Dy3.61), (Dy3.81), (Dy3.21), (Dy4.21), (Dr2.11), (Dr2.41), also (Gn2.74) on hills and slopes; valley plains of hard neutral or alkaline yellow mottled soils (Dy3.42 and Dy3.43) with red mottled soils (Dr3.33) and others not described but including cracking clays (Ug5.1) and (Um) soils. Soils of low-lying wet situations generally not studied but (Uf6.41) has been recorded therein. Note in the smaller areas of this unit only the dominant soils of the unit may occur therein.	0m	On-site
Va2	Sodosol	Plains with occasional stony rises: gilgai plains of hard alkaline and neutral yellow mottled soils (Dy3_43 and Dy3.42) in association with small areas of cracking grey clays (Ug5.2) which may be dominant locally; stony rises with shallow friable loamy soils (Um6.12, Um6.13, Um6.21, Um6.24, and Um6.41); dark cracking clays (Ug5. 16) on terraces and some floodplains along stream valleys; minor areas of (Dy3.41), (Dy3.11), (Dy5.42), and (Ug5.1) occur on the plains as well. Ironstone gravels are a common feature of surface horizons of (D) soils. Some volcanic cones occur in the Va2 area in Sheet 2 but their associated soils are not described.	460m	West
HH2	Sodosol	Undulating plain with volcanic cones: plains of hard alkaline dark mottled soils (Dd2.33) in association with (Dd2.43) and (Db1.43) and smaller areas of related soils such as (Dr2.12) and (Dy3.43); small areas of cracking grey clays (Ug5.2) in lower-lying situations; ribbon development of cracking dark clays (Ug5.15) along some stream valleys; and with friable red soils (Dr4.1) and friable earths (Gn3.11) on and around volcanic cones. Ironstone gravels occur in surface horizons of some D soils.	746m	North

Atlas of Australian Soils Data Source: CSIRO

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Soils

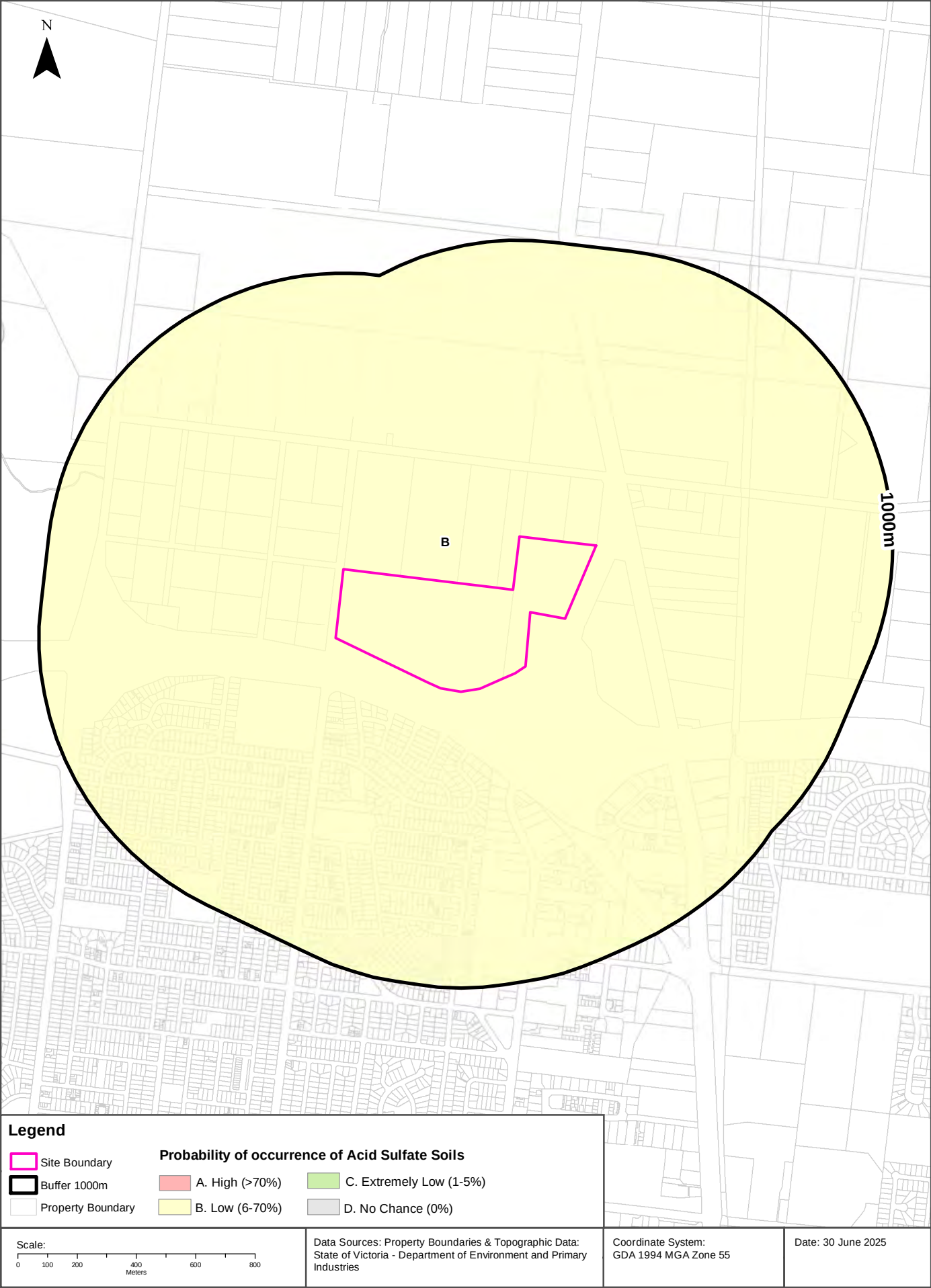
Noble Court, Mount Rowan, VIC 3352

Victorian Soil Type Mapping

Victorian Soil Types within the dataset buffer:

Symbol	Description	Distance	Direction
DEAA	Dermosols Red	0m	On-site
VEAD	Vertosols Grey	0m	On-site
KUAB	Kurosols Brown	0m	On-site
SOAB	Sodosols Brown	99m	North
CHAB	Chromosols Brown	263m	South West

Victorian Soil Type Mapping Data Source: Department of Economic Development, Jobs, Transport and Resources
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Acid Sulfate Soils

Noble Court, Mount Rowan, VIC 3352

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

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Acid Sulfate Soils

Noble Court, Mount Rowan, VIC 3352

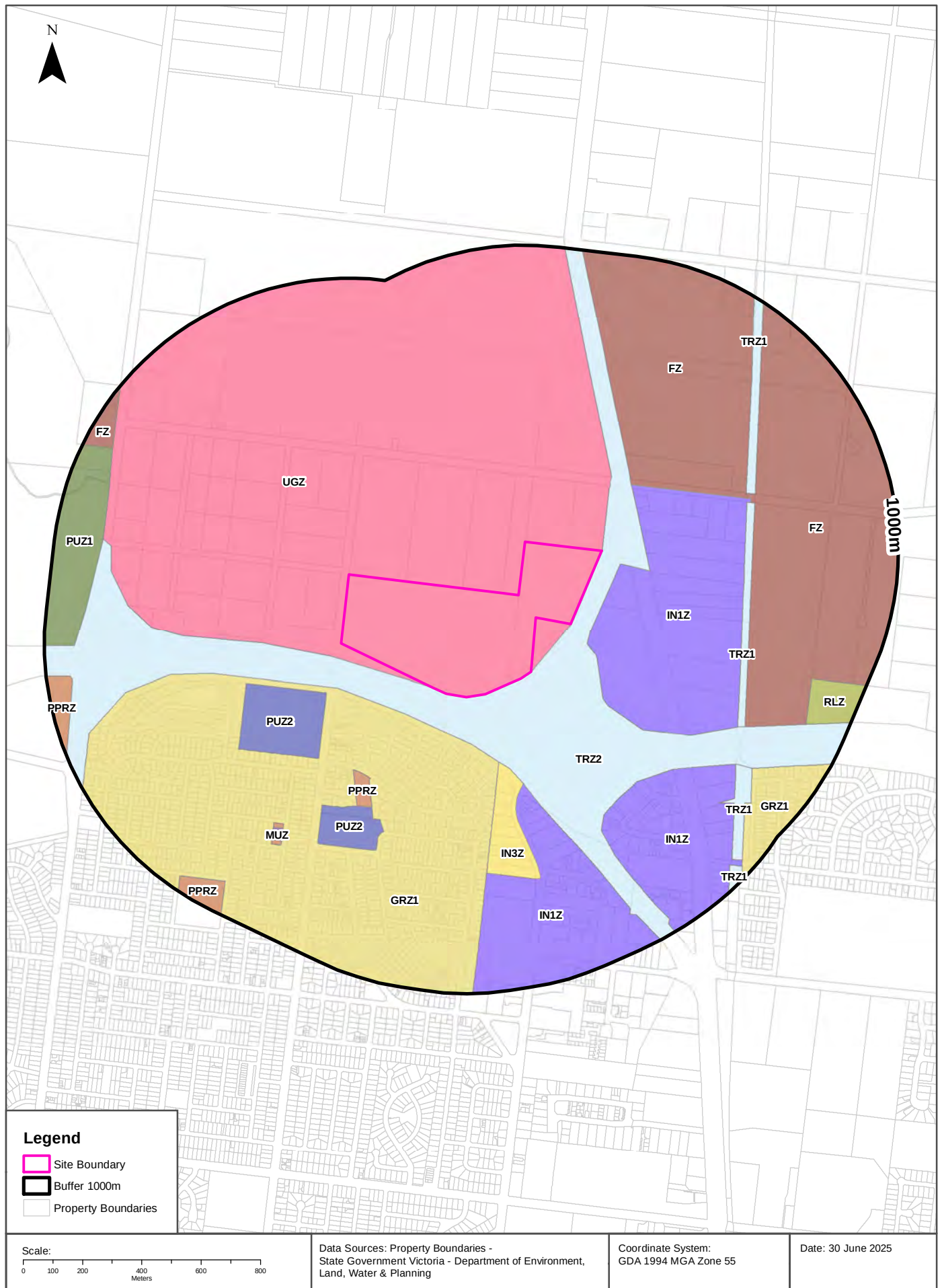
Coastal Acid Sulfate Soils

Coastal Acid Sulfate Soil types within the dataset buffer:

Coastal Acid Sulfate Soil Types	Distance (m)	Direction
No records in buffer		

Coastal Acid Sulfate Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Noble Court, Mount Rowan, VIC 3352



Planning

Noble Court, Mount Rowan, VIC 3352

Planning Zones

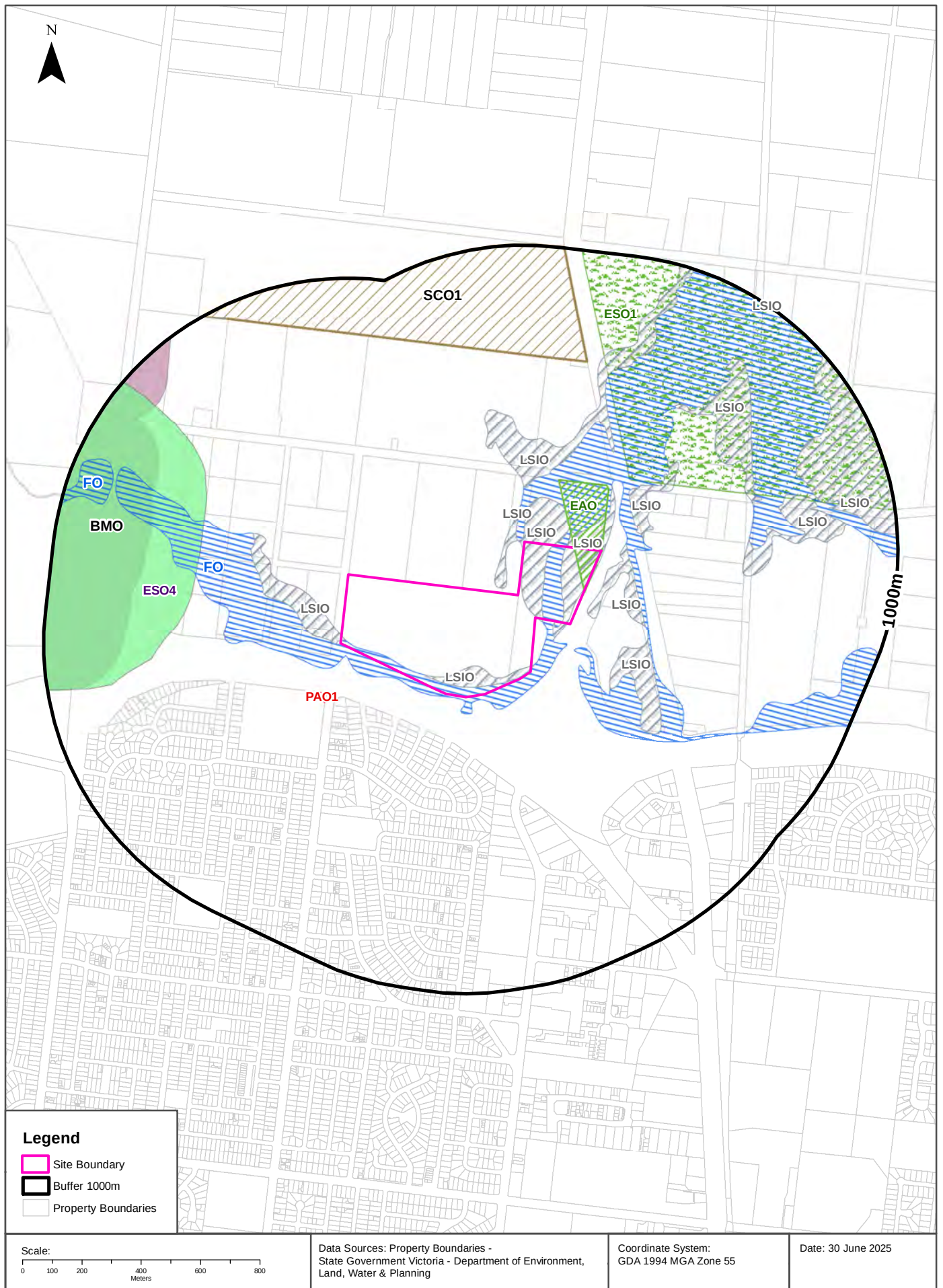
Planning zones within the dataset buffer:

Zone Code	Description	Distance	Direction
UGZ	URBAN GROWTH ZONE	0m	On-site
TRZ2	TRANSPORT ZONE 2 - PRINCIPAL ROAD NETWORK	0m	South
IN1Z	INDUSTRIAL 1 ZONE	69m	East
GRZ1	GENERAL RESIDENTIAL ZONE - SCHEDULE 1	120m	South West
PUZ2	PUBLIC USE ZONE - EDUCATION	172m	South West
IN3Z	INDUSTRIAL 3 ZONE	233m	South
FZ	FARMING ZONE	244m	North East
IN1Z	INDUSTRIAL 1 ZONE	327m	South
PPRZ	PUBLIC PARK AND RECREATION ZONE	365m	South West
PUZ2	PUBLIC USE ZONE - EDUCATION	453m	South West
TRZ1	TRANSPORT ZONE 1 - STATE TRANSPORT INFRASTRUCTURE	481m	East
FZ	FARMING ZONE	507m	East
IN1Z	INDUSTRIAL 1 ZONE	513m	South East
TRZ1	TRANSPORT ZONE 1 - STATE TRANSPORT INFRASTRUCTURE	523m	North East
PPRZ	PUBLIC PARK AND RECREATION ZONE	633m	South West
MUZ	MIXED USE ZONE	644m	South West
PPRZ	PUBLIC PARK AND RECREATION ZONE	688m	South West
TRZ1	TRANSPORT ZONE 1 - STATE TRANSPORT INFRASTRUCTURE	729m	South East
GRZ1	GENERAL RESIDENTIAL ZONE - SCHEDULE 1	781m	South East
RLZ	RURAL LIVING ZONE	818m	East
PUZ1	PUBLIC USE ZONE - SERVICE AND UTILITY	838m	West
PPRZ	PUBLIC PARK AND RECREATION ZONE	893m	South West
FZ	FARMING ZONE	905m	North West
PPRZ	PUBLIC PARK AND RECREATION ZONE	913m	West
TRZ1	TRANSPORT ZONE 1 - STATE TRANSPORT INFRASTRUCTURE	933m	South East

Planning Zone Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Planning Overlays

Noble Court, Mount Rowan, VIC 3352



Planning

Noble Court, Mount Rowan, VIC 3352

Planning Overlays

Planning overlays within the dataset buffer:

Zone Code	Description	Distance	Direction
FO	FLOODWAY OVERLAY	0m	On-site
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	0m	On-site
EAO	ENVIRONMENTAL AUDIT OVERLAY	0m	On-site
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	0m	West
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	33m	East
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	96m	North East
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	134m	North East
PAO1	PUBLIC ACQUISITION OVERLAY - PS MAP REF PAO1	172m	South West
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	184m	North East
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	191m	East
ESO1	ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 1	259m	North East
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	478m	East
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	502m	North East
ESO4	ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 4	506m	West
SCO1	SPECIFIC CONTROLS OVERLAY - PS MAP REF SCO1	626m	North
BMO	BUSHFIRE MANAGEMENT OVERLAY	680m	West
FO	FLOODWAY OVERLAY	853m	West

Planning Overlay Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Heritage

Noble Court, Mount Rowan, VIC 3352

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
N/A	No records in buffer							

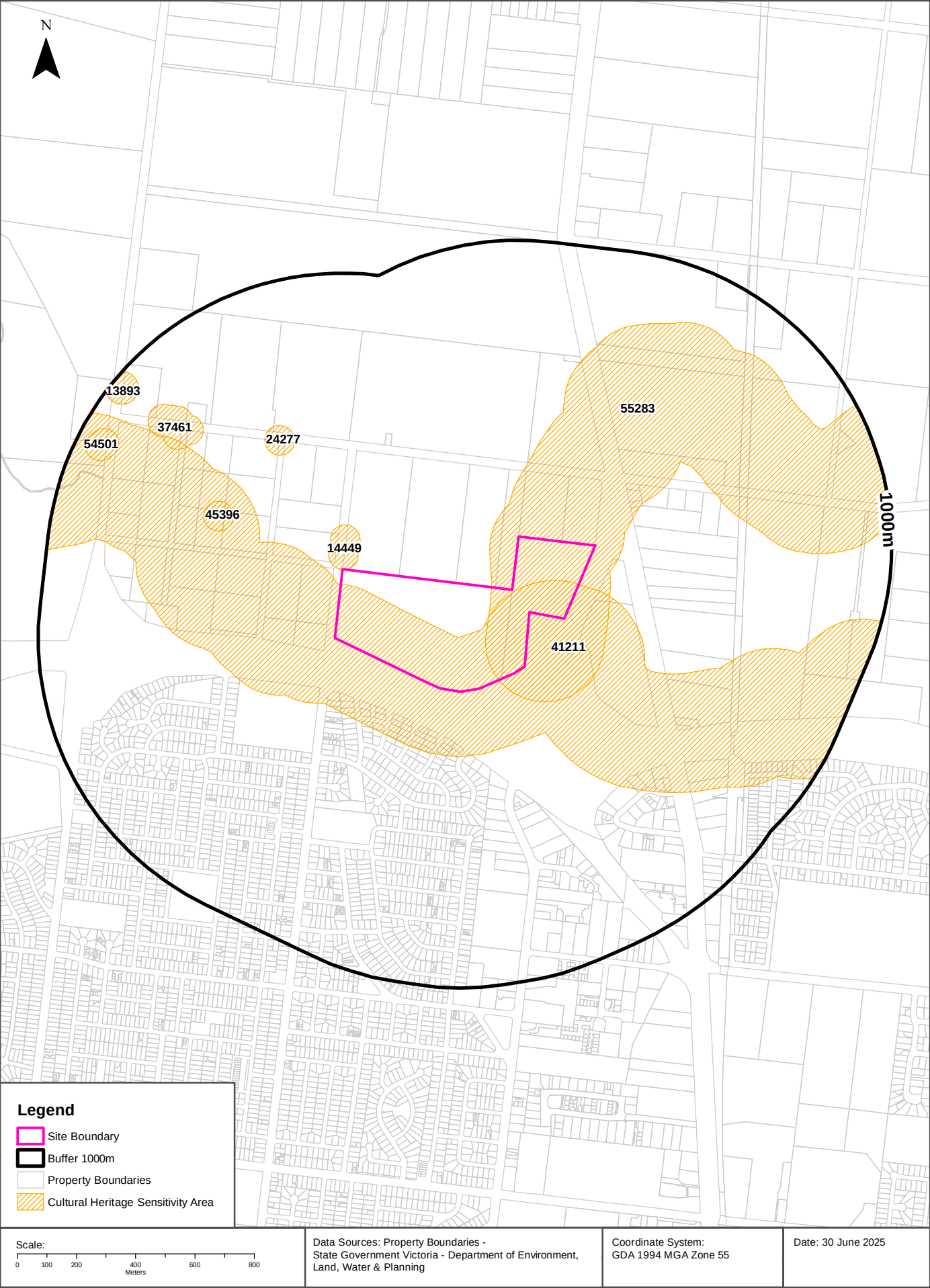
Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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Victorian Heritage Register

What are the Victorian Heritage Register items located within the dataset buffer?:

VHR Number	Description	Distance	Direction
N/A	No records in buffer		

Victorian Heritage Register Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Heritage

Noble Court, Mount Rowan, VIC 3352

Cultural Heritage Sensitivity

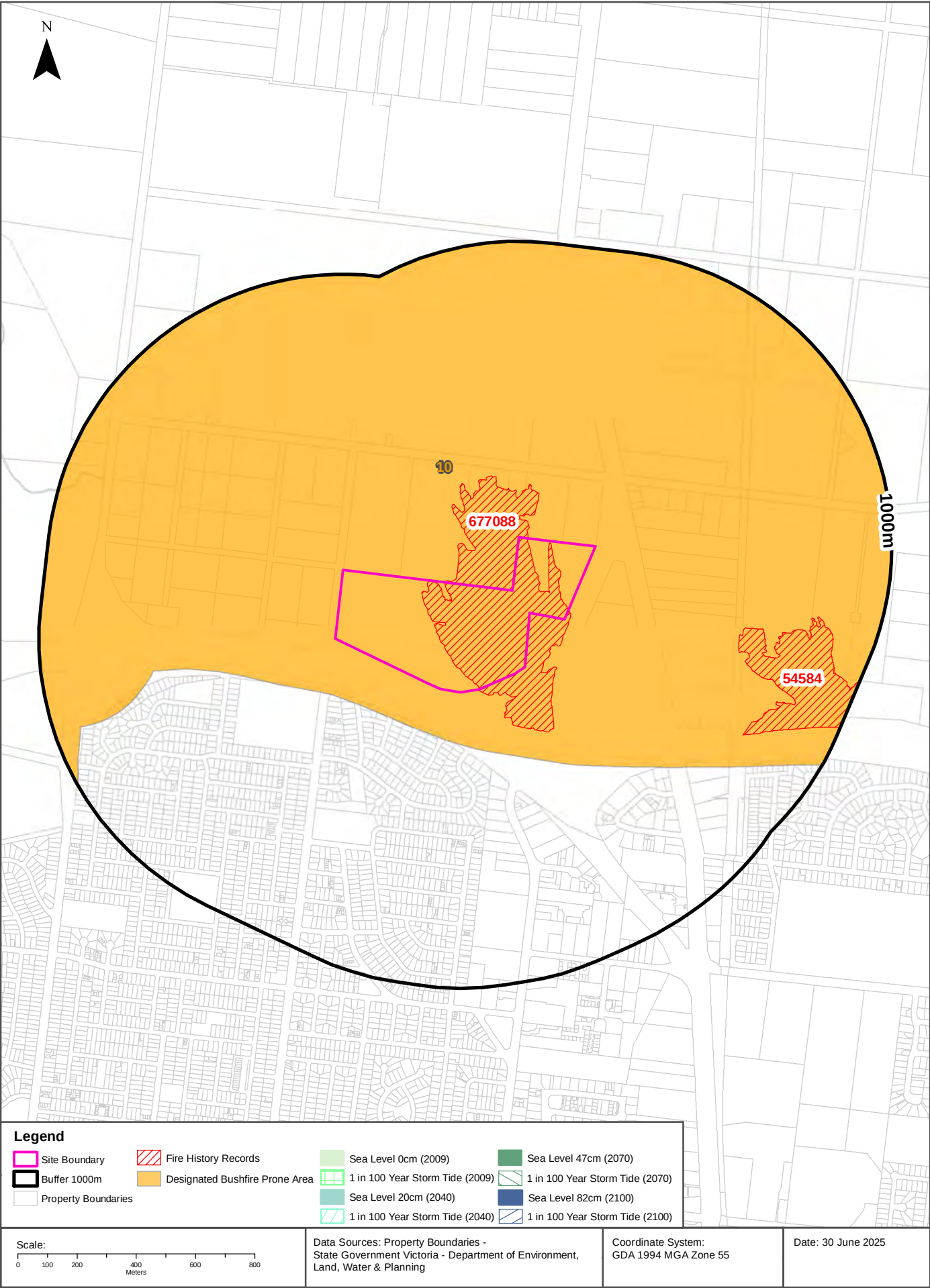
Areas of Cultural Heritage Sensitivity as specified in Division 3 of Part 2 in the Victorian Aboriginal Heritage Regulations 2018, within the dataset buffer:

Map Id	Distance	Direction
41211	0m	On-site
55283	0m	On-site
14449	0m	North West
45396	406m	North West
24277	435m	North West
37461	652m	North West
54501	861m	North West
13893	909m	North West

Cultural Heritage Sensitivity Data Custodian: State Government Victoria - Department of Premier and Cabinet
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Natural Hazards

Noble Court, Mount Rowan, VIC 3352



Natural Hazards

Noble Court, Mount Rowan, VIC 3352

Bushfire Prone Areas

What are the designated bushfire prone areas within the dataset buffer?

Map ID	Feature	Plan No	LGA	Gazetted Date	Distance	Direction
10	Designated Bushfire Prone Area	LEGL./24-173	BALLARAT	10/09/2024	0m	On-site

Bushfire Prone Area Data Custodian: State Government Victoria - Dept of Transport, Planning & Local Infrastructure
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Fire History

What are the fire history records of fires primarily on public land, within the dataset buffer?

Map Id	Fire Type	Fire Key	Season	Fire No	Fire Name	Treatment	Fire Cover	Start Date	Dist (m)	Direction
677088	BUSHFIRE	W201815076	2018	76	MIDLANDS 76 - INVERMAY - WESTERN FREEWAY	FIRE		25/02/2018	0m	On-site
54584	BUSHFIRE	W201815076	2018	76	MIDLANDS 76 - INVERMAY - WESTERN FREEWAY	FIRE		25/02/2018	565m	East

Fire History Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Natural Hazards

Noble Court, Mount Rowan, VIC 3352

Victorian Coastal Inundation Sea Level Rise

What coastal inundation sea level rise features exist within the dataset buffer?

Description	Distance	Direction
No records in buffer		

Victorian Coastal Inundation Sea Level Rise Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning

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Ecological Constraints - Native Vegetation 2005 & Ramsar Wetlands

Noble Court, Mount Rowan, VIC 3352



Ecological Constraints

Noble Court, Mount Rowan, VIC 3352

Native Vegetation (Modelled 2005 Ecological Vegetation Classes)

What native vegetation exists within the dataset buffer?

Veg Code	EVC Name	EVCCode	Group	Subgroup	Bioregion	Conservation Status	Geographic Occurance	Dist	Dir
VVP_0055	Plains Grassy Woodland	0055	Plains Woodlands or Forests	Freely-draining	Victorian Volcanic Plain	Endangered	Common	0m	On-site
VVP_0647	Plains Sedgy Wetland	0647	Wetlands	Freshwater	Victorian Volcanic Plain	Endangered	Common	472m	South West

Native Vegetation Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Ramsar Wetlands

What Ramsar wetland areas exist within the dataset buffer?

Map ID	Site Name	Lake Name	Distance	Direction
N/A	No records in buffer			

Ramsar Wetland Area Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning
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Ecological Constraints

Noble Court, Mount Rowan, VIC 3352

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
N/A	No records in buffer						

Collaborative Australian Protected Areas Database - Marine

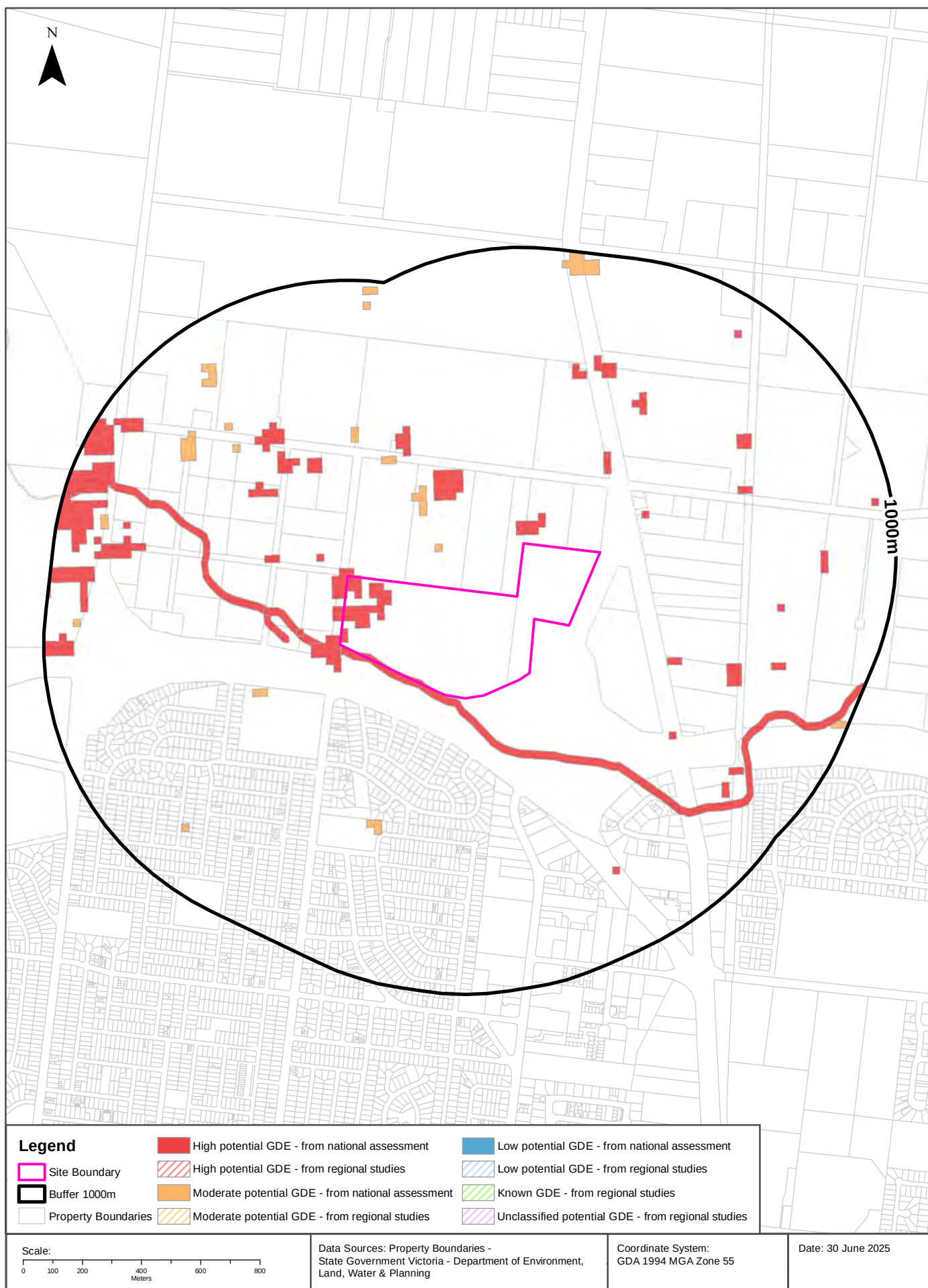
Protected areas in marine environments identified by the CAPAD within the dataset buffer:

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

Noble Court, Mount Rowan, VIC 3352



Ecological Constraints

Noble Court, Mount Rowan, VIC 3352

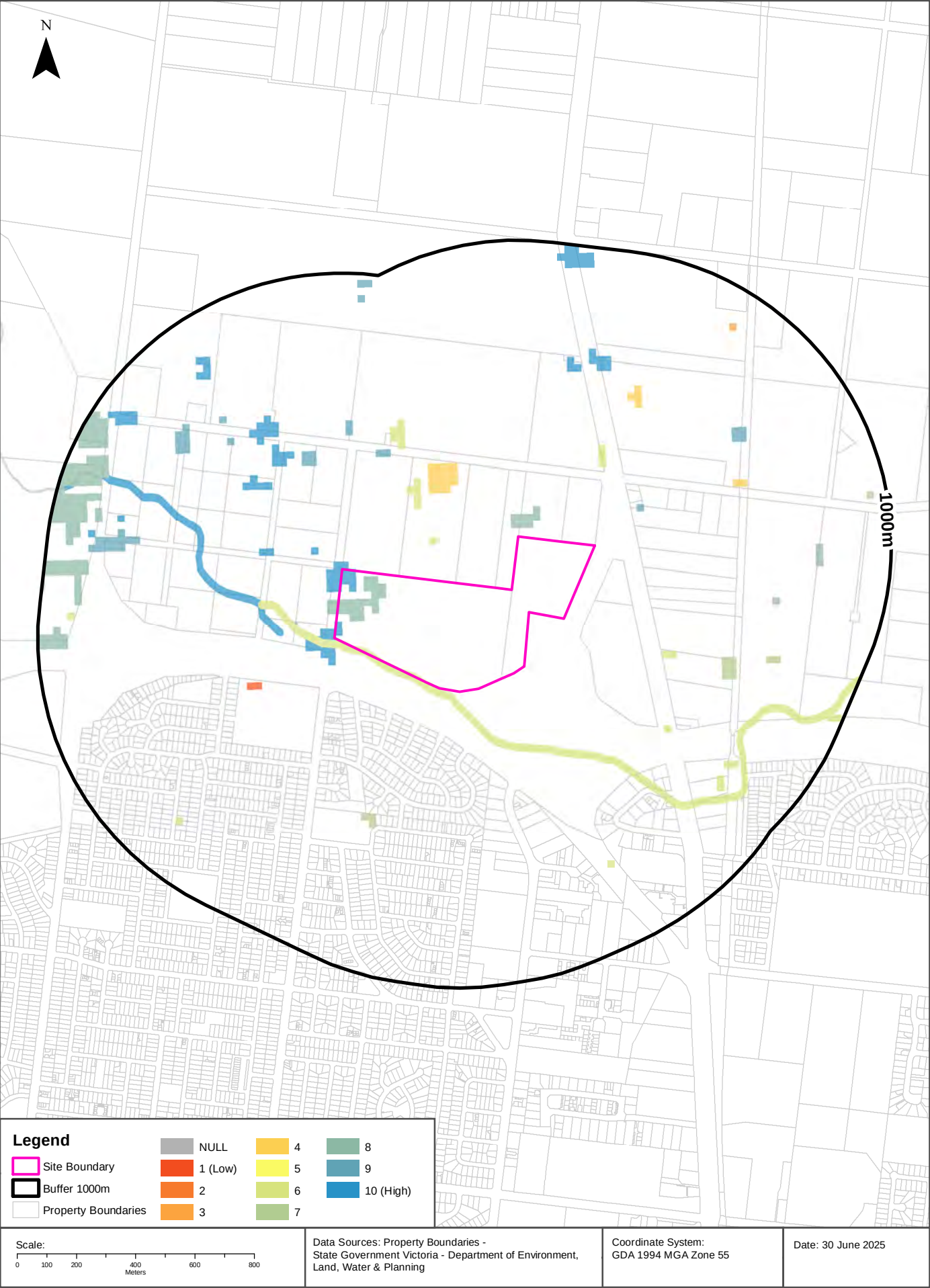
Groundwater Dependent Ecosystems Atlas

Type	Name	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial		High potential GDE - from national assessment	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	0m	On-site
Terrestrial		High potential GDE - from national assessment	Moderately high plateaus and strike ridges.	Vegetation	Fractured rock	0m	On-site
Aquatic		High potential GDE - from national assessment	Moderately high plateaus and strike ridges.	River	Unconsolidated sedimentary	0m	On-site
Terrestrial		Moderate potential GDE - from national assessment	Moderately high plateaus and strike ridges.	Vegetation	Fractured rock	116m	North
Aquatic		High potential GDE - from national assessment	Moderately high plateaus and strike ridges.	River	Fractured rock	256m	West
Terrestrial		Moderate potential GDE - from national assessment	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	472m	South West

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

Noble Court, Mount Rowan, VIC 3352



Ecological Constraints

Noble Court, Mount Rowan, VIC 3352

Inflow Dependent Ecosystems Likelihood

Type	Name	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Terrestrial		8	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	0m	On-site
Terrestrial		10	Moderately high plateaus and strike ridges.	Vegetation	Fractured rock	0m	On-site
Aquatic		6	Moderately high plateaus and strike ridges.	River	Unconsolidated sedimentary	0m	On-site
Terrestrial		10	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	0m	On-site
Terrestrial		8	Moderately high plateaus and strike ridges.	Vegetation	Fractured rock	27m	North East
Terrestrial		6	Moderately high plateaus and strike ridges.	Vegetation	Fractured rock	116m	North
Aquatic		10	Moderately high plateaus and strike ridges.	River	Unconsolidated sedimentary	171m	West
Terrestrial		9	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	182m	North East
Aquatic		10	Moderately high plateaus and strike ridges.	River	Fractured rock	256m	West
Terrestrial		6	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	263m	North East
Terrestrial		4	Moderately high plateaus and strike ridges.	Vegetation	Fractured rock	267m	North
Terrestrial		1	Moderately high plateaus and strike ridges.	Vegetation	Fractured rock	286m	West
Terrestrial		9	Moderately high plateaus and strike ridges.	Vegetation	Fractured rock	359m	North West
Terrestrial		7	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	472m	South West
Terrestrial		4	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	485m	North East
Terrestrial		3	Moderately high plateaus and strike ridges.	Vegetation	Unconsolidated sedimentary	853m	North East

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

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Appendix B: Landserv Landfill Gas Assessment



Landfill Gas Assessment

Former Wendouree Landfill, Mount Rowan, Victoria.

Prepared for:
City of Ballarat
Wadawurrung Country
PO Box 655
Ballarat, Victoria 3353

17 April 2025



DOCUMENT DISTRIBUTION

Document Title	Landfill Gas Assessment
Report Reference	RPT017
Project Name	Former Wendouree Landfill, Mount Rowan
Project Number	LS0145
Project Manager	██████████
Project Director	██████████
Client Name	City of Ballarat

DOCUMENT STATUS

Revision No.	Description	Date	Prepared By	Reviewed By
Rev0	Final	17 April 2025	LJ	AW

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EXECUTIVE SUMMARY

Landserv Pty Ltd (Landserv) were engaged by the City of Ballarat ('Council') to complete a landfill gas assessment the former Wendouree Landfill, known as Lot 1 on Title Plan TP846568, located at Noble Court, Mount Rowan VIC 3352 (referred to as the 'site').

The Council are seeking to further understand any landfill gas impacts associated with the former Wendouree landfill.

The landfill gas assessment concluded the following:

Historical gas monitoring from a leachate bore within the landfill indicates that the landfill is still producing methane and carbon dioxide gas.

Methane and carbon dioxide gas concentrations were recorded in monitoring bores located close to the landfill perimeter and beyond, including some concentrations above the adopted assessment criteria (i.e., Landfill BPEM action levels). Limited to negligible flow rate was detected during discrete monitoring events.

In future, further investigations including more wells (both groundwater and gas) and monitoring would be required (at a minimum) to understand the risks posed by the landfill to current and future receptors, and/or considering any alteration to the exiting 500 m buffer distance. Information gaps to be considered (but not limited to) include the spatial distribution of bores, temporal data, pathway analysis of dissolved methane in groundwater, the implications of the proposed development of PSP on the local water table levels (up or down) and delineation of the inferred landfill waste boundary.

These findings and all conclusions and advice in this report are subject to the limitations and assumptions made herein.

1 INTRODUCTION

1.1 General

Landserv Pty Ltd (Landserv) were engaged by the City of Ballarat ('Council') to complete a landfill gas assessment of the former Wendouree Landfill, known as Lot 1 on Title Plan TP846568, located at Noble Court, Mount Rowan VIC 3352 (referred to as the 'site').

The site was an operational landfill that accepted municipal solid waste between 1968 to 1983 and was closed and capped in approximately 1983. Council own's and manages the site and is responsible for ensuring all environmental and human health impacts based on the historic use of the site are managed.

Council supported by the Victorian Planning Authority (VPA) are currently seeking to rezone and redevelop the area to the north of the site under the Ballarat North Precinct Structure Plan (PSP). The PSP is a large scale rezoning of land proposed to accommodate residential development in line with the Councils growth strategy.

The Council are seeking to further understand any landfill gas impacts associated with the former Wendouree Landfill to fulfill their general environmental duty (GED) as the responsible authority.

This report documents installation and monitoring of landfill gas bores to the north of the former landfill, and includes a review of the site setting, information on the former filling at the site and a sub-surface gas monitoring program to further understand potential lateral gas movement from the landfill.

The site locality plan is provided on Figure 1, Appendix A.

1.2 Background

The Victorian Planning Authority (VPA) is preparing the Ballarat North Precinct Structure Plan (PSP) and Development Contributions Plan (DCP) in collaboration with the Council, The precinct is anticipated to accommodate approximately 6,000 – 8,500 residential dwellings once completed, and be a major growth area associated with the municipality.

The VPA engaged GHD Pty Ltd to complete the Adverse Amenity Impact Assessment (AAIA) for the site (currently under review). The findings of the AAIA report that the Ballarat North PSP is within close proximity to the former Wendouree Landfill, on the corner of Gilles Road North and the Western Freeway. The AAIA identified potential for adverse amenity impact based on the proposed new sensitive receptors (i.e. residential dwellings) that are planned for the area based on the PSP.

Jacobs Pty Ltd was engaged by the VPA to complete the Land Capability Assessment (LCA) in 2023 which was reviewed by EPA in 2024. Based on the review, EPA provided the following recommendations for VPA to consider supporting the development of the PSP;

- The LCA is updated to consider landfill gas migration from the former Wendouree Landfill, and the buffer distances and requirements of:
 - EPA Publication 1642 – Assessing Planning Proposals in the Buffer of a Landfill
 - Draft EPA Publication 1950 – Landfill buffer guideline.

Prior investigation and assessments completed at the site to support the development of the PSP include the following:

- Preliminary Site Investigation, Wendouree Landfill, Senversa, December 2021.
- Land Capability Assessment, Ballarat North PSP, Jacobs, December 2023.
- Bore Installation Report, SMEC, March 2024.
- Closed Landfill LFG Monitoring, SMEC, July 2024.
- Closed Landfill Water Monitoring, SMEC, July 2024.

Figure 1.1 – Site Locality Plan



Source: Land Capability Assessment, Ballarat North Precinct Structure Plan Jacobs 2023

Further to these investigations conducted, this assessment is aimed at undertaking landfill gas monitoring surrounding the site to get a better understanding of potential lateral landfill gas migration from the former Wendouree Landfill.

1.3 Objectives

The objective of the assessment is to undertake landfill gas monitoring works around the former Wendouree Landfill to further understand potential lateral landfill gas migration and meet the Councils GED as the responsible authority.

1.4 Scope

The scope of the investigation and the tasks undertaken were as follows:

- Reviewed background data and relevant information to the site to allow the development of a conceptual site model for the site.
- Drilled and installed four (4) landfill gas monitor bores to provide quantitative lateral gas movement from the former landfill.
- Completed gas monitoring on the landfill gas bores including;
 - Five (5) discrete monitoring events using hand held monitoring (GA5000); and
 - Continuous monitoring of each landfill gas bore for a period of one week using continuous monitoring device (i.e. GasClam).
- Compare the monitoring results to assessment criteria (i.e., BEPM action levels).
- Provision of a landfill gas assessment report, detailing monitoring gas monitoring results beyond the former landfill boundary.

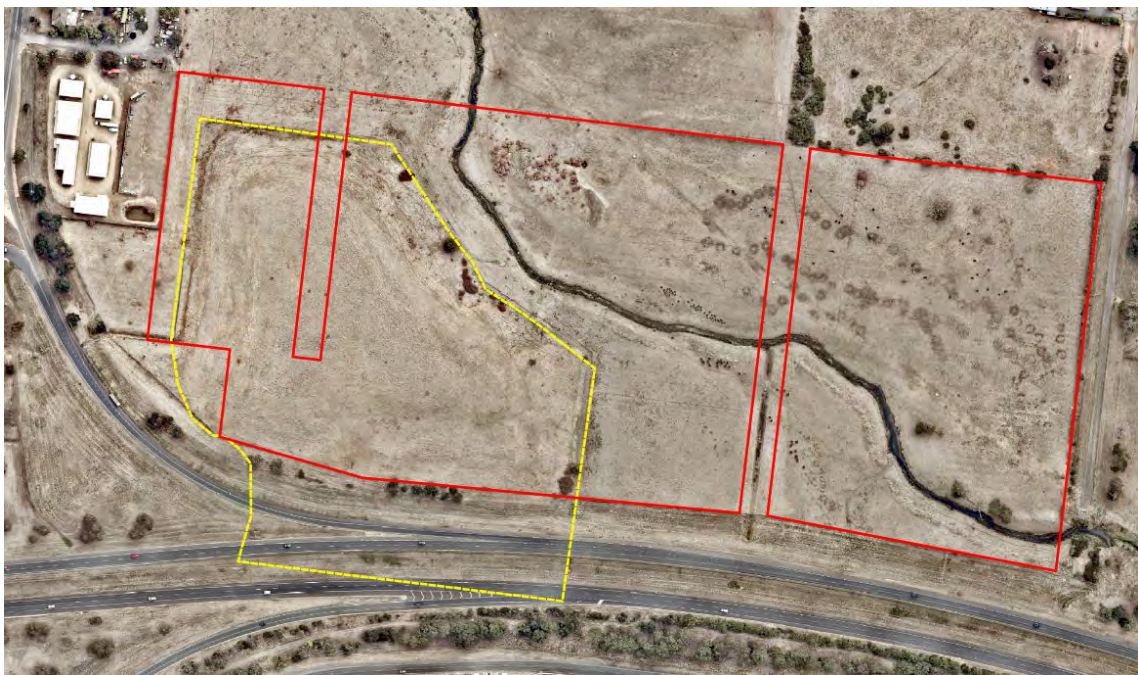
2 SITE SETTING

2.1 Overview

The site is situated in a Farming Zone (FZ) specified within the Ballarat planning scheme. The area surrounding the site to the north is agricultural with residences and associated buildings and structures. Burrumbeet Creek is located in close proximity north of the former landfill. East of the site is an asphalt manufacturing facility and other commercial/industrial facilities. South of the site is the western freeway with education facilities, parkland and residential housing beyond. West of the site is a water treatment facility.

Information provided in the Preliminary Site Investigation (Senversa 2021) indicates the landfill was operational between 1964 to 1983, receiving domestic and inert industrial waste. Capping was observed to have commenced by 1990 and completed by 2010. The PSI indicates the inferred extent of waste extends south of the site boundary i.e. beneath the Western Freeway Road Reserve. No filling has occurred over the eastern portion of the site, in particular no filling east and north of the Burrumbeet Creek.

Figure 2.1 – Inferred Extent of Waste (Senversa 2021)



No information is available on the construction of the landfill and whether there is a base lining to limit the downward and lateral migration of landfill gas and leachate. Given the age of the landfill it is considered unlikely that the site was lined.

Visual inspection of the site did not find evidence of underground services. Several areas of erosion of the capping material exposing waste were observed. From the visual inspection, potential gas migration pathways are limited to horizontal migration through subsurface geology however the most likely pathway would appear to be vertical migration through cracks and eroded areas of the capping material. There was no evidence to suggest impact from landfill gas migration on the surface of the site (i.e., vegetation dieback).

Photographs of the site and surroundings are provided in Appendix B.

2.2 Closed Landfill LFG Monitoring

During 2023 and 2024, SMEC Pty Ltd was engaged by the Council to undertake environmental monitoring at four closed landfills across the municipality. One of these sites was the former Wendouree Landfill. As part of these assessment works surface and sub surface gas was monitored in three monitoring events (August 2023, March and August 2024), with the following reported results:

August 2023

- Leachate Bore (LB2) reported concentrations of;
 - 84.4 % v/v methane; and
 - 12.9% v/v carbon dioxide.
- Landfill surface survey reported a maximum methane concentration of 2.4 ppm.

March 2024

- Leachate Bore (LB2) reported concentrations of;
 - 73.1% v/v methane; and
 - 12.2% v/v carbon dioxide.
- Landfill surface survey reported a maximum methane concentration of 2.0 ppm.

August 2024

- Leachate Bore (LB2) reported concentrations of;
 - 73.4 % v/v methane; and
 - 11.4% v/v carbon dioxide.
- Landfill surface survey reported a maximum methane concentration of 5.0 ppm.

Although LB2 reported concentrations of elevated concentrations of methane and carbon dioxide given the leachate bore is located within the waste mass, BPEM action levels do not apply. However, the concentrations of methane and carbon dioxide do indicate that methane generation is still occurring. Subsequently SMEC recommended that landfill gas bores be installed and monitored to identify if any lateral movement of gas is occurring from the site.

2.3 Victorian Landfill Register

The Victorian Landfill Register (VLR) brings together information from; EPA landfill licences and post closure pollution abatement notices; regional waste and resource recover implementation plans; and historical landfill records held by the EPA. The information provided by the VLR is included in the Table 1.1 below.

Table 1.1 – Victorian Landfill Register Information

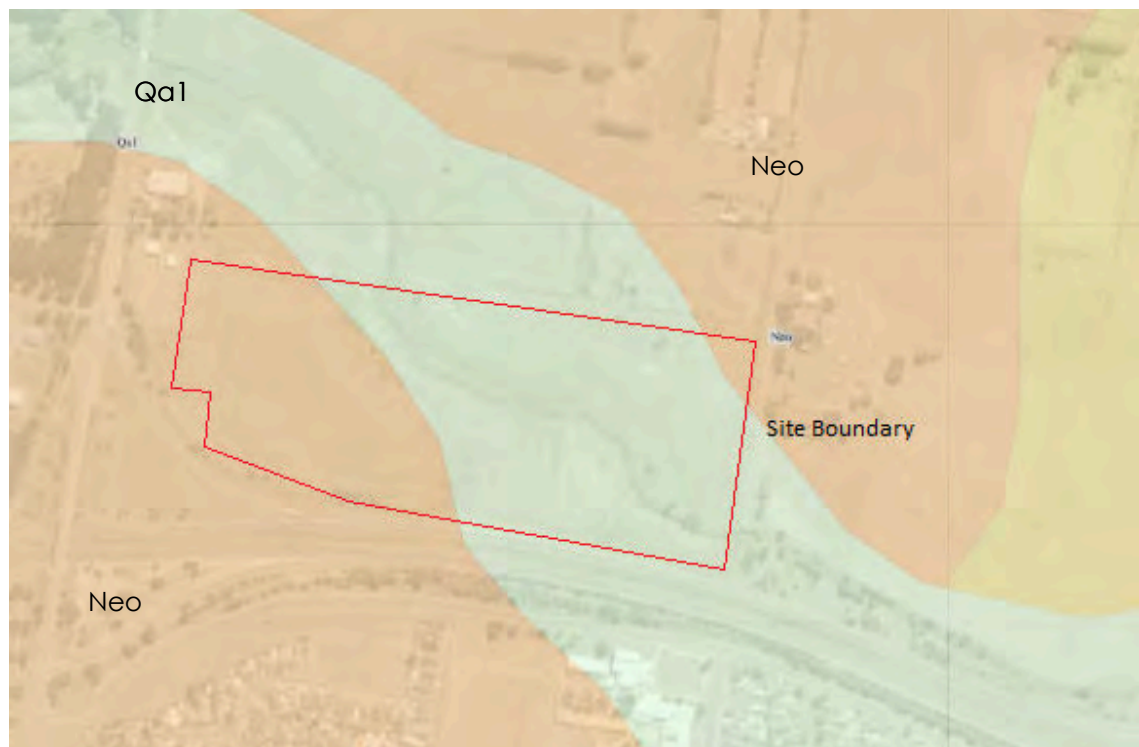
Item	Details
Landfill register number	10038
Reference number	Not available
Address	Lot 1 Noble Court, Mount Rowan, VIC, 3352 (Corner Gilles Road North and Western Freeway)

Item	Details
Suburb	Mount Rowan
Council	Ballarat City Council
Latitude	-37.5161
Longitude	143.8297
Operating status	Closed
Waste type accepted	Putrescible waste, Solid inert waste
Estimated year of closure	1983
Estimated total waste volume	Not available
Provenance	Not available
Licence number	Not available
Historic licence number	HS000542/3

2.4 Geology

According to the Geological Survey of Victoria 'Ballarat' 1:50,000 Geological Map, the site is located in an area underlain by the Tertiary (Pleistocene to Pliocene) aged Newer Volcanics basalt consisting of sheet basalt flows of dominantly fresh alkalic olivine-basalt (Neo). Nearer to Burrumbeet Creek in the site is underlain by Quaternary aged alluvial floodplain deposits consisting of gravel, sand, silt and clay (Qa1).

Figure 2.2 – Underlying Geology of the Site



Source: Visualising Victorias Groundwater

2.5 Hydrogeology

According to the Visualising Victoria's Groundwater (VVG) database, groundwater is expected to be present between 5 to 10 m bgl in the south to south west portion of the site and beneath the site at less than 5 m bgl in the north to north eastern portion of the site (i.e., adjacent to Burrumbeet Creek). Groundwater is expected to be encountered within the Quaternary Aquifer (alluvial) approximately 0 – 2 m bgl.

Depth to groundwater was validated in the most recent groundwater monitoring event (GME) conducted by SMEC in August 2023, which recorded a standing water level of 1.175 m bgl at the groundwater monitoring well (GW2) located between the former landfill and Burrumbeet Creek.

Groundwater was not assessed as part of this investigation, however based on the regional geology and topography it is considered likely that local groundwater would flow towards the Burrumbeet Creek.

2.6 Burrumbeet Creek

Burrumbeet Creek flows in a south easterly direction, located directly to the north of the former Wendouree Landfill.

Given shallow groundwater was identified on site (SMEC 2024), and during installation of LFG bore (GB1 - GB5), it was hypothesized that there is a likely direct connection between Burrumbeet Creek and the local water table. This saturation of the subsurface profile may be acting as a potential barrier to lateral landfill gas migration to the north of Burrumbeet Creek.

2.7 Topography

Based on the VVG database the topography at the site is relatively flat, with an elevation of approximately 448 m AHD in the west with a slight slope east to south east to approximately 444 m AHD. The land surrounding the site are generally flat with a slight slope to the west and southwest. The inferred landfill is slightly raised relative to the surrounding natural ground level.

3 LFG BORE INSTALLATION

3.1 Bore Locations

The number and location of bores to be included in the study were predetermined by the Council in consultation with the appointed EPA Environmental Auditor for the site (John Nolan of Nolan Consulting).

Four (4) LFG bores (labelled GB1 - GB4) were installed by Landserv on 1 October 2024. Due to one LFG being impacted by shallow groundwater ingress (GB4), an additional LFG bore (GB5) was installed on 15 October 2024 to the north of Burrumbeet Creek.

- LFG bores (GB1 – GB3) - installed north of the landfill; and
- LFG bore (GB4 and replacement bore GB5) - installed north of Burrumbeet Creek.

The LFG bore location details are summarised in the Table 3.1 below.

Table 3.1 – Landfill Gas Monitoring Bore Location Details

Bore I.D	Easting	Northing	Elevation m AHD (surface level)
GB1	220032.195	5843112.096	429.508
GB2	219904.853	5843200.615	429.860
GB3	219786.731	5843339.592	428.846
GB4	219993.100	5843315.863	432.720
GB5	219968.881	5843268.746	434.523

The bore location plan is provided as Figure 2 of Appendix A.

3.2 Bore Construction

LFG bores were installed to a maximum depth of 1.5 m bgl which was determined based on historical groundwater levels at the site of approximately 1.175 m bgl (SMEC 2024).

All LFG bores were advanced using a hand auger and constructed as follows:

- 4 mm slotted 50 mm PVC screen (installed above groundwater table);
- Solid casing to 0.7 m above natural ground level);
- Graded gravel backfill to above screened interval;
- 0.5 m thick hydrated bentonite layer; and
- Monument cover.

The hand auger diameter is 85 mm, the bore diameter produced during advancement is approximately 100 mm.

The LFG bore construction details are summarised in the Table 3.2 below.

Table 3.2 – Landfill Gas Monitoring Bore Construction Details

Bore I.D	Bore Depth m BGL	Seal Interval m BGL	Screen Interval m BGL	Screen Interval m AHD
GB1	1.5	0.0 – 0.65	0.7 – 1.5	428.01 – 428.81
GB2	1.5	0.0 – 0.65	0.7 – 1.5	428.36 – 429.16
GB3	1.5	0.0 – 0.65	0.7 – 1.5	476.35 – 428.15
GB4*	1.5	0.0 – 0.65	0.7 – 1.5	431.22 – 432.02
GB5	1.3	0.0 – 0.65	0.7 – 1.25	433.27 – 433.82
<i>Note: *GB4 was installed north of Burrumbeet Creek. Following first landfill gas monitoring event it was noted to have been impacted by shallow groundwater ingress, potential from adjacent stormwater service, and was noted as not suitable for the purpose of this assessment. An additional LFG bore was installed north of Burrumbeet Creek at a slightly higher elevation.</i>				

Bore construction details are provided in Appendix C.

3.3 Soil Observations

The soil observed during the hand auguring of the LFG bores was described as brown silty clay overlying grey/ yellow pale grey mottled clay with trace sand.

No waste type materials were observed with any of the soil bores, and it is inferred that the soil was natural from the surface, based on field observations.

Soil logs of the profile observed within each individual LFG monitoring bore are provided in Appendix C.

4 ASSESSMENT CRITERIA

EPA Publication 788 'Sitting, design, operation and rehabilitation of landfills' – Best practice environmental management (BPEM) 2015 sets out action levels for landfill gas at different monitoring locations at operating and closed landfills.

In accordance with the Table 6.4 of the Landfill BPEM, landfill gas action levels for subsurface geology were adopted to assess potential lateral migration of landfill gas from the former Wendouree Landfill. The specific landfill gas action levels are provided in Table 4.1 below.

Table 4.1 – LFG Action Levels

Location	Parameters	Action Level
Subsurface geology at the landfill boundary.	Methane	1.0 % v/v
	Carbon Dioxide	1.5 % v/v above background

Although the landfill gas bores were not installed directly at the boundary to the former Wendouree Landfill, the action level for subsurface geology at the landfill boundary were adopted for interpretive purposes. Furthermore it's understood no background carbon dioxide study has been completed at the site, a conservative 1.5% v/v action level was therefore adopted for interpretive purposes.

5 LFG MONITORING & RESULTS

5.1 Timeline

To monitoring lateral LFG gas movement in the network, Landserv completed the following discrete and continuous monitoring at the site.

- Discrete monitoring undertaken at five site visits using a portable landfill gas analyser (i.e. GA5000); and
- Continuous monitoring using GasClam set up in four LFG bores for a week sequentially over the month of sampling.

A timeline of the monitoring events is provided in Table 5.1 below.

Table 5.1 – LFG Monitoring Schedule

Date	Discrete Monitoring (GA5000)	Continuous Monitoring (GasClam)
8/10/24	GB1 - GB4	GB1
15/10/24	GB1 - GB4	GB2
22/10/24	GB1, GB3 - GB5	GB3
29/10/24	GB1 - GB2	GB5
6/11/24	GB1 - GB3	-

5.2 Discrete Gas Monitoring

Prior to the first discrete monitoring event, all LFG bores were left to stabilise over a seven day period, allowing the bore headspace to reach equilibrium with the surrounding ground gas. This was deemed sufficient based on the low permeability clays encountered at the site.

5.2.1 Sampling Methodology

Discrete monitoring was completed with a calibrated GA5000 extractive landfill gas analyser, by an experienced environmental scientist. All works was completed in accordance with EPA publication 1684, *Landfill Gas Fugitive Emissions Monitoring Guidelines* (EPA 2018) and included the collection of the following data:

- Gas composition of landfill gas bores, including the concentrations of key landfill gas components (methane, carbon dioxide, oxygen, balance gas (assumed nitrogen), hydrogen sulphide and carbon monoxide.
- Atmospheric and bore relative pressure for each bore;
- Gas flow rate (L/h) for each bore;
- Atmospheric pressure and climatic data from the Bureau of Meteorology (BOM) for the nearest weather station approximately 3 km to the west (Ballarat Aerodrome – station ID 089002); and
- Weather conditions at each sampling event.

Equipment calibration certificates for the monitoring are provided in Appendix D and meteorological data is provided in Appendix E.

5.2.2 Weather Conditions

The weather conditions observed during and prior to the five discrete monitoring events based on site observations and Bureau of Meteorology (BoM)

When compared to continuous atmospheric pressure reading collected from the GasClam the discrete monitoring events were generally associated with either a falling or stable atmospheric pressure systems.

Records of the weather conditions prior to discrete sampling event is provided in Table 5.2 below.

Table 5.2 – Weather Conditions prior to Discrete Monitoring Events

Date	Site Weather	Rain prior to monitoring (Ballarat Aerodrome)	Atmospheric Pressure Conditions
8/10/24	Overcast with passing showers	5 mm in prior 24 hrs	Increasing 1016 hPa at 10:30 am on the 7 October to 1026.7 hPa at 10:30 am on the 8 October.
15/10/24	Sunny and dry	0.4 m in prior 24 hrs	Stable with a slight fall from 1019.1 hPa at 1:00 pm on the 14 October to 1018.8 hPa at 1:00 pm on the 15 October.
22/10/24	Sunny and dry	No rain	Falling from 1020.6 hPa at 10:00 am on the 21 October to 1014.4 hPa at 10:00 am on the 22 October.
29/10/24	Overcast with light winds	No rain	Increasing slightly from 1024 hPa at 10:00 am on the 28 October to 1027 hPa at 10:00 am on the 29 October.
6/11/24	Sunny, dry and windy	No rain	Falling from 1016.8 hPa at 10:00 am on the 5 November to 1007.4 hPa at 10:00 am on the 6 November.

The generally dry conditions prior to discrete monitoring indicate that soil moisture content was unlikely to have had any significant impact the landfill gas results.

5.2.3 Monitoring Results

The sub-surface geology LFG bores (GB1 - GB5) were monitored at discrete intervals using GA5000 over a four week period from 8 October 2024 to 6 November 2024.

No to marginal flow was recorded in the LFG bores across all monitoring events.

No methane concentrations were detected during the sub-surface monitoring above the BEPM action level of 1.0 % v/v, however concentrations of carbon dioxide did exceed and BEPM action level of 1.5 % v/v. The exceedances of the adopted action levels are highlighted in Table 5.3 below.

Table 5.3 – Landfill Gas Bore Discrete Monitoring Results.

Bore I.D.	Peak Flow Rate (L/hr)	Landfill Gas Readings			
		Peak CH4 (%v/v)	Peak CO2 (%v/v)	Min O2 (%v/v)	Peak CO (ppm)
Monitoring Round One (8 October 2024)					
<u>GB1</u>	0.1*	0.0	2.3	18.8	0
GB2	0.1*	0.0	2.8	18.0	0
GB3	0.1*	0.0	1.7	18.7	0
GB4	0.1*	0.1	2.7	19.2	1
GB5	Not yet installed				
Monitoring Round Two (15 October 2024)					
GB1	GasClam data collected, and gas cap reinstated				
<u>GB2</u>	0.1*	0.0	2.0	17.7	1
GB3	0.1*	0.0	1.1	18.3	0
GB4	0.1*	0.0	1.8	19.3	0
GB5	GB5 installed, left for 7 days to equilibrate with ground gas conditions				
Monitoring Round Three (22 October 2024)					
GB1	0.1*	0.0	2.1	17.8	0
GB2	GasClam data collected, and gas cap reinstated				
<u>GB3</u>	0.1*	0.0	1.8	18.2	0
GB4	0.4	0.0	2.7	18.3	0
GB5	0.1*	0.0	0.3	20.2	0
Monitoring Round Four (29 October 2024)					
GB1	0.2	0.0	2.4	18.7	0
GB2	0.1*	0.0	3.2	16.8	0
GB3	GasClam data collected, and gas cap reinstated				
GB4	Gas monitoring discontinued due to groundwater blocking screen				
<u>GB5</u>	Cap knocked off due to cattle, no readings taken				
Monitoring Round Five (6 November 2024)					
GB1	0.1*	0.0	1.7	19.3	0
GB2	0.1*	0.0	2.9	17.7	0
GB3	0.1*	0.0	1.3	18.9	0
GB4	Gas monitoring discontinued due to groundwater blocking screen				
GB5	GasClam data collected, and gas cap reinstated				
Note: Underlined <u>GB</u> indicates the gas bore location where GasClam was installed. Exceedances of BPEM action levels highlighted.					

The landfill gas field monitoring forms for each round are provided in Appendix F.

5.3 Continuous Gas Monitoring

5.3.1 Sampling Methodology

Continuous landfill gas monitoring data was collected from (GB1 - GB3 and GB5) by an Ion Science GasClam2 Ground Gas Detector over a four week period from 8 October 2024 to 6 November 2024. Readings were collected at 30-minute intervals during the course of monitoring and included the following data:

- Date and Time;
- CH₄, CO₂, O₂, H₂S, CO concentrations;
- Bore and atmospheric pressure;
- Temperature;
- Battery voltage; and
- Filter pressure.

Table 5.4 below details the GasClam movements across the site.

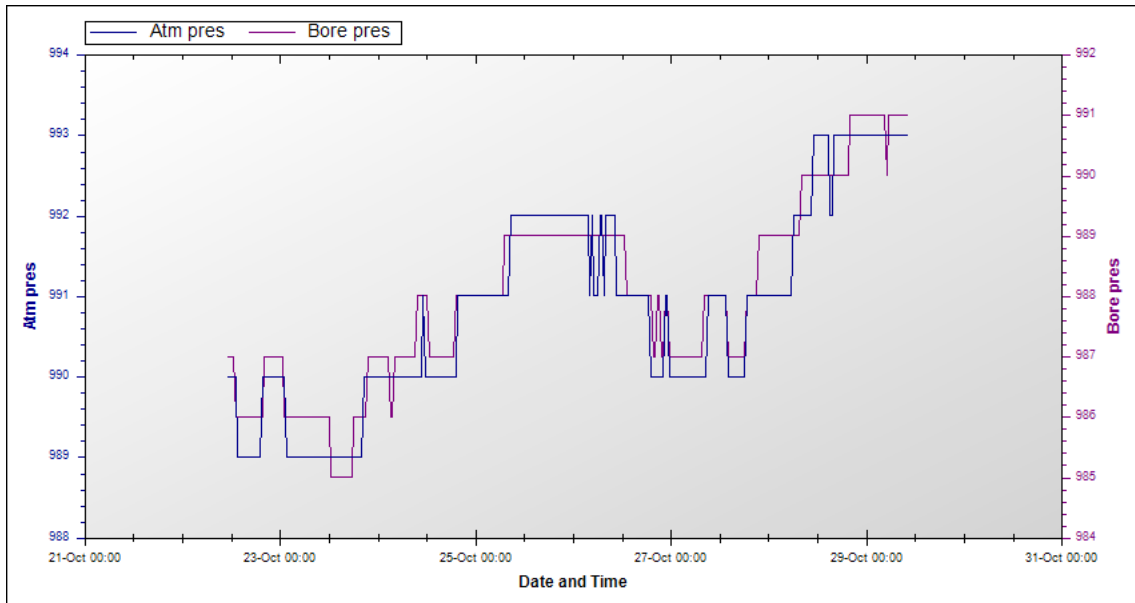
Table 5.4 – GasClam Installation and Movements

Bore I.D	Date & Time of GasClam Installation	Date & Time of GasClam Removal	Comments
GB1	8 October 2024 12:10 pm	15 October 2024 2:20 pm	Data downloaded. Desiccant filter checked and batteries replaced.
GB2	15 October 2024 2:30 pm	22 October 2024 10:51 am	Data downloaded. Desiccant filter checked and batteries replaced.
GB3	22 October 2024 11:10 am	29 October 2024 10:09 am	Data downloaded. Desiccant filter checked and batteries replaced.
GB5	29 October 2024 11:48 am	6 November 2024 10:53 am	Data downloaded.
Note: *The GasClam was not installed in GB4 due to groundwater ingress blocking/partially blocking the screened interval. The gas monitoring data would have been unreliable.			

5.3.2 Atmospheric and Bore Pressure

Generally, atmospheric and bore pressure were closely related, with bore pressure lagging slightly behind changes atmospheric pressure as shown in Figure 7.1 as an example from GB3.

Figure 5.1 – Atmospheric and Bore Pressure, GB3



5.3.3 Continuous Monitoring Results

Methane

Methane concentrations recorded in GB1 – GB3 (located south of the Burrumbeet Creek) ranged from 0 – 1.8 %v/v, and methane concentration in GB5 (located north of Burrumbeet Creek) ranged from 0 – 1.6 %v/v. All methane concentrations above 1.0% v/v are classified as exceedances of BPEM action levels for methane.

Carbon Dioxide

Carbon dioxide concentrations recorded in GB1 – GB3 ranged from 2.7 – 6.6 %v/v, and from 0.1 – 0.9 %v/v in GB5. No significant concentrations of hydrogen sulphide or carbon monoxide were recorded during the continuous monitoring of the landfill gas bores. All concentrations above 1.5% v/v are considered exceedances of BPEM action levels.

Continuous Gas Monitoring Graphs

The GasClam software was used to extract and handle the gas monitoring data. The below figures provide graphical data of the methane, carbon dioxide and atmospheric pressure obtained from GB1, GB2, GB3 and GB5.

Based on a review of the four landfill gas bores, the following was noted in regards to carbon dioxide concentration over the course of each 1 week monitoring period;

- GB1 reported relatively stable carbon dioxide concentrations;
- GB2 reported gradually increasing carbon dioxide concentrations;
- GB3 reported a drop in carbon dioxide concentration; and
- GB5 report relatively stable carbon dioxide concentrations.

The readings are based on low absolute differences with relatively low carbon dioxide concentrations reported throughout the monitoring period at the site.

Figure 5.2 – GB1 Methane (red), Carbon Dioxide (black), Atmospheric Pressure (blue)

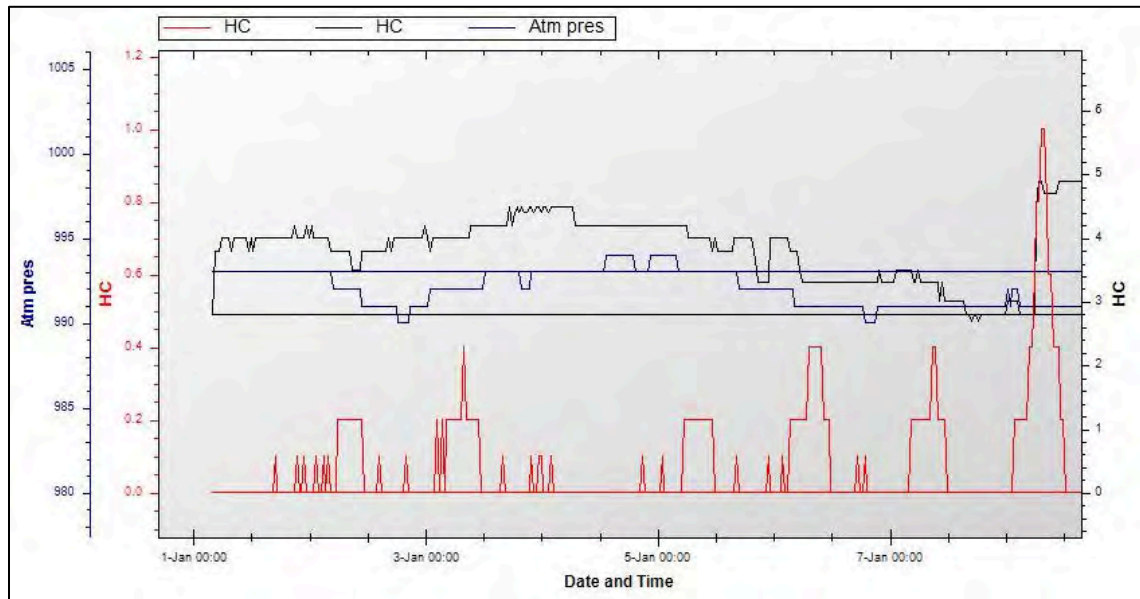


Figure 5.3 – GB2 Methane (red), Carbon Dioxide (black), Atmospheric Pressure (blue)

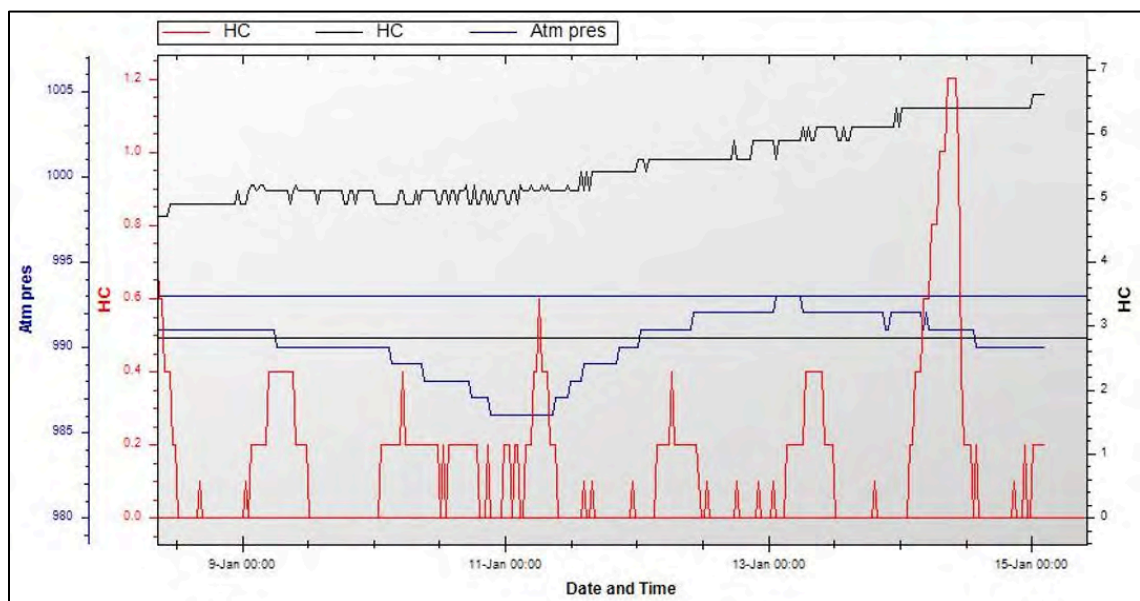


Figure 5.4 – GB3, Methane (red), Carbon Dioxide (black) and Atmospheric Pressure (blue)

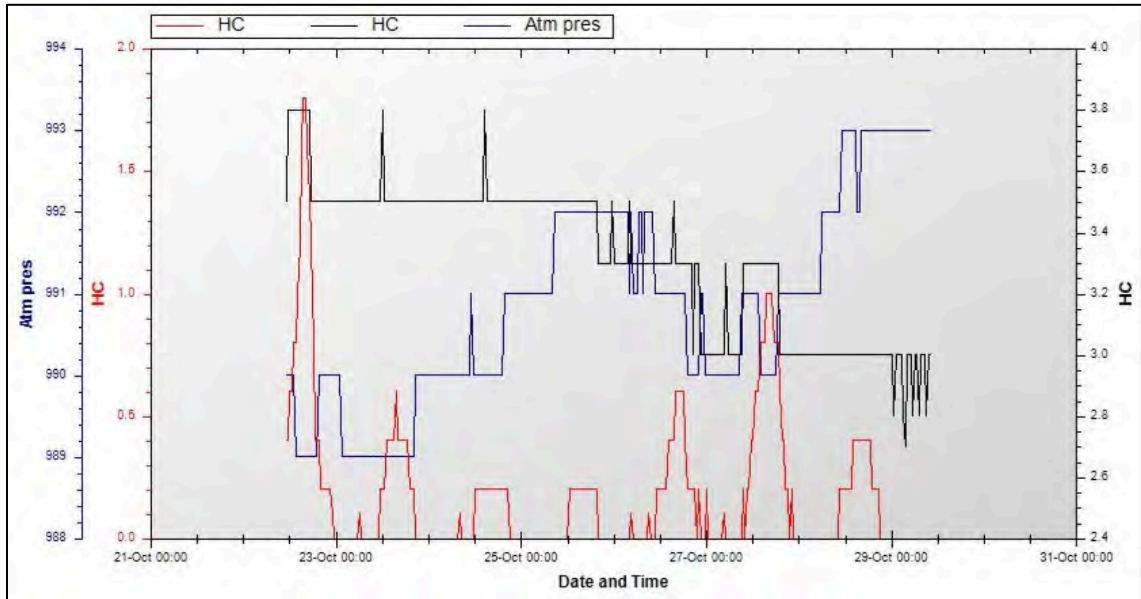
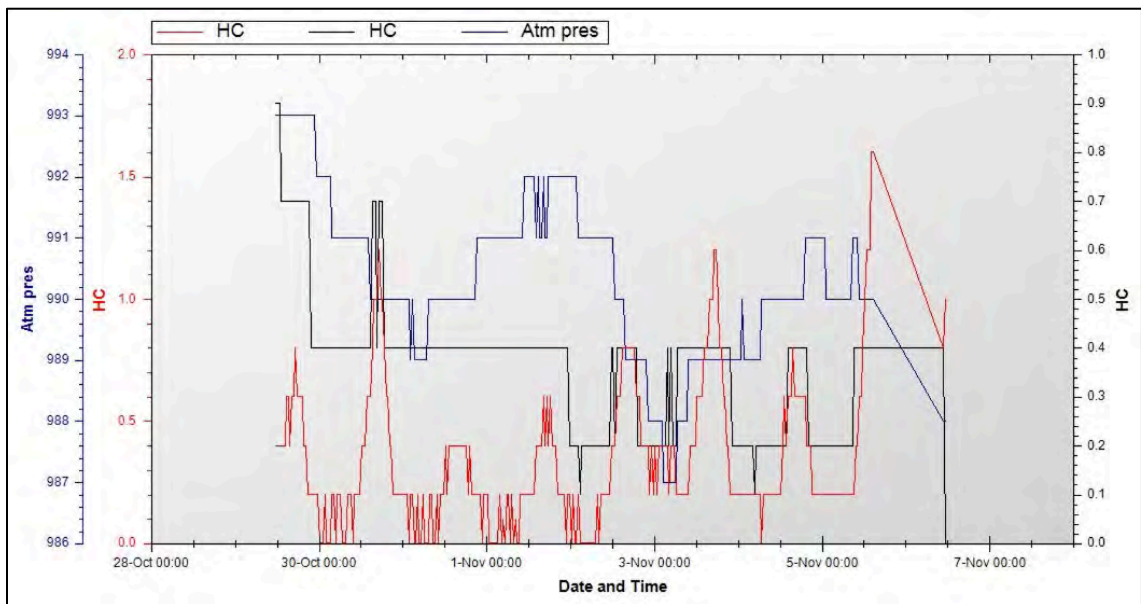


Figure 5.5 – GB5 Methane (red), Carbon Dioxide (black) and Atmospheric Pressure (blue)



Note: the date and time of the data obtained from GB1 and GB2 is not correct due to the GasClam resetting upon installation and starting the gas readings in the first LFG bore. This is not anticipated to affect the outcome of the landfill gas assessment as the correct date and time of readings was calculated from the GasClam installation and movement data.

Extracted GasClam data has been tabulated and provided in Appendix F.

6 CONCEPTUAL SITE MODEL

The conceptual site model (CSM) is based on the information provided from the prior investigation and assessments, landfill gas bore installation and sub-surface landfill gas monitoring. The following Table 6.1 presents a summary of the CSM.

Table 6.1 – Conceptual Site Model Summary

Landfill Characteristic	Details
Gas Hazard Source	
Landfill Operating Period	1964 – 1983
Waste Type	Putrescible waste, Solid inert waste
Landfill Area	Unknown, from historical aerial photos and inferred extent of waste (Senversa 2021) approximately 76,000 m ² .
Landfill Depth	Estimated depth from leachate bore installation is 11 m BGL.
Landfill Volume	Unknown.
Landfill Cap	Non-uniform, likely to be non-engineered given the age.
Landfill Lining	Unknown, likely to be unlined given the age.
Soil/Rock Type	Tertiary (Pleistocene to Pliocene) aged Newer Volcanics basalt and Quaternary aged alluvial floodplain deposits nearer to Burrumbeet Creek.
Groundwater depth	Expected to be between 5 to 10 m bgl in the south to south west portion of the site and beneath the site at less than 5 m depth in the north to north eastern portion of the site. The groundwater monitoring in August 2023 recorded a standing water level measure to 1.175 m BGL in GW2
Groundwater Contamination	Unknown. Potential for landfill leachate impacts. Exceedances of the Groundwater Investigation Limits for copper, manganese, nickel, zinc, hardness, TDS, sodium and chloride.
Groundwater Flow Direction	Local groundwater is considered to flow northeast towards the Burrumbeet Creek which runs north to south east through the broader site above the inferred landfill extent.
Leachate	Leachate monitoring (August 2023) recorded standing leachate level of 11.77 m Below Top of Casing (BTOC) (depth of well 12.07 m BTOC).
Landfill Current Use	Open space used for grazing of sheep, within an Urban Growth Zone (UGZ).
Pathways	
Potential Pathways	1) Vertical migration of landfill gas via diffusion and advection through fissures and around/cracked areas of the landfill cap, subsurface pore spaces or vegetation roots. 2) Horizontal migration of landfill gas via diffusion and advection, through fissures and subsurface pore spaces. 3) Partitioning of dissolved methane in groundwater to soil gas/ through fissures and pore spaces or vegetation roots.

Landfill Characteristic	Details
Receptor Site	
Off-site	Current residences and businesses surrounding the site and potential future off-site users of the residential growth area proposed by the PSP to the north of the site.
Topography	The eastern side of Gillies Road slopes gradually from 440 m AHD in the southern region near Burrumbeet Creek to 480 m AHD in the northern area at the base of Mount Rowan. The site features irregular elevations and depressions along its west-to-east axis. The land gently slopes from the west, near Burrumbeet Creek, towards Mount Rowan, and then gradually descends from the middle of the site towards the east, near the Midland Highway.
Soil/Rock Type	Quaternary Aged: - Swamp and lake deposits (Qm1) - Alluvium (Qa1) - Colluvium (Qc1) Quaternary-Tertiary Aged: - Newer Volcanic Group (Neo) - Incised Colluvium (Nc1) Ordovician Aged: - Castlemaine Group - Lancefieldian
Groundwater depth	Groundwater is generally 10 to 20 m BGL in the central precinct area, grading to <5 m BGL in the southeast and northwest. There is an isolated area east of Gilles Road where the water table is mapped at >50 m BGL. Based on site observations during installation of LFG monitoring wells groundwater immediately adjacent to Burrumbeet Creek is approximately 1-2 m bgl. This shallow groundwater may be limiting any lateral movement of landfill gas north from the landfill.
Groundwater Contamination	Unknown
Groundwater Flow Direction	Groundwater is considered to flow towards Burrumbeet Creek.
LFG generation and migration potential The following is noted with respect to landfill gas generation and migration potential: 1. The time since filling ceased at the site is approximately 41 years (based on aerial photographs, VLR and Council Information). 2. Given the age of the landfill, it is likely to be in the final phases of composition giving rise to aerobic conditions within the waste mass. 3. It is unlikely that the landfill was finished with an engineered cap of compacted clay and/or a membrane. 4. Burrumbeet Creek may be acting as a barrier to any lateral landfill gas migration north of Burrumbeet Creek.	

The CSM is represented graphically in Figure 3 in Appendix A.

7 SUMMARY OF FINDINGS

A summary of findings from the landfill gas assessment includes:

- Review of site setting and site investigations indicated the landfill operated from 1964 to 1983, receiving domestic (putrescible) and solid inert waste. Capping was observed to have commenced by 1990 and completed by 2010.
- LFG monitoring completed at the site during 2023-2024 indicates that the landfill is still producing elevated concentrations of methane and carbon dioxide. The highest concentration of methane reported over this time period was 84.4% v/v and the highest concentration of carbon dioxide was 12.9% v/v.
- Five LFG monitoring bores were installed on the site to target the following pathways identified of having the highest risk of landfill gas being present.
 - GB1 – GB3 south of Burrumbeet Creek targeting the lateral gas migration.
 - GB4 and GB5 north of Burrumbeet Creek targeting lateral gas migration (beyond Burrumbeet Creek).
- Five discrete landfill gas monitoring events and continuous gas monitoring was completed on gas bores over the course of a four-week period in Oct - Nov 2024.
- Sampling results from the discrete landfill gas monitoring reported;
 - No concentration of methane above BPEM action level of 1.0% v/v;
 - Thirteen (13) exceedances of the BPEM action level for carbon dioxide 1.5%;
 - Limited to negligible flow rates.
- Sampling results from the continuous landfill gas monitoring reported;
 - Methane concentrations of between 0 - 1.8% v/v in GB1 - GB3.
 - Methane concentrations of 0 - 1.6% v/v in GB5.
 - Carbon dioxide concentration between 2.7 – 6.6 %v/v in GB1-GB3.
- All concentrations above 1.0% v/v for methane and 1.5% v/v for carbon dioxide are exceedances of BPEM action levels.
- The CSM identified three potentially pathways between the former landfill areas and sensitive receptors:
 - Vertical migration of landfill gas via diffusion / advection through landfill cap;
 - Horizontal migration of landfill gas via diffusion and advection, through fissures and subsurface bore spaces; and
 - Partitioning of dissolved methane in groundwater to soil gas/ through fissures and pore spaces or vegetation roots.

8 CONCLUSIONS

Landserv has completed a landfill gas assessment at the former Wendouree Landfill, Lot 1 on Title Plan TP846568, located at Noble Court, Mount Rowan, Victoria.

Historical gas monitoring from a leachate bore within the landfill indicates that the landfill is still producing methane and carbon dioxide gas.

Methane and carbon dioxide gas concentrations were recorded in monitoring bores located close to the landfill perimeter and beyond, including some concentrations above the adopted assessment criteria (i.e., Landfill BPEM action levels). Limited to negligible flow rate was detected during discrete monitoring events.

In future, further investigations including more wells (both groundwater and gas) and monitoring would be required (at a minimum) to understand the risks posed by the landfill to current and future receptors, and/or considering any alteration to the existing 500 m buffer distance. Information gaps to be considered (but not limited to) include the spatial distribution of bores, temporal data, pathway analysis of dissolved methane in groundwater, the implications of the proposed development of PSP on the local water table levels (up or down) and delineation of the inferred landfill waste boundary.

These findings and all conclusions and advice in this report are subject to the limitations and assumptions made herein.

9 REFERENCES

Environment Protection Authority Victoria, *Best Practice Environmental Management: Siting, Design, Operation and Rehabilitation of Landfills*, Publication 788.3, August 2015.

Environment Protection Authority Victoria, *Assessing planning proposals within the buffer of a landfill*, Publication 1642, October 2017.

Environment Protection Authority Victoria, *Landfill gas fugitive emissions monitoring guideline*, Publication 1684, February 2018.

Environment Protection Authority Victoria, *Landfill buffer guideline*, August 2024.

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SMEC Pty Ltd, Historic Landfills: CoB Closed Landfill Water Monitoring, 17 July 2024.

SMEC Pty Ltd, Historic Landfills: CoB Closed Landfill LFG Monitoring, 2 July 2024.

SMEC Pty Ltd, Historic Landfills: CoB Closed Landfill LFG Monitoring, 29 August 2024.

10 LIMITATIONS

This report has been prepared by Landserv Pty Limited (Landserv) only for the use by the City of Ballarat, Environmental Auditor (Mr John Nolan) and the regulatory authorities or agencies directly involved with the project. No other parties should rely on the information in this report without prior written consent from Landserv and the City of Ballarat.

Landserv has performed its services for this project in accordance with the scope of work commissioned by the City of Ballarat in a manner consistent with the level of quality and skill generally exercised by members of its profession.

It should be noted that geological, environmental and contamination conditions often vary from conditions observed at the locations where investigation data has been obtained. Limited data can therefore result in uncertainty in the interpretation of geological, environmental and contamination conditions.

Geological, environmental and contamination conditions also often vary with the passing of time after the data is obtained, as do regulatory requirements, laws and guideline criteria.

Despite Landserv's due professional care, all of these uncertainties should be considered in relying and acting on the information contained in our reports. This is particularly so if few locations have been sampled, if a report is used after a significant delay in time, if regulations and guideline criteria are known to have changed, or if a change is proposed to the land use for the site.

Opinions and recommendations in our reports are based on the information available to Landserv at the time of undertaking the works, including the information gained during the project. The information we report relating to the condition of the subject Site for each project is considered to be sufficiently accurate for the purposes stated in the report at the time the document is issued.

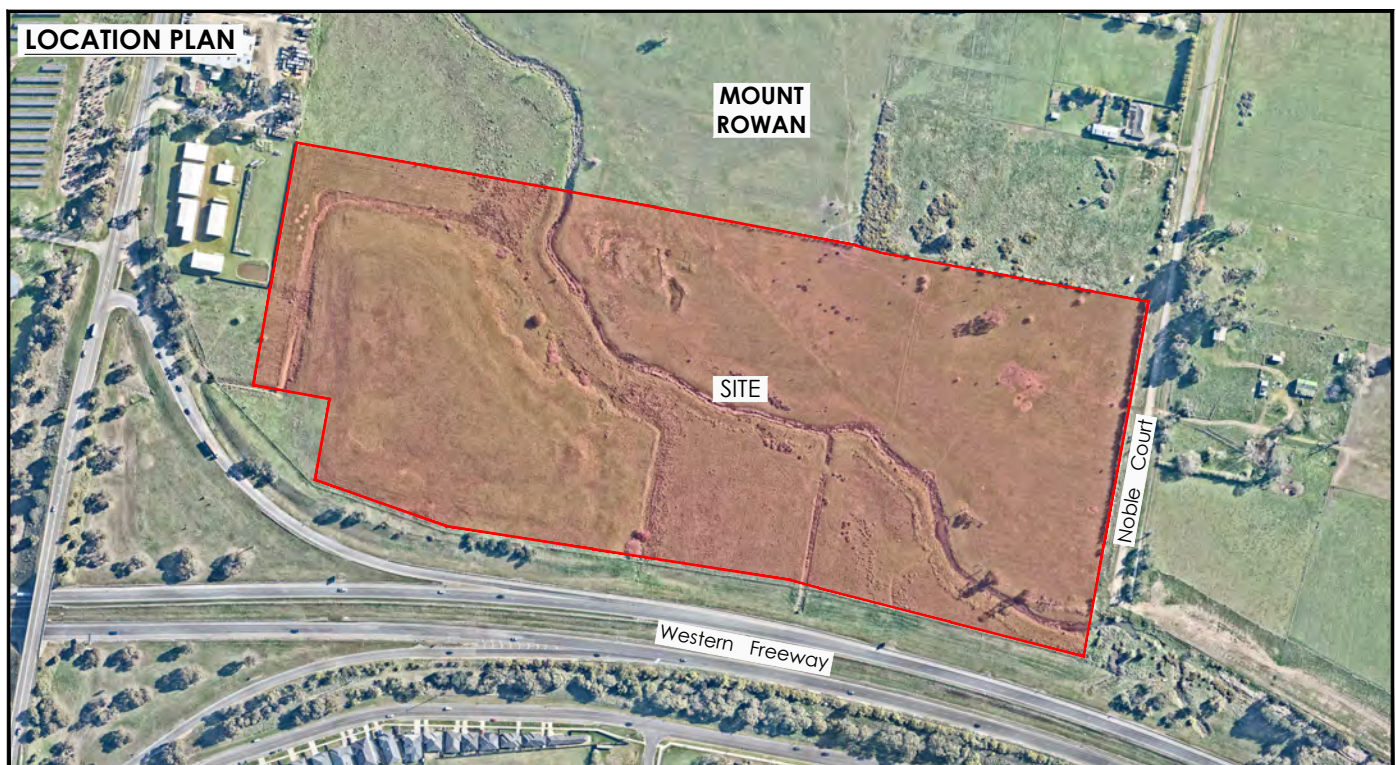
No warranty of site conditions is intended.

11 ABBREVIATIONS

AHD	Australian Height Datum
AS	Australia Standard
BGL	Below Ground Level
BH	Bore Hole
BoM	Bureau of Meteorology
BPEM	Best Practice Environmental Management
BYDA	Before You Dig Australia
CIRIA	Construction Industry Research and Information Association
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CS	Characteristic Situation
CSM	Conceptual Site Model
DELWP	Department of Environment, Land, Water and Planning
DPM	Damp Proof Membrane
EPA	Environment Protection Authority
GSV	Gas Screening Value
H ₂ S	Hydrogen Sulphide
ID	Identification
LFG	Landfill Gas
LFGR	Landfill Gas Risk Assessment
LFGRAP	Landfill Gas Remediation Action Plan
MGA	Map Grid of Australia
MSWLF	Municipal Solid Waste Landfill
O ₂	Oxygen
PIW	Prescribed Industrial Waste
SPI	Standard Parcel Identifier
VL	Victorian Landfill Register
VVG	Visualising Victorian's Groundwater

Appendix A

Figures



Project Number : LS0145	Figure : 1	Date : 2/12/2024	LEGEND : Site Boundary
Drawn By : P.Bazalicki	Revision : A	Vertical Datum : Australian Height Datum	
Checked By : A.Wigley	Horizontal Datum: MGA Zone 54 based on GDA2020 Datum		
Data Sources : - Nearmap Aerial Photography, Sep 2024 - Vicmap Property Boundaries, Sep 2024		Scale : 050100150200250 Scale in metres	Zone 54 MGA Mapping Note: All map locations are approximate only.

Landserv

Environment

GEELONG OFFICE

14 Albert Street,
Geelong West Vic 3218
T: 03 5222 4173

PO Box 1628 Geelong VIC 3220

MELBOURNE OFFICE

Suite 97, Level 4, 80 Market St,
South Melbourne Vic 3205
T: 03 9646 0833

Email admin@landserv.com.au
www.landserv.com.au

CLIENT : CITY OF BALLARAT

LOCATION : Noble Ct (Former Landfill), Mt Rowan, VIC

FIGURE TITLE : SITE LOCALITY PLAN

LS0145_Fig1_Site Locality Plan.dwg



LEGEND :

- Site Boundary
- ⊕ GB1 *Gas Bore Location
- ⊕ GW2 Existing Groundwater Bore (Approx. location)
- ⊕ LB2 Existing Leachate Bore (Approx. location)

Project Number : LS0145

Drawn By : P.Bazalicki

Checked By : F.Hollands

Data Sources :

- Nearmap Aerial Photography, Sep 2024
 - VICMAP Property Boundaries, Sep 2024
 - *Landserv Gas Bore Survey, Oct 2024
- Mapping Note: All bore locations are approximate only.

Figure : 2 **Date :** 26/11/2024

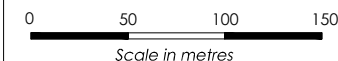
Revision : A

Vertical Datum : Australian Height Datum

Horizontal Datum : MGA Zone 54 based on GDA2020 Datum



Scale :



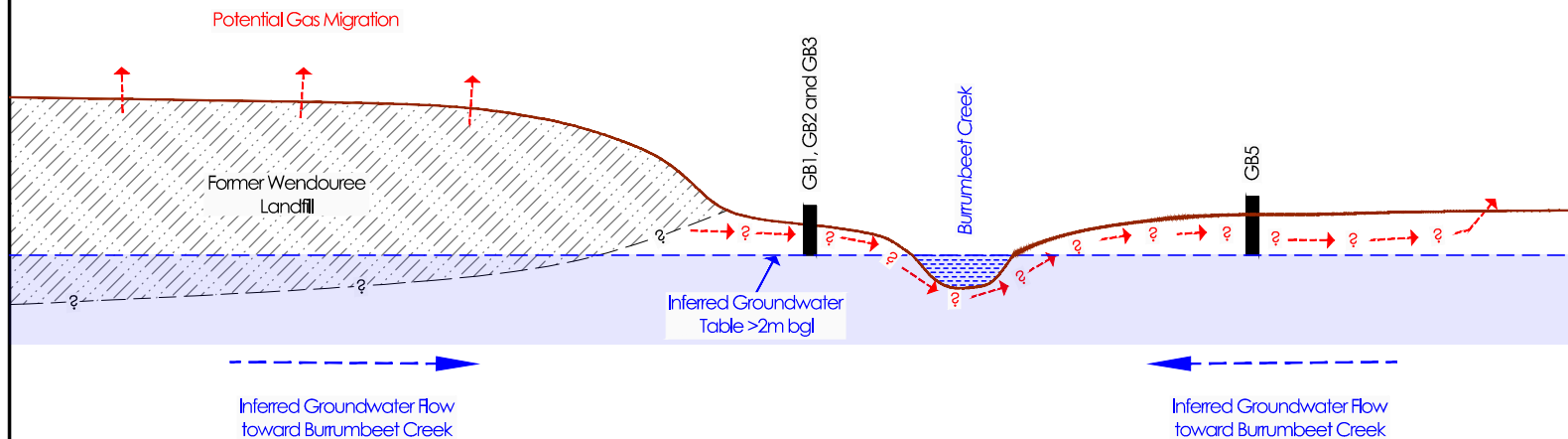
CLIENT : CITY OF BALLARAT

LOCATION : Noble Ct (Former Landfill), Mt Rowan, VIC

FIGURE TITLE : BORE LOCATION PLAN

South

North



LEGEND :

Project Number : LS0145

Drawn By : P.Bazalicki

Checked By : A.Wigley

Data Sources :

Figure : 3 Date : 15/4/2025

Revision : A

Vertical Datum : N/A

Horizontal Datum: N/A

Scale :

Not to Scale

CLIENT : CITY OF BALLARAT

LOCATION : Fomer Wendouree Landfill, Mt Rowan, VIC

FIGURE TITLE : CONCEPTUAL CROSS SECTION

Appendix B

Site Photographs



Photograph 1

Wendouree Landfill, facing east

Landfill Gas Bore Installation, 1 October 2024

Wendouree Landfill Gas Investigation, City of Ballarat



Photograph 2

General soil profile consisting of clay

Landfill Gas Bore Installation, 1 October 2024

Wendouree Landfill Gas Investigation, City of Ballarat





Photograph 5

Creek water level

Landfill Gas Bore Installation, 15 October 2024

Wendouree Landfill Gas Investigation, City of Ballarat



Photograph 6

Creek water level

Landfill Gas Bore Installation, 29 October 2024

Wendouree Landfill Gas Investigation, City of Ballarat



Landserv
Environment

Photograph 7

Creek water level

Landfill Gas Bore Installation, 6 November 2024

Wendouree Landfill Gas Investigation, City of Ballarat

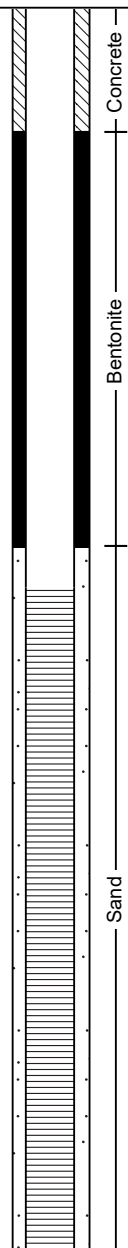
Appendix C

Bore Installation Logs

CLIENT: City of Ballarat	OPERATOR: Landserv	BORE DEPTH: 1.5 m
JOB NUMBER: LS0145	PLANT EQUIPMENT: Hand Auger	CASING LENGTH: 0.7 m
LOCATION: Wendouree Landfill	DATUM/ZONE: MGA-GDA94-Zone 54	CASING DIAMETER: 50 mm
DATE: 1/10/24	EASTING: 220032.195	SCREEN LENGTH: 0.8 m
LOGGED BY: FH	NORTHING: 5843112.096	SCREEN DIAMETER: 50 mm
CHECKED BY: LJ		

WELL HEAD COVER: Monument	CASING: Class 18 uPVC	SCREEN: Class 18 uPVC Factory Slotted
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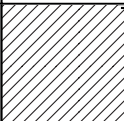
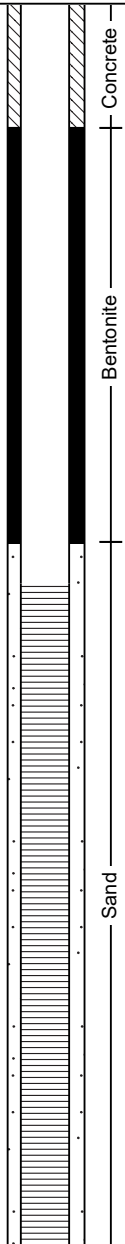
COMMENTS: Fitted with gas-tight quick-fit gas sampling port. Approx. 1m stick up

Elevation (m)	Depth (mBGL)	Graphic Log	Description of Strata (Colour, Texture, Structure)	Drilling Method	Bore Construction Details
429.5			Silty CLAY: Brown, low plasticity, soft, organic matter, moist	Hand Auger	
429.4	0.1				
429.3	0.2				
429.2	0.3		CLAY: Grey, high plasticity, firm, moist		
429.1	0.4				
429	0.5				
428.9	0.6		Becoming pale grey		
428.8	0.7				
428.7	0.8		CLAY: Pale brown grey yellow mottled, high plasticity, soft, trace fine sand, moist		
428.6	0.9				
428.5	1				
428.4	1.1				
428.3	1.2				
428.2	1.3				
428.1	1.4		Becoming wet		
428	1.5		Termination Depth: 1.5 m BGL		
427.9	1.6				

CLIENT: City of Ballarat	OPERATOR: Landserv	BORE DEPTH: 1.5 m
JOB NUMBER: LS0145	PLANT EQUIPMENT: Hand Auger	CASING LENGTH: 0.7 m
LOCATION: Wendouree Landfill	DATUM/ZONE: MGA-GDA94-Zone 54	CASING DIAMETER: 50 mm
DATE: 1/10/24	EASTING: 219904.853	SCREEN LENGTH: 0.8 m
LOGGED BY: FH	NORTHING: 5843200.615	SCREEN DIAMETER: 50 mm
CHECKED BY: LJ		

WELL HEAD COVER: Monument	CASING: Class 18 uPVC	SCREEN: Class 18 uPVC Factory Slotted
----------------------------------	------------------------------	--

COMMENTS: Fitted with gas-tight quick-fit gas sampling port. Approx. 1m stick up

Elevation (m)	Depth (mBGL)	Graphic Log	Description of Strata (Colour, Texture, Structure)	Drilling Method	Bore Construction Details
429.8	0.1		Clayey SILT: Brown, low plasticity, soft, organic matter, moist	Hand Auger	
429.7	0.2				
429.6	0.3				
429.5	0.4		CLAY: Grey brown, high plasticity, firm, moist		
429.4	0.5		Becoming brown orange mottled		
429.3	0.6		Becoming stiff		
429.2	0.7				
429.1	0.8				
429	0.9		CLAY: Yellow brown mottled, high plasticity, firm, moist		
428.9	1				
428.8	1.1		CLAY: Yellow pale grey mottled, high plasticity, soft, trace fine sand, moist		
428.7	1.2				
428.6	1.3				
428.5	1.4				
428.4	1.5		Becoming wet		
428.3	1.6		Termination Depth: 1.5 m BGL		
428.2					

CLIENT: City of Ballarat
JOB NUMBER: LS0145
LOCATION: Wendouree Landfill
DATE: 1/10/24
LOGGED BY: FH
CHECKED BY: LJ

OPERATOR: Landserv
PLANT EQUIPMENT: Hand Auger
DATUM/ZONE: MGA-GDA94-Zone 54
EASTING: 219786.731
NORTHING: 5843339.592

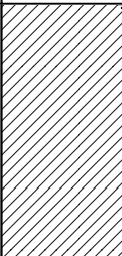
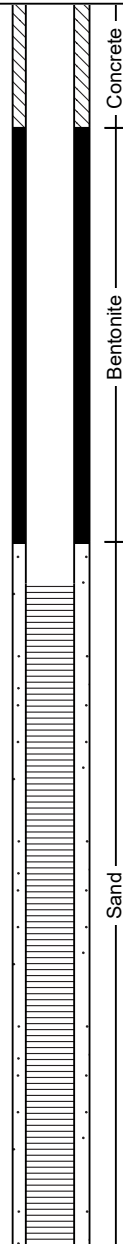
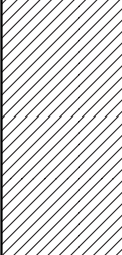
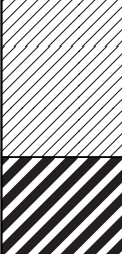
BORE DEPTH: 1.5 m
CASING LENGTH: 0.7 m
CASING DIAMETER: 50 mm
SCREEN LENGTH: 0.8 m
SCREEN DIAMETER: 50 mm

WELL HEAD COVER: Monument

CASING: Class 18 uPVC

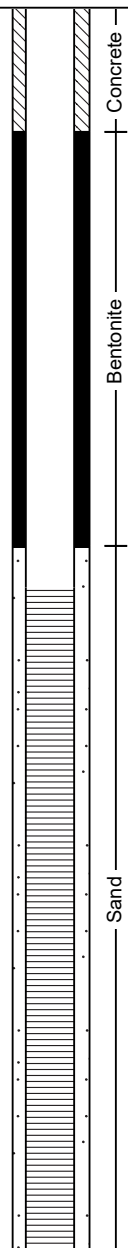
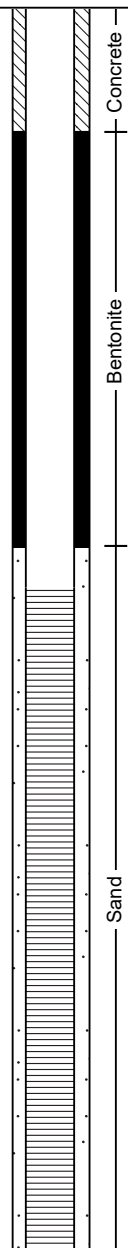
SCREEN: Class 18 uPVC Factory Slotted

COMMENTS: Fitted with gas-tight quick-fit gas sampling port. Approx. 1m stick up

Elevation (m)	Depth (mBGL)	Graphic Log	Description of Strata (Colour, Texture, Structure)	Drilling Method	Bore Construction Details
428.8	0.1		Clayey SILT: Brown, low plasticity, soft, organic matter, moist	Hand Auger	
428.7	0.2				
428.6	0.3				
428.5	0.4		Silty CLAY: Brown red mottled, low plasticity, firm, trace fine sand, moist		
428.4	0.5				
428.3	0.6				
428.2	0.7		Silty CLAY with trace Gravel: Brown orange mottled, low plasticity, firm, trace fine sub-rounded gravel, moist		
428.1	0.8				
428	0.9				
427.9	1		CLAY: Pale brown, high plasticity, firm, trace gravel, moist		
427.8	1.1				
427.7	1.2				
427.6	1.3		CLAY: Yellow pale grey mottled, high plasticity, firm, trace fine sand, moist		
427.5	1.4				
427.4	1.5		Becoming wet		
427.3	1.6		Termination Depth: 1.5 m BGL		
427.2					

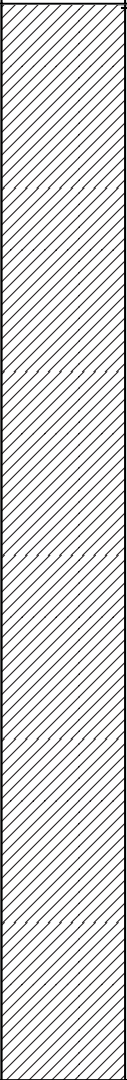
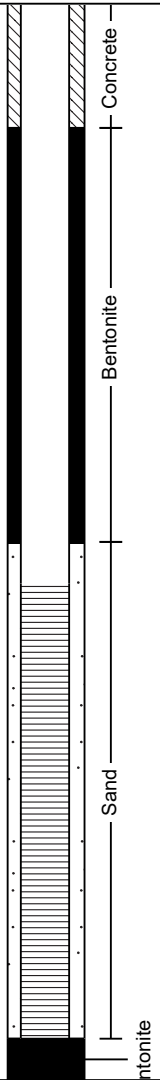
CLIENT: City of Ballarat	OPERATOR: Landserv	BORE DEPTH: 1.5 m
JOB NUMBER: LS0145	PLANT EQUIPMENT: Hand Auger	CASING LENGTH: 0.7 m
LOCATION: Wendouree Landfill	DATUM/ZONE: MGA-GDA94-Zone 54	CASING DIAMETER: 50 mm
DATE: 1/10/24	EASTING: 219993.100	SCREEN LENGTH: 0.8 m
LOGGED BY: FH	NORTHING: 5843315.863	SCREEN DIAMETER: 50 mm
CHECKED BY: LJ		

WELL HEAD COVER: Monument	CASING: Class 18 uPVC	SCREEN: Class 18 uPVC Factory Slotted
COMMENTS: Fitted with gas-tight quick-fit gas sampling port. Approx. 1m stick up		

Elevation (m)	Depth (mBGL)	Graphic Log	Description of Strata (Colour, Texture, Structure)	Drilling Method	Bore Construction Details
432.7			Silty CLAY: Brown, low plasticity, firm, organic matter, moist	Hand Auger	
432.6	0.1				
432.5	0.2		Silty CLAY: Grey, high plasticity, stiff, moist		
432.4	0.3				
432.3	0.4				
432.2	0.5				
432.1	0.6				
432	0.7		CLAY with trace Gravel: Brown yellow mottled, high plasticity, firm, trace fine sub-rounded gravel, moist	Hand Auger	
431.9	0.8				
431.8	0.9				
431.7	1				
431.6	1.1		CLAY: Yellow pale grey mottled, high plasticity, firm, trace fine sand, moist		
431.5	1.2				
431.4	1.3				
431.3	1.4		----- Becoming soft and wet		
431.2	1.5		Termination Depth: 1.5 m BGL		
431.1	1.6				

CLIENT: City of Ballarat	OPERATOR: Landserv	BORE DEPTH: 1.3 m
JOB NUMBER: LS0145	PLANT EQUIPMENT: Hand Auger	CASING LENGTH: 0.7 m
LOCATION: Wendouree Landfill	DATUM/ZONE: MGA-GDA94-Zone 54	CASING DIAMETER: 50 mm
DATE: 15/10/24	EASTING: 219968.881	SCREEN LENGTH: 0.55 m
LOGGED BY: FH	NORTHING: 5843268.746	SCREEN DIAMETER: 50 mm
CHECKED BY: LJ		

WELL HEAD COVER: Monument	CASING: Class 18 uPVC	SCREEN: Class 18 uPVC Factory Slotted
COMMENTS: Fitted with gas-tight quick-fit gas sampling port. Approx. 1m stick up		

Elevation (m)	Depth (mBGL)	Graphic Log	Description of Strata (Colour, Texture, Structure)	Drilling Method	Bore Construction Details
434.5			Clayey sandy SILT: pale grey white, dense to hard, fine grained, dry	Hand Auger	
434.4	0.1				
434.3	0.2				
434.2	0.3				
434.1	0.4				
434	0.5				
433.9	0.6				
433.8	0.7				
433.7	0.8				
433.6	0.9				
433.5	1				
433.4	1.1				
433.3	1.2				
433.2	1.3		Termination Depth: 1.3 m BGL		
433.1	1.4				
433	1.5				
432.9	1.6				

Appendix D

Equipment Calibration Certificates

Equipment Calibration Form
GA5000



Enqip #: 23295
Company: Landserv
Consultant: Fletcher Hollands
PO #: LSA0145
Certificate #: 34483

INSTRUMENT IDENTIFICATION

Model Number: GA5KA0F-100
Serial Number: K-234902 G501042
Instrument Type: GTI - GA5000

INSPECTION RECORD

Date & Time: PASS
Flow Rate: 675 mL/min

CALIBRATION DETAILS

Sensor	Standard	Reading	Traceability Lot #
CH ₄	N ₂ UHP	0 %	10013-7
	2.5 %	2.5 %	10369-3
	60 %	60.0 %	10820-3
CO ₂	5 %	5.0 %	10542-2
	40 %	40.0 %	10820-3
O ₂	N ₂ UHP	0 %	10013-7
	18.0 %	18.0 %	10369-3
	20.9 %	20.9 %	N/A
CO	N ₂ UHP	0 ppm	10013-7
	100 ppm	100 ppm	10369-3
H ₂ S	N ₂ UHP	0 ppm	10013-7
	25 ppm	25 ppm	10917-43

Calibration Successful: YES

Calibrated By: Phuong Tran Test Date: 7/10/2024

Calibration Certificate

AirMet Scientific P/L

7-11 Ceylon Street
Nunawading
VIC 3131, Australia
Tel: 03 8878 3300
Fax: 03 8878 3344

This document certifies that the instrument detailed has been calibrated to the parameters

Certificate Print Date: 8-Apr-2024

Call ID / Order No: 267236

Calibration Date: 31-Jan-2024

Job No / Pack No: S2672360004

Next Calibration Due: 30-Jan-2025

Customer: AMS NSW Rental-ID 399982

Serial No: 000012/06/18

Description: GasClam 0-100% CH₄, CO₂, O₂ ATEX IECEx approv

Calibration Summary

Frequency: 365 Days

Temp: 22°C

As Found: In Tolerance

Result: Pass

Humidity: 45%

Certificate: S2672360004

<u>Desc</u>	<u>As Found</u>		<u>As Left (Cal Status)</u>	
	<u>Actual</u>	<u>Result</u>	<u>Actual</u>	<u>Result</u>
H2S ppm	25.4	Pass	25.4	Pass
COppm	100.7	Pass	100.7	Pass
CH ₄ %	59.4	Pass	59.4	Pass
CO ₂ %	39.9	Pass	39.9	Pass
O ₂ % vol	20.9	Pass	20.9	Pass

<u>Standard Used</u>			
<u>Equip ID</u>	<u>Description</u>	<u>Valid Until</u>	<u>Cert</u>
ME1115	UHP N ₂ +99.999%	11/09/2026	PO04506
ME1126	59.7 %CH ₄ in CO ₂ Balance	03/08/2028	03000007146 8/1
ME1172	CH ₄ 50% LEL, CO 100ppm, H ₂ S 25ppm, 18% VOL in N ₂ Balance	21/02/2026	10577
MEFRESHAIR	Ambient Air	29/08/2028	

Completed By: Prashant Waghela

Signed: 

Equipment Calibration Form

GA5000



Enqip #: 23296

Company: Landserv

Consultant: Fletcher Hollands

PO #: LSA0145

Certificate #: 34568

INSTRUMENT IDENTIFICATION

Model Number: GA5KA0F-100

Serial Number: G506198

Instrument Type: GTI - GA5000

INSPECTION RECORD

Date & Time: PASS

Flow Rate: 658 mL/min

CALIBRATION DETAILS

Sensor	Standard	Reading	Traceability Lot #
CH ₄	N ₂ UHP	0 %	10013-7
	2.5 %	2.5 %	10369-3
	60 %	60.0 %	10820-4
CO ₂	5 %	5.0 %	10542-2
	40 %	40.0 %	10820-4
O ₂	N ₂ UHP	0 %	10013-7
	18.0 %	18.0 %	10369-3
	20.9 %	20.9 %	N/A
CO	N ₂ UHP	0 ppm	10013-7
	100 ppm	100 ppm	10369-3
H ₂ S	N ₂ UHP	0 ppm	10013-7
	25 ppm	25 ppm	10917-43

Calibration Successful: YES

Calibrated By: Phuong Tran

Test Date: 14/10/2024



Equipment Calibration Form

GA5000



Enqip #: 23297
Company: Landserv
Consultant: Fletcher Hollands
PO #: LSA0145
Certificate #: 34655

INSTRUMENT IDENTIFICATION

Model Number: GA5KA0F-100
Serial Number: K-234909
Instrument Type: GTI - GA5000

INSPECTION RECORD

Date & Time: PASS
Flow Rate: 638 mL/min

CALIBRATION DETAILS

Sensor	Standard	Reading	Traceability Lot #
CH ₄	N ₂ UHP	0 %	10013-7
	2.5 %	2.5 %	10369-3
	60 %	60.0 %	10820-4
CO ₂	5 %	5.0 %	10542-2
	40 %	40.0 %	10820-4
O ₂	N ₂ UHP	0 %	10013-7
	18.0 %	18.0 %	10369-3
	20.9 %	20.9 %	N/A
CO	N ₂ UHP	0 ppm	10013-7
	100 ppm	100 ppm	10369-3
H ₂ S	N ₂ UHP	0 ppm	10013-7
	25 ppm	25 ppm	10917-43

Calibration Successful: YES

Calibrated By: Phuong Tran

Test Date: 21/10/2024



116 Thistlethwaite St, South Melbourne 3205
P 1300 218 987

E bookings@enqip.com.au | W www.enqip.com.au

Equipment Calibration Form
GA5000



Enqip #: 23298
Company: Landserv
Consultant: Fletcher Hollands
PO #: LSA0145
Certificate #: 34719

INSTRUMENT IDENTIFICATION

Model Number: GA5KA0F-100
Serial Number: GA500129
Instrument Type: GTI - GA5000

INSPECTION RECORD

Date & Time: PASS
Flow Rate: 621 mL/min

CALIBRATION DETAILS

Sensor	Standard	Reading	Traceability Lot #
CH ₄	N ₂ UHP	0 %	10013-7
	2.5 %	2.5 %	10369-3
	60 %	60.0 %	10820-4
CO ₂	5 %	5.0 %	10542-2
	40 %	40.0 %	10820-4
O ₂	N ₂ UHP	0 %	10013-7
	18.0 %	18.0 %	10369-3
	20.9 %	20.9 %	N/A
CO	N ₂ UHP	0 ppm	10013-7
	100 ppm	100 ppm	10369-3
H ₂ S	N ₂ UHP	0 ppm	10013-7
	25 ppm	25 ppm	10917-43

Calibration Successful: YES

Calibrated By: Phuong Tran

Test Date: 28/10/2024



116 Thistlethwaite St, South Melbourne 3205
P 1300 218 987

E bookings@enqip.com.au | W www.enqip.com.au

Equipment Calibration Form

GA5000



Enqip #: 23438
Company: Landserv
Consultant: Fletcher Hollands
PO #: LSA0145
Certificate #: 34760

INSTRUMENT IDENTIFICATION

Model Number: GA5KA0F-100
Serial Number: G502985
Instrument Type: GTI - GA5000

INSPECTION RECORD

Date & Time: PASS
Flow Rate: 680 mL/min

CALIBRATION DETAILS

Sensor	Standard	Reading	Traceability Lot #
CH ₄	N ₂ UHP	0 %	10963-1
	2.5 %	2.5 %	10369-3
	60 %	60.0 %	10820-4
CO ₂	5 %	5.0 %	10542-2
	40 %	40.0 %	10820-4
O ₂	N ₂ UHP	0 %	10963-1
	18.0 %	18.0 %	10369-3
	20.9 %	20.9 %	N/A
CO	N ₂ UHP	0 ppm	10963-1
	100 ppm	100 ppm	10369-3
H ₂ S	N ₂ UHP	0 ppm	10963-1
	25 ppm	25 ppm	10917-43

Calibration Successful: YES

Calibrated By: Phuong Tran

Test Date: 4/11/2024



116 Thistlethwaite St, South Melbourne 3205
P 1300 218 987

E bookings@enqip.com.au | W www.enqip.com.au



Calibration Certificate

AirMet Scientific P/L

7-11 Ceylon Street
Nunawading
VIC 3131, Australia
Tel: 03 8878 3300
Fax: 03 8878 3344

This document certifies that the instrument detailed has been calibrated to the parameters

Certificate Print Date: 8-Apr-2024

Call ID / Order No: 267236

Calibration Date: 31-Jan-2024

Job No / Pack No: S2672360004

Next Calibration Due: 30-Jan-2025

Customer: AMS NSW Rental-ID 399982

Serial No: 000012/06/18

Description: GasClam 0-100% CH₄, CO₂, O₂ ATEX IECEx approv

Calibration Summary

Frequency: 365 Days

Temp: 22°C

As Found: In Tolerance

Result: Pass

Humidity: 45%

Certificate: S2672360004

<u>Desc</u>	<u>As Found</u>		<u>As Left (Cal Status)</u>	
	<u>Actual</u>	<u>Result</u>	<u>Actual</u>	<u>Result</u>
H2S ppm	25.4	Pass	25.4	Pass
COppm	100.7	Pass	100.7	Pass
CH ₄ %	59.4	Pass	59.4	Pass
CO ₂ %	39.9	Pass	39.9	Pass
O ₂ % vol	20.9	Pass	20.9	Pass

<u>Standard Used</u>			
<u>Equip ID</u>	<u>Description</u>	<u>Valid Until</u>	<u>Cert</u>
ME1115	UHP N ₂ +99.999%	11/09/2026	PO04506
ME1126	59.7 %CH ₄ in CO ₂ Balance	03/08/2028	03000007146 8/1
ME1172	CH ₄ 50% LEL, CO 100ppm, H ₂ S 25ppm, 18% VOL in N ₂ Balance	21/02/2026	10577
MEFRESHAIR	Ambient Air	29/08/2028	

Completed By: Prashant Waghele

Signed:

Appendix E

Meteorological Data

Date/Time EDT	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm	
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts				
08/01:30pm	10.9	4.6	3.5	60	3.3	SSE	26	35	14	19	1026.5	1026.5	0.2	
08/01:00pm	10.6	4.1	2.7	58	3.5	SSE	26	32	14	17	1026.6	1026.6	0.2	
08/12:30pm	10.7	4.6	2.5	57	3.6	SSE	24	39	13	21	1026.6	1026.6	0.2	
08/12:00pm	9.6	2.4	2.9	63	2.9	SSE	30	37	16	20	1026.8	1026.8	0	
08/11:30am	9.6	3.8	2.2	60	3.2	SSE	22	35	12	19	1026.8	1026.8	0	
08/11:00am	7.9	1.1	3	71	2.1	SSE	28	35	15	19	1026.9	1026.9	0	
08/10:30am	9.4	2.1	2.7	63	2.9	SE	30	39	16	21	1026.7	1026.7	0	
08/10:00am	8.7	2.2	2.9	67	2.5	SSE	26	37	14	20	1026.6	1026.6	0	
08/09:30am	7.4	1.4	3.6	77	1.7	SSE	24	33	13	18	1026.2	1026.2	0	
08/09:00am	6.5	1.2	3.1	79	1.5	S	20	26	11	14	1025.9	1025.9	5	
08/08:30am	5.4	0.3	2.9	84	1.1	SSE	19	24	10	13	1025.6	1025.5	5	
08/08:00am	3.2	-0.6	1.6	89	0.6	S	11	13	6	7	1025.3	1025.3	5	
08/07:30am	2.1	-2.2	0.9	92	0.5	S	13	15	7	8	1025	1025	5	
08/07:00am	1.4	-4.1	0.4	93	0.4	SSE	19	22	10	12	1024.3	1024.3	5	
08/06:30am	1.4	-3.4	0.1	91	0.5	S	15	19	8	10	1024.1	1024.1	5	
08/06:00am	1.5	-3.3	0.3	92	0.5	S	15	17	8	9	1023.9	1023.9	5	
08/05:30am	2	-3.1	0.8	92	0.5	S	17	20	9	11	1023.8	1023.7	5	
08/05:00am	1.9	-2.4	0.9	93	0.4	S	13	17	7	9	1023.4	1023.3	5	
08/04:30am	1.8	-2.5	0.9	94	0.3	S	13	17	7	9	1023.3	1023.2	5	
08/04:00am	2	-2.3	1.1	94	0.3	SSE	13	15	7	8	1023.3	1023.2	5	
08/03:30am	1.9	-2.4	0.9	93	0.4	SSE	13	15	7	8	1023.4	1023.3	5	
08/03:00am	2.2	-2.1	1	92	0.5	S	13	15	7	8	1023.4	1023.3	5	
08/02:30am	2.6	-1.7	1.3	91	0.5	S	13	15	7	8	1023.4	1023.3	5	
08/02:00am	3.2	-0.6	1.7	90	0.6	S	11	15	6	8	1023.4	1023.3	5	
08/01:30am	3	-1.2	1.5	90	0.6	S	13	17	7	9	1023.2	1023.1	5	
08/01:00am	3.1	-1.1	1.5	89	0.6	S	13	17	7	9	1023	1022.9	5	
08/12:30am	3.1	-0.8	1.3	88	0.7	S	11	15	6	8	1023.1	1023	5	
08/12:00am	3.7	-0.1	1.6	86	0.8	S	11	13	6	7	1023.1	1023	5	

Date/Time EDT	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm	
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts				
07/11:30pm	3.5	-0.4	1.1	84	1	S	11	13	6	7	1023	1022.9	5	
07/11:00pm	3.9	0	1.3	83	1	S	11	13	6	7	1022.7	1022.7	5	
07/10:30pm	4.9	1.1	1.7	80	1.3	S	11	15	6	8	1022.7	1022.7	5	
07/10:00pm	4.8	0.2	1.8	81	1.2	SSE	15	17	8	9	1022.6	1022.6	5	
07/09:30pm	6.1	2	2.2	76	1.6	S	13	19	7	10	1022.4	1022.4	5	
07/09:00pm	5.7	2.1	2.9	82	1.2	S	11	15	6	8	1022.1	1022.1	5	
07/08:30pm	7.5	3.2	3	73	1.9	S	15	20	8	11	1021.7	1021.6	5	
07/08:00pm	8.2	3.5	2.9	69	2.3	S	17	22	9	12	1021.4	1021.3	5	
07/07:30pm	9.1	4	3.3	67	2.6	SSW	19	26	10	14	1020.9	1020.8	5	
07/07:00pm	9.7	5.1	3.7	66	2.7	SSW	17	26	9	14	1020.6	1020.5	5	
07/06:30pm	10	5.6	4.8	70	2.4	SSW	17	22	9	12	1020.1	1020.1	5	
07/06:00pm	10.2	5.4	5.8	74	2.1	SSW	20	30	11	16	1019.5	1019.4	5	
07/05:30pm	11.2	6.6	6.5	73	2.3	SSW	20	32	11	17	1019.2	1019.1	5	
07/05:00pm	11.8	6.6	7.3	74	2.2	SSW	24	33	13	18	1018.8	1018.7	5	
07/04:30pm	11.6	6	7.3	75	2.1	SSW	26	39	14	21	1018.4	1018.3	5	
07/04:00pm	11.5	5.8	8.5	82	1.5	SW	28	43	15	23	1018	1018	5	
07/03:54pm	11.8	6.4	9.5	86	1.2	SW	28	46	15	25	1017.9	1017.9	5	
07/03:30pm	13.9	8.2	8.3	69	2.9	SW	28	41	15	22	1017.5	1017.4	4.2	
07/03:00pm	13.6	8.6	9.6	77	2.1	SW	26	39	14	21	1017.5	1017.4	4.2	
07/02:30pm	13.8	8	9.3	74	2.3	WSW	30	39	16	21	1017.3	1017.2	4.2	
07/02:09pm	11.8	6.7	9.2	84	1.3	WSW	26	37	14	20	1017.4	1017.3	4.2	
07/02:00pm	11.4	6.8	9.7	89	0.9	WSW	24	35	13	19	1017.5	1017.4	4.2	
07/01:53pm	11.2	6.6	9.8	91	0.7	WSW	24	35	13	19	1017.5	1017.4	4.2	
07/01:35pm	11.2	7.6	10	92	0.6	WSW	19	26	10	14	1017.4	1017.3	4.2	
07/01:30pm	11.2	7.4	9.8	91	0.7	WSW	20	32	11	17	1017.4	1017.3	4	
07/01:07pm	10.1	5.3	8.9	92	0.6	SW	24	35	13	19	1017.2	1017.1	4	
07/01:01pm	10.4	4.9	9.2	92	0.6	WSW	28	41	15	22	1017.2	1017.1	3.6	
07/01:00pm	10.4	4.9	9.2	92	0.6	WSW	28	41	15	22	1017.1	1017	3.6	
07/12:33pm	14.6	8.3	9.6	72	2.6	W	33	52	18	28	1016.5	1016.4	3.6	

07/12:30pm	15	8.9	10.6	75	2.4	W	33	43	18	23	1016.5	1016.4	3.6
07/12:00pm	13.9	8.8	10.7	81	1.7	W	28	41	15	22	1016.5	1016.4	3.6
07/11:30am	11.7	5.6	9.9	89	0.9	W	32	43	17	23	1016.5	1016.4	3.6
07/11:09am	11.7	6.5	10.1	90	0.8	W	28	44	15	24	1016.4	1016.3	3.6
07/11:02am	11.9	7.3	11	94	0.5	W	26	33	14	18	1016.4	1016.3	3.6
07/11:00am	11.7	7	10.8	94	0.5	W	26	33	14	18	1016.3	1016.2	3.6
07/10:38am	11.4	6.3	10.6	95	0.4	W	28	39	15	21	1016.1	1016	3.4
07/10:30am	11.3	6.1	10.4	94	0.5	W	28	41	15	22	1016	1015.9	3
07/10:10am	11.5	7.5	10.4	93	0.6	WNW	22	30	12	16	1016	1015.9	1
07/10:00am	11.7	7.7	10.4	92	0.7	WNW	22	30	12	16	1015.7	1015.5	0.4
07/09:44am	11.5	7.9	10.6	94	0.5	NW	20	26	11	14	1015.5	1015.4	0.4
07/09:37am	11.5	7.9	10.7	95	0.4	NW	20	24	11	13	1015.5	1015.4	0.4
07/09:30am	11.1	7.4	10.2	94	0.5	NW	20	26	11	14	1015.7	1015.5	0.4
07/09:26am	11.1	7.6	10.2	94	0.5	WNW	19	28	10	15	1015.7	1015.5	0.4
07/09:13am	11	7.2	9.9	93	0.6	WNW	20	28	11	15	1015.7	1015.5	0.2
07/09:03am	11.3	7.1	9.6	89	0.9	WNW	22	32	12	17	1015.5	1015.4	0
07/09:00am	11.4	7.8	9.7	89	0.9	WNW	19	30	10	16	1015.4	1015.3	0.2
07/08:32am	10.7	6.3	9.1	90	0.8	NNW	22	32	12	17	1015	1014.9	0.2
07/08:30am	10.7	6	9.1	90	0.8	N	24	32	13	17	1014.9	1014.8	0.2
07/08:25am	10.6	5.4	9	90	0.8	N	26	35	14	19	1014.8	1014.7	0.2
07/08:00am	10.3	4.7	8.9	91	0.7	N	28	33	15	18	1014.4	1014.3	0.2
07/07:30am	10.1	4.9	8.7	91	0.7	N	26	32	14	17	1014.3	1014.2	0.2
07/07:00am	9.4	4.8	8.3	93	0.5	N	22	28	12	15	1014	1013.9	0.2
07/06:30am	8.8	3.7	7.7	93	0.5	N	24	30	13	16	1013.9	1013.7	0.2
07/06:00am	10.1	4.7	8.2	88	0.9	NNW	26	32	14	17	1013.7	1013.5	0.2
07/05:30am	10.3	5	8.4	88	0.9	NNW	26	33	14	18	1013.4	1013.2	0.2
07/05:00am	10.1	5.2	8.5	90	0.8	NNW	24	30	13	16	1013.4	1013.2	0.2
07/04:30am	10.1	5.6	8.5	90	0.8	NNW	22	30	12	16	1013.4	1013.2	0.2
07/04:00am	10.4	5.9	8.7	89	0.9	NW	22	28	12	15	1013.5	1013.3	0.2
07/03:30am	10.8	7.8	9.1	89	0.9	NW	15	20	8	11	1013.7	1013.5	0.2
07/03:00am	10.2	7.3	8.3	88	0.9	NNW	13	15	7	8	1013.9	1013.7	0.2
07/02:30am	11.7	7.6	8.7	82	1.5	WNW	20	28	11	15	1014.1	1014	0.2
07/02:00am	11.7	8.7	9.3	85	1.2	WNW	15	20	8	11	1014.1	1014	0.2
07/01:30am	11.8	7.8	9	83	1.4	NW	20	28	11	15	1014.2	1014.1	0.2
07/01:00am	11.8	6.1	8.5	80	1.7	NNW	28	37	15	20	1014.1	1014	0.2
07/12:30am	11.4	5.5	7.7	78	1.8	NNW	28	35	15	19	1013.9	1013.7	0.2
07/12:00am	11.6	4.8	7.1	74	2.2	NNW	32	39	17	21	1013.7	1013.5	0.2

Date/Time EDT	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
06/11:30pm	11.2	6	7.1	76	2	NNW	24	30	13	16	1014	1013.9	0.2
06/11:00pm	11.3	6.1	7.2	76	2	NNW	24	30	13	16	1014.1	1014	0.2
06/10:30pm	10.9	5.6	7	77	1.9	NNW	24	28	13	15	1014.6	1014.5	0.2
06/10:00pm	11.4	5.7	6.9	74	2.2	NNW	26	32	14	17	1014.5	1014.4	0.2
06/09:30pm	11.9	6.7	7.2	73	2.3	NNW	24	33	13	18	1014.3	1014.2	0.2
06/09:00pm	9.9	5.6	6.8	81	1.5	N	19	20	10	11	1014.1	1014	0.2
06/08:30pm	10.5	6.5	6.6	77	1.9	NNW	17	19	9	10	1014.1	1014	0.2
06/08:00pm	12.7	8.3	7.2	69	2.7	WNW	20	26	11	14	1014.1	1014	0.2
06/07:30pm	13.5	8.3	7.3	66	3.1	WNW	24	32	13	17	1014	1013.9	0.2
06/07:00pm	14.1	9.2	6.9	62	3.6	WNW	22	33	12	18	1013.5	1013.3	0.2
06/06:30pm	15.2	10.9	7	58	4.1	WNW	19	26	10	14	1013.3	1013.1	0.2
06/06:00pm	14.9	10.5	7.5	61	3.7	WNW	20	26	11	14	1013.1	1013	0.2
06/05:32pm	15.7	9.4	5.9	52	4.8	WNW	28	50	15	27	1012.9	1012.8	0.2
06/05:30pm	16.1	10.3	6.3	52	4.9	WNW	26	50	14	27	1012.8	1012.7	0.2
06/05:00pm	15.4	8.9	6.7	56	4.4	WNW	30	41	16	22	1012.7	1012.6	0.2
06/04:30pm	15.5	9.4	6.5	55	4.5	WNW	28	39	15	21	1012.7	1012.6	0.2
06/04:00pm	16.5	10.4	6.6	52	5	WNW	28	43	15	23	1012.5	1012.4	0.2
06/03:30pm	16.3	10.7	7.3	55	4.6	WNW	26	35	14	19	1012.4	1012.3	0.2
06/03:00pm	16.3	10.7	7	54	4.7	WNW	26	39	14	21	1012.5	1012.4	0.2
06/02:30pm	15.6	10	7.1	57	4.3	W	26	35	14	19	1012.6	1012.5	0.2
06/02:00pm	15.8	9.2	7.6	58	4.2	WNW	32	43	17	23	1012.6	1012.5	0
06/01:30pm	15.7	9.6	6.7	55	4.5	W	28	41	15	22	1012.5	1012.4	0
06/01:00pm	14.8	9	8.1	64	3.4	W	28	39	15	21	1012.6	1012.5	0
06/12:30pm	14	7.9	8.2	68	3	W	30	43	16	23	1012.4	1012.3	0

06/12:00pm	12.9	6.1	7.1	68	2.9	W	32	41	17	22	1012.3	1012.2	0
06/11:30am	12.2	6.2	7.1	71	2.5	W	28	39	15	21	1012	1011.8	0
06/11:00am	11.9	5.7	7.8	76	2	W	30	46	16	25	1011.8	1011.6	0
06/10:30am	11.1	5	8.1	82	1.5	W	30	41	16	22	1011.4	1011.2	0
06/10:00am	10.2	4.8	7.8	85	1.2	W	26	39	14	21	1011	1010.8	0
06/09:30am	10.5	4.2	7.4	81	1.5	W	30	41	16	22	1010.4	1010.3	0
06/09:00am	9.7	3.3	7.1	84	1.3	W	30	41	16	22	1009.9	1009.7	12.6
06/08:30am	9.7	4.1	7.1	84	1.3	W	26	37	14	20	1009.5	1009.3	12.6
06/08:00am	9.1	3.4	6.9	86	1.1	W	26	41	14	22	1009	1008.8	12.6
06/07:30am	8.8	2.7	6.8	87	1	W	28	35	15	19	1008.4	1008.2	12.6
06/07:00am	8.8	2.8	6.9	88	0.9	W	28	41	15	22	1007.9	1007.7	12.6
06/06:30am	9.1	3.6	7.4	89	0.8	W	26	35	14	19	1007.4	1007.2	12.6
06/06:00am	9	3.4	7.3	89	0.8	W	26	32	14	17	1007.1	1006.9	12.6
06/05:30am	8.9	3.3	7	88	0.9	WSW	26	35	14	19	1006.7	1006.5	12.6
06/05:00am	8.8	3.6	7.1	89	0.8	W	24	32	13	17	1006.3	1006.1	12.6
06/04:50am	8.8	2.8	7.1	89	0.8	W	28	35	15	19	1006.2	1006	12.6
06/04:44am	8.7	3.1	7	89	0.8	W	26	35	14	19	1006.2	1006	12.6
06/04:30am	9.4	4.1	8.6	95	0.4	W	26	35	14	19	1006.3	1006.1	12.4
06/04:11am	9.7	3.4	8.9	95	0.4	NNW	32	39	17	21	1004.8	1004.6	10.2
06/04:06am	9.7	3.2	8.8	94	0.5	NNW	33	41	18	22	1004.7	1004.5	10
06/04:00am	9.7	3.2	8.8	94	0.5	NNW	33	43	18	23	1004.6	1004.4	9.6
06/03:30am	9.8	3.4	8.6	92	0.6	NNW	32	41	17	22	1004.7	1004.5	9.6
06/03:17am	9.7	3.1	8.5	92	0.6	NNW	33	44	18	24	1005	1004.8	9.6
06/03:00am	9.8	3.4	8.6	92	0.6	NNW	32	41	17	22	1005.3	1005.1	9.6
06/01:56am	9.8	3.8	8.6	92	0.6	NNW	30	41	16	22	1005.3	1005.1	9.6
06/01:30am	9.6	3.5	8.2	91	0.7	NNW	30	39	16	21	1005.4	1005.2	9.6
06/01:00am	9.6	4.2	7.9	89	0.8	NNW	26	32	14	17	1005.8	1005.6	9.6
06/12:30am	9.5	4.6	8.3	92	0.6	NNW	24	32	13	17	1006.4	1006.2	9.6
06/12:00am	9	4.3	7.9	93	0.5	NNW	22	28	12	15	1006.5	1006.3	9.6

Date/Time EDT	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts			
05/11:30pm	8.9	4.6	8	94	0.4	N	20	26	11	14	1006.4	1006.2	9.6
05/11:00pm	8.4	4.7	7.8	96	0.3	NNW	17	20	9	11	1006.9	1006.7	9.6
05/10:30pm	8.1	4.7	7.7	97	0.2	N	15	19	8	10	1007.1	1006.9	9.6
05/10:00pm	8	5.6	7.2	95	0.4	NW	9	11	5	6	1007.3	1007.1	9.6
05/09:30pm	9.3	7.3	8.5	95	0.4	NW	9	11	5	6	1007.5	1007.3	9.4
05/09:00pm	9.5	7.5	8.7	95	0.4	NW	9	11	5	6	1007.4	1007.2	9.4
05/08:30pm	9.6	7.6	8.8	95	0.4	NW	9	13	5	7	1007.6	1007.4	9.4
05/08:00pm	9.5	7.5	8.7	95	0.4	NW	9	11	5	6	1007.2	1007	9.4
05/07:30pm	9.5	7	8.4	93	0.5	WNW	11	15	6	8	1007	1006.8	9.4
05/07:00pm	9.6	6.8	8.5	93	0.6	W	13	19	7	10	1006.8	1006.6	9
05/06:39pm	9.6	6	8.5	93	0.5	WSW	17	20	9	11	1006.7	1006.5	9
05/06:30pm	9.6	5.7	8.5	93	0.5	WSW	19	28	10	15	1006.7	1006.5	9
05/06:00pm	10.6	7.3	9.7	94	0.5	W	17	24	9	13	1006.6	1006.4	9
05/05:50pm	10.5	7.2	9.7	95	0.4	WNW	17	26	9	14	1006.6	1006.4	8.8
05/05:30pm	10.5	6.8	9.4	93	0.6	WNW	19	26	10	14	1006.4	1006.2	8.6
05/05:00pm	10.7	5.6	9.1	90	0.8	WNW	26	32	14	17	1006	1005.7	8
05/04:30pm	10.6	7.3	9.7	94	0.5	NW	17	20	9	11	1005.7	1005.5	7.4
05/04:00pm	10.5	7.2	9.6	94	0.5	NNW	17	22	9	12	1005.5	1005.3	7.2
05/03:40pm	10.6	6.7	9.5	93	0.6	WNW	20	28	11	15	1005.3	1005.1	7.2
05/03:30pm	10.4	6.7	9.3	93	0.6	W	19	28	10	15	1005.3	1005.1	6.8
05/03:29pm	10.4	6.7	9.3	93	0.6	W	19	28	10	15	1005.3	1005.1	6.8
05/03:19pm	10.6	6.2	9	90	0.8	W	22	35	12	19	1005.6	1005.4	4.8
05/03:17pm	11.2	7.4	9.8	91	0.7	WNW	20	35	11	19	1005.7	1005.5	3.4
05/03:00pm	12	9.2	10.1	88	1	W	15	19	8	10	1005	1004.8	0.8
05/02:30pm	13.7	8.7	9.4	75	2.2	NW	26	39	14	21	1005.2	1005	0
05/02:00pm	13.6	8.7	9.8	78	2	NNW	26	35	14	19	1005.3	1005.1	0
05/01:30pm	14	9.9	10.2	78	2	NW	22	32	12	17	1005.6	1005.4	0
05/01:00pm	13.1	8.5	9.5	79	1.9	NW	24	32	13	17	1005.5	1005.3	0

Tuesday's Observations (15 October 2024)								
Time(AEDT)	Temp(°C)	Feels Like(°C)	Humidity(%)	Wind Direction	Wind Speed(km/h) (<i>knots</i>)	Wind Gust(km/h) (<i>knots</i>)	Pressure (hPa)	Rainfall since 9 am (mm)
11:30 PM	14.4	11.9	87	NE	17 9	20 11	1018.1	0.2
11:00 PM	15	14	84	ESE	9 5	15 8	1017.7	0
10:30 PM	14.9	12.8	85	ESE	15 8	19 10	1017.9	0
10:00 PM	14.8	13.2	87	SE	13 7	17 9	1018.3	0
9:30 PM	14.6	12.5	87	SE	15 8	20 11	1018.4	0
9:00 PM	14.6	12.6	88	SE	15 8	20 11	1018.2	0
8:30 PM	14.4	12.3	88	S	15 8	22 12	1018	0
8:00 PM	14.5	11.5	85	SW	19 10	28 15	1017.9	0
7:30 PM	14.6	10.4	86	SW	26 14	35 19	1018.1	0
7:00 PM	15.7	10	77	WNW	33 18	43 23	1018	0
6:48 PM	18.3	15.3	67	NNW	19 10	35 19	1017.5	0
6:30 PM	19.1	18	68	N	11 6	13 7	1017.2	0
6:00 PM	20.3	19	61	NNE	11 6	15 8	1016.9	0
5:30 PM	20.8	19.2	60	N	13 7	17 9	1016.9	0
5:00 PM	21	18.5	57	N	17 9	20 11	1017	0
4:30 PM	21.4	17.7	53	N	22 12	28 15	1017.1	0
4:00 PM	21.8	18.8	55	N	20 11	28 15	1017.1	0
3:30 PM	21.7	17.1	51	N	26 14	32 17	1017.3	0
3:00 PM	22.6	19.6	53	NNE	20 11	26 14	1017.5	0
2:30 PM	23.1	20.4	53	NNE	19 10	28 15	1017.9	0
2:00 PM	22	18.1	53	N	24 13	33 18	1018.2	0
1:30 PM	21.2	17.1	58	NNE	26 14	35 19	1018.5	0
1:00 PM	21.2	16.8	59	NNE	28 15	37 20	1018.8	0
12:30 PM	20.4	15.3	58	NNE	30	41	1019.1	0

12:00 PM	20.4	10.9	60	NNE	16	22	1019.1	0
12:00 PM	19.6	15.4	63	NNE	26 14	35 19	1019.3	0
11:30 AM	17.7	12.3	65	N	30 16	39 21	1019.7	0
11:00 AM	18.2	11.8	61	NNE	35 19	46 25	1019.9	0
10:30 AM	17.4	10.6	65	N	37 20	48 26	1020.1	0
10:03 AM	17.9	11.2	64	NNE	37 20	56 30	1020.3	0
10:00 AM	17.7	10.9	64	NNE	37 20	52 28	1020.2	0
9:46 AM	17.4	10.9	63	NNE	35 19	56 30	1020	0
9:30 AM	16.7	9.7	65	NNE	37 20	48 26	1019.9	0
9:10 AM	16.2	9.9	65	NNE	33 18	54 29	1019.7	0
9:00 AM	15.8	8.9	64	NNE	35 19	48 26	1019.9	0.4
8:30 AM	15.1	9.2	67	NNE	30 16	43 23	1020.1	0.4
8:00 AM	14.5	8.9	69	NNE	28 15	39 21	1019.5	0.4
7:30 AM	12.5	8	77	NNE	22 12	28 15	1019.1	0.4
7:00 AM	11.6	8	81	NNE	17 9	22 12	1019	0.4
6:30 AM	9.4	7.2	89	N	9 5	13 7	1019.2	0.4
6:00 AM	8.6	5.5	91	NW	13 7	15 8	1019.2	0.4
5:30 AM	8	6.1	96	NNE	7 4	11 6	1018.6	0.4
5:00 AM	7.4	4.9	95	SE	9 5	11 6	1018.5	0.4
4:30 AM	8.8	7.2	96	SE	6 3	7 4	1018.5	0.4
4:00 AM	9	6.5	95	ESE	11 6	15 8	1018.6	0.4
3:30 AM	9	6.1	95	ESE	13 7	15 8	1018.8	0.4
3:00 AM	9.4	7	95	ESE	11 6	15 8	1019	0.4
2:30 AM	10	6.6	95	ESE	17 9	26 14	1018.9	0.4
2:21 AM	10	6	95	ESE	20 11	30 16	1018.7	0.4
2:00 AM	10.1	5.8	95	ESE	22	30	1018.9	0.4

2:00 AM	10.1	5.0	95	ESE	12	16	1018.9	0.4
1:30 AM	10.4	5.4	95	ESE	26 14	35 19	1019	0.4
1:00 AM	10.6	4.9	94	ESE	30 16	35 19	1019.2	0.4
12:30 AM	10.8	5.1	93	ESE	30 16	39 21	1019.3	0.4
12:00 AM	11	4.9	91	ESE	32 17	41 22	1019.4	0.4

Monday's Observations (14 October 2024)

Time(AEDT)	Temp(°C)	Feels Like(°C)	Humidity(%)	Wind Direction	Wind Speed(km/h) (<i>knots</i>)	Wind Gust(km/h) (<i>knots</i>)	Pressure(hPa)	Rainfall since 9 am (mm)
11:39 PM	11.1	6.5	91	ESE	24 13	30 16	1019.5	0.4
11:30 PM	11.1	6.1	91	ESE	26 14	32 17	1019.6	0.4
11:00 PM	11.5	6.2	89	ESE	28 15	35 19	1019.6	0.4
10:30 PM	12	6.7	87	ESE	28 15	37 20	1019.5	0.4
10:11 PM	12.4	6.8	87	ESE	30 16	41 22	1019.6	0.4
10:00 PM	12.5	6.9	86	ESE	30 16	41 22	1019.7	0.4
9:30 PM	12.9	6.8	86	ESE	33 18	44 24	1019.6	0.4
9:00 PM	12.8	7.3	87	SE	30 16	43 23	1019.5	0.4
8:49 PM	12.7	6.8	87	ESE	32 17	41 22	1019.5	0.4
8:30 PM	12.5	6.9	85	ESE	30 16	39 21	1019.4	0.4
8:00 PM	13.1	7.9	82	SE	28 15	39 21	1019.1	0.4
7:30 PM	13.8	8.9	78	SE	26 14	35 19	1019	0.4
7:00 PM	14.9	8.8	71	ESE	32 17	39 21	1018.7	0.4
6:30 PM	15.9	10.7	69	ESE	28 15	35 19	1018.6	0.4
6:00 PM	16.4	10.3	64	ESE	32 17	41 22	1018.2	0.4
5:30 PM	16.7	10.9	62	ESE	30 16	37 20	1018.2	0.4
5:00 PM	17.8	12.4	58	ESE	28 15	37 20	1018.1	0.4
4:30 PM	17.9	13.1	61	ESE	26 14	35 19	1018	0.4
4:00 PM	18.4	14.3	64	ESE	24 13	35 19	1018.2	0.4

3:30 PM	17.7	13.3	62	ESE	24 13	39 21	1018.1	0.4
3:00 PM	17.2	12.2	66	ESE	28 15	37 20	1018.3	0.4
2:30 PM	16.6	11.6	69	ESE	28 15	39 21	1018.6	0.4
2:00 PM	16	10.4	69	ESE	30 16	41 22	1018.8	0.4
1:30 PM	15.2	10	72	SE	28 15	39 21	1018.9	0.4
1:00 PM	14.9	9.4	76	SE	30 16	39 21	1019.1	0.4
12:30 PM	15.2	10.1	74	ESE	28 15	37 20	1019.1	0.4
12:00 PM	16.3	11.6	69	SE	26 14	35 19	1019	0.4
11:34 AM	15.5	10.6	76	SE	28 15	35 19	1019.2	0.4
11:30 AM	15.3	10	77	SE	30 16	39 21	1019.2	0.4
11:00 AM	14.2	9.6	81	SE	26 14	35 19	1019.2	0.4

10:30 AM	13.3	8.3	86	SE	28 15	37 20	1019.2	0
10:00 AM	14	9	82	SE	28 15	35 19	1018.9	0
9:44 AM	14.6	10.6	84	SSE	24 13	32 17	1018.8	0
9:30 AM	13.8	10	83	SE	22 12	30 16	1018.7	0
9:14 AM	14.1	11	88	SE	20 11	26 14	1018.5	0
9:00 AM	13.2	9.9	90	ESE	20 11	28 15	1018.4	3.2
8:30 AM	11.9	7.6	93	ESE	24 13	28 15	1018.4	3.2
8:00 AM	11.8	8.4	96	ESE	20 11	24 13	1018.2	3.2
7:30 AM	11.4	8.1	96	ESE	19 10	26 14	1018	3.2
7:00 AM	11.2	7.8	96	SE	19 10	26 14	1017.5	3.2
6:34 AM	10.8	7.7	96	SSE	17 9	20 11	1017.2	3.2
6:30 AM	10.6	7.4	96	SSE	17 9	20 11	1017.2	3.2
6:00 AM	10.7	8.3	95	SSE	13 7	17 9	1017	3.2
5:30 AM	11.3	10.1	94	SSE	7 4	11 6	1016.7	3.2
5:00 AM	11.6	9.4	94	SE	13 7	17 9	1016.5	3.2
4:30 AM	11.6	9.4	94	SSE	13 7	19 10	1016.5	3.2
4:00 AM	11.8	10	93	SSE	11 6	13 7	1016.5	3.2
3:30 AM	12	11	93	S	7 4	11 6	1016.6	3.2
3:00 AM	11.7	9.8	92	ESE	11 6	13 7	1016.6	3.2
2:30 AM	12.2	10.3	90	ESE	11 6	13 7	1017	3.2
2:00 AM	12.4	10.8	86	SSW	9 5	11 6	1017.6	3.2
1:30 AM	12	11.5	92	SSW	4 2	11 6	1017.7	3.2
1:00 AM	12.1	9.9	92	ENE	13 7	17 9	1017.6	3
12:30 AM	12.1	10.9	89	NE	7 4	13 7	1017.2	3
12:00 AM	12.4	11.3	88	ESE	7 4	13 7	1017.2	3

Date/Time EDT	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm	
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts				
22/02:00pm	25.8	21	13	45	7.6	N	30	41	16	22	1012.4	1012.3	0	
22/01:30pm	24.6	20.3	13.2	49	6.8	N	28	39	15	21	1012.7	1012.6	0	
22/01:00pm	23.6	18.8	12.9	51	6.3	N	30	39	16	21	1013.1	1013	0	
22/12:30pm	23.3	18.4	12.6	51	6.2	N	30	39	16	21	1013.4	1013.2	0	
22/12:00pm	22.4	17.5	12.4	53	5.8	N	30	37	16	20	1014.1	1014	0	
22/11:30am	22.2	18.1	12.7	55	5.5	N	26	35	14	19	1014.1	1014	0	
22/11:00am	21.4	19.1	14.1	63	4.3	N	19	26	10	14	1014.5	1014.4	0	
22/10:30am	20	16.1	12	60	4.5	N	24	32	13	17	1014.6	1014.5	0	
22/10:00am	19.3	15	10.8	58	4.7	N	24	30	13	16	1014.4	1014.3	0	
22/09:30am	17.5	14	10.9	65	3.6	N	20	28	11	15	1014.4	1014.3	0	
22/09:00am	17.3	13.7	10.4	64	3.8	N	20	28	11	15	1014.5	1014.4	0	
22/08:30am	17	12.8	9.7	62	3.9	N	22	28	12	15	1014.4	1014.3	0	
22/08:00am	16.9	13.3	9.8	63	3.8	N	19	24	10	13	1014.2	1014.1	0	
22/07:30am	15.9	12.6	9.6	66	3.3	N	17	24	9	13	1014.1	1014	0	
22/07:00am	14.2	12.3	9.2	72	2.6	NNE	9	17	5	9	1014.4	1014.3	0	
22/06:30am	14.4	10.4	9.2	71	2.7	NNE	20	28	11	15	1014.1	1014	0	
22/06:00am	12.9	11.3	8.6	75	2.2	N	7	13	4	7	1014.1	1014	0	
22/05:30am	13.7	10.3	9.2	74	2.3	NNE	17	20	9	11	1013.9	1013.7	0	
22/05:00am	11.6	8.1	8.6	82	1.5	NNW	17	19	9	10	1014.3	1014.2	0	
22/04:30am	14.1	10.7	9.3	73	2.5	N	17	20	9	11	1013.8	1013.6	0	
22/04:00am	13.8	10.8	9.3	74	2.3	NNE	15	19	8	10	1013.9	1013.7	0	
22/03:30am	12.8	9.8	9.1	78	1.9	N	15	17	8	9	1014.4	1014.3	0	
22/03:00am	12.8	10.2	9.3	79	1.8	N	13	17	7	9	1014.7	1014.6	0	
22/02:30am	11.8	8.6	8.6	81	1.6	N	15	15	8	8	1015.1	1015	0	
22/02:00am	11.3	8.2	8.7	84	1.3	NNW	15	15	8	8	1015.4	1015.3	0	
22/01:30am	12.8	11.8	8.9	77	2	NNW	4	9	2	5	1015.7	1015.5	0	
22/01:00am	13.6	13.5	9.6	77	2.1	CALM	0	0	0	0	1016.2	1016.1	0	
22/12:30am	13.1	11.2	9	76	2.1	NNE	9	11	5	6	1016.3	1016.2	0	
22/12:00am	13.4	11.1	9.1	75	2.2	N	11	13	6	7	1016.3	1016.2	0	
Date/Time EDT	Temp °C	App Temp °C	Dew Point °C	Rel Hum %	Delta-T °C	Wind					Press QNH hPa	Press MSL hPa	Rain since 9am mm	
						Dir	Spd km/h	Gust km/h	Spd kts	Gust kts				
21/11:30pm	13.1	10.4	9	76	2.1	NNW	13	15	7	8	1016.6	1016.5	0	
21/11:00pm	14.5	12.6	9.1	70	2.8	NNE	9	11	5	6	1016.4	1016.3	0	
21/10:30pm	14.5	12.3	9.3	71	2.7	NNE	11	13	6	7	1016.5	1016.4	0	
21/10:00pm	15.8	14	9.5	66	3.3	N	9	11	5	6	1016.8	1016.7	0	
21/09:30pm	16.1	13.7	10	67	3.3	NE	13	13	7	7	1016.9	1016.8	0	
21/09:00pm	16.9	14.9	10.3	65	3.6	NE	11	11	6	6	1017	1016.9	0	
21/08:30pm	17.9	16.4	9	56	4.7	NNE	7	9	4	5	1017	1016.9	0	
21/08:00pm	18.9	17.3	8.8	52	5.4	NNE	7	9	4	5	1016.7	1016.6	0	
21/07:30pm	19.9	17.7	9.2	50	5.8	NNE	11	13	6	7	1016.5	1016.4	0	
21/07:00pm	19.9	17.5	10	53	5.4	NNE	13	15	7	8	1016.4	1016.3	0	
21/06:30pm	22	19.4	10.8	49	6.3	N	15	19	8	10	1016.5	1016.4	0	
21/06:00pm	23.3	20.9	10	43	7.4	N	13	17	7	9	1016.7	1016.6	0	
21/05:30pm	23.6	20.7	11	45	7.2	N	17	22	9	12	1016.5	1016.4	0	
21/05:00pm	23.9	20.5	9.1	39	8.1	N	17	24	9	13	1016.8	1016.7	0	
21/04:30pm	23.5	19.7	9.1	40	7.9	N	19	24	10	13	1017.2	1017.1	0	
21/04:00pm	23.1	20.3	11.2	47	6.8	N	17	22	9	12	1017.3	1017.2	0	
21/03:30pm	23.2	19.7	10.9	46	7	N	20	30	11	16	1017.5	1017.4	0	
21/03:00pm	22.7	19.4	11.7	49	6.3	N	20	30	11	16	1017.9	1017.9	0	
21/02:30pm	22.4	19.4	12.1	52	5.9	N	19	30	10	16	1018.3	1018.2	0	
21/02:00pm	21.9	18.7	11.3	51	6	N	19	26	10	14	1019.1	1019	0	
21/01:30pm	21.6	18.8	12.7	57	5.2	N	19	24	10	13	1019.5	1019.4	0	
21/01:00pm	20.9	17.6	11.5	55	5.3	NNW	20	28	11	15	1019.8	1019.7	0	
21/12:30pm	20.8	17.4	11.4	55	5.3	N	20	28	11	15	1019.8	1019.7	0	
21/12:00pm	20.4	17.2	11.9	58	4.8	N	20	28	11	15	1019.9	1019.9	0	
21/11:30am	20	16.4	11.8	59	4.6	N	22	28	12	15	1020.1	1020.1	0	
21/11:00am	19.4	15.1	10.9	58	4.7	N	24	30	13	16	1020.2	1020.2	0	
21/10:30am	18.7	16.4	10.5	59	4.5	N	13	20	7	11	1020.3	1020.3	0	
21/10:00am	16.8	15.3	9.2	61	4	ENE	7	9	4	5	1020.6	1020.5	0	

21/09:30am	15	13.2	9.4	69	2.9	ESE	9	13	5	7	1020.8	1020.7	0
21/09:00am	13	9.9	8.9	76	2.1	SE	15	17	8	9	1020.8	1020.7	0
21/08:30am	11.8	8.3	8.6	81	1.6	ESE	17	20	9	11	1021	1020.9	0
21/08:00am	10.3	5	8.4	88	0.9	SE	26	35	14	19	1020.6	1020.5	0
21/07:30am	9.4	5.1	8	91	0.7	SE	20	26	11	14	1020.8	1020.7	0
21/07:00am	8.8	3.2	7.3	90	0.7	SE	26	33	14	18	1020.7	1020.6	0
21/06:30am	9.3	2.9	6.9	85	1.2	ESE	30	37	16	20	1020	1020	0
21/06:00am	9.6	3.5	6.7	82	1.4	ESE	28	35	15	19	1020.2	1020.2	0
21/05:30am	9.3	3.7	7.3	87	1	ESE	26	33	14	18	1020.2	1020.2	0
21/05:00am	9.2	2.6	7.6	90	0.8	SE	32	41	17	22	1020.1	1020.1	0
21/04:30am	9.5	4	7.6	88	0.9	SE	26	35	14	19	1020.6	1020.5	0
21/04:05am	9.8	4.8	7.9	88	0.9	SE	24	33	13	18	1021	1020.9	0
21/04:00am	9.8	4.8	7.9	88	0.9	SE	24	33	13	18	1021.2	1021.1	0
21/03:30am	10.1	5.5	8.2	88	0.9	SE	22	30	12	16	1021.6	1021.5	0
21/03:00am	10.3	3.8	8.2	87	1	SE	32	43	17	23	1021.5	1021.4	0
21/02:43am	10.4	3.9	8.2	86	1.1	ESE	32	50	17	27	1021.5	1021.4	0
21/02:30am	10.6	3.5	8.2	85	1.2	SE	35	48	19	26	1021.7	1021.6	0
21/02:00am	10.9	5.3	8.8	87	1.1	SE	28	35	15	19	1022	1022	0
21/01:30am	10.8	4.4	8.7	87	1.1	SE	32	41	17	22	1022.5	1022.5	0
21/01:03am	10.4	4.4	8.7	89	0.9	SE	30	39	16	21	1022.7	1022.7	0
21/01:00am	10.3	4.3	8.6	89	0.9	SE	30	39	16	21	1022.6	1022.6	0
21/12:37am	10.3	3.9	8.6	89	0.9	SE	32	39	17	21	1022.6	1022.6	0
21/12:30am	10.3	3.9	8.6	89	0.9	SE	32	43	17	23	1022.8	1022.8	0
21/12:00am	10.6	4.7	9	90	0.8	SE	30	46	16	25	1023	1022.9	0

Ballarat Weather History for 27 October 2024

Time	Temp	Weather	Wind	Humidity	Barometer	Visibility
7:00 AM Sun, 27 Oct	16 °C	Refreshingly cool.	11 km/h	↑36%	1015 mbar	N/A
8:00 AM	17 °C	Mild.	17 km/h	↑33%	1015 mbar	N/A
9:00 AM	19 °C	Mild.	15 km/h	↑33%	1016 mbar	N/A
10:00 AM	20 °C	Mild.	17 km/h	↑31%	1016 mbar	N/A
11:00 AM	21 °C	Mild.	11 km/h	↑33%	1016 mbar	N/A
1:00 PM	23 °C	Mild.	20 km/h	↑32%	1016 mbar	N/A
2:00 PM	24 °C	Mild.	22 km/h	↑31%	1015 mbar	N/A
3:00 PM	25 °C	Mild.	20 km/h	↑30%	1015 mbar	N/A
4:00 PM	25 °C	Mild.	20 km/h	↑31%	1014 mbar	N/A
5:00 PM	23 °C	Mild.	19 km/h	↑43%	1015 mbar	N/A
6:00 PM	20 °C	Mild.	20 km/h	↑51%	1016 mbar	N/A
7:00 PM	17 °C	Mild.	17 km/h	↑61%	1017 mbar	N/A
8:00 PM	15 °C	Cool.	17 km/h	↑70%	1018 mbar	N/A
9:00 PM	14 °C	Cool.	13 km/h	↑69%	1019 mbar	N/A
10:00 PM	13 °C	Cool.	11 km/h	↑73%	1020 mbar	N/A

Ballarat Weather History for 28 October 2024

Time	Temp	Weather	Wind	Humidity	Barometer	Visibility
12:00 AM Mon, 28 Oct	12 °C	Cool.	7 km/h	↑76%	1020 mbar	N/A
1:00 AM	11 °C	Cool.	9 km/h	↑83%	1020 mbar	N/A
2:00 AM	11 °C	Cool.	9 km/h	↑83%	1020 mbar	N/A
3:00 AM	11 °C	Cool.	7 km/h	↑90%	1020 mbar	N/A
4:00 AM	11 °C	Cool.	11 km/h	↑87%	1020 mbar	N/A
5:00 AM	10 °C	Cool.	13 km/h	↑93%	1020 mbar	N/A
6:00 AM	9 °C	Cool.	11 km/h	↑97%	1021 mbar	N/A
7:00 AM	9 °C	Cool.	11 km/h	↑94%	1022 mbar	N/A
8:00 AM	11 °C	Cool.	11 km/h	↑83%	1023 mbar	N/A
9:00 AM	13 °C	Cool.	11 km/h	↑72%	1023 mbar	N/A
10:00 AM	13 °C	Cool.	15 km/h	↑57%	1024 mbar	N/A
11:00 AM	15 °C	Refreshingly cool.	15 km/h	↑51%	1024 mbar	N/A
12:00 PM	15 °C	Refreshingly cool.	11 km/h	↑48%	1024 mbar	N/A

1:00 PM	17 °C	Mild.	13 km/h	↑	44%	1024 mbar	N/A
2:00 PM	17 °C	Mild.	13 km/h	↑	44%	1024 mbar	N/A
3:00 PM	18 °C	Mild.	15 km/h	↑	39%	1024 mbar	N/A
4:00 PM	17 °C	Mild.	15 km/h	↑	50%	1024 mbar	N/A
5:00 PM	17 °C	Refreshingly cool.	13 km/h	↑	52%	1024 mbar	N/A
6:00 PM	16 °C	Refreshingly cool.	11 km/h	↑	54%	1024 mbar	N/A
7:00 PM	15 °C	Refreshingly cool.	9 km/h	↑	59%	1025 mbar	N/A
8:00 PM	13 °C	Cool.	4 km/h	↑	64%	1026 mbar	N/A
9:00 PM	11 °C	Cool.	No wind	↑	70%	1026 mbar	N/A
10:00 PM	9 °C	Cool.	2 km/h	↑	75%	1027 mbar	N/A
11:00 PM	8 °C	Cool.	6 km/h	↑	82%	1027 mbar	N/A

Ballarat Weather History for 29 October 2024

Time	Temp	Weather	Wind		Humidity	Barometer	Visibility
12:00 AM Tue, 29 Oct	7 °C	Quite cool.	6 km/h	↑	86%	1026 mbar	N/A
1:00 AM	6 °C	Quite cool.	6 km/h	↑	91%	1026 mbar	N/A
2:00 AM	6 °C	Quite cool.	7 km/h	↑	94%	1026 mbar	N/A
3:00 AM	6 °C	Quite cool.	6 km/h	↑	92%	1026 mbar	N/A
4:00 AM	8 °C	Cool.	6 km/h	↑	90%	1026 mbar	N/A
5:00 AM	10 °C	Cool.	9 km/h	↑	81%	1025 mbar	N/A
6:00 AM	10 °C	Cool.	7 km/h	↑	79%	1026 mbar	N/A
7:00 AM	10 °C	Cool.	7 km/h	↑	79%	1026 mbar	N/A
8:00 AM	11 °C	Cool.	9 km/h	↑	77%	1026 mbar	N/A
9:00 AM	11 °C	Cool.	11 km/h	↑	75%	1027 mbar	N/A
10:00 AM	12 °C	Cool.	11 km/h	↑	70%	1027 mbar	N/A
11:00 AM	13 °C	Cool.	11 km/h	↑	68%	1027 mbar	N/A
12:00 PM	15 °C	Cool.	15 km/h	↑	60%	1026 mbar	N/A
1:00 PM	16 °C	Refreshingly cool.	15 km/h	↑	54%	1026 mbar	N/A
2:00 PM	17 °C	Mild.	17 km/h	↑	53%	1025 mbar	N/A
3:00 PM	18 °C	Mild.	13 km/h	↑	49%	1025 mbar	N/A
4:00 PM	18 °C	Mild.	17 km/h	↑	48%	1024 mbar	N/A
5:00 PM	18 °C	Mild.	15 km/h	↑	46%	1024 mbar	N/A
6:00 PM	18 °C	Mild.	11 km/h	↑	47%	1024 mbar	N/A

7:00 PM	17 °C	Refreshingly cool.	11 km/h	↑	51%	1024 mbar	N/A
8:00 PM	14 °C	Refreshingly cool.	9 km/h	↑	59%	1025 mbar	N/A
9:00 PM	12 °C	Cool.	7 km/h	↑	70%	1025 mbar	N/A
10:00 PM	11 °C	Cool.	6 km/h	↑	76%	1025 mbar	N/A
11:00 PM	10 °C	Cool.	4 km/h	↑	82%	1024 mbar	N/A

Ballarat Weather History for 30 October 2024

Time	Temp	Weather	Wind		Humidity	Barometer	Visibility
12:00 AM	11 °C	Cool.	7 km/h	↑	82%	1024 mbar	N/A
Wed, 30 Oct							
1:00 AM	10 °C	Cool.	6 km/h	↑	86%	1023 mbar	N/A
2:00 AM	10 °C	Cool.	6 km/h	↑	87%	1022 mbar	N/A
3:00 AM	10 °C	Cool.	9 km/h	↑	90%	1021 mbar	N/A
4:00 AM	10 °C	Cool.	6 km/h	↑	98%	1021 mbar	N/A
5:00 AM	10 °C	Cool.	9 km/h	↑	95%	1020 mbar	N/A
6:00 AM	10 °C	Cool.	7 km/h	↑	95%	1020 mbar	N/A
7:00 AM	10 °C	Cool.	6 km/h	↑	91%	1020 mbar	N/A
8:00 AM	10 °C	Cool.	9 km/h	↑	91%	1020 mbar	N/A
9:00 AM	10 °C	Cool.	6 km/h	↑	95%	1020 mbar	N/A
10:00 AM	12 °C	Cool.	7 km/h	↑	83%	1020 mbar	N/A
11:00 AM	14 °C	Cool.	7 km/h	↑	70%	1019 mbar	N/A
12:00 PM	15 °C	Cool.	9 km/h	↑	63%	1018 mbar	N/A
1:00 PM	17 °C	Mild.	11 km/h	↑	55%	1017 mbar	N/A
2:00 PM	19 °C	Mild.	13 km/h	↑	49%	1017 mbar	N/A
3:00 PM	21 °C	Mild.	13 km/h	↑	44%	1016 mbar	N/A
4:00 PM	21 °C	Mild.	15 km/h	↑	40%	1015 mbar	N/A
5:00 PM	21 °C	Mild.	9 km/h	↑	44%	1015 mbar	N/A
6:00 PM	20 °C	Mild.	13 km/h	↑	48%	1015 mbar	N/A
7:00 PM	15 °C	Cool.	13 km/h	↑	70%	1015 mbar	N/A
8:00 PM	13 °C	Cool.	7 km/h	↑	79%	1015 mbar	N/A
9:00 PM	13 °C	Cool.	2 km/h	↑	82%	1016 mbar	N/A
10:00 PM	13 °C	Cool.	9 km/h	↑	77%	1016 mbar	N/A
11:00 PM	13 °C	Cool.	6 km/h	↑	77%	1015 mbar	N/A

Date/Time	Temp	App	Dew	Rel	Delta-T	Wind					Press	Press	Rain since	
EDT	°C	Temp	Point	Hum	°C						QNH	MSL	9am	
		°C	°C	%		Dir	Spd	Gust	Spd	Gust	hPa	hPa	mm	
							km/h	km/h	kts	kts				
07/08:00am	9.5	6.7	7.1	85	1.2	SSE	11	15	6	8	1010.7	1010.2	0	
07/07:30am	8.5	6.1	7	90	0.7	SSE	9	13	5	7	1010.6	1010	0	
07/07:11am	8.3	5.9	6.9	91	0.7	S	9	13	5	7	1010.6	1010	0	
07/07:00am	8.2	5.8	6.8	91	0.7	S	9	11	5	6	1010.6	1010	0	
07/06:56am	8.1	5.7	6.9	92	0.6	SSE	9	11	5	6	1010.6	1010	0	
07/06:51am	8.1	5.3	6.9	92	0.6	SSE	11	15	6	8	1010.3	1009.7	0	
07/06:36am	8.2	5.4	7	92	0.6	S	11	13	6	7	1010.4	1009.8	0	
07/06:30am	8.3	5.5	7.1	92	0.6	S	11	13	6	7	1010.4	1009.8	0	
07/06:00am	8.5	5.8	7.3	92	0.6	S	11	15	6	8	1010.3	1009.7	0	
07/05:30am	8.9	5.1	7.5	91	0.7	S	17	22	9	12	1010.2	1009.6	0	
07/05:00am	8.7	6	7.2	90	0.7	SSE	11	15	6	8	1010.1	1009.5	0	
07/04:30am	9.2	5.8	7.5	89	0.8	SSE	15	17	8	9	1010.2	1009.6	0	
07/04:11am	9.6	6.6	7.7	88	0.9	S	13	17	7	9	1010.3	1009.7	0	
07/04:00am	9.6	6.6	7.7	88	0.9	S	13	19	7	10	1010	1009.4	0	
07/03:50am	9.6	6.6	7.5	87	1	S	13	19	7	10	1010	1009.4	0	
07/03:30am	9.9	6.2	7.8	87	1	S	17	20	9	11	1010	1009.4	0	
07/03:00am	10.5	6.8	7.9	84	1.3	S	17	24	9	13	1010.4	1009.8	0	
07/02:30am	11	6.6	8.8	86	1.1	SSE	22	28	12	15	1010.1	1009.5	0	
07/02:00am	11.1	8	9	87	1.1	S	15	20	8	11	1010.5	1009.9	0	
07/01:30am	11	7.5	8.9	87	1.1	S	17	22	9	12	1010.5	1009.9	0	
07/01:00am	10.7	6.9	9	89	0.9	SSE	19	22	10	12	1010.9	1010.3	0	
07/12:30am	10.8	7.3	8.7	87	1.1	S	17	20	9	11	1011.1	1010.5	0	
07/12:00am	10.9	7.3	8.5	85	1.2	S	17	24	9	13	1011.2	1010.6	0	
Date/Time	Temp	App	Dew	Rel	Delta-T	Wind					Press	Press	Rain since	
EDT	°C	Temp	Point	Hum	°C						QNH	MSL	9am	
		°C	°C	%		Dir	Spd	Gust	Spd	Gust	hPa	hPa	mm	
							km/h	km/h	kts	kts				
06/11:55pm	11	7.1	8.6	85	1.2	S	19	26	10	14	1011.2	1010.6	0	
06/11:30pm	11	6.8	8.4	84	1.3	S	20	28	11	15	1011.5	1010.9	0	
06/11:00pm	11.2	7.6	8.2	82	1.5	S	17	24	9	13	1011.5	1010.9	0	
06/10:30pm	11.7	7.8	8.7	82	1.5	S	19	26	10	14	1011.4	1010.8	0	
06/10:00pm	12.3	7.9	7.6	73	2.3	S	20	28	11	15	1011.4	1010.8	0	
06/09:30pm	12.9	8.6	8	72	2.5	SSW	20	33	11	18	1010.9	1010.3	0	
06/09:00pm	13.6	9.6	9.1	74	2.3	SSW	20	30	11	16	1010.5	1009.9	0	
06/08:30pm	14.7	11	9.5	71	2.7	SSW	19	26	10	14	1009.8	1009.2	0	
06/08:00pm	15.3	11.7	9.9	70	2.9	SSW	19	24	10	13	1009.4	1008.8	0	
06/07:30pm	16.6	12.7	10.7	68	3.2	SSW	22	32	12	17	1008.9	1008.3	0	
06/07:00pm	17.6	13.8	11.2	66	3.5	SSW	22	30	12	16	1008.4	1007.7	0	
06/06:30pm	20.4	17.5	12.9	62	4.3	SW	20	32	11	17	1007.5	1006.9	0	
06/06:00pm	20.9	16.9	13.1	61	4.6	SSW	26	39	14	21	1007.1	1006.5	0	
06/05:30pm	22.8	19.3	13.3	55	5.6	SW	24	37	13	20	1006.4	1005.7	0	
06/05:00pm	24.1	19.8	13.3	51	6.4	SW	28	39	15	21	1006.1	1005.4	0	
06/04:30pm	26.1	21.6	12.5	42	8	SW	28	43	15	23	1005.1	1004.5	0	
06/04:00pm	28	23.7	12	37	9.5	WSW	26	39	14	21	1004.9	1004.3	0	
06/03:30pm	29.7	23.8	10.3	30	11.2	W	32	50	17	27	1004.5	1003.8	0	
06/03:00pm	30.2	24.3	9.1	27	12	NW	30	43	16	23	1004.7	1004	0	
06/02:30pm	29.9	24.9	10.9	31	11.1	NW	28	37	15	20	1005	1004.4	0	
06/02:00pm	28.9	22.3	8.6	28	11.4	NW	33	44	18	24	1005	1004.4	0	
06/01:30pm	29.3	22.4	8.9	28	11.5	NNW	35	50	19	27	1005	1004.4	0	
06/01:00pm	28.7	22.4	8.9	29	11.2	N	32	43	17	23	1005.4	1004.8	0	
06/12:30pm	27.4	19.5	7.8	29	10.8	N	39	52	21	28	1006	1005.3	0	
06/12:00pm	25.6	17.5	7.2	31	9.9	N	39	52	21	28	1006.5	1005.8	0	
06/11:33am	24.7	16.2	6.9	32	9.5	N	41	59	22	32	1006.4	1005.7	0	
06/11:30am	24.5	15.9	6.7	32	9.4	N	41	54	22	29	1006.4	1005.7	0	
06/11:00am	23.9	15	6.7	33	9.1	N	43	52	23	28	1006.5	1005.8	0	
06/10:30am	22.9	15.7	7.8	38	8.1	N	35	48	19	26	1006.9	1006.3	0	
06/10:08am	21.9	14.2	7	38	7.8	N	37	46	20	25	1007.2	1006.6	0	
06/10:00am	21	13.5	6.2	38	7.6	N	35	43	19	23	1007.4	1006.8	0	
06/09:58am	21.1	13.7	6.6	39	7.5	N	35	44	19	24	1007.6	1007	0	
06/09:30am	21.4	12.8	6.5	38	7.7	N	41	54	22	29	1007.7	1007.1	0	
06/09:00am	20.3	12.3	5.9	39	7.3	N	37	52	20	28	1007.8	1007.2	0	

06/08:30am	19.2	12	6	42	6.7	N	33	46	18	25	1007.9	1007.3	0	
06/08:00am	18.3	11	5.5	43	6.4	N	33	44	18	24	1007.5	1006.9	0	
06/07:30am	17.9	9.8	5.2	43	6.3	NNE	37	52	20	28	1007.3	1006.7	0	
06/07:00am	17.4	9.6	4.7	43	6.2	NNE	35	48	19	26	1007.1	1006.5	0	
06/06:30am	17.3	9.8	4.6	43	6.2	NNE	33	44	18	24	1007.3	1006.7	0	
06/06:00am	16.9	10.1	4.9	45	5.9	NNE	30	41	16	22	1007	1006.4	0	
06/05:30am	17.3	10.5	4.9	44	6.1	NNE	30	39	16	21	1007.3	1006.7	0	
06/05:00am	17	10.6	5	45	5.9	NNE	28	35	15	19	1007.3	1006.7	0	
06/04:30am	16.8	9.4	4.8	45	5.8	NNE	33	43	18	23	1007.2	1006.6	0	
06/04:00am	16.5	9.7	5.2	47	5.5	NNE	30	39	16	21	1007.6	1007	0	
06/03:30am	16.6	10.3	5.6	48	5.4	N	28	37	15	20	1008.4	1007.7	0	
06/03:00am	16.9	11.6	5.2	46	5.7	NNE	22	33	12	18	1008.8	1008.2	0	
06/02:30am	16.1	9.7	5.4	49	5.2	N	28	33	15	18	1009.1	1008.5	0	
06/02:00am	16	10.5	5.9	51	5	N	24	30	13	16	1009.5	1008.9	0	
06/01:30am	15.8	9.9	5.7	51	5	N	26	33	14	18	1009.9	1009.3	0	
06/01:00am	15.9	11.3	5.8	51	5	NNE	19	24	10	13	1010.4	1009.8	0	
06/12:30am	16.1	10.9	5.7	50	5.1	N	22	28	12	15	1010.9	1010.3	0	
06/12:00am	16.6	11	5.3	47	5.5	N	24	32	13	17	1011.2	1010.6	0	
Date/Time	Temp	App	Dew	Rel	Delta-T	Wind					Press	Press	Rain since	
EDT	°C	Temp	Point	Hum	°C	Dir	Spd	Gust	Spd	Gust	QNH	MSL	9am	
		°C	°C	%			km/h	km/h	kts	kts	hPa	hPa	mm	
05/11:30pm	16.6	11.7	5.3	47	5.5	N	20	24	11	13	1011.4	1010.8	0	
05/11:00pm	17.2	11.9	5.2	45	5.9	N	22	28	12	15	1011.8	1011.2	0	
05/10:30pm	16.1	11.8	5.4	49	5.2	NNE	17	20	9	11	1012.1	1011.5	0	
05/10:00pm	14.7	10.9	6	56	4.3	NE	15	17	8	9	1012.4	1011.8	0	
05/09:30pm	15.3	11.6	6.3	55	4.5	NE	15	17	8	9	1012.4	1011.8	0	
05/09:00pm	16.3	13.3	5.9	50	5.2	NE	11	13	6	7	1012.4	1011.8	0	
05/08:30pm	18.9	16.2	5.4	41	6.7	NNE	9	11	5	6	1012.3	1011.7	0	
05/08:00pm	19.5	16.6	6.3	42	6.7	N	11	13	6	7	1012.5	1011.9	0	
05/07:30pm	20.6	17.8	6.9	41	7.1	NNW	11	15	6	8	1012.4	1011.8	0	
05/07:00pm	22	17.9	6.3	36	8.1	NNW	17	20	9	11	1012.4	1011.8	0	
05/06:30pm	22.7	17.4	5.2	32	8.9	NW	22	28	12	15	1012.5	1011.9	0	
05/06:00pm	22.9	18.1	5.8	33	8.8	NNW	20	28	11	15	1012.4	1011.8	0	
05/05:30pm	23.1	18.4	6	33	8.9	NNW	20	30	11	16	1012.5	1011.9	0	
05/05:00pm	23.7	19.4	6.9	34	8.9	NNW	19	26	10	14	1012.1	1011.5	0	
05/04:30pm	22.6	18.5	6.4	35	8.4	NW	17	24	9	13	1012.6	1012	0	
05/04:00pm	22.4	18.1	7	37	8.1	NW	19	28	10	15	1012.8	1012.3	0	
05/03:30pm	22.2	17.5	6	35	8.4	NNW	20	33	11	18	1012.9	1012.4	0	
05/03:00pm	22.8	19	7.4	37	8.2	NNW	17	28	9	15	1013.4	1012.8	0	
05/02:30pm	22.9	19.4	7.4	37	8.2	NW	15	30	8	16	1013.8	1013.2	0	
05/02:00pm	22	18.8	6.7	37	8	N	13	22	7	12	1013.8	1013.2	0	
05/01:30pm	21.9	20.1	9.4	45	6.8	N	9	19	5	10	1014.3	1013.7	0	
05/01:00pm	21.1	18.5	7.7	42	7.1	N	11	19	6	10	1014.7	1014.2	0	
05/12:30pm	20.7	17.8	6.6	40	7.3	NW	11	17	6	9	1014.9	1014.4	0	
05/12:00pm	19.7	16.2	5.4	39	7.2	WNW	13	22	7	12	1015.5	1015	0	
05/11:30am	19.7	18	7.4	45	6.4	S	6	13	3	7	1015.8	1015.2	0	
05/11:00am	18.5	15.1	6	44	6.3	W	13	20	7	11	1016.2	1015.6	0	
05/10:30am	17.8	15.2	6.3	47	5.8	W	9	17	5	9	1016.6	1016	0	
05/10:00am	16.7	14.1	6.2	50	5.2	NNW	9	15	5	8	1016.8	1016.3	0	
05/09:30am	16.4	14.6	7.3	55	4.6	N	6	9	3	5	1016.9	1016.4	0	
05/09:00am	14.5	12.7	7.1	61	3.7	N	6	7	3	4	1016.9	1016.4	0	
05/08:30am	11.9	10.2	7.4	74	2.2	NNW	6	7	3	4	1016.9	1016.4	0	
05/08:00am	10.8	9.4	7.1	78	1.8	ENE	4	7	2	4	1016.7	1016.2	0	
05/07:30am	8.9	8.4	7.7	92	0.6	CALM	0	6	0	3	1016.4	1015.8	0	
05/07:00am	4.9	3.6	3.9	93	0.4	CALM	0	0	0	0	1016.1	1015.5	0	
05/06:30am	5.3	2.8	3.6	89	0.7	ESE	6	7	3	4	1015.9	1015.3	0	
05/06:00am	6.2	3.7	4.8	91	0.6	ESE	7	9	4	5	1015.4	1014.9	0	
05/05:30am	6.3	3.8	4.9	91	0.6	SE	7	9	4	5	1015.4	1014.9	0	
05/05:00am	6.7	3.5	5.2	90	0.7	SE	11	13	6	7	1015.2	1014.7	0	
05/04:30am	7.3	5	5.6	89	0.8	SSE	7	11	4	6	1015	1014.5	0	
05/04:00am	7.9	4.9	6	88	0.9	ESE	11	15	6	8	1015	1014.5	0	
05/03:30am	8.3	4.7	6.6	89	0.8	ESE	15	19	8	10	1015.1	1014.6	0	
05/03:00am	8.5	4.5	6.6	88	0.9	E	17	24	9	13	1015.4	1014.9	0	
05/02:30am	8.7	4.7	6.7	87	1	E	17	24	9	13	1015.8	1015.2	0	

05/02:00am	8.6	5.1	7.1	90	0.7	ESE	15	20	8	11	1016.2	1015.6	0	
05/01:30am	8.7	5.6	7.2	90	0.7	ESE	13	20	7	11	1016.7	1016.2	0	
05/01:00am	8.8	5.7	7.1	89	0.8	ESE	13	17	7	9	1017	1016.5	0	
05/12:30am	9.2	5.8	7.5	89	0.8	ESE	15	19	8	10	1017.1	1016.6	0	
05/12:00am	9.4	5.6	7.5	88	0.9	SE	17	20	9	11	1017.5	1017	0	
Date/Time	Temp	App	Dew	Rel	Delta-T	Wind					Press	Press	Rain since	
EDT	°C	Temp	Point	Hum	°C						QNH	MSL	9am	
		°C	°C	%		Dir	Spd	Gust	Spd	Gust	hPa	hPa	mm	
							km/h	km/h	kts	kts				
04/11:30pm	9.6	6.2	7.7	88	0.9	SE	15	20	8	11	1017.6	1017.1	0	
04/11:00pm	10.1	5.8	7.9	86	1.1	ESE	20	26	11	14	1017.5	1017	0	
04/10:30pm	10.5	5.8	7.9	84	1.3	ESE	22	30	12	16	1017.7	1017.2	0	
04/10:00pm	11	6.9	7.9	81	1.5	ESE	19	24	10	13	1018	1017.5	0	
04/09:30pm	11.8	8.5	7.9	77	1.9	SE	15	19	8	10	1017.8	1017.3	0	
04/09:00pm	12.2	8.1	6	66	3	S	17	20	9	11	1017.7	1017.2	0	
04/08:30pm	13	9.6	6.1	63	3.3	S	13	15	7	8	1017.4	1016.9	0	
04/08:00pm	13.9	10.2	6.3	60	3.7	S	15	19	8	10	1017.2	1016.7	0	
04/07:30pm	14.9	10.9	6.5	57	4.2	SSE	17	24	9	13	1016.8	1016.3	0	
04/07:00pm	15.2	10.9	5.1	51	4.9	SSW	17	22	9	12	1016.7	1016.2	0	
04/06:30pm	15.9	11.7	5.5	50	5.1	SSW	17	24	9	13	1016.3	1015.7	0	
04/06:00pm	15.9	11.7	5.8	51	5	S	17	26	9	14	1016.1	1015.5	0	
04/05:30pm	16.1	12.2	5.4	49	5.2	SW	15	22	8	12	1016.1	1015.5	0	
04/05:00pm	17	13	6.8	51	5.2	S	17	24	9	13	1015.8	1015.2	0	
04/04:30pm	16.4	12.1	5.4	48	5.4	SSW	17	26	9	14	1015.8	1015.2	0	
04/04:00pm	17.8	13.9	7	49	5.5	SW	17	28	9	15	1015.8	1015.2	0	
04/03:30pm	16.6	11.9	6.1	50	5.2	SW	20	30	11	16	1015.7	1015.1	0	
04/03:00pm	16.3	11.8	6.2	51	5	SSW	19	26	10	14	1015.8	1015.2	0	
04/02:30pm	15.9	11.3	5.5	50	5.1	SW	19	35	10	19	1015.8	1015.2	0	
04/02:00pm	16.1	11.3	5.4	49	5.2	SW	20	35	11	19	1015.8	1015.2	0	
04/01:30pm	15.7	10.9	4.4	47	5.4	W	19	28	10	15	1015.8	1015.2	0	
04/01:00pm	15.7	10.9	4.4	47	5.4	WSW	19	28	10	15	1016	1015.4	0	
04/12:30pm	15.4	11	4.5	48	5.2	WSW	17	30	9	16	1016	1015.4	0	
04/12:00pm	15.2	11	7.3	59	4	W	19	26	10	14	1016.2	1015.6	0	
04/11:30am	13.9	9.8	6	59	3.9	SSW	17	24	9	13	1016.2	1015.6	0	
04/11:00am	12.4	8.1	7.1	70	2.6	WSW	19	26	10	14	1016.1	1015.5	0	
04/10:30am	12.2	7.5	6	66	3	WSW	20	32	11	17	1015.9	1015.3	0	
04/10:00am	12.1	8.1	6.8	70	2.6	WSW	17	24	9	13	1015.4	1014.9	0	
04/09:30am	11.2	7.7	7.3	77	1.9	SW	15	22	8	12	1015.4	1014.9	0	
04/09:00am	10.8	8.3	6.7	76	2	SSW	9	15	5	8	1015.1	1014.6	0	
04/08:30am	10.1	7.2	6.3	77	1.8	SW	11	15	6	8	1015.2	1014.7	0	

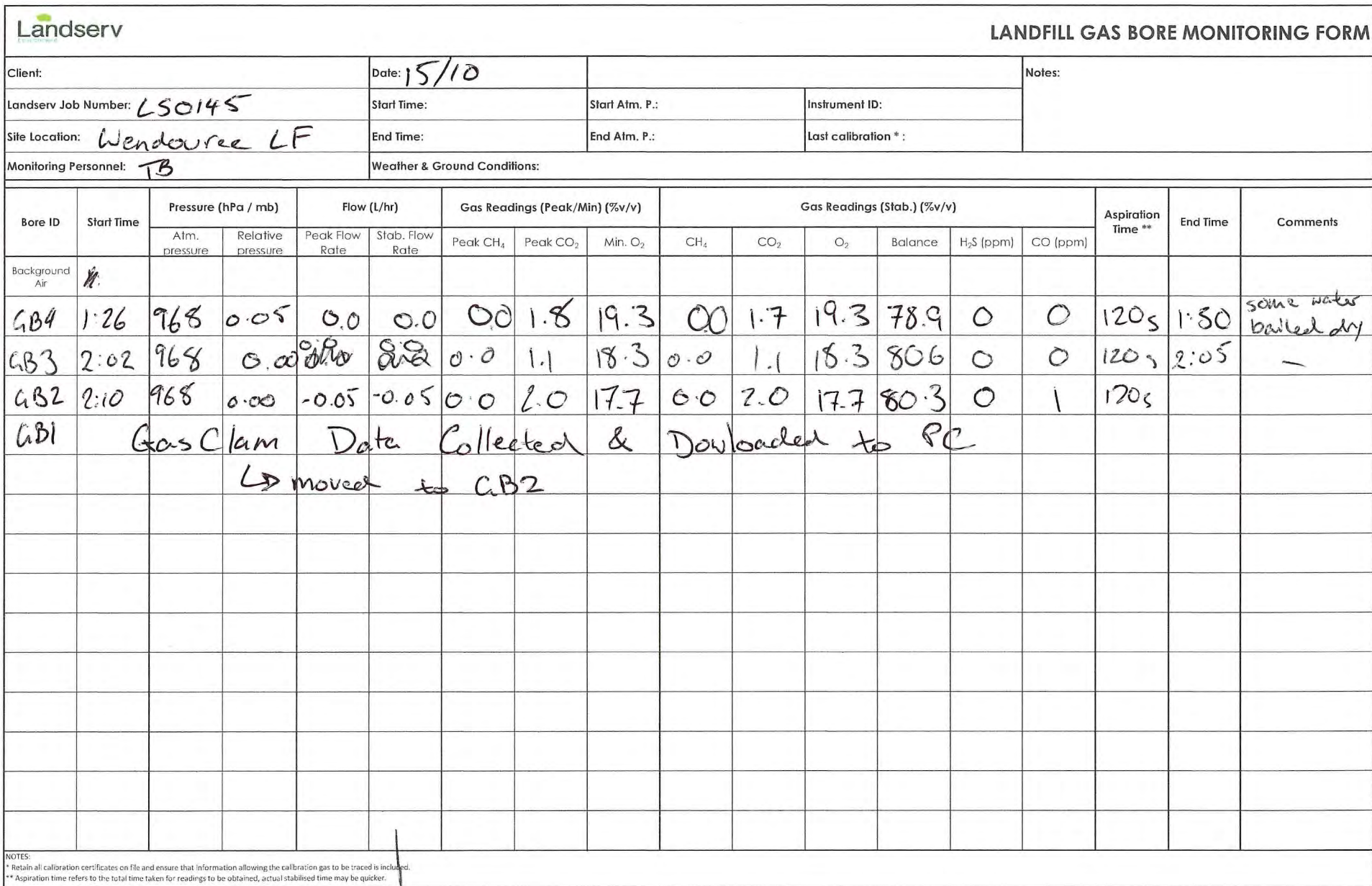
Appendix F

LFG Bore Monitoring Forms and Data

Client: CoB	Date: 8/6/24			Notes:
Landserv Job Number: L50145	Start Time: 10:36	Start Atm. P.: 978	Instrument Model & Serial No: CA-5000	
Site Location: Wendowiee LF	End Time: 12:10	End Atm. P.: 978	Last calibration *: 7/10/24	
Monitoring Personnel: FH	Weather & Ground Conditions: overcast, light showers			

[illegible]

potentially
pressurised
from install



Client: <u>City of Ballarat</u>	Date: <u>22/10</u>			Notes: <u>GB4 +5 likely damaged by cows</u>
Landserv Job Number: <u>LS0145</u>	Start Time: <u>10:20</u>	Start Atm. P.: <u>965</u>	Instrument Model & Serial No: <u>GA-5000</u>	
Site Location: <u>Wendouree Landfill</u>	End Time: <u>11:58</u>	End Atm. P.: <u>966</u>	Last calibration *: <u>see cal cert</u>	
Monitoring Personnel: <u>TB</u>	Weather & Ground Conditions: <u>Fine, dry</u>			

Bore ID	Start Time	Pressure (hPa / mb)		Flow (L/hr)		Gas Readings (Peak/Min) (%v/v)			Gas Readings (Stab.) (%v/v)						Aspiration Time **	End Time	Comments
		Atm. pressure	Relative pressure	Peak Flow Rate	Stab. Flow Rate	Peak CH ₄	Peak CO ₂	Min. O ₂	CH ₄	CO ₂	O ₂	Balance	H ₂ S (ppm)	CO (ppm)			
Background Air	10:15	965	—	—	—	0.0	0.1	20.3	0.0	0.1	20.5	79.4	0	0	120s	10:17	
GB3	10:20	965	0.09	0.1	0.1	0.0	1.9	18.2	0.0	1.9	18.2	79.9	0	0	120s	10:24	
GB1	10:37	966	0.00	0.0	0.0	0.0	2.1	17.8	0.0	2.1	17.9	80.0	0	0	120s	10:43	
GB2	Gasclam Data collected @ 10:54 ^(22/10) AM → GB3 @ 11:08 (PC Time)																
GB4	11:16	966	2.17	0.4	0.2	0.0	2.7	18.3	0.0	2.6	18.4	79.0	0	0	120s	11:27	Flow taken first
GB5	11:47	966	0.03	0.0	0.0	0.0	0.3	20.2	0.0	0.1	20.5	79.4	0	0	120s	11:58	purged twice managment knocked over, pipe exposed/open
																	J-cap taken from GB4 & placed on GB5

12

Landserv										LANDFILL GAS BORE MONITORING FORM									
Client: COB					Date: 29/10/24					Notes: GBS reinstated & barrier made, j-cap had been knocked off									
Landserv Job Number: LSO145					Start Time: 10:05					Start Atm. P.: 974 974					Instrument ID: GA5000				
Site Location: Wendoree					End Time: 12:05					End Atm. P.: 974 974					Last calibration*: Per cal cert				
Monitoring Personnel: TB					Weather & Ground Conditions: Overcast, light winds														
Bore ID	Start Time	Pressure (hPa / mb)		Flow (L/hr)		Gas Readings (Peak/Min) (%v/v)			Gas Readings (Stab.) (%v/v)						Aspiration Time **	End Time	Comments		
		Atm. pressure	Relative pressure	Peak Flow Rate	Stab. Flow Rate	Peak CH ₄	Peak CO ₂	Min. O ₂	CH ₄	CO ₂	O ₂	Balance	H ₂ S (ppm)	CO (ppm)					
Background Air	10:05					0.0	0.1	20.9	0.0	0.1	20.9	79.0	0	0					
GB1	10:09	975	0.12	0.2	0.2	0.0	2.4	18.7	0.0	2.4	18.7	79.0	0	0	120s	10:15			
GB2	10:19	975	-0.05	0.1	0.1	0.0	3.2	16.8	0.0	3.2	16.8	80.0	0	0	120s	10:25			
GB3	Data collected from Gasclam @ 10:32 - relocated to GBS @ 11:15																		
GB5	Cap knocked off pipe due to cows																		

NOTES:
 * Retain all calibration certificates on file and ensure that information allowing the calibration gas to be traced is included.
 ** Aspiration time refers to the total time taken for readings to be obtained, actual stabilised time may be quicker.

LANDFILL GAS BORE MONITORING FORM[illegible]

water in GB but lower than prev

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
GB1											
8/10/2024 12:12	0	2.8	18	0.2	1	991	993	-2	16.3	2.79	13
8/10/2024 12:42	0	3.8	18	0	0.7	991	993	-2	15.7	2.77	13
8/10/2024 13:12	0	3.8	18	0	1.3	991	993	-2	15.4	2.77	13
8/10/2024 13:42	0	3.8	17.9	0	0.7	991	993	-2	15.1	2.76	13
8/10/2024 14:12	0	4	18	0	1	991	993	-2	15.7	2.76	13
8/10/2024 14:42	0	4	18	0	2	991	993	-2	15.9	2.76	13
8/10/2024 15:12	0	4	18	0	0.1	991	993	-2	15.9	2.76	13
8/10/2024 15:42	0	4	18	0	1.6	991	993	-2	16	2.76	14
8/10/2024 16:12	0	3.8	18	0	2.6	991	993	-2	15.8	2.76	14
8/10/2024 16:42	0	4	18	0	1.6	991	993	-2	15.4	2.75	14
8/10/2024 17:12	0	4	17.9	0	1	991	993	-2	14.9	2.75	14
8/10/2024 17:42	0	4	17.9	0	0	991	993	-2	14.4	2.75	14
8/10/2024 18:12	0	4	17.9	0	3.8	991	993	-2	13.8	2.74	14
8/10/2024 18:42	0	4	17.9	0	1	991	993	-2	13.4	2.74	14
8/10/2024 19:12	0	4	17.9	0	2.3	991	993	-2	12.6	2.74	13
8/10/2024 19:42	0	3.8	17.9	0	0.1	991	993	-2	11.6	2.74	13
8/10/2024 20:12	0	4	17.9	0	2.9	991	993	-2	10.5	2.74	14
8/10/2024 20:42	0	3.8	17.8	0	0	991	993	-2	9.3	2.72	13
8/10/2024 21:12	0	4	17.8	0	0.4	991	993	-2	7.9	2.72	13
8/10/2024 21:42	0	4	17.8	0	0	991	993	-2	6.8	2.72	13
8/10/2024 22:12	0	4	17.8	0	0	991	993	-2	5.9	2.71	13
8/10/2024 22:42	0	4	17.7	0	0.1	991	993	-2	5.1	2.71	13
8/10/2024 23:12	0	4	17.7	0	0.4	991	993	-2	4.3	2.71	13
8/10/2024 23:42	0	4	17.7	0	0.4	991	993	-2	3.6	2.71	13
9/10/2024 0:12	0	4	17.7	0	0	991	993	-2	2.9	2.71	13
9/10/2024 0:42	0	4	17.7	0	0.4	991	993	-2	2.6	2.7	14
9/10/2024 1:12	0.1	4	17.7	0	0	991	993	-2	2.4	2.7	14
9/10/2024 1:42	0	4	17.6	0	0	991	993	-2	2.2	2.7	14
9/10/2024 2:12	0	4	17.6	0	0.1	991	993	-2	2	2.7	14
9/10/2024 2:42	0	4	17.6	0	1	991	993	-2	1.9	2.7	14
9/10/2024 3:12	0	4	17.6	0	0	991	993	-2	1.9	2.69	14
9/10/2024 3:42	0	4	17.6	0	0	991	993	-2	1.8	2.69	14
9/10/2024 4:12	0	4	17.6	0	0	990	993	-3	1.8	2.69	13
9/10/2024 4:42	0	4	17.6	0	0	990	993	-3	1.7	2.69	13
9/10/2024 5:12	0	4.2	17.6	0	1.6	990	993	-3	1.7	2.69	13
9/10/2024 5:42	0.1	4	17.6	0	3.5	990	993	-3	1.6	2.67	13
9/10/2024 6:12	0	4	17.6	0	0	990	993	-3	1.6	2.67	13
9/10/2024 6:42	0	4	17.6	0	1.6	990	993	-3	1.5	2.67	13
9/10/2024 7:12	0.1	4	17.6	0	0	991	993	-2	1.4	2.67	14
9/10/2024 7:42	0	4.2	17.6	0	0	991	993	-2	2	2.67	14
9/10/2024 8:12	0	4	17.6	0	0	991	993	-2	3.8	2.66	14
9/10/2024 8:42	0	4.2	17.7	0.2	0.4	991	993	-2	5.9	2.66	14
9/10/2024 9:12	0	4	17.7	0	0.1	991	993	-2	7.9	2.66	14
9/10/2024 9:42	0.1	4	17.8	0	1.6	991	993	-2	9.8	2.66	14
9/10/2024 10:12	0	4	17.8	0.2	0.1	991	993	-2	11.6	2.66	14
9/10/2024 10:42	0	4	17.9	0.2	0	991	993	-2	13.5	2.66	14
9/10/2024 11:12	0.1	4	17.9	0.3	1.6	991	993	-2	15.4	2.66	15
9/10/2024 11:42	0	4	17.9	0	1	991	993	-2	17.1	2.66	15
9/10/2024 12:12	0.1	4	18	0	1.6	990	993	-3	18.1	2.66	14
9/10/2024 12:42	0	3.8	18	0	3.2	990	993	-3	18.6	2.66	14
9/10/2024 13:12	0	3.8	18	0	2	990	992	-2	19.1	2.66	14
9/10/2024 13:42	0	3.8	18	0	2.9	990	992	-2	19.7	2.66	14
9/10/2024 14:12	0.2	3.8	18	0	2.9	990	992	-2	20.4	2.66	14
9/10/2024 14:42	0.2	3.8	18	0	2.3	990	992	-2	21.1	2.66	14
9/10/2024 15:12	0.2	3.8	18.1	0	0.1	990	992	-2	21.7	2.66	14
9/10/2024 15:42	0.2	3.8	18.1	0	2.6	989	992	-3	22.2	2.66	13
9/10/2024 16:12	0.2	3.8	18.1	0	2.6	989	992	-3	22.5	2.66	13
9/10/2024 16:42	0.2	3.8	18.1	0	0	989	992	-3	22.6	2.66	14
9/10/2024 17:12	0.2	3.5	18.1	0	3.5	989	992	-3	22.6	2.66	14
9/10/2024 17:42	0.2	3.5	18.1	0	0	989	992	-3	22.4	2.66	14
9/10/2024 18:12	0.2	3.5	18.1	0	6	989	992	-3	22.2	2.66	14
9/10/2024 18:42	0.2	3.5	18.1	0	3.8	989	992	-3	21.7	2.65	14
9/10/2024 19:12	0.2	3.8	18.1	0	2.9	989	991	-2	20.8	2.65	14
9/10/2024 19:42	0	3.8	18	0	0	989	991	-2	19	2.65	14
9/10/2024 20:12	0	3.8	18	0	0.7	989	991	-2	16.1	2.65	14
9/10/2024 20:42	0	3.8	17.9	0	2.3	989	991	-2	13	2.65	14
9/10/2024 21:12	0	3.8	17.9	0	0	989	991	-2	11.2	2.64	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
9/10/2024 21:42	0	3.8	17.8	0	1.3	989	991	-2	10.3	2.64	14
9/10/2024 22:12	0	3.8	17.8	0	0.1	989	991	-2	9.7	2.64	14
9/10/2024 22:42	0.1	3.8	17.8	0	1	989	991	-2	9.4	2.64	14
9/10/2024 23:12	0	3.8	17.8	0	3.2	989	991	-2	9.4	2.64	14
9/10/2024 23:42	0	3.8	17.8	0.2	0	988	991	-3	9.4	2.64	13
10/10/2024 0:12	0	3.8	17.8	0	3.5	988	991	-3	9.6	2.63	13
10/10/2024 0:42	0	4	17.8	0	0	988	991	-3	9.5	2.63	14
10/10/2024 1:12	0	3.8	17.8	0	0	988	991	-3	9.5	2.63	14
10/10/2024 1:42	0	4	17.8	0	0	988	991	-3	9.8	2.63	14
10/10/2024 2:12	0	4	17.8	0	1.3	988	991	-3	9.9	2.63	14
10/10/2024 2:42	0	4	17.8	0	0.1	988	990	-2	9.8	2.63	14
10/10/2024 3:12	0	4	17.8	0	1.3	988	990	-2	9.7	2.61	14
10/10/2024 3:42	0	4	17.8	0	2	987	990	-3	9.9	2.61	13
10/10/2024 4:12	0.1	4	17.8	0	0	987	990	-3	10.1	2.61	13
10/10/2024 4:42	0	4	17.8	0	0	988	990	-2	10.2	2.61	14
10/10/2024 5:12	0	4	17.8	0	0.4	988	991	-3	10.3	2.61	14
10/10/2024 5:42	0	4	17.8	0	0.1	988	991	-3	10.2	2.61	14
10/10/2024 6:12	0	4	17.8	0	1	988	991	-3	10.3	2.61	14
10/10/2024 6:42	0	4	17.8	0	4.8	988	991	-3	10.2	2.61	14
10/10/2024 7:12	0	4	17.8	0	1.6	988	991	-3	10	2.61	13
10/10/2024 7:42	0	4	17.8	0	0.7	988	991	-3	10.3	2.61	13
10/10/2024 8:12	0	4.2	17.8	0	1.6	989	991	-2	11.1	2.61	14
10/10/2024 8:42	0	4	17.9	0	0.4	989	991	-2	12.3	2.61	14
10/10/2024 9:12	0	3.8	17.9	0.2	1	989	992	-3	13.7	2.61	14
10/10/2024 9:42	0	4	18	0	2.9	989	992	-3	15.3	2.61	14
10/10/2024 10:12	0	4	18	0	0.7	989	992	-3	17.1	2.61	14
10/10/2024 10:42	0.2	4	18	0.2	2.3	989	992	-3	18.9	2.61	14
10/10/2024 11:12	0	4	18	0	4.2	989	992	-3	20.3	2.61	14
10/10/2024 11:42	0.2	4	18.1	0	1.3	989	992	-3	20.9	2.61	14
10/10/2024 12:12	0	4	18	0	0	989	992	-3	20.6	2.61	14
10/10/2024 12:42	0.2	4	18.1	0	1	989	992	-3	21.2	2.61	13
10/10/2024 13:12	0.2	4	18.1	0	3.2	989	992	-3	21.6	2.61	13
10/10/2024 13:42	0.2	4	18.1	0	3.8	989	992	-3	21.8	2.61	13
10/10/2024 14:12	0.2	4	18.1	0	0.1	989	992	-3	22.1	2.61	13
10/10/2024 14:42	0.2	4	18.1	0	2	989	992	-3	22.6	2.61	13
10/10/2024 15:12	0.2	4	18.1	0	1.6	989	992	-3	23.1	2.61	13
10/10/2024 15:42	0.2	4	18.1	0	3.8	989	992	-3	23.4	2.61	13
10/10/2024 16:12	0.4	4	18.1	0	3.2	989	992	-3	23.4	2.61	13
10/10/2024 16:42	0.2	4	18.1	0	0	989	992	-3	23.4	2.61	13
10/10/2024 17:12	0.2	4	18.1	0	2.6	989	992	-3	23.3	2.61	13
10/10/2024 17:42	0.2	4.2	18.1	0	0.1	989	992	-3	22.9	2.61	13
10/10/2024 18:12	0.2	4.2	18.1	0	2	989	992	-3	22.4	2.6	13
10/10/2024 18:42	0.2	4.2	18.1	0	1	990	992	-2	21.7	2.6	14
10/10/2024 19:12	0.2	4.2	18.1	0	3.8	990	992	-2	20.4	2.6	14
10/10/2024 19:42	0	4.2	18	0	1	990	992	-2	18.4	2.6	14
10/10/2024 20:12	0	4.2	18	0	1	990	992	-2	16	2.6	14
10/10/2024 20:42	0	4.2	18	0	0	990	993	-3	13.9	2.6	14
10/10/2024 21:12	0	4.2	17.9	0	0	990	993	-3	12.1	2.6	13
10/10/2024 21:42	0	4.2	17.9	0	1	990	993	-3	10.8	2.59	13
10/10/2024 22:12	0	4.2	17.9	0	2.9	990	993	-3	9.7	2.59	13
10/10/2024 22:42	0	4.2	17.9	0	1	991	993	-2	8.8	2.59	14
10/10/2024 23:12	0	4.2	17.8	0	0	990	993	-3	7.9	2.59	13
10/10/2024 23:42	0	4.2	17.8	0	2.9	990	993	-3	7.3	2.59	13
11/10/2024 0:12	0.1	4.2	17.8	0	1.6	991	993	-2	6.6	2.59	14
11/10/2024 0:42	0	4.2	17.8	0	0.7	991	993	-2	5.9	2.58	14
11/10/2024 1:12	0	4.2	17.8	0	0	991	993	-2	5.4	2.58	14
11/10/2024 1:42	0	4.5	17.8	0	0	991	993	-2	4.8	2.58	14
11/10/2024 2:12	0	4.2	17.8	0	2.9	990	993	-3	4.3	2.58	13
11/10/2024 2:42	0	4.4	17.8	0	0	990	993	-3	3.8	2.58	13
11/10/2024 3:12	0	4.5	17.7	0	0	990	993	-3	3.3	2.58	13
11/10/2024 3:42	0	4.4	17.7	0	1	990	993	-3	2.6	2.58	13
11/10/2024 4:12	0	4.5	17.7	0	0.7	990	992	-2	1.8	2.56	13

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
11/10/2024 4:42	0	4.4	17.7	0	0.4	990	992	-2	1.3	2.56	13
11/10/2024 5:12	0	4.4	17.7	0	0	990	992	-2	0.7	2.56	13
11/10/2024 5:42	0	4.5	17.7	0	0	990	992	-2	0.2	2.56	13
11/10/2024 6:12	0.1	4.5	17.6	0	0	990	993	-3	-0.3	2.56	13
11/10/2024 6:42	0	4.4	17.6	0	0	990	993	-3	-0.3	2.56	13
11/10/2024 7:12	0	4.5	17.5	0	2	990	993	-3	0.2	2.56	0
11/10/2024 7:42	0.1	4.5	17.6	0	0	991	993	-2	1.3	2.56	14
11/10/2024 8:12	0.1	4.4	17.7	0.2	0	991	993	-2	3.1	2.56	14
11/10/2024 8:42	0	4.5	17.7	0.2	0	991	993	-2	5.5	2.56	14
11/10/2024 9:12	0	4.5	17.8	0.2	0.1	991	993	-2	8.1	2.56	14
11/10/2024 9:42	0	4.4	17.9	0.2	0	991	993	-2	10.7	2.56	14
11/10/2024 10:12	0.1	4.5	17.9	0	5.1	991	993	-2	12.3	2.56	14
11/10/2024 10:42	0	4.5	17.9	0.2	2	991	993	-2	13.3	2.58	14
11/10/2024 11:12	0	4.5	18	0.2	2.3	991	993	-2	14.6	2.58	14
11/10/2024 11:42	0	4.5	18	0.2	1	991	993	-2	15.8	2.58	14
11/10/2024 12:12	0	4.5	18	0	2.3	991	993	-2	16.8	2.58	14
11/10/2024 12:42	0	4.5	18	0	2	991	993	-2	17.9	2.58	14
11/10/2024 13:12	0	4.5	18.1	0	2.9	991	993	-2	18.3	2.58	14
11/10/2024 13:42	0	4.5	18.1	0	0.4	991	993	-2	18.1	2.58	14
11/10/2024 14:12	0	4.5	18	0	2.6	991	993	-2	17.6	2.58	14
11/10/2024 14:42	0	4.5	18.1	0	0	991	993	-2	17.4	2.58	14
11/10/2024 15:12	0	4.2	18.1	0	1	991	993	-2	17.2	2.58	14
11/10/2024 15:42	0	4.2	18.1	0	0.7	991	993	-2	16.9	2.58	14
11/10/2024 16:12	0	4.2	18.1	0	1	991	993	-2	16.8	2.58	14
11/10/2024 16:42	0	4.2	18.1	0	2.6	991	993	-2	16.6	2.58	14
11/10/2024 17:12	0	4.2	18.1	0	0.1	991	993	-2	16.3	2.58	14
11/10/2024 17:42	0	4.2	18.1	0	1.3	991	993	-2	16.1	2.58	14
11/10/2024 18:12	0	4.2	18.1	0	1.6	991	993	-2	15.8	2.58	14
11/10/2024 18:42	0	4.2	18	0	2.3	991	993	-2	15.1	2.58	14
11/10/2024 19:12	0	4.2	18	0	3.8	991	993	-2	14.7	2.58	14
11/10/2024 19:42	0	4.2	18	0	1	991	993	-2	14	2.58	14
11/10/2024 20:12	0	4.2	18	0	0	991	993	-2	12.6	2.58	13
11/10/2024 20:42	0	4.2	18	0	0	991	993	-2	11.2	2.56	13
11/10/2024 21:12	0	4.2	18	0	1	991	993	-2	9.9	2.58	13
11/10/2024 21:42	0	4.2	18	0	1	992	994	-2	9.3	2.56	14
11/10/2024 22:12	0	4.2	17.9	0	0	992	994	-2	8.6	2.56	14
11/10/2024 22:42	0	4.2	17.9	0	1	992	994	-2	8	2.56	14
11/10/2024 23:12	0	4.2	17.9	0	0	992	994	-2	7.8	2.56	14
11/10/2024 23:42	0	4.2	17.9	0	0	992	994	-2	7.8	2.56	14
12/10/2024 0:12	0	4.2	17.9	0	0.4	992	994	-2	7.9	2.56	14
12/10/2024 0:42	0	4.2	17.9	0	3.5	992	994	-2	7.9	2.56	14
12/10/2024 1:12	0	4.2	17.9	0	0	992	994	-2	7.5	2.56	14
12/10/2024 1:42	0	4.2	17.9	0	0	992	994	-2	7.1	2.56	14
12/10/2024 2:12	0	4.2	17.9	0	0	992	994	-2	7.1	2.56	14
12/10/2024 2:42	0	4.2	17.9	0	0.4	992	994	-2	7.1	2.56	14
12/10/2024 3:12	0	4.2	17.9	0	0.7	992	994	-2	6.8	2.56	14
12/10/2024 3:42	0	4.2	17.9	0	0	991	993	-2	6.6	2.56	13
12/10/2024 4:12	0	4.2	17.9	0	0	991	993	-2	6.5	2.56	13
12/10/2024 4:42	0	4.2	17.9	0	0	991	993	-2	6.1	2.56	13
12/10/2024 5:12	0.1	4.2	17.9	0	0	991	993	-2	5.7	2.56	13
12/10/2024 5:42	0	4.2	17.9	0	0	991	993	-2	5.4	2.56	13
12/10/2024 6:12	0	4.2	17.9	0	0	991	993	-2	5.1	2.55	13
12/10/2024 6:42	0	4.2	17.9	0	0	992	994	-2	4.8	2.55	14
12/10/2024 7:12	0	4.2	17.9	0	0	992	994	-2	4.7	2.55	14
12/10/2024 7:42	0	4.2	17.9	0	1.3	992	994	-2	5.2	2.55	14
12/10/2024 8:12	0	4.2	17.9	0.2	0.7	992	994	-2	6.5	2.55	14
12/10/2024 8:42	0	4.2	17.9	0	0.7	992	994	-2	8.3	2.55	14
12/10/2024 9:12	0.1	4.2	18	0	0.4	992	994	-2	10	2.56	14
12/10/2024 9:42	0	4.2	18	0.2	0.4	992	994	-2	11.7	2.56	14
12/10/2024 10:12	0	4.2	18	0.2	0	992	994	-2	13.3	2.56	14
12/10/2024 10:42	0	4.2	18.1	0.2	0.7	992	994	-2	14.7	2.56	14
12/10/2024 11:12	0	4.2	18.1	0	1.3	992	994	-2	15.8	2.56	15
12/10/2024 11:42	0	4.2	18.1	0	4.5	992	994	-2	16.9	2.56	14
12/10/2024 12:12	0	4.2	18.2	0	0.1	991	994	-3	17.6	2.56	14
12/10/2024 12:42	0	4.2	18.2	0	2.9	991	993	-2	18.1	2.56	13
12/10/2024 13:12	0	4.2	18.2	0.2	1.6	991	993	-2	18.6	2.56	14
12/10/2024 13:42	0.2	4.2	18.2	0	2.3	991	993	-2	19.1	2.56	13

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
12/10/2024 14:12	0.2	4.2	18.2	0	0	991	993	-2	19.8	2.56	13
12/10/2024 14:42	0.2	4	18.2	0	1.3	991	993	-2	20.4	2.56	13
12/10/2024 15:12	0.2	4	18.3	0	0	991	993	-2	21.1	2.58	13
12/10/2024 15:42	0.2	4	18.3	0	0	991	993	-2	21.7	2.58	14
12/10/2024 16:12	0.2	4	18.3	0	0.7	991	993	-2	21.9	2.58	14
12/10/2024 16:42	0.2	4	18.3	0	0.1	991	993	-2	21.9	2.58	14
12/10/2024 17:12	0.2	4	18.3	0	3.2	991	993	-2	22	2.58	14
12/10/2024 17:42	0.2	4	18.3	0	2.9	991	993	-2	21.9	2.58	14
12/10/2024 18:12	0.2	4	18.3	0	0.7	991	993	-2	21.6	2.58	14
12/10/2024 18:42	0.2	4	18.3	0	1	990	993	-3	21.1	2.58	13
12/10/2024 19:12	0.2	4	18.3	0	2.9	990	993	-3	19.9	2.58	13
12/10/2024 19:42	0.2	3.8	18.2	0	1.3	990	993	-3	18.1	2.58	13
12/10/2024 20:12	0	4	18.2	0	0	990	993	-3	15.7	2.56	13
12/10/2024 20:42	0	3.8	18.2	0	0	990	993	-3	13.5	2.56	13
12/10/2024 21:12	0	3.8	18.1	0	0.7	990	993	-3	11.8	2.56	13
12/10/2024 21:42	0	3.8	18.1	0	2.3	990	993	-3	10.3	2.56	13
12/10/2024 22:12	0	3.8	18.1	0	0.7	990	993	-3	9.2	2.56	13
12/10/2024 22:42	0	3.8	18	0	1.6	990	993	-3	8.3	2.56	13
12/10/2024 23:12	0	3.8	18	0	1	990	993	-3	7.4	2.56	13
12/10/2024 23:42	0	3.8	18	0	0	990	993	-3	6.4	2.56	13
13/10/2024 0:12	0	4	18	0	2.6	990	993	-3	5.2	2.56	13
13/10/2024 0:42	0.1	4	18	0	0	990	993	-3	3.7	2.55	13
13/10/2024 1:12	0	4	17.9	0	0	990	992	-2	2.3	2.55	13
13/10/2024 1:42	0	4	17.8	0	0	990	992	-2	1.1	2.55	0
13/10/2024 2:12	0	4	17.7	0	0	990	992	-2	0.3	2.55	0
13/10/2024 2:42	0	4	17.5	0	0.7	990	992	-2	-0.4	2.55	0
13/10/2024 3:12	0	4	17.2	0	0.1	990	992	-2	0.5	2.55	0
13/10/2024 3:42	0	4	17.2	0	0	990	992	-2	0	2.55	1
13/10/2024 4:12	0	3.8	18.2	0	0	989	992	-3	-0.4	2.54	0
13/10/2024 4:42	0	3.5	18.2	0	0	989	992	-3	-0.9	2.54	0
13/10/2024 5:12	0	3.3	18.2	0	0	989	992	-3	-1.3	2.54	0
13/10/2024 5:42	0	3.3	18.2	0	0	989	992	-3	-1.5	2.54	0
13/10/2024 6:12	0	3.3	18.2	0	0.4	989	992	-3	-1.8	2.54	0
13/10/2024 6:42	0	3.3	18.2	0	0	989	992	-3	-1.6	2.54	0
13/10/2024 7:12	0.1	3.3	18.2	0	0	990	992	-2	-0.9	2.54	1
13/10/2024 7:42	0	4	17.7	0	1	990	992	-2	0.3	2.54	1
13/10/2024 8:12	0	4	17.9	0.2	0	990	992	-2	3.7	2.54	14
13/10/2024 8:42	0	4	18	0.2	0	990	992	-2	7.1	2.54	14
13/10/2024 9:12	0	4	18	0.2	0	990	992	-2	9.7	2.54	14
13/10/2024 9:42	0	4	18.1	0	1.6	990	992	-2	12	2.54	15
13/10/2024 10:12	0.1	4	18.1	0.2	0	989	992	-3	14.1	2.55	14
13/10/2024 10:42	0	4	18.2	0.2	0	989	992	-3	15.9	2.55	14
13/10/2024 11:12	0	4	18.2	0	0	989	992	-3	17.3	2.55	14
13/10/2024 11:42	0.2	3.8	18.3	0	1	989	992	-3	18.6	2.56	14
13/10/2024 12:12	0.2	3.8	18.3	0	5.7	989	992	-3	19.6	2.56	14
13/10/2024 12:42	0.2	3.8	18.3	0.2	0.4	989	991	-2	20.4	2.56	14
13/10/2024 13:12	0.2	3.8	18.3	0	3.5	989	991	-2	20.9	2.56	14
13/10/2024 13:42	0.2	3.5	18.4	0	0.7	989	991	-2	21.6	2.56	14
13/10/2024 14:12	0.2	3.3	18.4	0	0.4	989	991	-2	22.2	2.56	14
13/10/2024 14:42	0.2	3.3	18.4	0	1.6	988	991	-3	22.6	2.56	13
13/10/2024 15:12	0.2	3.3	18.4	0	0.4	988	991	-3	23.3	2.56	13
13/10/2024 15:42	0.4	3.3	18.4	0	0	988	991	-3	23.8	2.56	14
13/10/2024 16:12	0.4	3.3	18.4	0	2.3	988	991	-3	23.9	2.56	14
13/10/2024 16:42	0.4	3.3	18.4	0	0	988	991	-3	23.8	2.56	14
13/10/2024 17:12	0.4	3.3	18.4	0	1.6	988	991	-3	23.6	2.56	14
13/10/2024 17:42	0.4	3.3	18.4	0	0	988	991	-3	23.2	2.56	14
13/10/2024 18:12	0.4	3.3	18.4	0	0	988	991	-3	22.5	2.56	14
13/10/2024 18:42	0.2	3.3	18.4	0	1.6	988	991	-3	21.6	2.56	14
13/10/2024 19:12	0.2	3.3	18.3	0	3.5	988	991	-3	20.5	2.56	14
13/10/2024 19:42	0.2	3.3	18.3	0	3.5	988	991	-3	19.5	2.56	14
13/10/2024 20:12	0	3.3	18.3	0	2.6	988	991	-3	18.4	2.56	14
13/10/2024 20:42	0	3.3	18.3	0	1	988	991	-3	17.1	2.56	14
13/10/2024 21:12	0	3.3	18.3	0	0	988	991	-3	15.7	2.56	13
13/10/2024 21:42	0	3.3	18.2	0	2.6	988	991	-3	14.6	2.56	13
13/10/2024 22:12	0	3.3	18.2	0	0.1	988	991	-3	13.7	2.56	13
13/10/2024 22:42	0	3.3	18.2	0	0	988	991	-3	13.1	2.56	14
13/10/2024 23:12	0	3.3	18.2	0	1.6	988	991	-3	12.6	2.56	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
13/10/2024 23:42	0	3.3	18.2	0	2	988	991	-3	12.2	2.56	14
14/10/2024 0:12	0	3.3	18.2	0.2	0	988	991	-3	11.9	2.55	14
14/10/2024 0:42	0	3.3	18.2	0	2	988	991	-3	11.6	2.55	14
14/10/2024 1:12	0	3.3	18.2	0	0.4	988	991	-3	11.4	2.55	14
14/10/2024 1:42	0.1	3.3	18.1	0	0.1	988	991	-3	11.3	2.55	14
14/10/2024 2:12	0	3.3	18.1	0	0	988	991	-3	11	2.55	14
14/10/2024 2:42	0	3.3	18.1	0	0.1	988	991	-3	10.8	2.55	14
14/10/2024 3:12	0.1	3.3	18.1	0	0	988	990	-2	10.7	2.55	14
14/10/2024 3:42	0	3.3	18.1	0	0	988	990	-2	10.6	2.55	15
14/10/2024 4:12	0	3.3	18.1	0	1.3	987	990	-3	10.6	2.55	13
14/10/2024 4:42	0	3.3	18.1	0	0	988	990	-2	10.7	2.55	14
14/10/2024 5:12	0	3.3	18.1	0	1	988	990	-2	10.8	2.55	14
14/10/2024 5:42	0	3.3	18.1	0	0	988	991	-3	10.6	2.55	14
14/10/2024 6:12	0	3.5	18.1	0	0.1	988	991	-3	10.4	2.54	14
14/10/2024 6:42	0	3.3	18.1	0	0.7	988	991	-3	10.1	2.54	14
14/10/2024 7:12	0	3.3	18.1	0	0	988	991	-3	10.2	2.54	14
14/10/2024 7:42	0	3.3	18.1	0	0.1	988	991	-3	10.4	2.54	14
14/10/2024 8:12	0	3.3	18.1	0	2	988	991	-3	10.9	2.54	14
14/10/2024 8:42	0	3.3	18.1	0	1.3	988	991	-3	11.4	2.54	14
14/10/2024 9:12	0	3.3	18.2	0.2	0	988	991	-3	12.6	2.54	14
14/10/2024 9:42	0	3.5	18.2	0.2	2.3	988	991	-3	14.7	2.54	14
14/10/2024 10:12	0	3.5	18.2	0	0.1	988	991	-3	15.9	2.55	14
14/10/2024 10:42	0	3.5	18.2	0	1.3	989	991	-2	16.2	2.54	14
14/10/2024 11:12	0	3.5	18.2	0	0.7	989	991	-2	16.3	2.55	14
14/10/2024 11:42	0	3.5	18.3	0	0	988	991	-3	17.2	2.55	14
14/10/2024 12:12	0	3.5	18.3	0.2	2.3	988	991	-3	18.7	2.55	14
14/10/2024 12:42	0.2	3.5	18.3	0.2	1.3	988	991	-3	19.2	2.55	13
14/10/2024 13:12	0.2	3.3	18.3	0	2	988	991	-3	19.5	2.55	13
14/10/2024 13:42	0.2	3.3	18.3	0	0.4	988	991	-3	19.8	2.55	14
14/10/2024 14:12	0.2	3.5	18.3	0.2	0	988	991	-3	20.1	2.55	14
14/10/2024 14:42	0.2	3.3	18.3	0.2	0.7	988	991	-3	20.4	2.55	14
14/10/2024 15:12	0.2	3.3	18.4	0	1.3	988	991	-3	20.8	2.55	14
14/10/2024 15:42	0.2	3.3	18.4	0	1	988	991	-3	21.4	2.55	14
14/10/2024 16:12	0.2	3.3	18.4	0.2	2.3	988	991	-3	21.9	2.55	14
14/10/2024 16:42	0.2	3.3	18.4	0.2	2.9	988	991	-3	22.3	2.55	14
14/10/2024 17:12	0.4	3.3	18.4	0	3.8	988	991	-3	22.4	2.55	13
14/10/2024 17:42	0.4	3.3	18.4	0	2.6	988	991	-3	22.4	2.55	13
14/10/2024 18:12	0.2	3.3	18.4	0	1.6	988	991	-3	22.1	2.55	13
14/10/2024 18:42	0.2	3	18.4	0	1.6	988	991	-3	21.6	2.55	13
14/10/2024 19:12	0.2	3.3	18.4	0	1.3	988	991	-3	20.6	2.55	13
14/10/2024 19:42	0.2	3	18.4	0	0	989	991	-2	19.1	2.55	14
14/10/2024 20:12	0	3	18.3	0	0	988	991	-3	17.2	2.55	13
14/10/2024 20:42	0	3	18.3	0	1	989	991	-2	15.5	2.55	14
14/10/2024 21:12	0	3	18.3	0	2	989	991	-2	14.4	2.55	14
14/10/2024 21:42	0	3	18.3	0	1.3	989	991	-2	13.8	2.54	14
14/10/2024 22:12	0	3	18.3	0	0	989	991	-2	13.3	2.54	14
14/10/2024 22:42	0	3	18.3	0	0	989	991	-2	12.7	2.54	14
14/10/2024 23:12	0	3	18.3	0	0	989	991	-2	12.1	2.54	14
14/10/2024 23:42	0	3	18.2	0	1.6	989	991	-2	11.6	2.54	14
15/10/2024 0:12	0	2.8	18.2	0	0	989	991	-2	11.3	2.54	14
15/10/2024 0:42	0	2.8	18.2	0	2	989	991	-2	11.2	2.54	14
15/10/2024 1:12	0	2.7	18.2	0	1	989	991	-2	11.1	2.54	14
15/10/2024 1:42	0	2.8	18.2	0	1.6	988	991	-3	10.9	2.54	13
15/10/2024 2:12	0	2.8	18.2	0	0	988	991	-3	10.8	2.54	14
15/10/2024 2:42	0	2.7	18.2	0	1	988	991	-3	10.3	2.54	13
15/10/2024 3:12	0	2.8	18.2	0	0.7	988	991	-3	9.8	2.54	13
15/10/2024 3:42	0	2.8	18.2	0	2.3	988	991	-3	9.3	2.53	13
15/10/2024 4:12	0	2.8	18.2	0	2.3	988	991	-3	8.8	2.53	14
15/10/2024 4:42	0	2.8	18.2	0	0	988	991	-3	7.9	2.53	14
15/10/2024 5:12	0	2.8	18.2	0	1	988	991	-3	7.1	2.53	13
15/10/2024 5:42	0	2.8	18.2	0	0	988	991	-3	6.6	2.53	13
15/10/2024 6:12	0	2.8	18.1	0	0.1	988	991	-3	6.9	2.53	13
15/10/2024 6:42	0	2.8	18.2	0	1.3	988	991	-3	7.6	2.53	13
15/10/2024 7:12	0	2.8	18.2	0	0	988	991	-3	8.3	2.53	13
15/10/2024 7:42	0	2.8	18.2	0	2.9	989	991	-2	9.3	2.53	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
15/10/2024 8:12	0	2.8	18.2	0.2	1	989	991	-2	11.2	2.53	14
15/10/2024 8:42	0	3	18.3	0.2	0.1	989	992	-3	13.4	2.53	14
15/10/2024 9:12	0	3	18.3	0.2	0	989	991	-2	15.4	2.53	14
15/10/2024 9:42	0	3	18.3	0.2	0	989	992	-3	17	2.53	14
15/10/2024 10:12	0.2	3	18.4	0	1.3	989	992	-3	18.5	2.53	14
15/10/2024 10:42	0.2	3	18.4	0	1.3	989	992	-3	19.4	2.54	14
15/10/2024 11:12	0.2	2.8	18.4	0	0	989	991	-2	20.1	2.54	14
15/10/2024 11:42	0.2	2.8	18.4	0	3.5	989	991	-2	20.7	2.54	14
15/10/2024 12:12	0.2	2.8	18.5	0	0.7	989	991	-2	20.9	2.54	14
15/10/2024 12:42	0.2	2.8	18.5	0	3.2	988	991	-3	22.1	2.54	13
15/10/2024 13:12	0.4	2.8	18.5	0	2.9	988	991	-3	23.4	2.54	14
15/10/2024 13:42	0.4	2.8	18.5	0	3.2	988	991	-3	24.6	2.54	13
15/10/2024 14:12	0.6	2.8	18.5	0	2	988	991	-3	25.6	2.54	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
GB2											
15/10/2024 14:32	0.8	4.5	18.2	0	2	988	991	-3	27.8	3.11	13
15/10/2024 15:02	0.8	4.9	18.2	0	1	988	991	-3	28.8	3.12	13
15/10/2024 15:32	1	4.9	18.2	0	2	988	991	-3	28.8	3.11	14
15/10/2024 16:02	1	4.7	18.2	0	1.6	988	991	-3	28.1	3.11	13
15/10/2024 16:32	0.8	4.7	18.2	0	2.9	988	991	-3	27.1	3.11	13
15/10/2024 17:02	0.6	4.7	18.2	0	2	988	991	-3	25.9	3.1	14
15/10/2024 17:32	0.6	4.7	18.1	0	1	988	991	-3	24.8	3.1	14
15/10/2024 18:02	0.4	4.7	18.1	0	0.4	988	991	-3	23.8	3.1	14
15/10/2024 18:32	0.4	4.7	18.1	0	5.7	988	991	-3	22.6	3.09	14
15/10/2024 19:02	0.4	4.9	18.1	0	0	988	991	-3	21.4	3.09	13
15/10/2024 19:32	0.2	4.9	18.1	0	0	988	991	-3	19.5	3.07	13
15/10/2024 20:02	0.2	4.9	18	0	0	988	991	-3	17.9	3.06	14
15/10/2024 20:32	0	4.9	18	0	0	988	991	-3	16.6	3.06	14
15/10/2024 21:02	0	4.9	18	0	2	988	991	-3	15.8	3.06	13
15/10/2024 21:32	0	4.9	18	0	2.6	988	991	-3	15.2	3.06	13
15/10/2024 22:02	0	4.9	18	0	0	988	991	-3	14.7	3.05	13
15/10/2024 22:32	0	4.9	18	0	3.2	988	991	-3	14.3	3.05	14
15/10/2024 23:02	0	4.9	18	0	1.3	988	991	-3	14.1	3.04	14
15/10/2024 23:32	0	4.9	18	0	0.4	988	991	-3	13.9	3.04	14
16/10/2024 0:02	0	4.9	18	0	0.1	988	991	-3	13.9	3.04	14
16/10/2024 0:32	0.1	4.9	18	0	0.7	988	991	-3	13.8	3.02	14
16/10/2024 1:02	0	4.9	18	0	2	988	991	-3	13.9	3.02	14
16/10/2024 1:32	0	4.9	18	0.2	2.6	988	991	-3	13.9	3.02	14
16/10/2024 2:02	0	4.9	18	0	4.2	988	991	-3	13.9	3.01	14
16/10/2024 2:32	0	4.9	18	0	0	988	991	-3	13.9	3.01	14
16/10/2024 3:02	0	4.9	18	0	0	988	991	-3	14.1	3.01	14
16/10/2024 3:32	0	4.9	18	0	2.6	988	991	-3	14.3	3.01	14
16/10/2024 4:02	0	4.9	18	0	0	988	991	-3	14.3	3	14
16/10/2024 4:32	0	4.9	18	0	0	988	991	-3	14.3	3	14
16/10/2024 5:02	0	4.9	18	0	0	988	991	-3	14.3	3	14
16/10/2024 5:32	0	4.9	18	0	2.6	988	991	-3	14.3	2.99	14
16/10/2024 6:02	0	4.9	18	0	0	988	991	-3	14.2	2.99	14
16/10/2024 6:32	0	4.9	18	0	2.9	988	991	-3	14.2	2.99	14
16/10/2024 7:02	0	4.9	18	0	1.3	988	991	-3	14.2	2.99	14
16/10/2024 7:32	0	5.1	18	0.2	0.4	988	991	-3	14.3	2.97	14
16/10/2024 8:02	0	4.9	18	0	4.8	988	991	-3	14.4	2.97	14
16/10/2024 8:32	0	4.9	18	0	1	988	991	-3	15.2	2.97	14
16/10/2024 9:02	0.1	4.9	18	0	1.3	988	991	-3	15.7	2.96	14
16/10/2024 9:32	0	5.1	18	0	4.2	988	991	-3	16	2.96	13
16/10/2024 10:02	0.2	5.2	18	0	2.3	988	991	-3	16.5	2.96	13
16/10/2024 10:32	0.2	5.2	18	0	1	988	991	-3	17.6	2.96	14
16/10/2024 11:02	0.2	5.1	18	0	0.7	988	991	-3	18.6	2.96	14
16/10/2024 11:32	0.2	5.2	18.1	0.2	0.1	988	991	-3	19.6	2.96	14
16/10/2024 12:02	0.2	5.2	18.1	0	2.6	988	991	-3	20.5	2.96	14
16/10/2024 12:32	0.2	5.1	18.1	0	3.5	988	991	-3	21.3	2.96	14
16/10/2024 13:02	0.4	5.1	18.1	0	2	988	991	-3	22	2.96	14
16/10/2024 13:32	0.4	5.1	18.1	0	0.7	988	991	-3	22.7	2.96	14
16/10/2024 14:02	0.4	5.1	18.1	0	3.5	988	991	-3	22.8	2.95	14
16/10/2024 14:32	0.4	5.1	18.1	0	0	988	990	-2	22.8	2.95	14
16/10/2024 15:02	0.4	5.1	18.1	0	3.5	987	990	-3	23.1	2.95	13
16/10/2024 15:32	0.4	5.1	18.1	0	2	987	990	-3	23	2.95	13
16/10/2024 16:02	0.4	5.1	18.1	0.2	1.6	987	990	-3	23.2	2.95	13
16/10/2024 16:32	0.4	5.1	18.1	0	3.2	987	990	-3	23.2	2.95	13
16/10/2024 17:02	0.4	4.9	18.1	0	2.9	987	990	-3	23.1	2.95	13
16/10/2024 17:32	0.4	5.1	18.1	0	0.7	987	990	-3	22.7	2.94	13
16/10/2024 18:02	0.2	5.2	18.1	0	2.6	987	990	-3	22.3	2.94	13
16/10/2024 18:32	0.2	5.1	18.1	0	4.2	987	990	-3	21.8	2.94	13
16/10/2024 19:02	0.2	5.1	18.1	0	2.3	987	990	-3	20.6	2.94	13
16/10/2024 19:32	0.2	5.1	18.1	0	0	987	990	-3	19.4	2.94	14
16/10/2024 20:02	0.2	5.1	18	0	0	987	990	-3	18.2	2.94	13
16/10/2024 20:32	0	5.1	18	0	2.3	987	990	-3	16.9	2.92	13
16/10/2024 21:02	0	5.1	18	0	2.9	988	990	-2	16	2.92	14
16/10/2024 21:32	0	5.1	18	0	4.2	987	990	-3	15.2	2.92	13
16/10/2024 22:02	0	4.9	18	0	1.3	987	990	-3	14.9	2.92	14
16/10/2024 22:32	0	5.1	18	0	0	987	990	-3	14.9	2.91	14
16/10/2024 23:02	0	5.1	18	0	2.6	987	990	-3	14.8	2.91	13
16/10/2024 23:32	0	5.1	18	0	0.1	987	990	-3	14.4	2.91	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
17/10/2024 0:02	0	5.1	18	0	0.1	987	990	-3	14.4	2.91	13
17/10/2024 0:32	0	5.1	18	0.2	0	987	990	-3	14.4	2.91	13
17/10/2024 1:02	0	5.1	18	0	0.1	987	990	-3	14.2	2.91	13
17/10/2024 1:32	0	5.1	18	0	1.3	987	990	-3	13.9	2.91	13
17/10/2024 2:02	0	5.1	17.9	0	0	987	990	-3	13.8	2.9	14
17/10/2024 2:32	0	5.1	17.9	0	0	987	990	-3	13.9	2.9	14
17/10/2024 3:02	0	4.9	18	0	3.8	986	990	-4	14.1	2.9	13
17/10/2024 3:32	0	4.9	18	0	0.7	986	990	-4	14.3	2.9	13
17/10/2024 4:02	0	5.1	18	0	0.4	986	990	-4	14.3	2.9	13
17/10/2024 4:32	0	5.1	18	0	2	987	990	-3	14.3	2.9	14
17/10/2024 5:02	0	4.9	18	0	0	987	990	-3	14.2	2.9	14
17/10/2024 5:32	0	5.1	18	0	4.5	986	990	-4	14	2.89	13
17/10/2024 6:02	0	5.1	18	0.2	0.7	986	990	-4	13.8	2.89	13
17/10/2024 6:32	0	5.1	18	0.2	0	986	990	-4	13.8	2.89	13
17/10/2024 7:02	0	5.1	18	0.2	0.4	987	990	-3	13.8	2.89	14
17/10/2024 7:32	0	5.1	18	0	2.9	987	990	-3	14.4	2.89	14
17/10/2024 8:02	0	5.1	18	0	3.2	987	990	-3	14.9	2.89	14
17/10/2024 8:32	0	4.9	18	0.2	0	987	990	-3	15.7	2.87	14
17/10/2024 9:02	0	4.9	18	0	0.7	987	990	-3	17	2.87	14
17/10/2024 9:32	0.2	4.9	18	0.2	2	987	990	-3	18	2.87	14
17/10/2024 10:02	0.2	4.9	18.1	0	0	987	990	-3	18.6	2.87	14
17/10/2024 10:32	0.2	4.9	18.1	0	2.3	986	990	-4	18.9	2.87	13
17/10/2024 11:02	0.2	4.9	18.1	0	1	986	990	-4	19.9	2.87	13
17/10/2024 11:32	0.2	4.9	18.1	0	0.7	986	989	-3	20.5	2.87	13
17/10/2024 12:02	0.2	4.9	18.1	0.2	1.3	986	989	-3	21	2.87	13
17/10/2024 12:32	0.2	4.9	18.1	0	0	986	989	-3	21.6	2.87	14
17/10/2024 13:02	0.2	5.1	18.1	0	0.4	986	989	-3	21.3	2.87	13
17/10/2024 13:32	0.4	5.1	18.1	0	0	986	989	-3	20.5	2.87	14
17/10/2024 14:02	0.2	4.9	18.1	0	0.1	986	989	-3	19.9	2.87	14
17/10/2024 14:32	0.2	4.9	18.1	0	1.3	986	989	-3	19.3	2.86	14
17/10/2024 15:02	0.2	4.9	18.1	0.2	1	985	989	-4	19.6	2.86	13
17/10/2024 15:32	0.2	4.9	18.1	0	0.4	985	989	-4	20.7	2.86	13
17/10/2024 16:02	0.2	5.1	18.1	0	2.6	985	989	-4	21.1	2.86	13
17/10/2024 16:32	0.2	4.9	18.1	0	2	985	989	-4	20.7	2.86	13
17/10/2024 17:02	0.2	5.1	18.1	0	0.1	985	989	-4	20.4	2.86	13
17/10/2024 17:32	0.2	5.1	18.1	0	0.1	985	988	-3	20.1	2.86	13
17/10/2024 18:02	0.2	5.1	18.1	0	1	985	988	-3	19.6	2.86	14
17/10/2024 18:32	0.2	5.1	18.1	0	1.3	985	988	-3	19.3	2.86	13
17/10/2024 19:02	0.2	5.1	18.1	0	3.5	985	988	-3	18.9	2.86	14
17/10/2024 19:32	0.2	5.1	18	0	0	985	988	-3	18.3	2.86	14
17/10/2024 20:02	0.2	4.9	18	0	3.2	984	988	-4	17.8	2.86	13
17/10/2024 20:32	0	4.9	18	0	1.3	984	988	-4	17.5	2.85	13
17/10/2024 21:02	0.2	5.1	18	0	0.7	984	988	-4	17.4	2.85	13
17/10/2024 21:32	0	5.1	18	0	1.6	985	988	-3	17.3	2.85	14
17/10/2024 22:02	0.2	4.9	18	0	3.2	984	988	-4	17.5	2.85	13
17/10/2024 22:32	0.2	5.1	18	0	1.3	984	988	-4	17.8	2.85	13
17/10/2024 23:02	0.2	5.1	18	0	2.6	984	988	-4	18	2.85	13
17/10/2024 23:32	0.2	4.9	18	0	0.7	984	988	-4	18.1	2.85	13
18/10/2024 0:02	0.2	5.1	18	0	1.6	984	988	-4	18.1	2.85	13
18/10/2024 0:32	0.2	5.1	18	0	0	984	988	-4	18.2	2.85	13
18/10/2024 1:02	0.2	5.2	18	0	2.3	984	988	-4	18	2.84	13
18/10/2024 1:32	0.2	4.9	18	0	2	984	988	-4	17.6	2.84	13
18/10/2024 2:02	0.2	4.9	18	0	1.6	984	987	-3	17.3	2.84	14
18/10/2024 2:32	0.2	5.2	18	0	2.6	984	987	-3	17.1	2.84	14
18/10/2024 3:02	0.2	4.9	18	0.2	2	983	987	-4	16.9	2.84	13
18/10/2024 3:32	0	4.9	18	0	2.6	983	987	-4	16.7	2.84	13
18/10/2024 4:02	0	5.1	18	0	0.7	983	987	-4	16.5	2.84	13
18/10/2024 4:32	0	5.1	18	0	0.7	983	987	-4	16.4	2.84	13
18/10/2024 5:02	0.2	4.9	18	0	0	983	987	-4	16.4	2.84	13
18/10/2024 5:32	0	5.1	18	0	0	982	986	-4	16.3	2.84	13
18/10/2024 6:02	0	4.9	18	0	0.1	982	986	-4	16.3	2.84	13
18/10/2024 6:32	0	4.9	18	0	2	982	986	-4	16.1	2.84	13
18/10/2024 7:02	0	5.1	18	0	0.7	982	986	-4	16.1	2.84	13
18/10/2024 7:32	0	5.1	18	0	0	982	986	-4	16.2	2.84	13
18/10/2024 8:02	0.2	5.1	18	0	1	982	986	-4	16.2	2.82	13
18/10/2024 8:32	0.2	4.9	18	0	0	982	986	-4	16.1	2.82	13
18/10/2024 9:02	0.2	4.9	18	0	0.4	982	986	-4	16	2.82	14
18/10/2024 9:32	0	5.1	18	0	2	982	986	-4	15.8	2.82	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
18/10/2024 10:02	0.2	5.1	18	0	1	982	986	-4	15.9	2.82	14
18/10/2024 10:32	0.2	4.9	18	0	0	982	986	-4	16	2.82	14
18/10/2024 11:02	0	5.2	18	0	0.1	982	986	-4	16.3	2.82	14
18/10/2024 11:32	0	5.1	18	0	0.1	982	986	-4	17.2	2.82	14
18/10/2024 12:02	0.2	5.1	18	0.2	1.6	982	986	-4	18.5	2.82	14
18/10/2024 12:32	0.2	5.1	18.1	0	3.5	981	986	-5	20.3	2.82	13
18/10/2024 13:02	0.2	5.2	18.1	0	0	981	986	-5	21.9	2.82	13
18/10/2024 13:32	0.4	5.1	18.1	0	3.8	981	986	-5	22.9	2.82	13
18/10/2024 14:02	0.4	5.1	18.1	0	4.2	981	986	-5	24	2.82	13
18/10/2024 14:32	0.6	5.1	18.1	0	4.8	981	986	-5	24.8	2.82	12
18/10/2024 15:02	0.4	5.2	18.1	0	3.2	981	986	-5	24.6	2.82	12
18/10/2024 15:32	0.4	5.1	18.1	0	2.6	982	986	-4	23.6	2.82	13
18/10/2024 16:02	0.4	5.2	18.1	0	2.3	982	986	-4	21.8	2.82	13
18/10/2024 16:32	0.2	5.1	18.1	0	0	982	986	-4	20.3	2.82	13
18/10/2024 17:02	0.2	5.1	18.1	0	1	982	986	-4	19.1	2.82	13
18/10/2024 17:32	0.2	5.1	18	0	1.3	983	987	-4	18	2.82	13
18/10/2024 18:02	0	5.1	18	0	1	983	987	-4	16.9	2.81	13
18/10/2024 18:32	0	5.1	18	0	2.3	983	987	-4	15.9	2.82	13
18/10/2024 19:02	0	5.1	18	0	0	983	987	-4	15.2	2.81	13
18/10/2024 19:32	0	5.2	18	0	0.7	984	987	-3	14.5	2.81	14
18/10/2024 20:02	0	5.1	17.9	0	0	984	988	-4	13.9	2.81	13
18/10/2024 20:32	0	5.1	17.9	0	0.4	984	988	-4	13.4	2.81	13
18/10/2024 21:02	0	5.1	17.9	0	0	985	988	-3	13.1	2.81	14
18/10/2024 21:32	0	5.1	17.9	0	2.6	985	988	-3	12.8	2.81	14
18/10/2024 22:02	0	5.4	17.9	0	0	985	988	-3	12.6	2.8	13
18/10/2024 22:32	0.1	5.1	17.9	0	1	985	989	-4	12.4	2.8	13
18/10/2024 23:02	0	5.4	17.9	0	1	985	989	-4	12.2	2.8	13
18/10/2024 23:32	0	5.1	17.9	0	0	985	989	-4	12.1	2.8	13
19/10/2024 0:02	0.1	5.4	17.9	0	4.2	986	989	-3	11.9	2.8	14
19/10/2024 0:32	0	5.4	17.9	0	4.5	986	989	-3	11.8	2.8	14
19/10/2024 1:02	0	5.4	17.9	0	0	986	989	-3	11.6	2.8	14
19/10/2024 1:32	0	5.4	17.9	0	0	986	989	-3	11.5	2.79	14
19/10/2024 2:02	0	5.4	17.9	0	1.6	986	989	-3	11.3	2.79	14
19/10/2024 2:32	0	5.4	17.9	0	0	986	989	-3	11.2	2.79	13
19/10/2024 3:02	0	5.4	17.9	0	0.4	986	989	-3	11.1	2.77	13
19/10/2024 3:32	0	5.4	17.8	0	1.6	986	989	-3	10.9	2.77	13
19/10/2024 4:02	0	5.4	17.8	0	0	986	989	-3	10.8	2.77	13
19/10/2024 4:32	0	5.4	17.8	0	0	986	989	-3	10.8	2.77	13
19/10/2024 5:02	0	5.4	17.8	0	1.3	986	990	-4	10.7	2.77	13
19/10/2024 5:32	0	5.4	17.8	0	0.1	987	990	-3	10.6	2.77	14
19/10/2024 6:02	0	5.4	17.8	0	0	987	990	-3	10.6	2.76	14
19/10/2024 6:32	0	5.4	17.8	0	0	987	990	-3	10.5	2.76	14
19/10/2024 7:02	0	5.4	17.8	0	1.3	987	990	-3	10.4	2.76	13
19/10/2024 7:32	0.1	5.4	17.8	0.2	0	987	990	-3	10.4	2.76	13
19/10/2024 8:02	0	5.4	17.8	0.2	0.1	987	990	-3	10.4	2.76	13
19/10/2024 8:32	0	5.6	17.8	0	0.1	988	990	-2	10.3	2.76	14
19/10/2024 9:02	0	5.6	17.8	0	2	988	991	-3	10.3	2.76	14
19/10/2024 9:32	0	5.6	17.8	0	2	988	991	-3	10.4	2.76	13
19/10/2024 10:02	0	5.4	17.8	0.2	2.9	988	991	-3	11.7	2.76	14
19/10/2024 10:32	0	5.6	17.8	0	1.6	988	991	-3	13.2	2.76	14
19/10/2024 11:02	0	5.6	17.9	0.3	0.4	988	991	-3	14.8	2.76	13
19/10/2024 11:32	0	5.6	17.9	0.2	1	988	991	-3	16.2	2.76	13
19/10/2024 12:02	0.2	5.6	17.9	0	0.4	988	991	-3	17.3	2.76	13
19/10/2024 12:32	0.2	5.6	17.9	0	2.9	988	991	-3	18.4	2.76	13
19/10/2024 13:02	0.2	5.6	17.9	0	1.6	988	991	-3	19.2	2.76	13
19/10/2024 13:32	0.2	5.6	17.9	0	4.2	988	991	-3	19.8	2.76	13
19/10/2024 14:02	0.2	5.6	17.9	0	3.5	988	991	-3	20.5	2.76	13
19/10/2024 14:32	0.4	5.6	17.9	0	3.5	988	991	-3	20.9	2.76	13
19/10/2024 15:02	0.2	5.6	17.9	0	4.5	988	991	-3	21.1	2.77	13
19/10/2024 15:32	0.2	5.6	17.9	0	1.6	988	991	-3	20.9	2.76	13
19/10/2024 16:02	0.2	5.6	17.9	0	0.4	989	991	-2	20.4	2.76	14
19/10/2024 16:32	0.2	5.6	17.9	0	1.6	989	991	-2	20.1	2.76	14
19/10/2024 17:02	0.2	5.6	17.9	0	2.9	989	991	-2	20.8	2.76	13
19/10/2024 17:32	0.2	5.6	17.9	0	2.9	989	991	-2	20	2.76	14
19/10/2024 18:02	0.2	5.6	17.9	0	2.6	989	991	-2	18.8	2.76	13
19/10/2024 18:32	0.2	5.6	17.9	0	1.3	989	992	-3	17.7	2.76	13
19/10/2024 19:02	0.2	5.6	17.8	0	0	989	992	-3	17	2.76	13
19/10/2024 19:32	0.1	5.6	17.8	0	1.6	989	992	-3	15.8	2.76	13

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
19/10/2024 20:02	0	5.6	17.8	0	0.7	989	992	-3	14.6	2.75	13
19/10/2024 20:32	0	5.6	17.8	0	1.3	989	992	-3	13.4	2.75	13
19/10/2024 21:02	0.1	5.6	17.7	0	0.7	990	992	-2	12.6	2.75	14
19/10/2024 21:32	0	5.6	17.7	0	2.6	990	992	-2	11.9	2.74	14
19/10/2024 22:02	0	5.6	17.7	0	0	990	992	-2	11.6	2.74	14
19/10/2024 22:32	0	5.6	17.7	0	0.7	990	992	-2	11.3	2.74	14
19/10/2024 23:02	0	5.6	17.7	0	0	990	992	-2	11.2	2.72	14
19/10/2024 23:32	0	5.6	17.7	0	2.9	990	992	-2	11.1	2.72	14
20/10/2024 0:02	0	5.6	17.7	0	0.4	990	992	-2	10.9	2.71	14
20/10/2024 0:32	0	5.6	17.7	0	2.3	990	992	-2	10.8	2.71	14
20/10/2024 1:02	0	5.6	17.7	0	0	990	992	-2	10.7	2.71	14
20/10/2024 1:32	0	5.6	17.7	0	2.6	990	992	-2	10.6	2.71	14
20/10/2024 2:02	0	5.9	17.7	0	0	989	992	-3	10.6	2.71	13
20/10/2024 2:32	0.1	5.6	17.7	0	2.6	989	992	-3	10.5	2.71	13
20/10/2024 3:02	0	5.6	17.6	0	2	989	992	-3	10.4	2.71	13
20/10/2024 3:32	0	5.6	17.6	0	2	989	992	-3	10.4	2.71	13
20/10/2024 4:02	0	5.6	17.6	0	0.4	990	992	-2	10.3	2.71	14
20/10/2024 4:32	0	5.6	17.6	0	0	990	992	-2	10.3	2.71	14
20/10/2024 5:02	0	5.6	17.6	0.2	0.7	990	992	-2	10.1	2.71	14
20/10/2024 5:32	0	5.9	17.6	0	0	990	992	-2	9.8	2.71	14
20/10/2024 6:02	0	5.9	17.6	0	0	990	992	-2	9.4	2.71	14
20/10/2024 6:32	0.1	5.9	17.6	0	0	990	992	-2	9.1	2.7	14
20/10/2024 7:02	0	5.9	17.6	0	2.9	990	992	-2	8.9	2.7	14
20/10/2024 7:32	0	5.9	17.6	0	2.9	990	992	-2	9.1	2.7	13
20/10/2024 8:02	0	5.9	17.6	0.2	0	990	992	-2	9.5	2.7	13
20/10/2024 8:32	0	5.9	17.6	0.2	0	990	992	-2	10.1	2.7	13
20/10/2024 9:02	0.1	5.9	17.6	0	0.7	990	992	-2	10.7	2.7	13
20/10/2024 9:32	0	5.6	17.6	0.2	2.3	990	993	-3	11.7	2.7	14
20/10/2024 10:02	0	5.9	17.6	0	2.6	990	993	-3	12.9	2.71	13
20/10/2024 10:32	0	5.9	17.6	0.2	1.6	990	993	-3	14.6	2.71	13
20/10/2024 11:02	0	5.9	17.7	0.2	0.7	990	993	-3	16.1	2.71	13
20/10/2024 11:32	0.2	5.9	17.7	0.2	0.1	990	993	-3	17.3	2.71	13
20/10/2024 12:02	0.2	5.9	17.7	0	0.7	990	993	-3	18.2	2.71	13
20/10/2024 12:32	0.2	5.9	17.7	0.2	0.4	990	993	-3	18.9	2.72	13
20/10/2024 13:02	0.2	5.9	17.7	0.2	4.5	990	993	-3	19.6	2.72	13
20/10/2024 13:32	0.2	5.9	17.7	0.2	1.3	990	993	-3	20.2	2.72	13
20/10/2024 14:02	0.2	5.9	17.7	0	5.1	990	993	-3	20.8	2.74	13
20/10/2024 14:32	0.2	6.1	17.7	0	4.2	990	992	-2	21.3	2.74	13
20/10/2024 15:02	0.4	5.9	17.7	0	0.1	990	992	-2	21.8	2.74	13
20/10/2024 15:32	0.4	6.1	17.7	0	0.7	990	992	-2	22.3	2.74	13
20/10/2024 16:02	0.4	5.9	17.7	0	2	990	992	-2	22.3	2.74	13
20/10/2024 16:32	0.4	5.9	17.7	0	2.3	990	992	-2	22.3	2.74	13
20/10/2024 17:02	0.4	6.1	17.7	0	3.5	990	992	-2	22.4	2.75	13
20/10/2024 17:32	0.4	6.1	17.6	0	3.8	990	992	-2	22.4	2.75	13
20/10/2024 18:02	0.4	6.1	17.6	0	2.3	990	992	-2	22.1	2.75	13
20/10/2024 18:32	0.2	6.1	17.6	0	2.3	990	992	-2	21.3	2.75	13
20/10/2024 19:02	0.2	6.1	17.6	0	2.6	990	992	-2	20.1	2.75	13
20/10/2024 19:32	0.2	6.1	17.5	0	4.8	990	992	-2	18.3	2.75	14
20/10/2024 20:02	0.2	6.1	17.5	0	0	990	992	-2	16.4	2.75	14
20/10/2024 20:32	0	6.1	17.5	0	0.7	990	992	-2	14.8	2.75	13
20/10/2024 21:02	0	5.9	17.4	0	4.8	990	992	-2	13.4	2.74	13
20/10/2024 21:32	0	5.9	17.4	0	1.6	990	992	-2	12.4	2.74	13
20/10/2024 22:02	0	6.1	17.4	0	1.6	990	992	-2	11.6	2.74	14
20/10/2024 22:32	0	5.9	17.3	0	1.6	990	992	-2	10.9	2.72	13
20/10/2024 23:02	0	5.9	17.3	0	4.8	990	992	-2	10.4	2.72	14
20/10/2024 23:32	0	6.1	17.3	0	2.9	990	992	-2	10	2.71	14
21/10/2024 0:02	0	6.1	17.3	0	0.4	990	992	-2	10	2.71	14
21/10/2024 0:32	0	6.1	17.3	0	2.3	990	992	-2	9.9	2.71	14
21/10/2024 1:02	0	6.1	17.3	0	2	990	992	-2	9.8	2.71	14
21/10/2024 1:32	0	6.1	17.3	0	2.9	990	992	-2	9.9	2.71	14
21/10/2024 2:02	0	6.1	17.3	0	2.3	989	992	-3	10.1	2.71	13
21/10/2024 2:32	0	6.1	17.3	0	0.1	989	992	-3	10.1	2.71	13
21/10/2024 3:02	0	6.1	17.2	0	2.6	989	992	-3	9.9	2.7	13
21/10/2024 3:32	0.1	6.1	17.2	0	0	989	992	-3	9.7	2.7	13
21/10/2024 4:02	0	6.1	17.2	0	1.6	989	992	-3	9.4	2.7	13
21/10/2024 4:32	0	6.1	17.2	0	2.3	989	992	-3	9	2.7	13
21/10/2024 5:02	0	6.1	17.2	0	3.8	989	992	-3	8.7	2.7	14
21/10/2024 5:32	0	6.1	17.2	0	0	989	991	-2	8.4	2.7	13

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
21/10/2024 6:02	0	6.1	17.1	0	0.4	989	991	-2	8.2	2.69	13
21/10/2024 6:32	0	6.1	17.1	0	0	989	992	-3	8	2.69	13
21/10/2024 7:02	0	6.1	17.1	0	0	989	992	-3	8	2.69	13
21/10/2024 7:32	0	6.4	17.1	0	0	989	992	-3	8.6	2.69	13
21/10/2024 8:02	0	6.1	17.1	0	0.1	989	992	-3	9.9	2.69	13
21/10/2024 8:32	0	6.4	17.2	0	1.3	989	992	-3	11.8	2.7	13
21/10/2024 9:02	0	6.4	17.2	0	3.2	989	992	-3	14.2	2.7	14
21/10/2024 9:32	0	6.4	17.3	0.3	1.6	989	992	-3	16.6	2.7	14
21/10/2024 10:02	0.2	6.4	17.3	0	2.9	989	992	-3	19.3	2.7	13
21/10/2024 10:32	0.2	6.4	17.3	0.2	2.3	989	992	-3	21.6	2.71	13
21/10/2024 11:02	0.4	6.4	17.3	0	1.6	989	992	-3	23	2.71	13
21/10/2024 11:32	0.4	6.4	17.3	0	4.5	989	992	-3	23.8	2.71	13
21/10/2024 12:02	0.4	6.4	17.3	0	2.9	989	992	-3	24.3	2.71	13
21/10/2024 12:32	0.6	6.4	17.3	0	4.2	989	991	-2	24.7	2.72	13
21/10/2024 13:02	0.6	6.4	17.3	0	2.3	989	992	-3	25	2.72	13
21/10/2024 13:32	0.6	6.4	17.3	0	4.5	989	991	-2	25.4	2.74	13
21/10/2024 14:02	0.8	6.4	17.3	0	2.6	988	991	-3	26	2.74	12
21/10/2024 14:32	0.8	6.4	17.3	0	2.9	988	991	-3	26.6	2.74	12
21/10/2024 15:02	0.8	6.4	17.3	0	1.3	988	991	-3	27.1	2.74	13
21/10/2024 15:32	1	6.4	17.3	0	4.2	988	991	-3	27.5	2.74	13
21/10/2024 16:02	1	6.4	17.3	0	2.6	988	991	-3	27.6	2.75	13
21/10/2024 16:32	1	6.4	17.3	0	3.5	988	991	-3	28.1	2.75	13
21/10/2024 17:02	1.2	6.4	17.3	0	4.2	988	991	-3	28.6	2.75	13
21/10/2024 17:32	1.2	6.4	17.3	0	2.3	988	991	-3	29.1	2.75	13
21/10/2024 18:02	1.2	6.4	17.3	0	4.8	988	991	-3	29.3	2.75	13
21/10/2024 18:32	1.2	6.4	17.3	0	5.7	988	991	-3	28.9	2.76	13
21/10/2024 19:02	1	6.4	17.3	0	1.6	988	991	-3	27.2	2.76	13
21/10/2024 19:32	0.4	6.4	17.3	0	1	988	991	-3	24.2	2.76	14
21/10/2024 20:02	0.2	6.4	17.2	0	2.6	988	991	-3	21.2	2.76	14
21/10/2024 20:32	0.2	6.4	17.2	0	2.6	988	991	-3	18.3	2.75	14
21/10/2024 21:02	0.2	6.4	17.2	0	3.2	988	991	-3	16.1	2.75	14
21/10/2024 21:32	0	6.4	17.1	0	3.5	988	991	-3	14.7	2.75	14
21/10/2024 22:02	0.2	6.4	17.1	0	2.3	988	990	-2	13.6	2.74	14
21/10/2024 22:32	0	6.4	17.1	0	0.1	987	990	-3	12.9	2.74	13
21/10/2024 23:02	0	6.4	17.1	0	4.8	987	990	-3	12.7	2.74	13
21/10/2024 23:32	0	6.4	17.1	0	0.1	987	990	-3	12.6	2.74	13
22/10/2024 0:02	0	6.4	17.1	0	2.6	987	990	-3	12.4	2.74	13
22/10/2024 0:32	0	6.4	17.1	0.2	1	987	990	-3	12.1	2.72	13
22/10/2024 1:02	0	6.4	17.1	0	0.7	987	990	-3	12.1	2.72	13
22/10/2024 1:32	0	6.4	17.1	0.2	1.6	987	990	-3	12.3	2.72	13
22/10/2024 2:02	0	6.4	17.1	0	0	987	990	-3	12.4	2.71	13
22/10/2024 2:32	0	6.4	17.1	0	2.6	987	990	-3	12.3	2.71	13
22/10/2024 3:02	0	6.4	17.1	0	0	987	990	-3	12.1	2.71	14
22/10/2024 3:32	0	6.4	17	0	1.6	987	990	-3	12.1	2.71	14
22/10/2024 4:02	0	6.4	17	0.2	1	987	990	-3	12.4	2.71	14
22/10/2024 4:32	0	6.4	17	0	0.1	987	990	-3	12.8	2.71	14
22/10/2024 5:02	0.1	6.4	17	0	2.6	987	990	-3	13	2.71	14
22/10/2024 5:32	0	6.4	17	0.2	0	987	990	-3	12.9	2.7	14
22/10/2024 6:02	0	6.4	17	0	1.6	987	990	-3	12.9	2.7	14
22/10/2024 6:32	0	6.4	17	0.2	1	987	990	-3	12.7	2.7	14
22/10/2024 7:02	0.2	6.4	17	0	1	987	990	-3	12.8	2.7	14
22/10/2024 7:32	0	6.4	17	0.2	1.6	987	990	-3	13.6	2.7	14
22/10/2024 8:02	0	6.4	17.1	0.2	2.3	987	990	-3	14.8	2.7	14
22/10/2024 8:32	0.2	6.6	17.1	0	0.4	987	990	-3	16.1	2.7	14
22/10/2024 9:02	0.2	6.6	17.1	0.2	4.8	987	990	-3	16.9	2.7	14
22/10/2024 9:32	0.2	6.6	17.1	0	2	987	990	-3	17.6	2.7	14
22/10/2024 10:02	0.2	6.6	17.1	0.2	1.6	987	990	-3	18.8	2.7	14
22/10/2024 10:32	0.2	6.6	17.1	0.2	1	987	990	-3	20.6	2.7	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
GB3											
22/10/2024 11:10	0.4	3.5	18.1	0.2	2	987	990	-3	22.6	2.64	13
22/10/2024 11:39	0.4	3.8	18.2	0	0.1	987	990	-3	23.9	2.64	14
22/10/2024 12:09	0.6	3.8	18.2	0	1.6	987	990	-3	24.8	2.64	14
22/10/2024 12:39	0.6	3.8	18.2	0.2	0.7	987	990	-3	25.7	2.64	14
22/10/2024 13:09	0.8	3.8	18.2	0	4.5	986	990	-4	26.3	2.64	13
22/10/2024 13:39	0.8	3.8	18.2	0.2	5.4	986	989	-3	26.9	2.64	13
22/10/2024 14:09	1	3.8	18.2	0	1	986	989	-3	27.7	2.64	13
22/10/2024 14:39	1.2	3.8	18.2	0.2	3.8	986	989	-3	28.6	2.64	13
22/10/2024 15:09	1.6	3.8	18.2	0	5.1	986	989	-3	29.4	2.64	13
22/10/2024 15:39	1.8	3.8	18.2	0	3.2	986	989	-3	30.1	2.63	13
22/10/2024 16:09	1.8	3.8	18.2	0	2.6	986	989	-3	30.1	2.63	13
22/10/2024 16:39	1.6	3.8	18.2	0	3.8	986	989	-3	29.8	2.63	13
22/10/2024 17:09	1.4	3.8	18.2	0	0	986	989	-3	28.8	2.63	13
22/10/2024 17:39	1.2	3.5	18.2	0	2	986	989	-3	27.3	2.63	13
22/10/2024 18:09	0.8	3.5	18.2	0	0.1	986	989	-3	25.5	2.63	13
22/10/2024 18:39	0.4	3.5	18.1	0	0.4	986	989	-3	23.7	2.63	13
22/10/2024 19:09	0.4	3.5	18.1	0	2	986	989	-3	22	2.61	13
22/10/2024 19:39	0.4	3.5	18.1	0	3.2	986	990	-4	20.3	2.61	13
22/10/2024 20:09	0.2	3.5	18.1	0	3.8	987	990	-3	18.7	2.61	14
22/10/2024 20:39	0.2	3.5	18.1	0	0	987	990	-3	17.3	2.61	14
22/10/2024 21:09	0.2	3.5	18	0	0.4	987	990	-3	16.3	2.61	14
22/10/2024 21:39	0.2	3.5	18	0	1.3	987	990	-3	15.4	2.61	14
22/10/2024 22:09	0.2	3.5	18	0	1.3	987	990	-3	14.6	2.6	14
22/10/2024 22:39	0.2	3.5	18	0.2	0.7	987	990	-3	13.9	2.6	14
22/10/2024 23:09	0.1	3.5	18	0	1.6	987	990	-3	13.3	2.6	14
22/10/2024 23:39	0	3.5	18	0	0	987	990	-3	12.7	2.6	14
23/10/2024 0:09	0	3.5	18	0	2.3	987	990	-3	12.2	2.6	14
23/10/2024 0:39	0	3.5	18	0	2.6	987	990	-3	11.7	2.6	14
23/10/2024 1:09	0	3.5	18	0	0.4	986	990	-4	11.2	2.59	13
23/10/2024 1:39	0	3.5	17.9	0	1	986	989	-3	10.8	2.59	13
23/10/2024 2:09	0	3.5	17.9	0	0.1	986	989	-3	10.4	2.59	13
23/10/2024 2:39	0	3.5	17.9	0	1.6	986	989	-3	10.1	2.59	13
23/10/2024 3:09	0	3.5	17.9	0	0.7	986	989	-3	9.9	2.59	13
23/10/2024 3:39	0	3.5	17.9	0	0	986	989	-3	9.7	2.59	13
23/10/2024 4:09	0	3.5	17.9	0	1	986	989	-3	9.4	2.59	13
23/10/2024 4:39	0	3.5	17.9	0	1	986	989	-3	9.3	2.59	13
23/10/2024 5:09	0	3.5	17.9	0	1	986	989	-3	9.2	2.58	13
23/10/2024 5:39	0	3.5	17.9	0	1.3	986	989	-3	9.1	2.58	13
23/10/2024 6:09	0.1	3.5	17.9	0	0	986	989	-3	9	2.58	13
23/10/2024 6:39	0	3.5	17.9	0	0	986	989	-3	8.9	2.58	13
23/10/2024 7:09	0	3.5	17.9	0	2.6	986	989	-3	8.8	2.58	13
23/10/2024 7:39	0	3.5	17.9	0.2	2.9	986	989	-3	8.7	2.58	13
23/10/2024 8:09	0	3.5	17.9	0	1	986	989	-3	8.8	2.56	13
23/10/2024 8:39	0	3.5	17.9	0	1.3	986	989	-3	8.9	2.56	13
23/10/2024 9:09	0	3.5	17.9	0	0	986	989	-3	9.1	2.56	13
23/10/2024 9:39	0	3.5	17.9	0	0	986	989	-3	9.8	2.56	13
23/10/2024 10:09	0	3.5	17.9	0	0.1	986	989	-3	11	2.56	14
23/10/2024 10:39	0	3.5	18	0.2	0.1	986	989	-3	12.3	2.58	14
23/10/2024 11:09	0	3.5	18	0.2	0	986	989	-3	14.3	2.56	14
23/10/2024 11:39	0.2	3.5	18	0.2	2.3	986	989	-3	16.6	2.56	14
23/10/2024 12:09	0.2	3.8	18.1	0.2	3.2	986	989	-3	18.4	2.58	14
23/10/2024 12:39	0.2	3.5	18.1	0.3	3.2	985	989	-4	19.7	2.58	13
23/10/2024 13:09	0.4	3.5	18.1	0	0.1	985	989	-4	20.4	2.58	13
23/10/2024 13:39	0.4	3.5	18.1	0.2	2	985	989	-4	20.8	2.58	13
23/10/2024 14:09	0.4	3.5	18.1	0.2	0	985	989	-4	21.3	2.58	13
23/10/2024 14:39	0.4	3.5	18.2	0.3	0	985	989	-4	21.9	2.58	13
23/10/2024 15:09	0.4	3.5	18.2	0.2	2	985	989	-4	22.4	2.58	13
23/10/2024 15:39	0.6	3.5	18.2	0.2	4.8	985	989	-4	23	2.58	13
23/10/2024 16:09	0.4	3.5	18.2	0.2	4.2	985	989	-4	23.2	2.58	13
23/10/2024 16:39	0.4	3.5	18.2	0	5.4	985	989	-4	23.1	2.58	13
23/10/2024 17:09	0.4	3.5	18.2	0	2	985	989	-4	23.1	2.58	13
23/10/2024 17:39	0.4	3.5	18.2	0	0.7	985	989	-4	22.6	2.58	13
23/10/2024 18:09	0.4	3.5	18.2	0	2	986	989	-3	22	2.58	14
23/10/2024 18:39	0.4	3.5	18.2	0	0.4	986	989	-3	21.2	2.58	14
23/10/2024 19:09	0.2	3.5	18.1	0	0.1	986	989	-3	19.6	2.58	14
23/10/2024 19:39	0.2	3.5	18.1	0	0	986	989	-3	17.6	2.58	13
23/10/2024 20:09	0.2	3.5	18.1	0	0.1	986	989	-3	15.5	2.58	13

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
23/10/2024 20:39	0	3.5	18.1	0	0	986	990	-4	13.6	2.58	13
23/10/2024 21:09	0	3.5	18	0	2.9	986	990	-4	11.9	2.58	13
23/10/2024 21:39	0	3.5	18	0	0	987	990	-3	10.4	2.56	14
23/10/2024 22:09	0	3.5	18	0	0	987	990	-3	9.5	2.56	14
23/10/2024 22:39	0	3.5	18	0	1.6	987	990	-3	8.9	2.56	14
23/10/2024 23:09	0	3.5	17.9	0	0	987	990	-3	8.3	2.56	14
23/10/2024 23:39	0	3.5	17.9	0	0	987	990	-3	7.6	2.56	14
24/10/2024 0:09	0	3.5	17.9	0	0	987	990	-3	7.1	2.56	14
24/10/2024 0:39	0	3.5	17.9	0	1.3	987	990	-3	6.6	2.56	13
24/10/2024 1:09	0	3.5	17.9	0	2.6	987	990	-3	6.1	2.56	14
24/10/2024 1:39	0	3.5	17.9	0	0	987	990	-3	5.6	2.56	13
24/10/2024 2:09	0	3.5	17.9	0	0.1	987	990	-3	5.5	2.55	14
24/10/2024 2:39	0	3.5	17.9	0.2	1	987	990	-3	5.6	2.55	14
24/10/2024 3:09	0	3.5	17.9	0	0	986	990	-4	5.4	2.55	13
24/10/2024 3:39	0	3.5	17.9	0	3.2	986	990	-4	5	2.55	13
24/10/2024 4:09	0	3.5	17.9	0	0	987	990	-3	4.6	2.55	14
24/10/2024 4:39	0	3.5	17.9	0	1.3	987	990	-3	4.6	2.55	14
24/10/2024 5:09	0	3.5	17.9	0	0	987	990	-3	4.9	2.55	14
24/10/2024 5:39	0	3.5	17.9	0	0	987	990	-3	5.1	2.55	14
24/10/2024 6:09	0	3.5	17.9	0	0.1	987	990	-3	5.3	2.55	13
24/10/2024 6:39	0	3.5	17.9	0	0	987	990	-3	5.1	2.55	13
24/10/2024 7:09	0	3.5	17.9	0	0	987	990	-3	4.9	2.55	13
24/10/2024 7:39	0	3.5	17.9	0	0	987	990	-3	5.3	2.55	13
24/10/2024 8:09	0.1	3.5	17.9	0	2	987	990	-3	5.7	2.55	13
24/10/2024 8:39	0	3.5	17.9	0	2	987	990	-3	6.4	2.55	13
24/10/2024 9:09	0	3.5	17.9	0	0	987	990	-3	7.5	2.55	13
24/10/2024 9:39	0	3.5	17.9	0	0.1	988	990	-2	8.6	2.55	14
24/10/2024 10:09	0	3.5	18	0.2	0	988	990	-2	9.8	2.55	14
24/10/2024 10:39	0	3.5	18	0.2	2.6	988	990	-2	11.1	2.55	14
24/10/2024 11:09	0	3.5	18	0	2	988	991	-3	12.1	2.55	14
24/10/2024 11:39	0	3.5	18	0.2	0.4	988	990	-2	12.8	2.55	14
24/10/2024 12:09	0.2	3.5	18.1	0.2	0	988	990	-2	14.3	2.55	14
24/10/2024 12:39	0.2	3.5	18.1	0	0	987	990	-3	15.1	2.55	13
24/10/2024 13:09	0.2	3.5	18.1	0.2	2.3	987	990	-3	16.1	2.55	13
24/10/2024 13:39	0.2	3.5	18.1	0.2	1.3	987	990	-3	17.1	2.56	13
24/10/2024 14:09	0.2	3.5	18.1	0.2	0.1	987	990	-3	17.9	2.56	13
24/10/2024 14:39	0.2	3.8	18.2	0	2.9	987	990	-3	18.6	2.56	13
24/10/2024 15:09	0.2	3.5	18.2	0.2	1	987	990	-3	18.6	2.56	13
24/10/2024 15:39	0.2	3.5	18.2	0.2	0	987	990	-3	18.9	2.56	13
24/10/2024 16:09	0.2	3.5	18.2	0	1.3	987	990	-3	18.9	2.56	13
24/10/2024 16:39	0.2	3.5	18.2	0.2	1	987	990	-3	19	2.56	14
24/10/2024 17:09	0.2	3.5	18.2	0.2	3.5	987	990	-3	19.1	2.56	13
24/10/2024 17:39	0.2	3.5	18.2	0.2	1.3	987	990	-3	19	2.56	13
24/10/2024 18:09	0.2	3.5	18.2	0.2	1	987	990	-3	19.1	2.56	13
24/10/2024 18:39	0.2	3.5	18.2	0	1	987	990	-3	18.7	2.56	13
24/10/2024 19:09	0.2	3.5	18.2	0	1.6	988	990	-2	17.6	2.56	14
24/10/2024 19:39	0.2	3.5	18.2	0	0	988	991	-3	16.4	2.56	14
24/10/2024 20:09	0.2	3.5	18.1	0	2.9	988	991	-3	14.7	2.56	14
24/10/2024 20:39	0.2	3.5	18.1	0	0	988	991	-3	12.9	2.56	13
24/10/2024 21:09	0	3.5	18.1	0	2.3	988	991	-3	11.4	2.56	13
24/10/2024 21:39	0	3.5	18	0	3.5	988	991	-3	9.9	2.55	13
24/10/2024 22:09	0	3.5	18	0	0.4	988	991	-3	8.8	2.55	13
24/10/2024 22:39	0	3.5	18	0	1.6	988	991	-3	8.3	2.55	13
24/10/2024 23:09	0	3.5	18	0	0	988	991	-3	8	2.55	13
24/10/2024 23:39	0	3.5	18	0	2	988	991	-3	7.9	2.55	13
25/10/2024 0:09	0	3.5	18	0	0	988	991	-3	7.8	2.55	13
25/10/2024 0:39	0	3.5	18	0	0.4	988	991	-3	7.6	2.55	13
25/10/2024 1:09	0	3.5	18	0	0.7	988	991	-3	7.5	2.54	13
25/10/2024 1:39	0	3.5	18	0	0.4	988	991	-3	7.4	2.55	13
25/10/2024 2:09	0	3.5	18	0	1.3	988	991	-3	7.2	2.54	13
25/10/2024 2:39	0	3.5	18	0	1.3	988	991	-3	6.9	2.54	13
25/10/2024 3:09	0	3.5	18	0	0	988	991	-3	6.9	2.54	13
25/10/2024 3:39	0	3.5	18	0	0	988	991	-3	6.8	2.54	13
25/10/2024 4:09	0	3.5	18	0	0	988	991	-3	6.4	2.54	13
25/10/2024 4:39	0	3.5	18	0	2.3	988	991	-3	6.2	2.54	13
25/10/2024 5:09	0	3.5	18	0	2.6	988	991	-3	6.1	2.54	13
25/10/2024 5:39	0	3.5	18	0	0	988	991	-3	5.9	2.54	13
25/10/2024 6:09	0	3.5	18	0	1	988	991	-3	5.8	2.54	13

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
25/10/2024 6:39	0	3.5	18	0	1	988	991	-3	5.7	2.54	13
25/10/2024 7:09	0	3.5	18	0	0	989	991	-2	5.6	2.54	14
25/10/2024 7:39	0	3.5	18	0	1	989	991	-2	5.8	2.54	13
25/10/2024 8:09	0	3.5	18	0	2.3	989	991	-2	6	2.54	13
25/10/2024 8:39	0	3.5	18	0	0	989	992	-3	6.4	2.54	13
25/10/2024 9:09	0	3.5	18	0	0.1	989	992	-3	7.4	2.54	13
25/10/2024 9:39	0	3.5	18	0.2	0	989	992	-3	8.2	2.54	13
25/10/2024 10:09	0	3.5	18	0.2	1.6	989	992	-3	9.2	2.54	13
25/10/2024 10:39	0	3.5	18.1	0.2	1	989	992	-3	10.4	2.54	13
25/10/2024 11:09	0	3.5	18.1	0	0	989	992	-3	11.4	2.54	13
25/10/2024 11:39	0	3.5	18.1	0	1	989	992	-3	12.2	2.54	13
25/10/2024 12:09	0	3.5	18.1	0.2	1	989	992	-3	13.7	2.54	13
25/10/2024 12:39	0.2	3.5	18.2	0	1.6	989	992	-3	14.7	2.54	13
25/10/2024 13:09	0.2	3.5	18.2	0.2	0	989	992	-3	15.6	2.54	13
25/10/2024 13:39	0.2	3.5	18.2	0	0	989	992	-3	15.8	2.54	13
25/10/2024 14:09	0.2	3.5	18.2	0	0	989	992	-3	16.3	2.55	14
25/10/2024 14:39	0.2	3.5	18.2	0.2	0.1	989	992	-3	17.1	2.55	13
25/10/2024 15:09	0.2	3.5	18.2	0.2	0	989	992	-3	17.6	2.55	14
25/10/2024 15:39	0.2	3.5	18.2	0	0	989	992	-3	18.4	2.55	13
25/10/2024 16:09	0.2	3.5	18.3	0	0	989	992	-3	18.9	2.55	14
25/10/2024 16:39	0.2	3.5	18.2	0	2.9	989	992	-3	18.7	2.55	14
25/10/2024 17:09	0.2	3.5	18.3	0	1.3	989	992	-3	18.6	2.55	14
25/10/2024 17:39	0.2	3.5	18.3	0	2.9	989	992	-3	18.5	2.55	14
25/10/2024 18:09	0.2	3.5	18.2	0	3.2	989	992	-3	17.6	2.55	14
25/10/2024 18:39	0.2	3.5	18.2	0	2	989	992	-3	17.3	2.55	13
25/10/2024 19:09	0.2	3.5	18.2	0	0	989	992	-3	17.1	2.55	14
25/10/2024 19:39	0.2	3.5	18.2	0	0.4	989	992	-3	16.3	2.55	13
25/10/2024 20:09	0	3.3	18.2	0	0	989	992	-3	14.5	2.55	13
25/10/2024 20:39	0	3.3	18.2	0	0	989	992	-3	12.3	2.55	13
25/10/2024 21:09	0	3.3	18.1	0	0.4	989	992	-3	10.4	2.54	13
25/10/2024 21:39	0	3.3	18.1	0	0	989	992	-3	9	2.54	13
25/10/2024 22:09	0	3.3	18.1	0	1.6	989	992	-3	7.9	2.54	13
25/10/2024 22:39	0	3.3	18	0	0	989	992	-3	7.1	2.54	13
25/10/2024 23:09	0	3.3	18	0	2	989	992	-3	6.3	2.54	13
25/10/2024 23:39	0	3.5	18	0	0.7	989	992	-3	5.5	2.54	13
26/10/2024 0:09	0	3.3	18	0	0	989	992	-3	4.9	2.54	13
26/10/2024 0:39	0	3.3	18	0	0	989	992	-3	4.4	2.54	13
26/10/2024 1:09	0	3.3	18	0	2	989	992	-3	4.1	2.54	13
26/10/2024 1:39	0	3.3	18	0	0	989	992	-3	3.8	2.53	13
26/10/2024 2:09	0	3.3	17.9	0	0	989	992	-3	3.3	2.53	13
26/10/2024 2:39	0	3.3	17.9	0	0	989	992	-3	2.9	2.53	13
26/10/2024 3:09	0	3.3	17.9	0	0.1	989	992	-3	2.2	2.53	13
26/10/2024 3:39	0	3.3	17.9	0	0	989	992	-3	1.4	2.53	13
26/10/2024 4:09	0	3.5	17.8	0	1	989	991	-2	0.7	2.53	0
26/10/2024 4:39	0.1	3.3	17.7	0	0	989	992	-3	0.1	2.53	0
26/10/2024 5:09	0	3.3	17.6	0	0	989	991	-2	-0.3	2.53	0
26/10/2024 5:39	0	3.3	17.5	0	2.3	989	991	-2	-0.6	2.53	0
26/10/2024 6:09	0	3.3	17.3	0	0.1	989	991	-2	0.6	2.53	0
26/10/2024 6:39	0	3.3	17.3	0	0	989	992	-3	0.7	2.53	0
26/10/2024 7:09	0	3.3	17.5	0	2	989	992	-3	-0.3	2.51	0
26/10/2024 7:39	0	3.3	17.8	0	0.1	989	991	-2	1.1	2.51	13
26/10/2024 8:09	0	3.3	17.9	0	0	989	992	-3	2.6	2.51	14
26/10/2024 8:39	0	3.3	17.9	0	0.4	989	992	-3	4.1	2.51	14
26/10/2024 9:09	0.1	3.3	18	0	0.7	989	992	-3	5.9	2.51	14
26/10/2024 9:39	0	3.3	18	0	0.1	989	992	-3	7.8	2.51	14
26/10/2024 10:09	0	3.3	18.1	0.2	0	989	992	-3	9.9	2.53	14
26/10/2024 10:39	0	3.3	18.1	0.2	0	989	991	-2	12.4	2.53	14
26/10/2024 11:09	0.2	3.3	18.2	0.2	0.4	989	991	-2	14.9	2.53	14
26/10/2024 11:39	0.2	3.3	18.2	0.2	1.6	989	991	-2	16.9	2.54	14
26/10/2024 12:09	0.2	3.3	18.3	0.2	0.7	989	991	-2	18.5	2.54	14
26/10/2024 12:39	0.2	3.3	18.3	0.2	2.3	989	991	-2	19.5	2.54	14
26/10/2024 13:09	0.2	3.3	18.3	0	2	988	991	-3	20.2	2.54	13
26/10/2024 13:39	0.2	3.3	18.3	0	0	988	991	-3	20.9	2.54	13
26/10/2024 14:09	0.4	3.3	18.3	0	0.4	988	991	-3	21.6	2.54	13
26/10/2024 14:39	0.4	3.3	18.3	0.2	0	988	991	-3	22.4	2.54	14
26/10/2024 15:09	0.4	3.3	18.3	0	2.9	988	991	-3	23.4	2.54	14
26/10/2024 15:39	0.4	3.5	18.4	0.2	0	988	991	-3	24.1	2.54	14
26/10/2024 16:09	0.6	3.3	18.4	0.2	0	988	991	-3	24.3	2.54	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
26/10/2024 16:39	0.6	3.3	18.4	0	3.8	988	991	-3	24.4	2.54	14
26/10/2024 17:09	0.6	3.3	18.4	0	1.3	988	991	-3	24.5	2.54	14
26/10/2024 17:39	0.6	3.3	18.4	0	4.2	988	991	-3	23.9	2.54	14
26/10/2024 18:09	0.6	3.3	18.3	0	1.6	988	991	-3	22.7	2.54	14
26/10/2024 18:39	0.4	3.3	18.3	0	0	988	991	-3	21.4	2.54	14
26/10/2024 19:09	0.2	3.3	18.3	0	0	988	990	-2	20	2.54	14
26/10/2024 19:39	0.2	3.3	18.3	0	1	987	990	-3	18.5	2.54	13
26/10/2024 20:09	0.2	3.3	18.3	0	0	987	990	-3	16.9	2.54	13
26/10/2024 20:39	0.2	3	18.2	0	2	988	990	-2	15.3	2.54	14
26/10/2024 21:09	0.2	3.3	18.2	0	0	988	990	-2	14	2.54	14
26/10/2024 21:39	0	3.3	18.2	0	2.3	987	990	-3	13.2	2.54	13
26/10/2024 22:09	0.2	3.3	18.2	0	0	987	990	-3	12.9	2.54	13
26/10/2024 22:39	0	3	18.2	0.2	2.9	988	991	-3	12.9	2.53	14
26/10/2024 23:09	0	3	18.2	0	0	988	991	-3	12.9	2.53	14
26/10/2024 23:39	0	3	18.2	0	0	987	990	-3	12.7	2.53	13
27/10/2024 0:09	0.2	3	18.2	0	2.9	987	990	-3	12.6	2.53	13
27/10/2024 0:39	0	3	18.2	0	0	987	990	-3	12.4	2.53	13
27/10/2024 1:09	0	3	18.2	0	1	987	990	-3	12.4	2.53	13
27/10/2024 1:39	0	3	18.2	0	1.6	987	990	-3	12.4	2.53	13
27/10/2024 2:09	0	3	18.2	0	0	987	990	-3	12.2	2.53	13
27/10/2024 2:39	0	3	18.1	0	0	987	990	-3	11.8	2.51	13
27/10/2024 3:09	0	3	18.1	0	0.7	987	990	-3	11.7	2.51	13
27/10/2024 3:39	0	3	18.1	0	0	987	990	-3	11.7	2.51	13
27/10/2024 4:09	0	3	18.1	0	0	987	990	-3	11.6	2.51	14
27/10/2024 4:39	0.1	3	18.1	0.2	0	987	990	-3	11.4	2.51	14
27/10/2024 5:09	0	3.3	18.1	0.2	0.4	987	990	-3	11.6	2.51	13
27/10/2024 5:39	0	3	18.1	0	0	987	990	-3	11.9	2.51	14
27/10/2024 6:09	0	3	18.2	0	0	987	990	-3	12.1	2.51	13
27/10/2024 6:39	0	3	18.2	0	0	987	990	-3	12.1	2.51	13
27/10/2024 7:09	0	3	18.1	0	0.4	987	990	-3	12	2.51	13
27/10/2024 7:39	0	3	18.2	0	0	987	990	-3	12.3	2.51	13
27/10/2024 8:09	0	3	18.2	0.2	0	988	990	-2	12.6	2.51	14
27/10/2024 8:39	0	3	18.2	0	2.6	988	990	-2	13	2.51	14
27/10/2024 9:09	0	3	18.2	0.2	1.3	988	991	-3	13.7	2.51	14
27/10/2024 9:39	0.2	3.3	18.2	0	0.7	988	991	-3	14.6	2.51	14
27/10/2024 10:09	0	3.3	18.2	0	0	988	991	-3	15.9	2.51	14
27/10/2024 10:39	0.2	3.3	18.2	0.2	1.3	988	991	-3	17.2	2.51	14
27/10/2024 11:09	0.2	3.3	18.3	0.2	0.7	988	991	-3	18.8	2.51	14
27/10/2024 11:39	0.4	3.3	18.3	0.2	0	988	991	-3	21	2.51	14
27/10/2024 12:09	0.4	3.3	18.3	0.2	2	988	991	-3	22.4	2.51	14
27/10/2024 12:39	0.6	3.3	18.3	0.2	1	988	991	-3	23.4	2.51	14
27/10/2024 13:09	0.6	3.3	18.4	0	1.3	988	991	-3	23.9	2.51	14
27/10/2024 13:39	0.6	3.3	18.4	0.2	1.6	988	991	-3	24.6	2.51	14
27/10/2024 14:09	0.8	3.3	18.4	0	2	987	990	-3	25.4	2.51	13
27/10/2024 14:39	0.8	3.3	18.4	0	0.4	987	990	-3	25.6	2.51	14
27/10/2024 15:09	0.8	3.3	18.4	0	2.9	987	990	-3	26.5	2.51	13
27/10/2024 15:39	1	3.3	18.4	0.2	4.8	987	990	-3	27.6	2.51	14
27/10/2024 16:09	1	3.3	18.4	0	4.2	987	990	-3	27.4	2.51	14
27/10/2024 16:39	1	3.3	18.4	0	1	987	990	-3	27	2.51	14
27/10/2024 17:09	1	3.3	18.4	0	2.9	987	990	-3	26.3	2.51	14
27/10/2024 17:39	0.8	3.3	18.4	0	1	987	990	-3	25.8	2.51	14
27/10/2024 18:09	0.8	3.3	18.4	0.2	2.6	987	990	-3	25.6	2.51	13
27/10/2024 18:39	0.8	3.3	18.4	0	0	988	991	-3	24.3	2.51	14
27/10/2024 19:09	0.6	3	18.4	0	1.6	988	991	-3	22.6	2.51	14
27/10/2024 19:39	0.4	3	18.3	0	0.1	988	991	-3	20.7	2.51	14
27/10/2024 20:09	0.4	3	18.3	0	2	988	991	-3	18.8	2.51	13
27/10/2024 20:39	0.2	3	18.3	0	0.1	988	991	-3	17.3	2.51	13
27/10/2024 21:09	0.2	3	18.2	0	1	988	991	-3	15.8	2.51	13
27/10/2024 21:39	0	3	18.2	0	1.6	989	991	-2	14.6	2.51	14
27/10/2024 22:09	0.2	3	18.2	0	0.4	989	991	-2	13.6	2.51	14
27/10/2024 22:39	0	3	18.2	0	0	989	991	-2	12.7	2.5	14
27/10/2024 23:09	0	3	18.2	0	0	989	991	-2	11.9	2.5	14
27/10/2024 23:39	0	3	18.2	0	0	989	991	-2	11.2	2.5	14
28/10/2024 0:09	0	3	18.2	0	0.7	989	991	-2	10.6	2.5	14
28/10/2024 0:39	0	3	18.1	0	0.1	989	991	-2	10.1	2.5	14
28/10/2024 1:09	0	3	18.1	0	0	989	991	-2	9.8	2.49	14
28/10/2024 1:39	0	3	18.1	0	1	989	991	-2	9.6	2.5	14
28/10/2024 2:09	0	3	18.1	0	0	989	991	-2	9.4	2.5	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
28/10/2024 2:39	0	3	18.1	0	0	989	991	-2	9.4	2.49	14
28/10/2024 3:09	0	3	18.1	0	1.6	989	991	-2	9.3	2.49	14
28/10/2024 3:39	0	3	18.1	0	0	989	991	-2	9.3	2.49	14
28/10/2024 4:09	0	3	18.1	0	0	989	991	-2	9.1	2.49	14
28/10/2024 4:39	0	3	18.1	0	0.7	989	991	-2	9	2.49	14
28/10/2024 5:09	0	3	18.1	0	0	989	991	-2	9	2.49	14
28/10/2024 5:39	0	3	18.1	0	3.5	989	991	-2	8.8	2.49	14
28/10/2024 6:09	0	3	18.1	0	0	989	992	-3	8.3	2.49	13
28/10/2024 6:39	0	3	18.1	0	4.2	989	992	-3	8.1	2.48	13
28/10/2024 7:09	0	3	18.1	0	0	989	992	-3	8.2	2.48	13
28/10/2024 7:39	0	3	18.1	0	0	989	992	-3	8.4	2.48	13
28/10/2024 8:09	0	3	18.1	0	0	990	992	-2	8.9	2.48	14
28/10/2024 8:39	0	3	18.1	0	2	990	992	-2	9.4	2.48	14
28/10/2024 9:09	0	3	18.1	0.2	0	990	992	-2	10.2	2.48	14
28/10/2024 9:39	0	3	18.2	0	0	990	992	-2	11.3	2.48	14
28/10/2024 10:09	0	3	18.2	0	0	990	992	-2	12.1	2.48	14
28/10/2024 10:39	0.2	3	18.2	0.2	1.3	990	992	-2	13.3	2.48	14
28/10/2024 11:09	0.2	3	18.2	0	0.4	990	993	-3	14.8	2.48	14
28/10/2024 11:39	0.2	3	18.3	0	3.8	990	993	-3	16.3	2.48	14
28/10/2024 12:09	0.2	3	18.3	0.2	0.4	990	993	-3	17.4	2.48	14
28/10/2024 12:39	0.2	3	18.3	0.2	1	990	993	-3	18.4	2.49	14
28/10/2024 13:09	0.2	3	18.3	0.2	3.5	990	993	-3	19	2.49	14
28/10/2024 13:39	0.2	3	18.3	0.2	0.4	990	993	-3	19.6	2.49	14
28/10/2024 14:09	0.4	3	18.4	0.2	0	990	993	-3	20.4	2.49	14
28/10/2024 14:39	0.4	3	18.4	0	0.1	990	993	-3	20.9	2.49	14
28/10/2024 15:09	0.4	3	18.4	0	0	990	992	-2	21.5	2.49	14
28/10/2024 15:39	0.4	3	18.4	0	1.3	990	992	-2	21.9	2.49	14
28/10/2024 16:09	0.4	3	18.4	0.2	2.3	990	993	-3	22.2	2.49	14
28/10/2024 16:39	0.4	3	18.4	0	0	990	993	-3	22.3	2.49	14
28/10/2024 17:09	0.4	3	18.4	0	2	990	993	-3	22.3	2.49	14
28/10/2024 17:39	0.4	3	18.4	0	1.6	990	993	-3	22.1	2.49	13
28/10/2024 18:09	0.4	3	18.4	0.2	0	990	993	-3	21.8	2.49	14
28/10/2024 18:39	0.4	3	18.4	0	0	990	993	-3	21.1	2.49	13
28/10/2024 19:09	0.2	3	18.4	0	1	990	993	-3	20.3	2.49	13
28/10/2024 19:39	0.2	3	18.4	0	0	990	993	-3	19.1	2.49	13
28/10/2024 20:09	0.2	3	18.3	0	1	991	993	-2	17.1	2.49	14
28/10/2024 20:39	0.2	3	18.3	0	0	991	993	-2	15.2	2.49	14
28/10/2024 21:09	0	3	18.3	0	0	991	993	-2	13.5	2.49	14
28/10/2024 21:39	0	3	18.2	0	2.3	991	993	-2	12.1	2.49	14
28/10/2024 22:09	0	3	18.2	0	1.6	991	993	-2	10.9	2.48	14
28/10/2024 22:39	0	3	18.2	0	0	991	993	-2	9.8	2.48	13
28/10/2024 23:09	0	3	18.2	0	2.3	991	993	-2	8.9	2.48	13
28/10/2024 23:39	0	3	18.2	0	1.3	991	993	-2	8.1	2.48	13
29/10/2024 0:09	0	3	18.1	0	0	991	993	-2	7.6	2.48	13
29/10/2024 0:39	0	2.8	18.1	0	0	991	993	-2	6.8	2.46	14
29/10/2024 1:09	0	3	18.1	0	0	991	993	-2	6.2	2.46	14
29/10/2024 1:39	0	3	18.1	0	2	991	993	-2	5.8	2.46	14
29/10/2024 2:09	0	3	18.1	0	0	991	993	-2	5.8	2.46	14
29/10/2024 2:39	0	3	18.1	0	0.4	991	993	-2	5.6	2.46	14
29/10/2024 3:09	0	2.8	18.1	0	1.3	991	993	-2	5.8	2.46	14
29/10/2024 3:39	0	2.7	18.1	0	0	991	993	-2	6.3	2.46	14
29/10/2024 4:09	0	3	18.1	0	0.1	991	993	-2	6.7	2.46	14
29/10/2024 4:39	0	3	18.1	0	0.4	991	993	-2	7.1	2.46	14
29/10/2024 5:09	0	3	18.1	0	0	990	993	-3	7.4	2.46	13
29/10/2024 5:39	0	2.8	18.1	0	0.4	991	993	-2	7.6	2.45	14
29/10/2024 6:09	0	3	18.1	0	0.7	991	993	-2	7.8	2.45	14
29/10/2024 6:39	0	3	18.1	0	0.4	991	993	-2	7.9	2.45	14
29/10/2024 7:09	0	2.8	18.1	0	0	991	993	-2	8	2.45	14
29/10/2024 7:39	0	3	18.1	0	1	991	993	-2	8.2	2.45	14
29/10/2024 8:09	0	3	18.1	0	2	991	993	-2	8.4	2.45	13
29/10/2024 8:39	0	3	18.2	0	0	991	993	-2	8.9	2.45	13
29/10/2024 9:09	0	2.8	18.2	0	2.3	991	993	-2	9.6	2.45	13
29/10/2024 9:39	0	3	18.2	0	2.3	991	993	-2	10.4	2.45	14
29/10/2024 10:09	0	3	18.2	0	0	991	993	-2	11.5	2.45	13

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
GB5											
29/10/2024 11:48	0.4	0.9	18.7	0.2	2.9	991	993	-2	22.8	2.46	14
29/10/2024 12:17	0.4	0.9	18.7	0.2	1.6	991	993	-2	22.3	2.46	14
29/10/2024 12:47	0.4	0.9	18.7	0.2	0	991	993	-2	21.9	2.48	14
29/10/2024 13:17	0.4	0.7	18.7	0.2	2.3	991	993	-2	21.6	2.48	14
29/10/2024 13:47	0.4	0.7	18.7	0	0.4	991	993	-2	21.3	2.46	14
29/10/2024 14:17	0.4	0.7	18.7	0	0	991	993	-2	21.6	2.46	14
29/10/2024 14:47	0.6	0.7	18.7	0.2	1.3	990	993	-3	21.9	2.46	14
29/10/2024 15:17	0.6	0.7	18.7	0.2	2.3	990	993	-3	22.4	2.46	13
29/10/2024 15:47	0.4	0.7	18.7	0.2	3.2	990	993	-3	22.9	2.48	14
29/10/2024 16:17	0.6	0.7	18.7	0.2	2.3	990	993	-3	23.3	2.48	14
29/10/2024 16:47	0.6	0.7	18.7	0.2	2	990	993	-3	23.4	2.48	14
29/10/2024 17:17	0.8	0.7	18.7	0.2	4.5	990	993	-3	23.5	2.46	14
29/10/2024 17:47	0.6	0.7	18.7	0.2	0	990	993	-3	23.2	2.48	14
29/10/2024 18:17	0.6	0.7	18.7	0.3	2.6	990	993	-3	22.9	2.48	14
29/10/2024 18:47	0.6	0.7	18.7	0.2	1.3	990	993	-3	22.3	2.48	14
29/10/2024 19:17	0.6	0.7	18.7	0.2	0	990	993	-3	21.4	2.48	14
29/10/2024 19:47	0.4	0.7	18.7	0	1.3	990	993	-3	20.1	2.48	14
29/10/2024 20:17	0.4	0.7	18.6	0	2.3	990	993	-3	18.3	2.46	14
29/10/2024 20:47	0.2	0.7	18.6	0	0.4	990	993	-3	16.6	2.46	14
29/10/2024 21:17	0.2	0.7	18.6	0	0.4	990	993	-3	15	2.46	14
29/10/2024 21:47	0.2	0.4	18.5	0	0.4	990	993	-3	13.7	2.46	14
29/10/2024 22:17	0.2	0.4	18.5	0	1.6	990	993	-3	12.6	2.46	14
29/10/2024 22:47	0.2	0.4	18.5	0	1.3	990	993	-3	11.7	2.45	14
29/10/2024 23:17	0.2	0.4	18.5	0	0.7	990	992	-2	10.9	2.45	14
29/10/2024 23:47	0.2	0.4	18.4	0	3.5	990	992	-2	10.4	2.45	14
30/10/2024 0:17	0	0.4	18.4	0	0	990	992	-2	9.8	2.45	14
30/10/2024 0:47	0	0.4	18.4	0	0	990	992	-2	9.3	2.45	14
30/10/2024 1:17	0	0.4	18.4	0	1.3	990	992	-2	8.9	2.45	14
30/10/2024 1:47	0.2	0.4	18.4	0	0	989	992	-3	8.9	2.45	14
30/10/2024 2:17	0	0.4	18.4	0	2.3	989	992	-3	9	2.44	14
30/10/2024 2:47	0	0.4	18.4	0	0	989	992	-3	9	2.45	14
30/10/2024 3:17	0	0.4	18.4	0	0	989	992	-3	9.1	2.44	14
30/10/2024 3:47	0.2	0.4	18.4	0	1.6	989	991	-2	9	2.44	14
30/10/2024 4:17	0.2	0.4	18.4	0	0	989	991	-2	8.9	2.44	15
30/10/2024 4:47	0	0.4	18.5	0	0	989	991	-2	8.9	2.44	15
30/10/2024 5:17	0.2	0.4	18.5	0	0	989	991	-2	8.8	2.44	15
30/10/2024 5:47	0.2	0.4	18.5	0	1	989	991	-2	8.6	2.44	15
30/10/2024 6:17	0.2	0.4	18.5	0	0.4	989	991	-2	8.5	2.44	15
30/10/2024 6:47	0	0.4	18.5	0	0	989	991	-2	8.3	2.44	15
30/10/2024 7:17	0	0.4	18.5	0	0	988	991	-3	8.3	2.44	14
30/10/2024 7:47	0	0.4	18.5	0	0	989	991	-2	8.3	2.44	15
30/10/2024 8:17	0.2	0.4	18.5	0	1	989	991	-2	8.7	2.44	15
30/10/2024 8:47	0.2	0.4	18.5	0	0	989	991	-2	9.3	2.44	15
30/10/2024 9:17	0.2	0.4	18.5	0	1	989	991	-2	9.9	2.44	15
30/10/2024 9:47	0	0.4	18.5	0	0	989	991	-2	10.7	2.44	15
30/10/2024 10:17	0.2	0.4	18.5	0	0	988	991	-3	11.4	2.44	14
30/10/2024 10:47	0.2	0.4	18.5	0	1.6	988	991	-3	13.1	2.44	15
30/10/2024 11:17	0.2	0.4	18.5	0.2	2	988	991	-3	15.1	2.44	15
30/10/2024 11:47	0.2	0.4	18.5	0.2	0.7	988	991	-3	16.9	2.44	15
30/10/2024 12:17	0.4	0.4	18.5	0.2	2.6	988	991	-3	18.6	2.44	15
30/10/2024 12:47	0.4	0.4	18.6	0.2	1	988	991	-3	19.9	2.45	15
30/10/2024 13:17	0.4	0.4	18.6	0.2	0.7	988	991	-3	20.8	2.45	15
30/10/2024 13:47	0.6	0.4	18.6	0.2	1.3	988	991	-3	21.5	2.45	15
30/10/2024 14:17	0.6	0.4	18.6	0.3	2.3	988	991	-3	22.3	2.45	15
30/10/2024 14:47	0.6	0.4	18.6	0.2	0	988	990	-2	23.2	2.45	15
30/10/2024 15:17	0.8	0.7	18.6	0.3	4.2	987	990	-3	24.1	2.45	14
30/10/2024 15:47	1	0.7	18.6	0.3	0.7	987	990	-3	24.8	2.45	14
30/10/2024 16:17	1	0.7	18.6	0.3	0	987	990	-3	25.6	2.45	14
30/10/2024 16:47	1	0.4	18.7	0.3	1.6	987	990	-3	26	2.46	14
30/10/2024 17:17	1.2	0.7	18.7	0.3	0.1	987	990	-3	26	2.46	14
30/10/2024 17:47	1	0.7	18.7	0.2	0	987	990	-3	25.8	2.46	14
30/10/2024 18:17	1	0.7	18.7	0.2	3.8	987	990	-3	25.3	2.46	15
30/10/2024 18:47	0.8	0.4	18.7	0.2	3.5	987	990	-3	24.8	2.46	14
30/10/2024 19:17	0.6	0.4	18.8	0	0.4	987	990	-3	23.8	2.46	15
30/10/2024 19:47	0.6	0.4	18.8	0	1	987	990	-3	22.1	2.46	14
30/10/2024 20:17	0.4	0.4	18.7	0	1.6	987	990	-3	20.1	2.46	14
30/10/2024 20:47	0.4	0.4	18.7	0	0.7	987	990	-3	18.2	2.46	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
30/10/2024 21:17	0.2	0.4	18.7	0	3.5	987	990	-3	16.4	2.45	14
30/10/2024 21:47	0.2	0.4	18.7	0	0	987	990	-3	14.9	2.45	14
30/10/2024 22:17	0.2	0.4	18.6	0	1.3	987	990	-3	13.6	2.45	14
30/10/2024 22:47	0.2	0.4	18.6	0	0.1	987	990	-3	12.6	2.45	14
30/10/2024 23:17	0.2	0.4	18.6	0	0.1	987	990	-3	12.2	2.44	14
30/10/2024 23:47	0.2	0.4	18.6	0	0	987	990	-3	11.9	2.44	14
31/10/2024 0:17	0.2	0.4	18.6	0	0	987	990	-3	11.8	2.44	15
31/10/2024 0:47	0.2	0.4	18.6	0	0	987	990	-3	11.4	2.44	15
31/10/2024 1:17	0.2	0.4	18.6	0	2	986	990	-4	11.1	2.44	14
31/10/2024 1:47	0	0.4	18.6	0	0	986	990	-4	10.9	2.44	14
31/10/2024 2:17	0.2	0.4	18.5	0	0	986	989	-3	10.6	2.44	14
31/10/2024 2:47	0.2	0.4	18.5	0	0	986	990	-4	10.4	2.44	14
31/10/2024 3:17	0	0.4	18.5	0	0	986	989	-3	10.1	2.43	14
31/10/2024 3:47	0	0.4	18.5	0	0	986	989	-3	9.9	2.43	14
31/10/2024 4:17	0.2	0.4	18.5	0	0	986	989	-3	9.8	2.43	14
31/10/2024 4:47	0	0.4	18.5	0	0.4	986	989	-3	9.7	2.43	14
31/10/2024 5:17	0	0.4	18.5	0	1.6	986	989	-3	9.4	2.43	14
31/10/2024 5:47	0.2	0.4	18.5	0	0	986	989	-3	9.3	2.43	14
31/10/2024 6:17	0	0.4	18.5	0	0	986	989	-3	9.2	2.43	14
31/10/2024 6:47	0	0.4	18.5	0	0	986	989	-3	9.1	2.43	14
31/10/2024 7:17	0	0.4	18.5	0	1	986	990	-4	9	2.43	14
31/10/2024 7:47	0.2	0.4	18.5	0	0	986	990	-4	9	2.43	14
31/10/2024 8:17	0.2	0.4	18.5	0	0	987	990	-3	9.3	2.43	15
31/10/2024 8:47	0	0.4	18.5	0	2	987	990	-3	9.8	2.43	15
31/10/2024 9:17	0	0.4	18.5	0	0.1	987	990	-3	10.7	2.43	15
31/10/2024 9:47	0.2	0.4	18.5	0.2	0	987	990	-3	11.7	2.41	15
31/10/2024 10:17	0	0.4	18.5	0.2	0	987	990	-3	13.1	2.43	15
31/10/2024 10:47	0.2	0.4	18.5	0.2	0	987	990	-3	14.4	2.43	15
31/10/2024 11:17	0.2	0.4	18.5	0.2	0	987	990	-3	15.5	2.43	15
31/10/2024 11:47	0.2	0.4	18.6	0.2	2	987	990	-3	16.4	2.43	15
31/10/2024 12:17	0.4	0.4	18.6	0	0	987	990	-3	17	2.43	15
31/10/2024 12:47	0.2	0.4	18.6	0.2	0	987	990	-3	18	2.43	15
31/10/2024 13:17	0.4	0.4	18.6	0.2	1	987	990	-3	18	2.43	15
31/10/2024 13:47	0.4	0.4	18.6	0.2	0	987	990	-3	18.5	2.43	15
31/10/2024 14:17	0.4	0.4	18.6	0.2	0.1	987	990	-3	19.1	2.44	15
31/10/2024 14:47	0.4	0.4	18.6	0	0.4	987	990	-3	19.3	2.44	15
31/10/2024 15:17	0.4	0.4	18.6	0.2	0.7	987	990	-3	19.6	2.44	15
31/10/2024 15:47	0.4	0.4	18.7	0.2	0.4	987	990	-3	19.8	2.44	15
31/10/2024 16:17	0.4	0.4	18.7	0	1.3	987	990	-3	19.8	2.44	15
31/10/2024 16:47	0.4	0.4	18.7	0	0	987	990	-3	19.8	2.44	15
31/10/2024 17:17	0.4	0.4	18.7	0.2	2.3	987	990	-3	19.9	2.44	15
31/10/2024 17:47	0.4	0.4	18.7	0	0.7	987	990	-3	19.3	2.44	14
31/10/2024 18:17	0.4	0.4	18.7	0	1.3	987	990	-3	18.9	2.44	14
31/10/2024 18:47	0.2	0.4	18.7	0.2	0.4	987	990	-3	18.3	2.44	14
31/10/2024 19:17	0.4	0.4	18.7	0	1	987	990	-3	17.5	2.44	14
31/10/2024 19:47	0.2	0.4	18.7	0.2	2.3	987	990	-3	16.5	2.44	14
31/10/2024 20:17	0.2	0.4	18.7	0	0	987	990	-3	14.9	2.43	14
31/10/2024 20:47	0.2	0.4	18.6	0	0	987	990	-3	13.2	2.43	13
31/10/2024 21:17	0.2	0.4	18.6	0	0	988	991	-3	11.8	2.43	14
31/10/2024 21:47	0.2	0.4	18.6	0	0.4	988	991	-3	10.8	2.43	14
31/10/2024 22:17	0.2	0.4	18.6	0	2.6	988	991	-3	9.9	2.43	14
31/10/2024 22:47	0	0.4	18.5	0	0.1	988	991	-3	9.2	2.43	14
31/10/2024 23:17	0.2	0.4	18.5	0	0	988	991	-3	8.9	2.41	14
31/10/2024 23:47	0.2	0.4	18.5	0	0.4	988	991	-3	8.6	2.41	14
1/11/2024 0:17	0.2	0.4	18.5	0	0.7	988	991	-3	8.5	2.41	14
1/11/2024 0:47	0	0.4	18.5	0	0	988	991	-3	8.3	2.41	14
1/11/2024 1:17	0	0.4	18.5	0	0	988	991	-3	8.1	2.41	14
1/11/2024 1:47	0	0.4	18.5	0	0.1	988	991	-3	7.9	2.41	14
1/11/2024 2:17	0	0.4	18.5	0	0	988	991	-3	7.8	2.41	14
1/11/2024 2:47	0	0.4	18.5	0	0.4	988	991	-3	7.4	2.41	15
1/11/2024 3:17	0	0.4	18.5	0	0	988	991	-3	7.1	2.41	15
1/11/2024 3:47	0.2	0.4	18.5	0	2.6	988	991	-3	6.9	2.41	15
1/11/2024 4:17	0	0.4	18.5	0	1.3	988	991	-3	6.9	2.41	15
1/11/2024 4:47	0.1	0.4	18.5	0	0	988	991	-3	6.9	2.41	15
1/11/2024 5:17	0	0.4	18.5	0	0	988	991	-3	6.9	2.41	15
1/11/2024 5:47	0.2	0.4	18.5	0	0.1	988	991	-3	7	2.41	15
1/11/2024 6:17	0.2	0.4	18.5	0	2.3	988	991	-3	7.1	2.4	15
1/11/2024 6:47	0	0.4	18.5	0	0	988	991	-3	7.2	2.4	15

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
1/11/2024 7:17	0.2	0.4	18.5	0	0	988	991	-3	7.3	2.4	14
1/11/2024 7:47	0	0.4	18.5	0	0	988	991	-3	7.6	2.4	14
1/11/2024 8:17	0.1	0.4	18.5	0	1	988	991	-3	8	2.4	14
1/11/2024 8:47	0	0.4	18.5	0	0	988	991	-3	8.8	2.4	14
1/11/2024 9:17	0	0.4	18.5	0	0	989	991	-2	10.1	2.4	15
1/11/2024 9:47	0.2	0.4	18.5	0	0.1	989	991	-2	11.1	2.4	15
1/11/2024 10:17	0.2	0.4	18.5	0.2	0	989	991	-2	11.8	2.4	15
1/11/2024 10:47	0.2	0.4	18.5	0	0.4	989	992	-3	12.6	2.41	15
1/11/2024 11:17	0.2	0.4	18.5	0	0	989	992	-3	13.7	2.41	15
1/11/2024 11:47	0.2	0.4	18.5	0.2	0	989	992	-3	14.7	2.41	15
1/11/2024 12:17	0.2	0.4	18.6	0.2	0	989	992	-3	15.5	2.41	15
1/11/2024 12:47	0.2	0.4	18.6	0.2	0	989	992	-3	16.2	2.41	15
1/11/2024 13:17	0.2	0.4	18.6	0.2	2	989	992	-3	16.6	2.41	15
1/11/2024 13:47	0.2	0.4	18.6	0.3	0.4	989	992	-3	17.1	2.41	15
1/11/2024 14:17	0.4	0.4	18.6	0.2	2	989	991	-2	17.8	2.41	15
1/11/2024 14:47	0.4	0.4	18.6	0.2	0	989	992	-3	18.7	2.41	15
1/11/2024 15:17	0.4	0.4	18.6	0.2	0	989	991	-2	19.4	2.41	15
1/11/2024 15:47	0.4	0.4	18.6	0.2	3.2	989	991	-2	19.9	2.41	15
1/11/2024 16:17	0.6	0.4	18.7	0.2	2.9	989	992	-3	20.4	2.43	15
1/11/2024 16:47	0.4	0.4	18.7	0.2	1	989	991	-2	20.8	2.43	15
1/11/2024 17:17	0.6	0.4	18.7	0.2	0.7	989	991	-2	20.9	2.43	15
1/11/2024 17:47	0.4	0.4	18.7	0	3.8	989	992	-3	20.6	2.43	15
1/11/2024 18:17	0.6	0.4	18.7	0	0	989	992	-3	20.1	2.43	14
1/11/2024 18:47	0.4	0.4	18.7	0	3.5	989	992	-3	19.4	2.41	14
1/11/2024 19:17	0.4	0.4	18.8	0	0	989	992	-3	18.8	2.43	14
1/11/2024 19:47	0.4	0.4	18.8	0	0	989	992	-3	17.3	2.41	14
1/11/2024 20:17	0.2	0.4	18.7	0	0.1	989	992	-3	15.4	2.41	14
1/11/2024 20:47	0.2	0.4	18.7	0	0	989	992	-3	13.6	2.41	14
1/11/2024 21:17	0.2	0.4	18.7	0	0.7	989	992	-3	11.9	2.41	14
1/11/2024 21:47	0.2	0.4	18.6	0	0	989	992	-3	10.6	2.41	14
1/11/2024 22:17	0.2	0.4	18.6	0	0.1	989	992	-3	9.5	2.4	14
1/11/2024 22:47	0	0.4	18.6	0	2.3	989	992	-3	8.6	2.4	14
1/11/2024 23:17	0.2	0.4	18.6	0	0	989	992	-3	7.8	2.4	14
1/11/2024 23:47	0.2	0.2	18.5	0	0	989	992	-3	7.1	2.4	14
2/11/2024 0:17	0	0.2	18.6	0	0	989	992	-3	6.4	2.4	14
2/11/2024 0:47	0.2	0.2	18.5	0	0	989	992	-3	6	2.4	14
2/11/2024 1:17	0	0.2	18.5	0	0	989	992	-3	5.8	2.4	14
2/11/2024 1:47	0	0.2	18.4	0	0	989	992	-3	5.7	2.39	15
2/11/2024 2:17	0.2	0.2	18.5	0	0	989	991	-2	5.7	2.39	15
2/11/2024 2:47	0	0.1	18.5	0	1	989	991	-2	5.7	2.39	15
2/11/2024 3:17	0	0.2	18.5	0	0	988	991	-3	5.7	2.39	14
2/11/2024 3:47	0	0.2	18.5	0	2.3	988	991	-3	5.6	2.39	14
2/11/2024 4:17	0	0.2	18.5	0	0	988	991	-3	5.6	2.39	14
2/11/2024 4:47	0	0.2	18.5	0	0	988	991	-3	5.4	2.39	14
2/11/2024 5:17	0	0.2	18.5	0	0	988	991	-3	5.2	2.39	14
2/11/2024 5:47	0	0.2	18.5	0	1.6	988	991	-3	4.9	2.39	14
2/11/2024 6:17	0	0.2	18.5	0	0	988	991	-3	4.3	2.38	15
2/11/2024 6:47	0	0.2	18.5	0	0	988	991	-3	3.4	2.38	14
2/11/2024 7:17	0	0.2	18.4	0	0	988	991	-3	3.5	2.38	14
2/11/2024 7:47	0.2	0.2	18.4	0	1	988	991	-3	5	2.38	15
2/11/2024 8:17	0	0.2	18.4	0	2	988	991	-3	7.2	2.38	15
2/11/2024 8:47	0.2	0.2	18.4	0.2	0	988	991	-3	9.6	2.38	15
2/11/2024 9:17	0.2	0.2	18.4	0.2	2	989	991	-2	11.6	2.39	16
2/11/2024 9:47	0.2	0.2	18.5	0.2	3.2	989	991	-2	13.4	2.39	16
2/11/2024 10:17	0.2	0.2	18.5	0	0	988	991	-3	14.9	2.39	15
2/11/2024 10:47	0.2	0.2	18.5	0.2	3.2	988	991	-3	16.4	2.39	15
2/11/2024 11:17	0.2	0.2	18.5	0.2	2.9	988	991	-3	17.8	2.39	15
2/11/2024 11:47	0.4	0.4	18.6	0.2	2	988	991	-3	19.1	2.4	15
2/11/2024 12:17	0.4	0.4	18.6	0.2	1	988	991	-3	20.3	2.4	16
2/11/2024 12:47	0.4	0.2	18.6	0.2	0.1	988	990	-2	21.1	2.4	15
2/11/2024 13:17	0.6	0.4	18.6	0.2	0.4	987	990	-3	21.8	2.4	14
2/11/2024 13:47	0.6	0.4	18.7	0	0	987	990	-3	22.5	2.4	14
2/11/2024 14:17	0.6	0.4	18.7	0.2	0.7	987	990	-3	23	2.4	15
2/11/2024 14:47	0.8	0.4	18.7	0.2	1.6	987	990	-3	23.6	2.41	15

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
2/11/2024 15:17	0.8	0.4	18.7	0.2	2.3	987	990	-3	24.1	2.41	15
2/11/2024 15:47	0.8	0.4	18.7	0.2	0.1	986	989	-3	24.4	2.41	14
2/11/2024 16:17	0.8	0.4	18.7	0.2	0	986	989	-3	24.5	2.41	14
2/11/2024 16:47	0.8	0.4	18.7	0.2	2.6	986	989	-3	24.7	2.41	15
2/11/2024 17:17	0.8	0.4	18.8	0.2	1	986	989	-3	24.6	2.41	15
2/11/2024 17:47	0.8	0.4	18.8	0	3.2	986	989	-3	24.1	2.41	15
2/11/2024 18:17	0.8	0.4	18.8	0.2	1.3	986	989	-3	23.6	2.41	14
2/11/2024 18:47	0.6	0.4	18.8	0	0	986	989	-3	23	2.41	14
2/11/2024 19:17	0.6	0.2	18.8	0	2.3	986	989	-3	22.6	2.41	14
2/11/2024 19:47	0.6	0.2	18.8	0	0	985	989	-4	21.7	2.41	13
2/11/2024 20:17	0.4	0.2	18.8	0.2	1.6	985	989	-4	20.8	2.4	13
2/11/2024 20:47	0.4	0.2	18.8	0	0.7	985	989	-4	19.8	2.4	14
2/11/2024 21:17	0.4	0.2	18.8	0	0.7	985	989	-4	19.1	2.4	14
2/11/2024 21:47	0.4	0.2	18.8	0	0.7	985	989	-4	18.6	2.4	14
2/11/2024 22:17	0.4	0.2	18.8	0	0.7	985	988	-3	18.3	2.4	14
2/11/2024 22:47	0.2	0.2	18.8	0	1.3	985	988	-3	18.2	2.4	14
2/11/2024 23:17	0.4	0.2	18.8	0	1.6	985	988	-3	18	2.4	14
2/11/2024 23:47	0.2	0.2	18.8	0	0	984	988	-4	17.9	2.4	13
3/11/2024 0:17	0.4	0.2	18.8	0	0.1	984	988	-4	17.9	2.4	13
3/11/2024 0:47	0.2	0.2	18.7	0.2	0.7	984	988	-4	17.8	2.39	14
3/11/2024 1:17	0.4	0.2	18.8	0	1	984	988	-4	17.9	2.39	14
3/11/2024 1:47	0.4	0.2	18.7	0.2	2	984	988	-4	18.2	2.39	14
3/11/2024 2:17	0.4	0.2	18.7	0	0	984	988	-4	18.4	2.39	14
3/11/2024 2:47	0.4	0.2	18.7	0	0	984	987	-3	18.6	2.39	14
3/11/2024 3:17	0.4	0.2	18.7	0	1.3	984	987	-3	18.6	2.39	14
3/11/2024 3:47	0.4	0.4	18.7	0.2	0.4	983	987	-4	18.6	2.39	13
3/11/2024 4:17	0.2	0.2	18.8	0	0.7	983	987	-4	18.6	2.39	13
3/11/2024 4:47	0.4	0.4	18.8	0.2	0	983	987	-4	18.4	2.39	13
3/11/2024 5:17	0.4	0.2	18.8	0	0	983	987	-4	18.1	2.39	13
3/11/2024 5:47	0.4	0.2	18.8	0.2	0.1	983	987	-4	17.7	2.39	13
3/11/2024 6:17	0.2	0.2	18.8	0	1	984	987	-3	17.4	2.39	14
3/11/2024 6:47	0.2	0.4	18.8	0	1	984	988	-4	17.1	2.38	14
3/11/2024 7:17	0.2	0.4	18.7	0	0	984	988	-4	16.8	2.38	13
3/11/2024 7:47	0.2	0.4	18.7	0	0.1	984	988	-4	16.8	2.38	13
3/11/2024 8:17	0.2	0.4	18.7	0.2	2	985	988	-3	16.7	2.38	14
3/11/2024 8:47	0.2	0.4	18.7	0	0	985	988	-3	16.6	2.38	14
3/11/2024 9:17	0.2	0.4	18.7	0	0	985	988	-3	16.6	2.38	14
3/11/2024 9:47	0.2	0.4	18.7	0	1.6	985	989	-4	17.6	2.38	14
3/11/2024 10:17	0.4	0.4	18.7	0.2	0	985	989	-4	18.7	2.38	14
3/11/2024 10:47	0.4	0.4	18.7	0.3	2	985	989	-4	19.7	2.38	14
3/11/2024 11:17	0.4	0.4	18.7	0	1	985	989	-4	20.5	2.38	13
3/11/2024 11:47	0.4	0.4	18.7	0.2	2.3	985	989	-4	21.3	2.38	14
3/11/2024 12:17	0.6	0.4	18.7	0.2	1.3	985	989	-4	21.9	2.38	13
3/11/2024 12:47	0.6	0.4	18.7	0.2	0.4	985	989	-4	22.3	2.38	14
3/11/2024 13:17	0.6	0.4	18.8	0.2	4.2	985	989	-4	22.5	2.38	14
3/11/2024 13:47	0.6	0.4	18.8	0.3	4.8	985	989	-4	22.9	2.38	13
3/11/2024 14:17	0.8	0.4	18.8	0.2	0.7	985	989	-4	23.3	2.38	13
3/11/2024 14:47	0.8	0.4	18.8	0.3	0.1	985	989	-4	24.1	2.38	14
3/11/2024 15:17	0.8	0.4	18.8	0.2	3.8	985	989	-4	24.7	2.38	14
3/11/2024 15:47	1	0.4	18.8	0.3	0	985	989	-4	25.1	2.38	14
3/11/2024 16:17	1	0.4	18.8	0.2	2.6	985	989	-4	25.4	2.39	14
3/11/2024 16:47	1	0.4	18.8	0.2	1	985	989	-4	25.6	2.39	14
3/11/2024 17:17	1.2	0.4	18.8	0.2	2	985	989	-4	25.6	2.39	14
3/11/2024 17:47	1.2	0.4	18.8	0.2	0	985	989	-4	25.4	2.39	14
3/11/2024 18:17	1	0.4	18.8	0	0.7	985	989	-4	24.9	2.39	14
3/11/2024 18:47	0.8	0.4	18.9	0.2	2.9	985	989	-4	24.4	2.39	14
3/11/2024 19:17	0.8	0.4	18.9	0	0.7	985	989	-4	23.6	2.38	13
3/11/2024 19:47	0.6	0.4	18.9	0	2.9	985	989	-4	22.4	2.38	13
3/11/2024 20:17	0.6	0.4	18.9	0	0.7	986	989	-3	20.4	2.38	14
3/11/2024 20:47	0.4	0.4	18.8	0	0	986	989	-3	18.3	2.38	14
3/11/2024 21:17	0.4	0.4	18.8	0	1.6	986	989	-3	16.4	2.36	14
3/11/2024 21:47	0.2	0.4	18.8	0	0	986	989	-3	14.8	2.36	14
3/11/2024 22:17	0.2	0.2	18.8	0	1.3	986	989	-3	13.4	2.36	14
3/11/2024 22:47	0.2	0.2	18.7	0	0.4	986	989	-3	12.4	2.36	14
3/11/2024 23:17	0.2	0.2	18.7	0	0	986	989	-3	11.6	2.35	14
3/11/2024 23:47	0.2	0.2	18.6	0	0	986	989	-3	10.8	2.35	14
4/11/2024 0:17	0.2	0.2	18.6	0	0	986	989	-3	10.3	2.35	14
4/11/2024 0:47	0.2	0.2	18.6	0	0	986	989	-3	9.9	2.35	14

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
4/11/2024 1:17	0.2	0.2	18.6	0	0.7	986	990	-4	9.4	2.34	14
4/11/2024 1:47	0.2	0.2	18.6	0	0	986	989	-3	8.9	2.34	14
4/11/2024 2:17	0.2	0.2	18.6	0	0	986	989	-3	8.3	2.34	14
4/11/2024 2:47	0.2	0.2	18.5	0	1.3	986	989	-3	7.7	2.34	15
4/11/2024 3:17	0.2	0.2	18.5	0	1.3	986	989	-3	6.8	2.33	15
4/11/2024 3:47	0.2	0.2	18.5	0	0	986	989	-3	6.2	2.33	15
4/11/2024 4:17	0.2	0.2	18.5	0	0	986	989	-3	5.9	2.33	15
4/11/2024 4:47	0.2	0.1	18.5	0	0	986	989	-3	5.7	2.33	15
4/11/2024 5:17	0.2	0.2	18.5	0	0	986	989	-3	5.7	2.31	15
4/11/2024 5:47	0.2	0.2	18.5	0	0	986	989	-3	5.8	2.31	15
4/11/2024 6:17	0.2	0.2	18.4	0	0	986	989	-3	6.1	2.31	15
4/11/2024 6:47	0	0.2	18.5	0	0	986	990	-4	6.4	2.31	15
4/11/2024 7:17	0.2	0.2	18.5	0	2.9	986	990	-4	6.6	2.31	14
4/11/2024 7:47	0.2	0.2	18.5	0	0.4	987	990	-3	7.6	2.31	15
4/11/2024 8:17	0.2	0.2	18.5	0	0	987	990	-3	8.9	2.31	15
4/11/2024 8:47	0.2	0.2	18.5	0.2	0.1	987	990	-3	10	2.31	16
4/11/2024 9:17	0.2	0.2	18.5	0	0	987	990	-3	10.9	2.31	16
4/11/2024 9:47	0.2	0.2	18.5	0	0	987	990	-3	11.9	2.31	16
4/11/2024 10:17	0.2	0.2	18.5	0	0	987	990	-3	12.9	2.31	15
4/11/2024 10:47	0.2	0.2	18.5	0	0	987	990	-3	13.8	2.31	15
4/11/2024 11:17	0.2	0.2	18.6	0.2	1	987	990	-3	14.6	2.31	15
4/11/2024 11:47	0.2	0.2	18.6	0.2	0	987	990	-3	15.5	2.31	15
4/11/2024 12:17	0.2	0.2	18.6	0.2	1.3	987	990	-3	16.6	2.33	15
4/11/2024 12:47	0.4	0.2	18.6	0.2	0	987	990	-3	17.6	2.33	15
4/11/2024 13:17	0.6	0.2	18.6	0.2	1.3	987	990	-3	18.9	2.33	15
4/11/2024 13:47	0.4	0.2	18.6	0.3	1.3	987	990	-3	19.9	2.33	15
4/11/2024 14:17	0.6	0.4	18.7	0	0	987	990	-3	20.8	2.33	15
4/11/2024 14:47	0.6	0.4	18.7	0.2	0	987	990	-3	21.3	2.33	15
4/11/2024 15:17	0.6	0.4	18.7	0.2	1.6	987	990	-3	22.1	2.33	15
4/11/2024 15:47	0.8	0.4	18.7	0.2	2	987	990	-3	22.4	2.34	15
4/11/2024 16:17	0.6	0.4	18.7	0	2.6	987	990	-3	21.9	2.34	14
4/11/2024 16:47	0.6	0.4	18.8	0.2	0.7	987	990	-3	21.8	2.33	14
4/11/2024 17:17	0.6	0.4	18.7	0.2	0.1	987	990	-3	22.1	2.33	14
4/11/2024 17:47	0.6	0.4	18.8	0	0.1	987	990	-3	21.6	2.33	14
4/11/2024 18:17	0.6	0.4	18.8	0	3.2	987	990	-3	21	2.33	14
4/11/2024 18:47	0.6	0.4	18.8	0	0	987	990	-3	20.5	2.33	14
4/11/2024 19:17	0.6	0.4	18.8	0	0	987	991	-4	20	2.33	14
4/11/2024 19:47	0.4	0.4	18.8	0	2	987	991	-4	19	2.31	14
4/11/2024 20:17	0.4	0.2	18.8	0	0.4	987	991	-4	17.6	2.31	14
4/11/2024 20:47	0.4	0.2	18.8	0	0	988	991	-3	16.1	2.31	14
4/11/2024 21:17	0.2	0.2	18.7	0	0	988	991	-3	14.8	2.3	14
4/11/2024 21:47	0.2	0.2	18.8	0	0	988	991	-3	13.6	2.3	14
4/11/2024 22:17	0.2	0.2	18.7	0	0	988	991	-3	12.5	2.3	14
4/11/2024 22:47	0.2	0.2	18.7	0	0	988	991	-3	11.6	2.29	15
4/11/2024 23:17	0.2	0.2	18.6	0	0	988	991	-3	10.7	2.28	15
4/11/2024 23:47	0.2	0.2	18.6	0	0	988	991	-3	9.9	2.28	15
5/11/2024 0:17	0.2	0.2	18.6	0	3.2	987	991	-4	9.3	2.26	14
5/11/2024 0:47	0.2	0.2	18.5	0	0	987	991	-4	8.8	2.26	14
5/11/2024 1:17	0.2	0.2	18.6	0	0.1	987	990	-3	8.4	2.26	14
5/11/2024 1:47	0.2	0.2	18.6	0	0.7	987	990	-3	7.9	2.25	14
5/11/2024 2:17	0.2	0.2	18.5	0	0	987	990	-3	7.6	2.25	14
5/11/2024 2:47	0.2	0.2	18.5	0	0	987	990	-3	7.3	2.24	15
5/11/2024 3:17	0.2	0.2	18.5	0	0.1	987	990	-3	6.9	2.24	15
5/11/2024 3:47	0.2	0.2	18.5	0	1.6	987	990	-3	6.6	2.23	15
5/11/2024 4:17	0.2	0.2	15.4	0	0	987	990	-3	6.3	2.23	94
5/11/2024 4:47	0.2	0.2	15.3	0	0	983	990	-7	6.1	2.21	91
5/11/2024 5:17	0.2	0.2	15.3	0	0	982	990	-8	5.8	2.21	90
5/11/2024 5:47	0.2	0.2	15.3	0	0	981	990	-9	5.3	2.2	89
5/11/2024 6:17	0.2	0.2	15.3	0	0	981	990	-9	4.6	2.2	89
5/11/2024 6:47	0.2	0.2	15.2	0	0.1	982	990	-8	3.9	2.19	89
5/11/2024 7:17	0.2	0.2	15.3	0	0	982	990	-8	4.3	2.18	90
5/11/2024 7:47	0.2	0.2	15.3	0	0.4	986	990	-4	6	2.18	94
5/11/2024 8:17	0.2	0.2	15.3	0	0.7	987	990	-3	8.4	2.16	96
5/11/2024 8:47	0.2	0.2	15.2	0	0	988	991	-3	11.1	2.18	98
5/11/2024 9:17	0.2	0.4	15.3	0	3.8	988	991	-3	14.1	2.2	98
5/11/2024 9:47	0.4	0.4	15.6	0	0	988	991	-3	16.9	2.2	98
5/11/2024 10:17	0.4	0.4	15.9	0	0.1	988	991	-3	19.2	2.2	96
5/11/2024 10:47	0.6	0.4	16.1	0.2	0.4	988	990	-2	21.1	2.21	93

Date and Time	CH4	CO2	O2	H2S	CO	Bore press	Atm press	Diff press	°C	Battery (V)	Filter press
5/11/2024 11:17	0.6	0.4	16.2	0.2	2.6	988	990	-2	22.6	2.21	88
5/11/2024 11:47	0.8	0.4	16.5	0.2	2	988	990	-2	23.8	2.21	83
5/11/2024 12:17	1	0.4	17	0.3	4.5	987	990	-3	24.7	2.21	81
5/11/2024 12:47	1.2	0.4	16.8	0.2	0.7	987	990	-3	25.4	2.2	75
5/11/2024 13:17	1.2	0.4	17.2	0.2	3.2	987	990	-3	26	2.2	75
5/11/2024 13:47	1.2	0.4	16.8	0.2	0	987	990	-3	26.4	2.19	75
5/11/2024 14:17	1.6	0.4	16.9	0.2	0.1	987	990	-3	27	2.18	75
5/11/2024 14:47	1.6	0.4	17	0.3	1.6	987	990	-3	27.6	2.16	72



Appendix C: Before You Dig Plans

[Review responses online](#) ↗



Received 7 of 7 responses
All responses received

35 Noble Court, Mount Rowan VIC 3352

Job dates
27/06/2025 → 27/06/2025

These plans expire on
23 Jul 2025

Lodged by
Chris Ford

Authority	Status	Page
✉ BYDA Confirmation		2
🏢 AARNet Pty Ltd Vic	Received	4
🏢 AusNet Gas Services Pty Ltd	Received	12
🏢 Ballarat City Council	Received	25
🏢 Central Highlands Water	Received	31
🏢 NBN Co VicTas	Received	36
🏢 Powercor Australia (Ballarat)	Received	48
🏢 Telstra VICTAS	Received	54

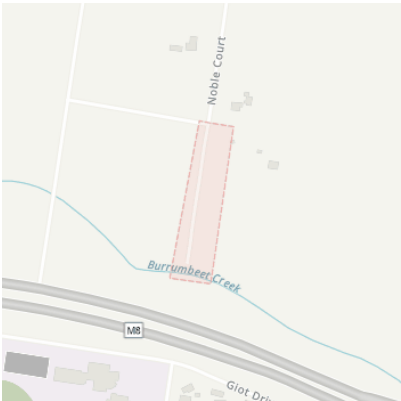
Contact Details

Contact	Contact number	Company	Enquirer ID
Chris Ford	0424 447 671	-	3177629
Email	Address		
chris.ford@automatedenvironmental.com	27 Storrer Avenue Torquay VIC 3228		

Job Site and Enquiry Details

WARNING: The map below only displays the location of the proposed job site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

Enquiry date	Start date	End date	On behalf of	Job purpose	Locations	Onsite activities
25/06/2025	27/06/2025	27/06/2025	Private	Design	Private	Planning & Design



Check that the location of the job site is correct. If not, you must submit a new enquiry.

If the scope of works change or plan validity dates expire, you must submit a new enquiry.

Do NOT dig without plans. Safe excavation is your responsibility. If you don't understand the plans or how to proceed safely, please contact the relevant asset owners.

User Reference	Address	Notes/description
ESA LFG RA	35 Noble Court Mount Rowan VIC 3352	-

Your Responsibility and Duty of Care

- Lodging an enquiry does not authorise project commencement.** Before starting work, you must obtain all necessary information from all affected asset owners.
- If you don't receive plans within 2 business days, contact the asset owner & quote their sequence number.
- Always follow the 5Ps of Safe Excavation (page 2), and locate assets before commencing work.
- Ensure you comply with State legislative requirements for Duty of Care and safe digging.
- If you damage an underground asset, you MUST advise the asset owner immediately.
- By using the BYDA service, you agree to the [Privacy Policy](#) and [Term of Use](#).
- For more information on safe digging practices, visit www.byda.com.au

Asset Owner Details

Below is a list of asset owners with underground infrastructure in and around your job site. It is your responsibility to identify the presence of these assets. Plans issued by Members are indicative only unless specified otherwise. Note: not all asset owners are registered with BYDA. You must contact asset owners not listed here directly.

Referral ID (Seq. no)	Authority Name	Phone	Status
257011023	AARNet Pty Ltd Vic	1300 275 662	NOTIFIED
257011024	AusNet Gas Services Pty Ltd	1800 088 208	NOTIFIED
257011027	Ballarat City Council	(03) 5320 5500	NOTIFIED
257011021	Central Highlands Water	1800 061 514	NOTIFIED
257011025	NBN Co VicTas	1800 687 626	NOTIFIED
257011022	Powercor Australia (Ballarat)	13 22 06	NOTIFIED
257011026	Telstra VICTAS	1800 653 935	NOTIFIED

END OF UTILITIES LIST



Plan

Plan your job. Use the BYDA service at least one day before your job is due to begin, and ensure you have the correct plans and information required to carry out a safe project.



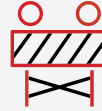
Prepare

Prepare by communicating with asset owners if you need assistance. Look for clues onsite. Engage a skilled Locator.



Pothole

Potholing is physically sighting the asset by hand digging or hydro vacuum extraction.



Protect

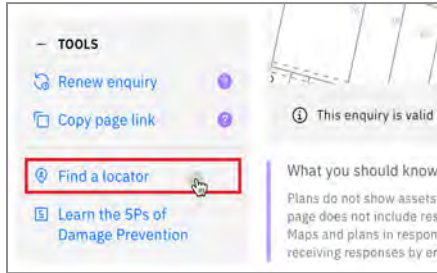
Protecting and supporting the exposed infrastructure is the responsibility of the excavator. Always erect safety barriers in areas of risk and enforce exclusion zones.



Proceed

Only proceed with your excavation work after planning, preparing, potholing (unless prohibited), and having protective measures in place.

Engage a skilled Locator



When you lodge an enquiry you will see skilled Locators to contact

Visit the Certified Locator website directly and search for a locator near you

certloc.com.au/locators

Get FREE Quotes for Contractors & Equipment Fast



Use isseekplant's FREE marketplace to get quotes for the equipment or services you need on your project. Compare quotes from trusted local contractors and get your project done on time and in budget.

1. Fill out your job details in our FREE quick quote form.
2. We send the request to trusted local contractors.
3. The local contractors will contact you directly with quotes

GET QUOTE

Use isseekplant to find trusted contractors near you today, visit:
blog.isseekplant.com.au/byda-isp-get-quotes

Book a FREE BYDA Session



BYDA offers free training sessions to suit you and your organisation's needs covering safe work practices when working near essential infrastructure assets. The free sessions are offered in two different formats - online and face-to-face.

To book a session, visit:
byda.com.au/contact/education-awareness-enquiry-form

BOOK NOW

Referral

257011023

Member Phone

1300 275 662

Responses from this member

Response received Wed 25 Jun 2025 11.24am

File name	Page
Response Body	5
AARNet - Guidelines for Fibre Optic.pdf	7
257011023 - AARNet Plan.pdf	9

Date: 25 Jun 2025

To: Chris Ford

Please DO NOT SEND A REPLY to this email as it has been automatically generated and replies are not monitored.

Thank you for your BYDA enquiry (referenced below)—this letter is in relation to the proposed work at location detailed below. AARNet has assets in the area but not in the local vicinity of the proposed work.

SEQUENCE NO.:	257011023
JOB NO.:	50505592
LOCATION:	35 Noble Court Mount Rowan VIC 3352
COMMENCEMENT DATE:	27 Jun 2025

Attached is a map indicating the location of the enquiry area and an approximate location of AARNet's underground infrastructure in the local vicinity.

There may be additional AARNet assets in this area that are contained within Telstra duct. No work is to take place until plans have been obtained from Telstra and reviewed as necessary.

Any information provided is valid for 28 days from the date of issue of this document.

WARNING: When working in the vicinity of AARNet's underground infrastructure you have a legal Duty of Care that must be observed.

Please review the map and if you have any further concerns, contact the AARNet NOC on [1300 APL NOC](#).

To best manage the risk of damage and liability, we recommend that you engage the services of a [BYDA Certified Locator](#)

Important Notice

Where AARNet plans have been attached, they are indicative of the position of AARNet Pty Ltd's (**AARNet**) installation/s **only**. Services belonging to other third parties are not included on these plans.

These plans have been prepared solely for the use of AARNet and any reliance placed on these plans by you is entirely at your own risk. The plans may show the position of our assets relative to fences, buildings, etc, as they existed at the time the fibre, etc, was installed. The plans may not have been updated to take account of any subsequent change in the location or style of those features since the time at which the plans were initially prepared.

AARNet makes no warranty as to the accuracy or completeness of the enclosed plans and does not assume any duty of care to you nor any responsibility for the accuracy, adequacy, suitability or completeness of the plans or for any error, omission, lack of detail, transmission

failure or corruption in the information provided. AARNet does not accept any responsibility for any loss that you or anyone else may suffer in connection with the provision of these plans, however that loss may arise (including whether or not arising from the negligence of AARNet, its employees, agents, officers or contractors).

The recipient of these plans must use their own care and diligence in carrying out their works and must carry out further surveys to locate services at their work site. Persons excavating or carrying out other earthworks will be held responsible for any damage caused to AARNet's installations.

Disclaimer: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither AARNet nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

If you are unable to launch any of the files for viewing and printing, you may need to download and install free viewing and printing software such as [Adobe Acrobat Reader \(for PDF files\)](#).

Guidelines for digging in the vicinity of AARNet Fibre Optic infrastructure

REQUIREMENTS FOR ALL AREAS

Under no circumstances shall construction, digging or excavating work entailing crossing AARNet plant be carried out without first exposing or locating the AARNet asset by an accredited locator and under the supervision of an accredited plant location contractor.

Manual pot-holing needs to be undertaken with extreme care, common-sense and employing techniques least likely to damage cables. For example, orientate shovel blades and trowels parallel to the cable rather than digging across the cable.

Visual location of asset must be carried out by hand digging or using non-destructive water jet method (pot holing) where construction activities may damage or interfere with AARNet assets.

The following minimum clearances must be maintained between mechanical construction activity and the located AARNet asset.

Jackhammers / Pneumatic Breakers	Not within 1.0m of actual location
Vibrating Plate or Wacker Packer Compactor	Not within 0.5m of actual location 300mm compact clearance before compactor can be used over AARNet conduits. 750mm compact clearance cover before compactor can be used Over AARNet Direct Buried cable
Boring Equipment (in-line, horizontal and vertical)	Not within 5.0m of actual location without supervision of accredited plant location contractor onsite OR AARNet asset must exposed via hand dig or nondestructive water jet method (pot holing). AND AARNet asset must not be crossed without first exposing the asset at the crossing point and not without an accredited plant location contractor representative onsite
Heavy vehicle Traffic (over 3 tonnes)	Not to be driven over AARNet conduits or assets with less than 600mm of cover. Depth to be verified via hand digging
Mechanical Excavators, Farm ploughing, Boring, Tree removal, fencing	Not within 1.0m of actual location. Constructor to hand dig or use non-destructive water jet method (pot holing) and expose asset

General Enquires **1300 APL NOC (1300 275 662)**

To resubmit or change the nominated search area contact BYDA via www.1100.com.au

REQUIREMENTS FOR URBAN AREAS

Under no circumstances shall construction, digging or excavating work be carried out: within 1.5m of AARNet assets without first locating and identifying the AARNet asset by an accredited locator and under the supervision of an accredited plant location contractor.

REQUIREMENTS FOR RURAL AREAS

Under no circumstances shall construction, digging or excavating work be carried out within 10m of AARNet plant be carried out without first locating and identifying the AARNet asset by an accredited locator and under the supervision of an accredited plant location contractor.

ASSET RELOCATIONS

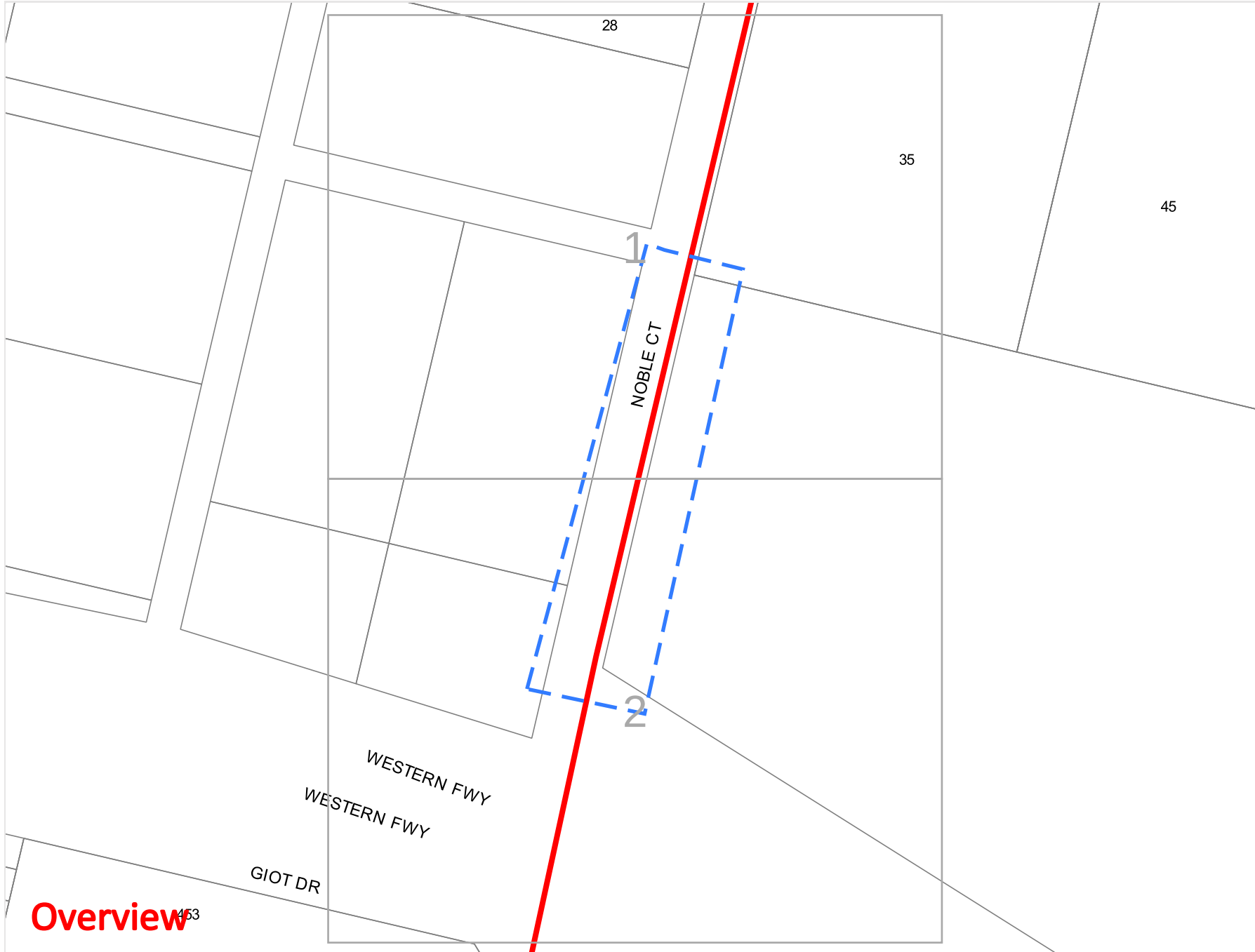
You are not permitted to relocate, modify or alter any AARNet assets under any circumstances. Please contact AARNet Infrastructure Development Group via email apl-dig@aarnet.edu.au for all enquiries relating to the relocation of AARNet assets.

DAMAGE

AARNet will seek Compensation for any loss caused by damage to its assets. Damage to any AARNet asset must be immediately reported to AARNet NOC on 1300 APL NOC (1300 275 662).

FURTHER ASSISTANCE

Assistance can be obtained by contacting AARNet NOC on 1300 APL NOC (1300 275 662) Where an on-site location is provided by an accredited locator, the owner is responsible for all costs associated with hand digging or use of non-destructive water jet method (pot holing) to visually locate AARNet assets. If plant location drawings or visual location of AARNet assets by digging reveals that the location of AARNet plant is situated wholly or partly within the owner work area, then AARNet Infrastructure Development Group apl-dig@aarnet.edu.au must be contacted to discuss possible engineering solutions.



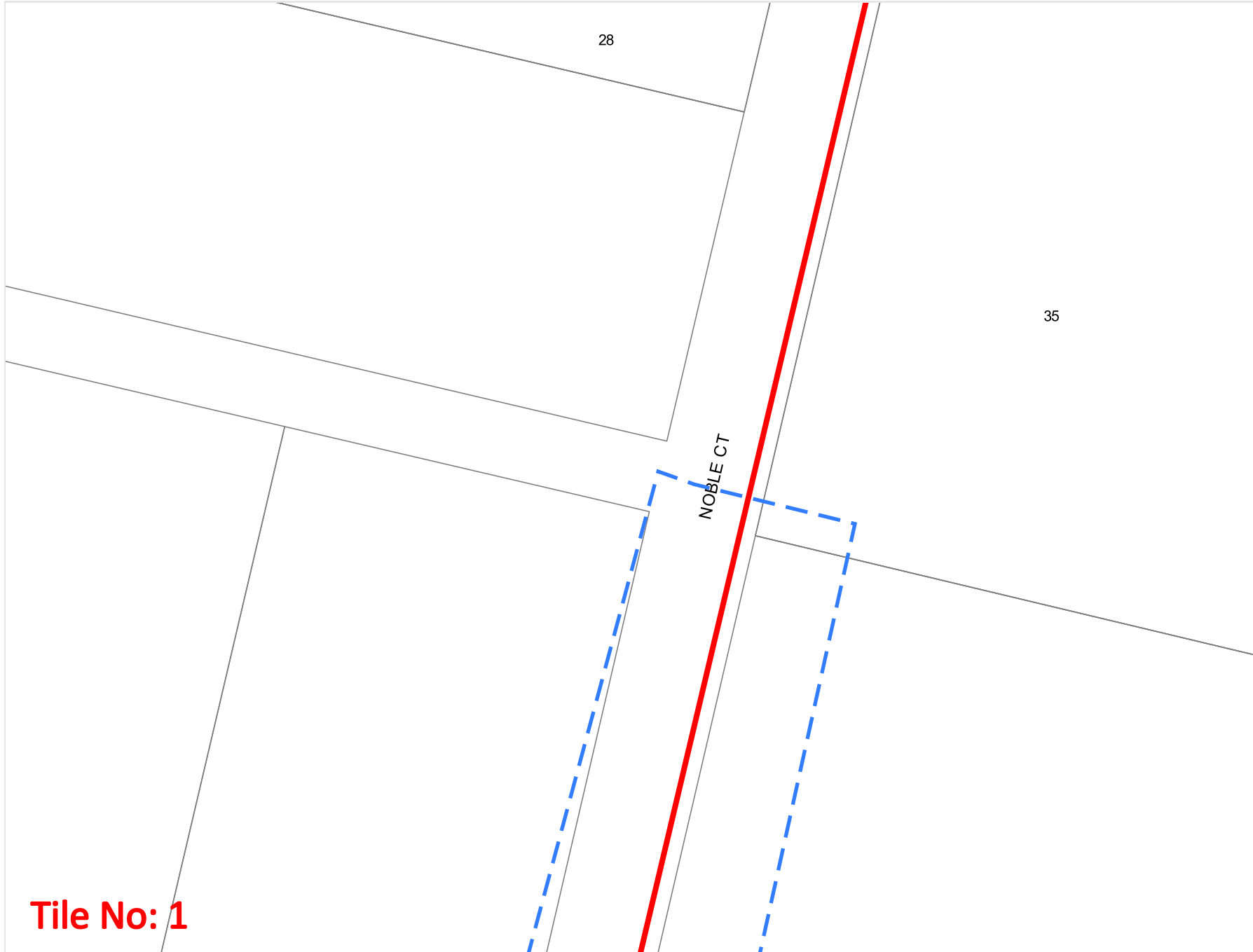
Legend

- Enquiry Area
- AARNET Fibre Optic Assets
- AARNET Power Assets
- Cadastre



Scale: 1:3075
Expires: 23 Jul 2025

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither AARNET nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.



Legend

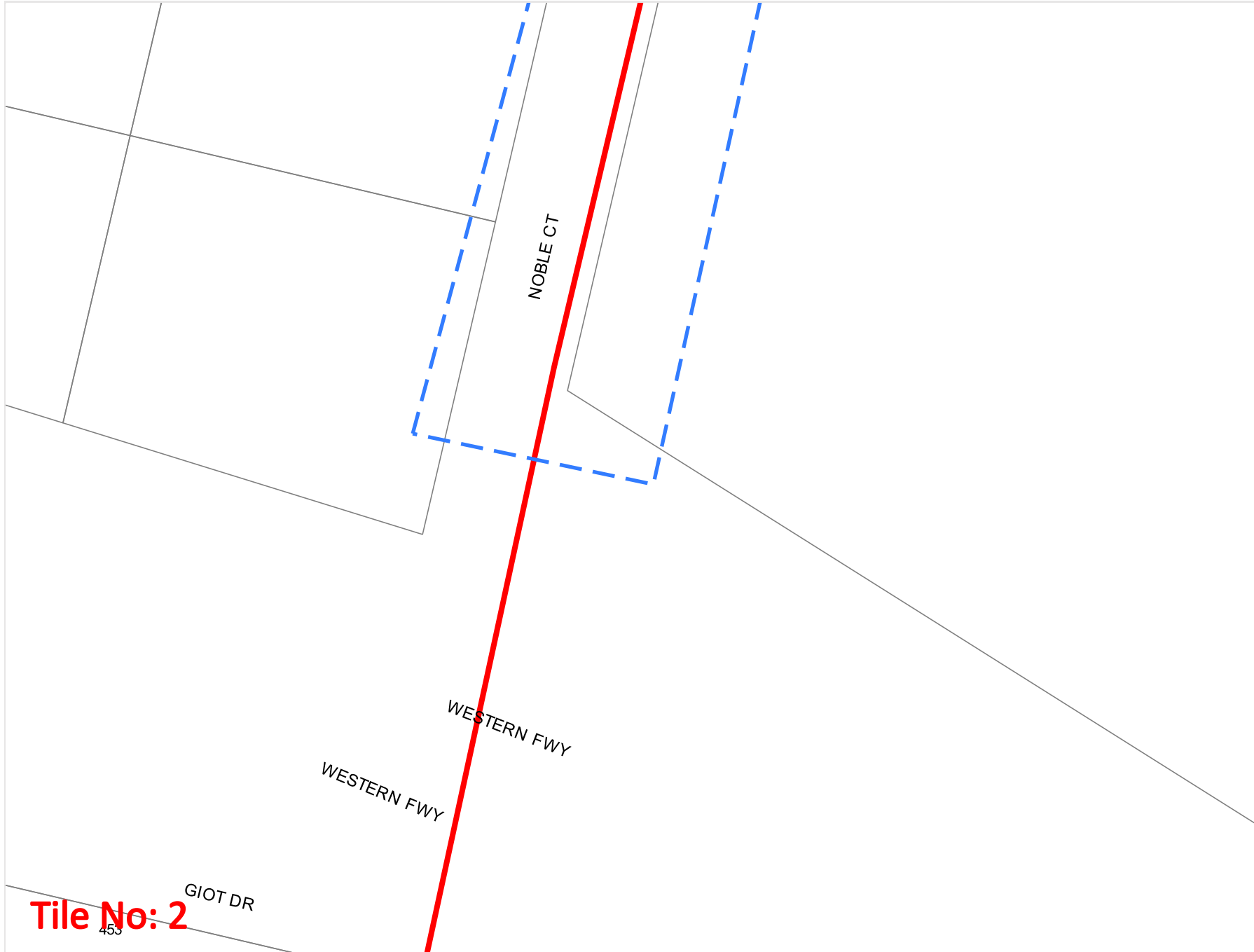
-  Enquiry Area
-  AARNET Fibre Optic Assets
-  AARNET Power Assets
-  Cadastre



Scale: 1:1500
Expires: 23 Jul 2025

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither AARNET nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

Tile No: 1



Legend

-  Enquiry Area
-  AARNET Fibre Optic Assets
-  AARNET Power Assets
-  Cadastre



Scale: 1:1500
Expires: 23 Jul 2025

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither AARNET nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

Tile No: 2

GIOT DR

453

Referral

257011024

Member Phone

1800 088 208

Responses from this member

Response received Wed 25 Jun 2025 8.09pm

File name	Page
Response Body	13
Coversheet.pdf	14
Legend.pdf	15
Condition-of-Works-Gas.pdf	16
4028c-M-20250625200844-0000.pdf	20
Condition-of-Works-Gas-EX.pdf	21

Thank you for using the Dial Before You Dig (DBYD) service before engaging in work at the location detailed below. Please find AusNet Services response documents attached.

IMPORTANT: This information is only valid for 28 Days from the receipt of this email.

Date of enquiry: 25/06/2025 11:24:00 AM

Job No: 50505592 (Notification No)

Sequence No: 257011024

Customer's Name: Chris Ford

Customer's Phone No: +61424447671

Customer's Mobile No: No longer supplied

Customer's Fax No: No longer supplied

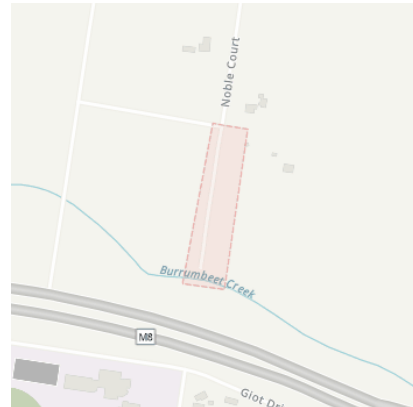
Address supplied for dig site location 35 Noble Court, Mount Rowan, VIC

You will require a PDF viewer such as Adobe Acrobat Reader to view the attached documents. Adobe Acrobat Reader is freely available at <http://get.adobe.com/reader/>. AusNet Services – DBYD Support



DBYD Response from AusNet Gas Services Pty Ltd.

Job Number: 50505592
Sequence Number: 257011024
Enquiry Date: 25/06/2025
Enquiry Location: 35 Noble Court Mount Rowan, VIC



Thank you for using the Dial Before You Dig (DBYD) service before engaging in work at the above location.

AusNet Gas Services Pty Ltd – Gas Assets Present

Please find attached Plans and Conditions for Works near gas assets in the vicinity of your enquiry.

** Please note this information is only valid for 28 Days from date of issue.*

Do not rely solely on these Dial Before You Dig plans for underground asset location. The exact location of existing underground assets should be established on site prior to commencement of work. Should you wish to advise AusNet Gas Services Pty Ltd of any data discrepancy, please call 1800 088 208.

For Your Safety

In case of emergency, gas escapes, hit or damaged gas pipelines call 136707.

Where proposed work is in close proximity to a gas pipe, the exact location of the pipe must first be determined by careful hand excavation.

Gas Service Lines on Private Property

Supplied plans do not show gas service lines on private property and do not show any gas assets of authorities other than AusNet Gas Services Pty Ltd, which may exist on site.

If you require assistance to locate gas services please contact Downer Group at the following locations.

Melb Metro	(03) 7379 8800	Ballarat	(03) 5342 6400	Warrnambool	(03) 5561 9614
Geelong	(03) 5223 9400	Bendigo	(03) 5442 4855		

AusNet Services – DBYD Support



TYPE OF PIPE		FITTINGS AND NOTATIONS							
C2	CAST IRON	90'	BEND	L1-5000	CITY GATE	— — —		PROPOSED TITLE BOUNDARY	
C3	CAST IRON MECHANICAL JOINT	B.P.	BLADDER PLATE		REGULATOR NUMBER	= = = = =		EASEMENT BOUNDARY	
C4	CAST IRON SOUTHERN	(C.B.)	COMBINED BEND		REGULATOR COMPOUND/KIOSK/PIT	- - - - -		BACK OF KERB (B.O.K.)	
C5	CAST IRON A.I.S.	F. & F.	FLANGE & FAUCET PIECE		SERVICE REGULATOR	— / — / —		FENCE LINE	
C6	CAST IRON METTERS CLOW	F. & S.	FLANGE & SPIGOT PIECE		REMOTE TELEMETRY UNIT	2/74		DATE MAIN LAID FEB. 1974	
C7	CAST IRON STAVELEY	L.T.	LONGTHREAD		SYSTEM CONTROL & DATA ACQUISITION NUMBER	E.O.M.		END OF MAIN	
C8	CAST IRON STANTON	MA	MUELLER ADAPTOR (HP)		HEATER	N.T.I.		NOT TIED IN	
C9	CAST IRON STANTON-STAVELEY	D.E.	OFF A WILLIAMSON TEE		METER CTM	2.1		OFFSET	
C10	CAST IRON LEAD JOINT	L.S.	MUELLER DEAD END EXTENSION		METER ROOM			COVER	
CU1	COPPER	T.S.	MUELLER SERVICE TEE		ANODE BED / TEST POINT	C1.0		VIC ROADS	
F2	FIBRO CEMENT	T.V.	MUELLER TEE VALVE		CATHODIC PROTECTION UNIT	VR		} SURVEY / TITLE DRAWINGS	
P2	PLASTIC POLYETHYLENE (PE)	P.L.	PROPERTY LINE	G1-5050	CORROSION MITIGATION	CP 12345 LP12345			
P3	PLASTIC POLYVINYL CHLORIDE (PVC)	P3T	PVC TEE		GAS CRITICAL VALVE	PS 123456 RP12345			
P4	PLASTIC POLYETHYLENE (P.E.) CL 250 HIGH DENSITY IMPERIAL, (YELLOW)	R.	REDUCER		VALVE	RCA 12345 SP12345		} SURVEY / TITLE DRAWINGS	
P6	PLASTIC POLYETHYLENE (P.E.) CL 500 MEDIUM DENSITY (HP), (YELLOW)	SD.	SADDLE (C.I. MAINS ONLY)		VALVE INSULATED	C.T.			COMMON TRENCHING
P7	PLASTIC POLYETHYLENE (P.E.) CL 250 MEDIUM DENSITY (LP/MP), (YELLOW)	ST.	STOOL (C.I. MAINS ONLY)		VALVE INSULATED	D.B.			DIRECTIONAL BORING
P8	PLASTIC POLYETHYLENE (P.E.) PE80B METRIC, (BLACK WITH YELLOW STRIPES)	T.	TEE		FLANGE BLANK	T.P.			TRANSMISSION PIPE
P9	PLASTIC POLYETHYLENE (P.E.) PE100 METRIC, (BLACK WITH ORANGE STRIPES)	T.SP.	TEE SPLIT		INSULATED FITTING	C.T.L.12345			CONSENT TO LAY
P10	PLASTIC POLYETHYLENE (P.E.) PE100 METRIC, (BLACK WITH YELLOW STRIPES)	TH.	THIMBLE		SYPHON	F.L.			FLOOR LEVEL
S2	STEEL	TH.R	THIMBLE REDUCER		PURGE, PRESSURE POINT				PRELAI D GAS SERVICE TO LOTS SHADED GREEN
S3	STEEL COATED & SCREWED	TH.SP.	THIMBLE SPLIT		ENCASING PIPE/INSERTION PIPE				
S4	STEEL COATED & WELDED	TH.SP.B.	THIMBLE SPLIT BOSSED		CONCRETE SLABbing				
S5	STEEL GALVANIZED	TH.SP.F	THIMBLE SPLIT FLANGED		CROSS				
S6	STEEL COATED GIBAUT JOINT	(V)	VERTICAL		INSTRUMENT STATION				
S7	STEEL PLASTIC COATED & WELDED	W.S.	WILLIAMSON SHORT STOPP						
S8	STEEL PLASTIC COATED & SCREWED	W.T.	WILLIAMSON TEE						
S9	STEEL INTERPON FBE COATED								
S10	STEEL NAPGARD FBE COATED								
S11	STEEL (3LPE) TRI LAMINATE COATED								
S15	STEEL HBE COATED								
S20	STEEL WELDED-EXTRUDED POLETHYLENE COATED (T.P.)								
S21	STEEL WELDED-ENAMEL COATED (T.P.)								
S22	STEEL WELDED-FUSION BOND EPOXY COATED (T.P.)								
S23	STEEL WELDED-FUSION BONDED POLYETHYLENE COATED (T.P.)								
S24	STEEL WELDED-(3LPE) TRI LAMINATE COATED (T.P.)								
S25	STEEL WELDED-HBE COATED (T.P.)								
W2	WROUGHT IRON GALVANIZED								
NOTE: FOR MORE INFORMATION REFER LATEST VERSION OF TS2613 FOR "RECORDING OF MAINS INFORMATION ON RECORD PLANS". REFER TS4099 FOR "DEPTH OF COVER FOR GAS MAINS", UNLESS OTHERWISE STATED ON THE MAP OR ON AN ACCOMPANYING M1 DRAWING.						Drawing No. GS-0091646-001			
						Plot Program 5Si-Sp-A3.pcp (Scale To Fit)			

Technical Standard 2607.1 CONDITIONS FOR WORKS NEAR GAS INFRASTRUCTURE (MAINS AND SERVICES)

This information is provided by AusNet, the Gas Distribution Company whose infrastructure may be affected by the proposed works.

AusNet Gas Infrastructure includes:

- Transmission pipelines, gas mains and services operating at pressure tiers ranging from *Low Pressure* to *High Pressure 2*, see table below.

Pressure Tier:	Pressure Range:	Colour Code:		System Pressure:	Conditions of Works:
Low Pressure (LP)	Up to 7 kPa	Black		Distribution	TS 2607.1 and .3
Medium Pressure (MP)	15 to 140 kPa	Green		Distribution	TS 2607.1 and .3
High Pressure1 (HP1)	140 to 515 kPa	Blue		Distribution	TS 2607.1 and .3
High Pressure2 (HP2)	515 to 1050 kPa	Orange		Distribution	TS 2607.1 and .3
Transmission Pressure (TP)	1050 to 2760 kPa	Red		Transmission	TS 2607.2 and .3

- Above and below-ground structures e.g., pressure regulator kiosk or pit and valve pit.
- Corrosion Mitigation equipment e.g., test point, anode bed and cathodic protection unit.
- SCADA and communications equipment e.g., remote terminal unit.

In case of emergency, gas escapes, hit or damaged gas infrastructure call **AusNet 13 67 07**.

It is the responsibility of the person(s) carrying out the works to have the utmost regard for the safety of property and life. To assist in this, AusNet has provided these minimum Conditions for Works which the person(s) carrying out the works must comply with.

NOTE 1

Part of AusNet gas network consists of underground steel pipes and metallic assets protected by a *Cathodic Protection System* (CPS). The CPS could cause 'electrolysis' (stray current corrosion) to proponents buried or submerged metallic structures.

It is important that the proponents undertake their own due diligence in design of installations to account for existing CPS and validate their design is not adversely impacted. For further information please contact AusNet's, Principal Service Provider; *Downer*, engineering team email engenquiries@downergroup.com. *Downer* will advise the proponent of necessary assessments e.g., electrical hazards on metallic pipes to Australian/New Zealand Standard, AS/NZS 4853 and other requirements. These assessments are performed by AusNet's cathodic protection service provider, fees may apply.

NOTE 2

Under no circumstances will AusNet accept liability for the acts or omissions of person(s) carrying out works. If in doubt, contact *Downer*, radio room team; email radioroomgas@downergroup.com or call **(03) 7379 8877**.

- Every care has been taken to ensure 'as-built records' of gas mains shown on Before You Dig Australia (BYDA) Plans, Mains drawings or District Plans is accurate. However, some variations from as-built records may exist and

complete accuracy cannot be guaranteed. AusNet does not accept any responsibility for any inaccuracies of its records.

- The alignment of **HP2 mains is not normally shown** on supplied BYDA plans, Mains Drawings, District Plans or GIS system (SDMG); please contact *Downer*, engineering team, email enquiries@downergroup.com for offset prior to excavation work.
- **Gas Service lines from Gas Mains to consumer premises is not normally shown on 'as-build records' i.e., BYDA Plans, Mains Drawings, District Plans or SDMG.** The location of gas mains and services must be proven by *potholing* (Quality Level A or QL-A as defined by Australian Standard, AS 5488.1 *Subsurface utility information*) by hand digging or *non-destructive digging* (NDD) including use of sensitive vacuum excavation techniques so that any protective external pipe coating is not damaged or destroyed.

The *Gas Industry Act 2001*, *Gas Safety Act 1997* and *Pipelines Act 2005* provides penalties for unauthorised excavation including boring that exposes gas mains and services or tampering with gas infrastructure.

If damage occurs to any property that is owned by AusNet, AusNet will assert its legal rights. These legal rights include, but not limited to seeking compensation for tortious damage to property and asserting statutory rights.

Minimum Conditions for Work Near Gas Mains or Services

1. It is essential that prior to any work being carried out, detailed design plans of the proposed construction work be checked by *Downer*; engineering team; email enquiries@downergroup.com for **impact assessment**. Only after *Downer* have considered and approved the proposal, works commence.
N.B. Proponents are encouraged to submit plans no later than *detailed design stage*. Proponents of large Infrastructure Projects should refer to specific guidance on page 4. Plans submitted after detailed design stage such as *Issued for Construction* (IFC) may involve increased cost, time or delays to proponent if impacting AusNet gas infrastructure.
2. Final construction plans approved by *Downer*, engineering team; together with any relevant gas plans supplied are only to be used for proposed work. BYDA plans is valid for 28 day from date of issue, plans must be renewed for works exceeding 28-days.
3. If the depth of cover above gas mains is to be reduced, *Traffic Loading Calculations* shall be completed by AusNet approved consultants before heavy vehicles is permitted to crossover. Based on proposed calculations a specific crossing (crushed rock ramp or steel road plate) may be installed for heavy vehicle traffic.
4. It is the responsibility of the person(s) undertaking works to locate **mains and services** by *potholing* (Quality Level A or QL-A as defined by AS 5488.1) prior to the commencement of works by hand digging or NDD including use of sensitive vacuum excavation techniques so that any protective external pipe coating is not damaged or destroyed. Damage to protective coating on steel pipes or steel pipe itself can with time, create a hazardous situation. If damage does occur, it must be reported to **AusNet** call **13 67 07**. If gas mains cannot be located within 1.5 metres either side of as-built records or communicated location, contact *Downer*; radio room team; email radioroomgas@downergroup.com or call **(03) 7379 8877**.
5. For works near gas mains or services operating at **LP to HP1** pressure tiers, onsite location assistance can be requested at least 2 working days prior to commencement of planned works, contact *Downer*, radio room team, radioroomgas@downergroup.com or call **(03) 7379 8877**. After hours location assistance call **AusNet 13 67 07**. **NB:** The proponent should use their own Service Locator or engage a suitable Service Location contractor when large areas of subsurface utility identification is required.

6. For works near **HP2 gas mains**, the proponent must engage onsite location/assistance contact *Downer*, radio room team, email **radioroomgas@downergroup.com** or call **(03) 7379 8877** at least 2 working days prior to commencement of planned works.
7. Planting of vegetation and trees near gas mains shall be in accordance with *TS 4156 Policy Vegetation and of Trees Near Gas Mains, Compounds and Licensed Transmission Pipelines*.
8. The use of explosives (blasting) near gas mains and services must be in accordance with AS 2187.2 and TS 2607.3 *Conditions for the use of explosives near transmission pipelines and mains*.

Minimum Clearances (guide only) for Design and Construction of Gas Mains:

As an aid to your design and/or construction, the following minimum clearances from AusNet gas mains are necessary and shall be observed: (distances stated are from edge of gas pipe to edge of installation)

- 150mm when crossing gas mains with installations up to 1500 mm wide or Outside Diameter (OD).
- 300 mm when crossing gas mains with installations greater than 1500 mm wide or OD.
- 300 mm when installations are laid parallel to gas mains.
- 500 mm between all gas mains and earthing stakes.
- 300 mm between bottom of road boxing from existing level and the top of gas mains.
- 500 mm between electrical underground cables laid parallel to gas pipe larger than 32 mm OD and up to 250 mm OD. Where this is not possible, or the gas pipe is above 250 mm OD, the matter must be referred to *Downer*; engineering team.
- 300 mm between electrical underground cables laid parallel to gas pipe 32mm OD or less.
- 300mm between the bottom of a standard concrete driveway crossover or footpath, and the top of a gas main. Double reinforced heavy vehicle driveways over gas mains not permitted, unless approved by *Downer*, engineering team.
- 1000mm between gas main and Back of Kerb (BOK).

Minimum Clearances (guide only) for Design and Construction of Gas Services:

As an aid to your design and/or construction, the following minimum clearances from AusNet gas services are necessary and shall be observed: (distances stated are from edge of gas pipe to edge of installation)

- 300 mm when any installation less than 40 mm OD (except electrical cables and TP Services), is laid parallel to a gas service. For installations of 40mm OD or greater, the minimum clearance requirements must be approved by *Downer*, engineering team.
- 500 mm between gas services and earthing stakes.
- 300 mm between the bottom of road boxing and the top of a gas service.
- 150 mm in vertical distance to any installation (except electrical cables and TP Services).
- 300 mm between electrical underground cables laid parallel to a gas service.
- 300mm between the bottom of a concrete driveway crossover or footpath, and the top of a gas service pipe. Double reinforced heavy vehicle driveways over gas services not permitted, unless approved by *Downer*, engineering team.

NOTE 3

Any variations from the above minimum clearances and particularly in relation to, multiple utility assets in shared or common trenches, must be approved by AusNet.

NOTE 4

No auger drilling is allowed within 1.0m from gas infrastructure without the use of vibration monitoring equipment. A maximum vibration limit of 20mm/sec is permitted towards gas infrastructure, no relaxation maximum vibration limit will be given, unless approved by AusNet. Refer to *TS 2607.3 Conditions for the use of explosives near gas transmission pipelines and mains* for further detail.

NOTE 5

No vibration compaction or padfoot rollers is allowed within 1.0m from gas infrastructure, unless approved by *Downer*; engineering team.

NOTE 6

No *building* (as defined by the *Building Act 1993*) is permitted within one metre of a gas main without prior AusNet approval.

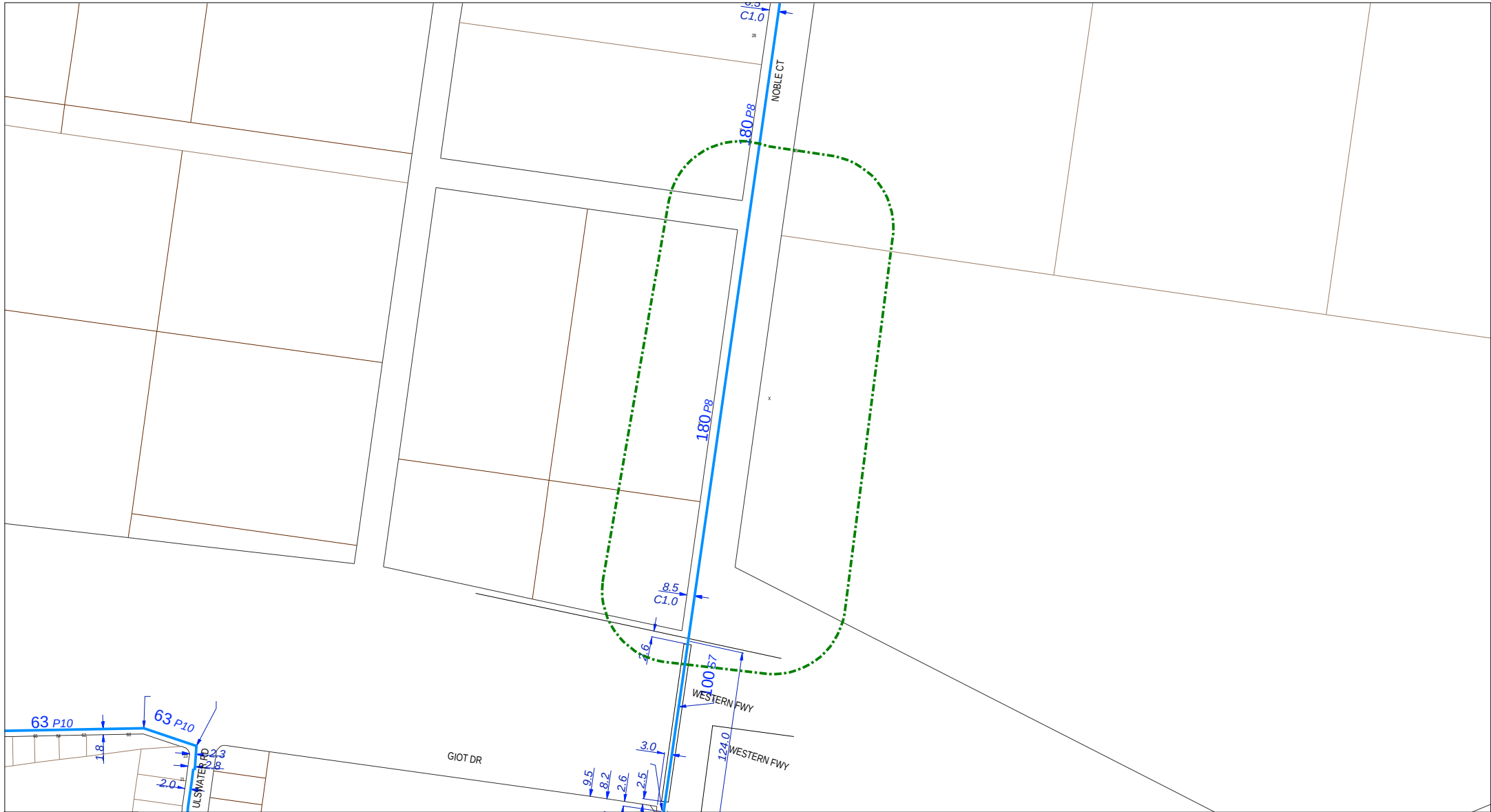
NOTE 7

Where an easement overlay exists in favour of AusNet, applications for proposed *building* or *structures* will be reviewed as per *TS 4076 Gas Easement Requirements* for gas mains and services operating at LP to HP1 pressure tiers. Easements with gas mains and services operating at HP2 pressure tier will be reviewed as per *TS 4078 Management of Transmission Pipeline Easements*. AusNet at its discretion may issue a *build over approval* letter for agreed buildings or structures over easement.

Guidance for Infrastructure Projects

It is recommended proponents of large infrastructure projects that may impact existing AusNet gas infrastructure:

1. Contact *Downer*, engineering team; email **engquiries@downergroup.com** as early as possible to discuss potential project impacts.
2. The proponent present detail of proposal for initial review and comment to *Downer*; engineering team.
3. Depending on potential project impacts, the proponent should allow additional time and cost for the following activities, but not limited to:
 - Gas network planning and design e.g., mains extension, alteration, or augmentation.
 - Conducting of necessary safety studies and integrity assessments e.g., *Formal Safety Assessment (FSA)* as per requirements of *AS/NZS 4645.1 Gas distribution networks*, assessment of electrical hazards on metallic pipes to *AS/NZS 4853*, *coating fault surveys*, *traffic loading calculations* etc. Actions or recommendations from assessments must be closed to satisfaction of AusNet.
 - Statutory consents and land access negotiation including easements where required.
 - *Build over easement* approval from AusNet.
 - Construction or decommissioning of gas infrastructure.
4. The proponent must submit detailed designs for **impact assessment** by *Downer*; engineering team and AusNet endorsement.



NOTE: AusNet Services has taken care to ensure that the locations of Gas Mains shown on this plan are accurate however some variations from records do exist and complete accuracy is not guaranteed. It is essential that the position of pipes be proved on site by hand excavation. AusNet Services shall not be liable for any loss damage claim or demand incurred either directly or indirectly resulting from any act or omission which was made in reliance in whole or in part upon this plan.

Warning - Take Precautions if Printing this Plot in Black & White.
All planned mains shall be treated as live mains, as mains under pressure may be in existence.

- Gas Transmission Pipeline
- Gas Distribution Mains
- Planned Gas Assets
- Abandoned Gas Assets
- Requested Area

Technical Standard 2607.3

CONDITIONS FOR THE USE OF EXPLOSIVES NEAR GAS TRANSMISSION PIPELINES AND MAINS

This information is provided by AusNet, the Gas Distribution Company whose infrastructure may be affected by the proposed works.

Ausnet Gas Infrastructure includes:

- Transmission pipelines, gas supply mains and services operating at *High Pressure*2 to *Low Pressure*, pressure tiers, see table.

Pressure Tier:	Pressure Range:	Colour Code:		System Pressure:	Conditions of Works:
Transmission Pressure (TP)	1050 to 2760 kPa	Red		Transmission	TS 2607.2 and .3
High Pressure2 (HP2)	515 to 1050 kPa	Orange		Distribution	TS 2607.1 and .3
High Pressure1 (HP1)	140 to 515 kPa	Blue		Distribution	TS 2607.1 and .3
Medium Pressure (MP)	15 to 140 kPa	Green		Distribution	TS 2607.1 and .3
Low Pressure (LP)	Up to 7 kPa	Black		Distribution	TS 2607.1 and .3

- Corrosion Mitigation equipment e.g., test point, anode bed and cathodic protection unit.
- Above and below ground structures e.g., pressure regulator Kiosk or pit, and valve pit.
- SCADA and communications equipment e.g., remote terminal unit.

It is the responsibility of person(s) carrying out work which may cause *earth movement* or *ground vibrations* e.g., seismic work, earthworks, pile driving, rock breaking and use of explosives (blasting) towards AusNet gas infrastructure to have the utmost regard for the safety of property and life. To assist in this, AusNet provides these minimum Conditions for Use which must be complied with by the person(s) which may generate *earth movement* or *ground vibrations* towards AusNet gas infrastructure.

In case of emergency, gas escapes, hit or damaged gas infrastructure call **AusNet 13 67 07**.

Under no circumstances will AusNet accept liability for the acts or omissions of person(s) carrying out work generating ground vibrations including blasting towards AusNet gas infrastructure. If in doubt contact AusNet Principal Service Provider, *Downer*; engineering team; email enginquiries@downergroup.com or *Downer*; radio room team; call **(03) 7379 8877**.

If damage occurs to gas infrastructure, AusNet will assert its legal rights. These legal rights include, but are not limited to:

- Seeking compensation for tortious damage to property; and
- Asserting statutory entitlements, including prosecution under the *Pipelines Act 2005* or *Gas Safety Act 1997*.

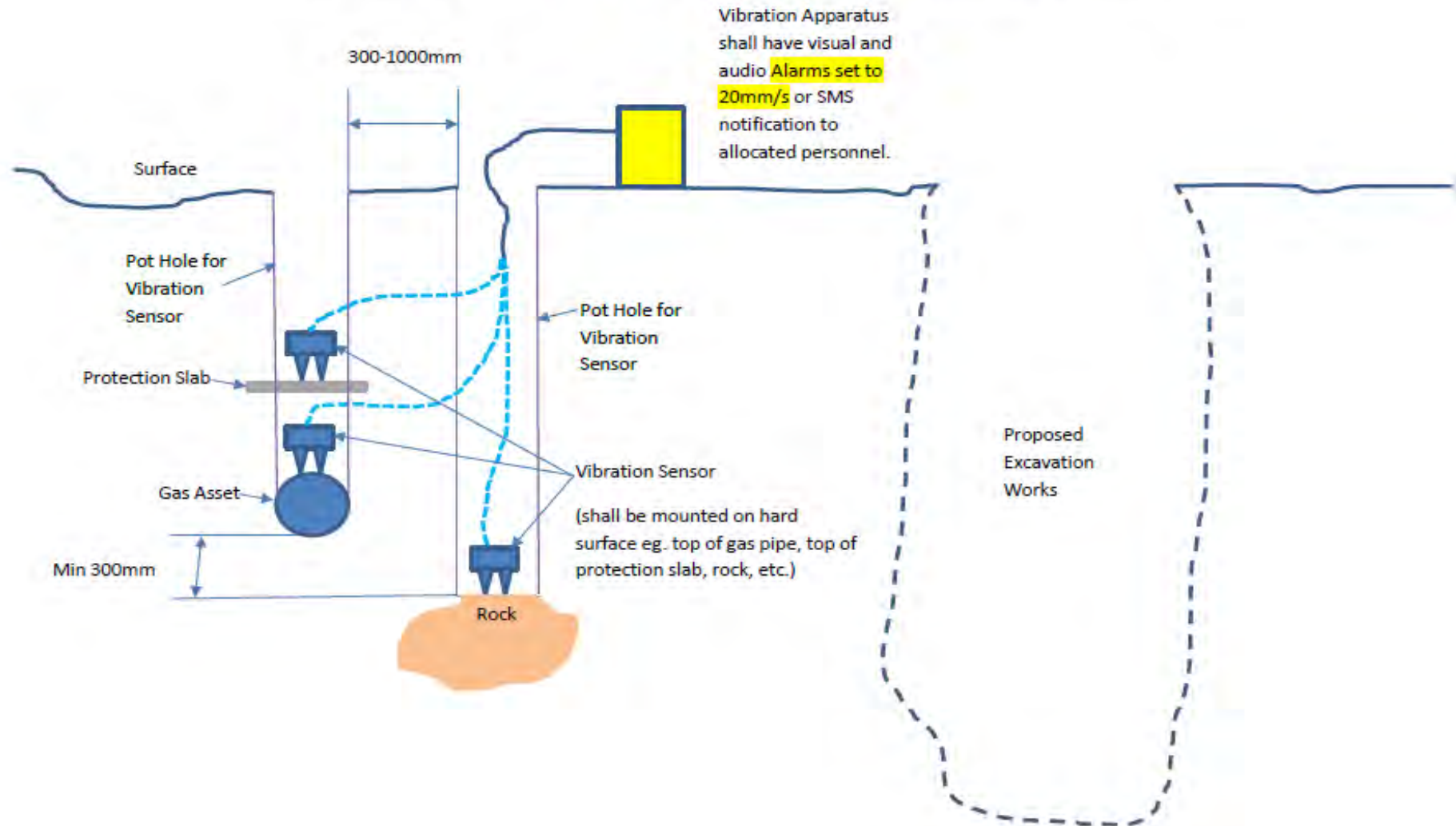
Minimum Conditions for the use of Explosives near Gas Transmission Pipelines and Mains

- In all cases activities generating *earth movement* or *ground vibrations* towards AusNet gas infrastructure must be arranged to limit ground vibrations so that the peak particle velocity does not exceed 20mm/sec at any point on AusNet gas infrastructure (as mentioned above). No relaxation of this requirement will be permitted without AusNet approval. A Vibration Monitoring Plan including real time monitoring and alerts for exceedance of 20mm/sec is provided to *Downer*, engineering team, email enginquiries@downergroup.com may be required.

As a guide:

- a) The placement of vibration sensors and equipment is shown on page 3.
 - b) Please, take photos of the sensor set-up and email to *Downer*, engineering team, email **engenquiries@downergroup.com** for review.
 - c) Complete Sensor Register see example on page 4.
 - d) Collected vibration data and associated graph shall be obtained at the end of shift or working day and email to *Downer*, engineering team, email **engenquiries@downergroup.com** for review.
2. In all cases where explosives are to be used within 50 metres of AusNet gas infrastructure, a minimum of five (5) business days' notice must be given to *Downer*; engineering team; email **engenquiries@downergroup.com** together with a ground vibration and design aspects report of proposed blasting. Blasting must not proceed until approval is given by *Downer*.
 3. No explosives are to be used within a 50-metre radius of a gas transmission pipeline or main without approval of *Downer*, engineering team, email **engenquiries@downergroup.com**.
 4. Blasting shall be in accordance with the Australian Standard, AS 2187.
 5. The person who is using the explosives on the site must be a holder of a current permit to use explosives issued under Australian Standard, AS 2187 Explosives - Storage, transport, and use.
 6. Heavy coir or other approved matting must be used to cover the entire explosives area.
 7. "Cordtex" or other detonating type fuses must not cross the line of a gas transmission pipeline or gas mains if cover is less than 500mm.
 8. Carriers containing explosives must not be left within 10 metres of a gas transmission pipeline or gas mains during blasting operations.

LOCATION/S OF VIBRATION SENSOR DURING EXCAVATION WORKS



Vibration Sensor Locations									
No.	Vibration Sensor Type	SMS nick name (e.g., 'TEXCEL E7474 EVENT')	Site Location	Distance from nearest Gas Infrastructure	Date of Install	Name of Site Contact	Site Contact Mobile no.	Date of Removal	Comments
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									
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19.									
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21.									
22.									
23.									
24.									
25.									
26.									
27.									

Referral
257011027

Member Phone
(03) 5320 5500

Responses from this member

Response received Wed 25 Jun 2025 11.24am

File name	Page
Response Body	26
257011027.pdf	27

To: Chris Ford RE: Before You Dig Australia (BYDA) REFERRAL NOTIFICATION FROM THE CITY OF BALLARAT Sequence No: 257011027 Enquiry Date: 25/06/2025 Commencement Date: 27/06/2025 Completion Date: 27/06/2025 Thank you for the above enquiry. Please find attached the "257011027.pdf" which overviews your proposed work area in association with City of Ballarat's assets. Please note that this communication, including any attachments, is confidential. If you are not the intended recipient, you should not read it please contact us immediately, destroy it, and do not copy or use any part of this communication.

PO Box 665
Ballarat, VIC, 3350
03 5320 5500
dbyd@ballarat.vic.gov.au

To:

Chris Ford
27 Storrer Avenue
Torquay VIC 3228

Enquiry Details	
Utility ID	20570
Sequence Number	257011027
Enquiry Date	25/06/2025 11:24
Response	NOT AFFECTED
Address	35 Noble Court Mount Rowan
Location in Road	
Activity	Planning and Design

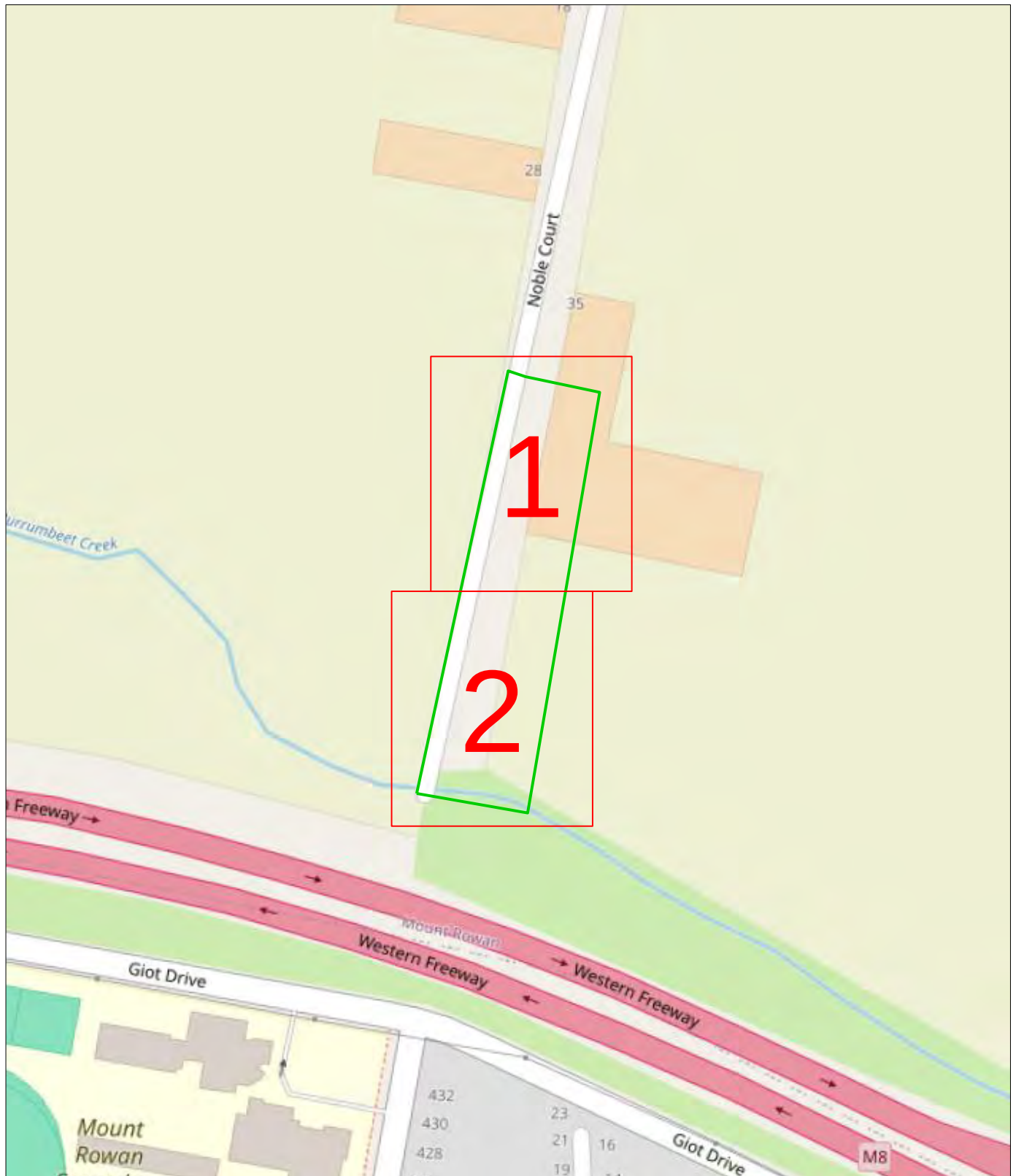
Enquirer Details	
Customer ID	3177629
Contact	C [REDACTED]
Company	
Email	[REDACTED] [REDACTED]
Phone	[REDACTED]

Disclaimer

Whilst every care is taken by the City of Ballarat to ensure the accuracy of this data, BCC makes no representation or warranties about the accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and liability for any expenses, losses, damages and costs that may be incurred as a result of the use of this data. **Exact positions of all assets must be confirmed on-site using suitably qualified and licensed contractors.**

Notes

1. The information in this document is only valid until midnight on the expiry date shown above.
2. The information supplied is of a general nature only.
3. The information in this document and attachments is intended for the use of the addressee only. Any other use is strictly prohibited.
4. If you have received this document in error, please inform us by telephone or email and destroy this document.
5. Council does not provide a field location service.
6. Work on public land may need a permit from the owner or manager of the land.



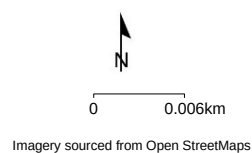
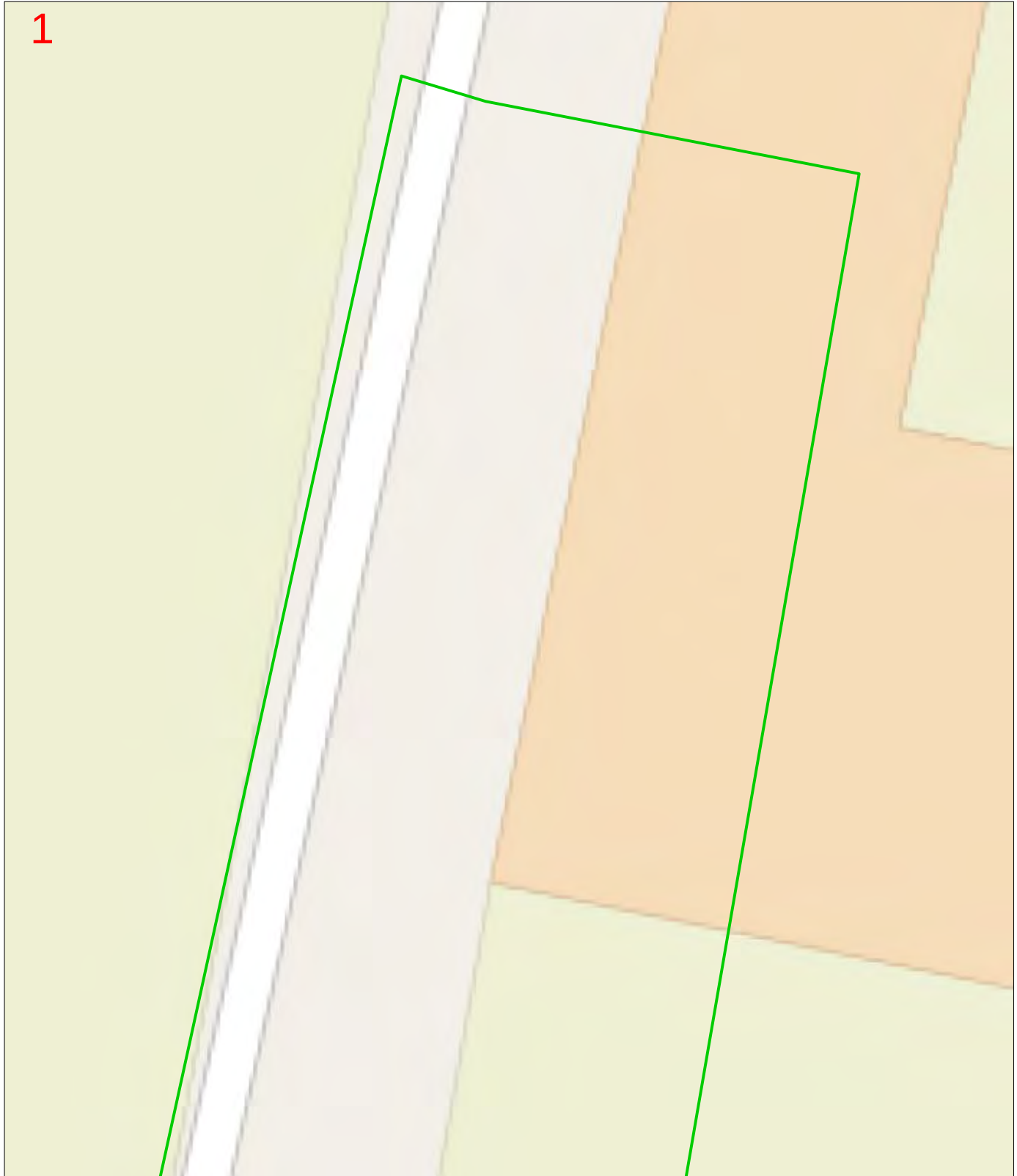
LEGEND:



Detail Map

Affected BYDA
Work Area

Imagery sourced from Open StreetMaps

**LEGEND:**

- Not Affected
- BYDA Work Area
- Footpath



Tree



Drainage

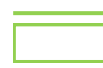


Reserve



Council Boundary

**LEGEND:**

-  Not Affected
-  BYDA Work Area
-  Footpath



Tree



Drainage



Reserve



Council Boundary



0 0.006km

Imagery sourced from Open StreetMaps

Referral

257011021

Member Phone

1800 061 514

Responses from this member

Response received Wed 25 Jun 2025 11.24am

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ASSET 257011021.pdf	34

25 June 2025



RE: Before You Dig Request – Assets Impacted

Site location: 35 Noble Court, Mount Rowan VIC 3352
Sequence No: 257011021
Job No: 50505592

We have received your request through the 1100 Before You Dig (BYDA) service for drawings showing all Central Highlands Water sewer and water assets. These plans are attached.

This information is supplied in good faith and is indicative only. The plans are subject to field verification and the following two points must be noted:

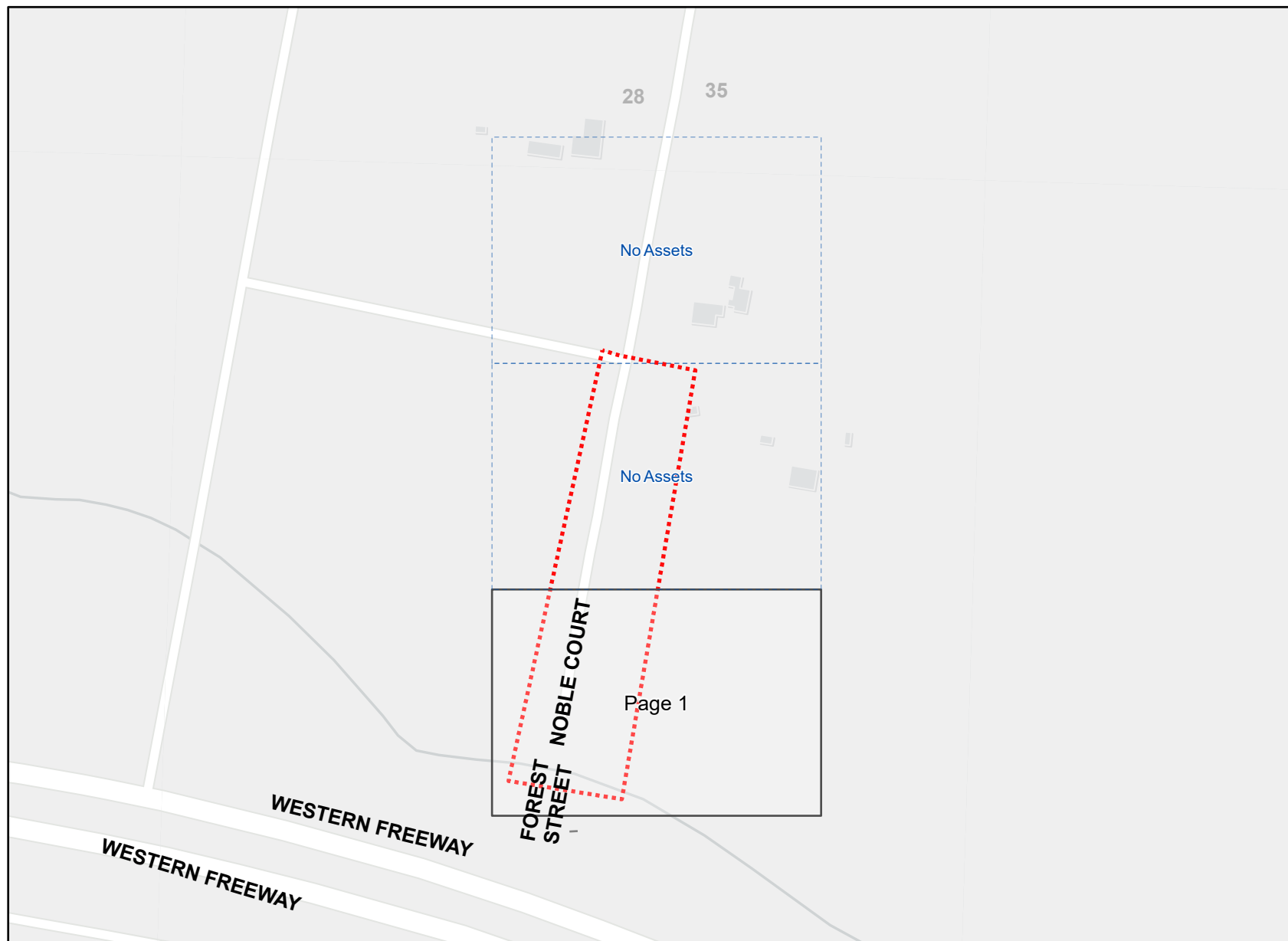
- **Important:** Abandoned pipes may contain asbestos cement and/or fibro cement. Special work and handling procedures to deal with these potentially hazardous materials are required. Metallic water mains and associated fittings may pose an electrocution hazard if electrical earth wires have been connected to the property service or water main. The contractor shall ensure that adequate electrical testing is carried out prior to working on these mains. If a positive reading is recorded, the contractor shall cease all works and notify the relevant power distributor, the customer and Central Highlands Water.
- **Disclaimer:** The plans accompanying this letter are issued solely for asset identification purposes and should not be used for any other purpose. Central Highlands Water provides the information it has available to it on sewer and water assets but does not guarantee, and accepts no responsibility or liability for the currency, accuracy or completeness of the information, or for any actions taken or not taken, including excavation, by any person in reliance on or otherwise in connection with the information, regardless of the cause of action, whether in contract, tort (including negligence) or otherwise. The information is provided "as is" and the location of all assets identified in the plans must be proven on site (by manual digging) prior to the commencement of any works or use of machine excavators.

It is important that all attached material is clearly read before proceeding with any works. For additional assistance please contact Central Highlands Water on **1800 061 514**.



Central Highlands Region Water Corporation
7 Learmonth Rd Wendouree VIC 3355 PO Box 152
Ballarat VIC 3353
T: 1800 061 514 F: 03 5320 3299 E:
customerenquiries@chw.net.au ABN: 75 224 340 348

chw.net.au



- Legend**
- BYDA Enquiry
 - Detailed map page
 - No dig site assets

Esri Community Maps Contributors, Vicmap, ©
OpenStreetMap, Microsoft, Esri, TomTom, Garmin,

Central Highlands Water has taken care to ensure that the information shown on this plan is accurate, however, complete accuracy cannot be guaranteed. The position of assets should be proven through field survey and hand excavation prior to any works. It is an offence to destroy, damage, alter or in any way interfere with any works or property of CHW (Water Act, 1989 Section 288)



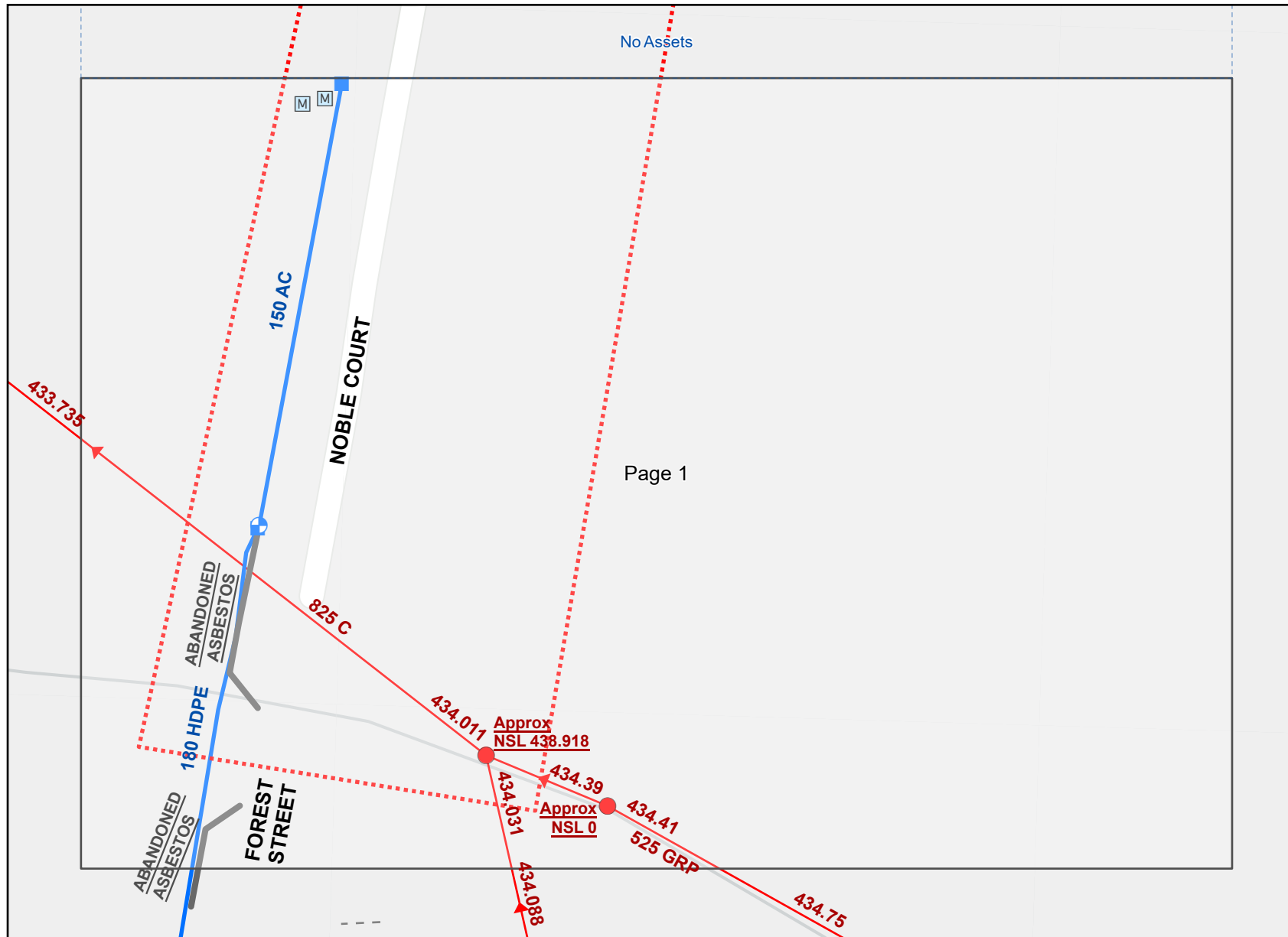
CENTRAL
HIGHLANDS
WATER

Job # 50505592

Seq # 257011021

Provider: Central Highlands Water

Telephone: 1800 061 514



Legend

BYDA Enquiry

Water Fittings

- Water meter location
- Water valve
- Fire plug

Sewerage Fittings

- Sewerage manholes

Water Mains

- Abandoned AC water mains
- CLEAR

Sewerage Mains

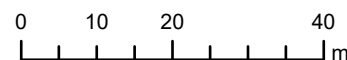
unitttype

- Gravity Sewer

Esri Community Maps Contributors, Vicmap, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, METI/NASA, USGS

Central Highlands Water has taken care to ensure that the information shown on this plan is accurate, however, complete accuracy cannot be guaranteed. The position of assets should be proven through field survey and hand excavation prior to any works. It is an offence to destroy, damage, alter or in any way interfere with any works or property of CHW (Water Act, 1989 Section 288)

In an emergency contact Central Highlands Water on 1800 061 514
25/06/25 (valid for 14 days (2 weeks))



Scale 1:1,000



Plans generated by
SmarterWX™ Automate

Referral
257011025

Member Phone
1800 687 626

Responses from this member

Response received Wed 25 Jun 2025 11.36am

File name	Page
Response Body	37
Disclaimer_257011025_20250625_013524212309.pdf	38
4678_NBN_Dial_Before_You_Dig_Poster_20170517.pdf	42
257011025_20250625_013524212309_1.pdf	44

Hi Chris Ford,

Please find attached the response to your DBYD referral for the address mentioned in the subject line. The location shown in our DBYD response is assumed based off the information you have provided. If the location shown is different to the location of the excavation then this response will consequently be rendered invalid.

Take the time to read the response carefully and note that this information is only valid for 28 days after the date of issue.

If you have any further enquiries, please do not hesitate to contact us.

Regards,
Network Services and Operations
NBN Co Limited
P: 1800626329
E: dbyd@nbnco.com.au
www.nbnco.com.au

Confidentiality and Privilege Notice

This e-mail is intended only to be read or used by the addressee. It is confidential and may contain legally privileged information. If you are not the addressee indicated in this message (or responsible for delivery of the message to such person), you may not copy or deliver this message to anyone, and you should destroy this message and kindly notify the sender by reply e-mail. Confidentiality and legal privilege are not waived or lost by reason of mistaken delivery to you. Any views expressed in this message are those of the individual sender, except where the sender specifically states them to be the views of NBN Co Limited

Please Do Not Reply To This Mail

To: [REDACTED]
Phone: Not Supplied
Fax: Not Supplied
Email: c [REDACTED]

Before You Dig Australia Job #:	50505592	
Sequence #	257011025	
Issue Date:	25/06/2025	
Location:	35 Noble Court , Mount Rowan , VIC , 3352	

Information

The area of interest requested by you contains one or more assets.

nbn™ Assets	Search Results
Communications	Asset identified
Electricity	No assets

In this notice **nbn™ Facilities** means *underground fibre optic, telecommunications and/or power facilities, including but not limited to cables, owned and controlled by nbn™*

Location of nbn™ Underground Assets

We thank you for your enquiry. In relation to your enquiry at the above address:

- **nbn's** records indicate that there **ARE nbn™** Facilities in the vicinity of the location identified above ("Location").
- **nbn** indicative plan/s are attached with this notice ("Indicative Plans").
- The Indicative Plan/s show general depth and alignment information only and are not an exact, scale or accurate depiction of the location, depth and alignment of **nbn™** Facilities shown on the Plan/s.
- In particular, the fact that the Indicative Plans show that a facility is installed in a straight line, or at uniform depth along its length cannot be relied upon as evidence that the facility is, in fact, installed in a straight line or at uniform depth.
- You should read the Indicative Plans in conjunction with this notice and in particular, the notes below.
- You should note that, at the present time, the Indicative Plans are likely to be more accurate in showing location of fibre optics and telecommunications cables than power cables. There may be a variation between the line depicted on the Indicative Plans and the location of any power cables. As such, consistent with the notes below, particular care must be taken by you to make your own enquiries and investigations to precisely locate any power cables and manage the risk arising from such cables accordingly.
- The information contained in the Indicative Plan/s is valid for 28 days from the date of issue set out above. You are expected to make your own inquiries and perform your own investigations (including engaging appropriately qualified plant locators, e.g BYDA Certified Locators, at your cost to locate **nbn™** Facilities during any activities you carry out on site).

We thank you for your enquiry and appreciate your continued use of the Before You Dig Australia Service. For any enquiries related to moving assets or Planning and Design activities, please visit the **nbn Commercial Works** website to complete the online application form. If you are planning to excavate and require further information, please email dbyd@nbnco.com.au or call 1800 626 329.

Notes:

1. You are now aware that there are **nbn™** Facilities in the vicinity of the above property that could be damaged as a result activities carried out (or proposed to be carried out) by you in the vicinity of the Location.
2. You should have regard to section 474.6 and 474.7 of the *Criminal Code Act 1995* (CoA) which deals with the consequences of interfering or tampering with a telecommunications facility. Only persons authorised by **nbn** can interact with **nbn's** network facilities.
3. Any information provided is valid only for **28 days** from the date of issue set out above.

Referral Conditions

The following are conditions on which **nbn** provides you with the Indicative Plans. By accepting the plans, you are agreeing to these conditions. These conditions are in addition, and not in replacement of, any duties and obligations you have under applicable law.

1. **nbn** does not accept any responsibility for any inaccuracies of its plans including the Indicative Plans. You are expected to make your own inquiries and perform your own investigations (including engaging appropriately qualified plant locators, e.g BYDA Certified Locators, at your cost to locate **nbn™** Facilities during any activities you carry out on site).
2. You acknowledge that **nbn** has specifically notified you above that the Indicative Plans are likely to be more accurate in showing location of fibre optics and telecommunications cables than power cables. There may be a variation between the line depicted on the Indicative Plans and the location of any power cables.
3. You should not assume that **nbn™** Facilities follow straight lines or are installed at uniform depths

along their lengths, even if they are indicated on plans provided to you. Careful onsite investigations are essential to locate the exact position of cables.

4. In carrying out any works in the vicinity of **nbn**™ Facilities, you must maintain the following minimum clearances:
 - 300mm when laying assets inline, horizontally or vertically.
 - 500mm when operating vibrating equipment, for example: jackhammers or vibrating plates.
 - 1000mm when operating mechanical excavators.
 - Adherence to clearances as directed by other asset owner's instructions and take into account any uncertainty for power cables.
5. You are aware that there are inherent risks and dangers associated with carrying out work in the vicinity of underground facilities (such as **nbn**™ fibre optic, copper and coaxial cables, and power cable feed to **nbn**™ assets). Damage to underground electric cables may result in:
 - Injury from electric shock or severe burns, with the possibility of death.
 - Interruption of the electricity supply to wide areas of the city.
 - Damage to your excavating plant.
 - Responsibility for the cost of repairs.
6. You must take all reasonable precautions to avoid damaging **nbn**™ Facilities. These precautions may include but not limited to the following:
 - All excavation sites should be examined for underground cables by careful hand excavation. Cable cover slabs if present must not be disturbed. Hand excavation needs to be undertaken with extreme care to minimise the likelihood of damage to the cable, for example: the blades of hand equipment should be aligned parallel to the line of the cable rather than digging across the cable.
 - If any undisclosed underground cables are located, notify **nbn** immediately.
 - All personnel must be properly briefed, particularly those associated with the use of earth-moving equipment, trenching, boring and pneumatic equipment.
 - The safety of the public and other workers must be ensured.
 - All excavations must be undertaken in accordance with all relevant legislation and regulations.
7. You will be responsible for all damage to **nbn**™ Facilities that are connected whether directly, or indirectly with work you carry out (or work that is carried out for you or on your behalf) at the Location. This will include, without limitation, all losses expenses incurred by **nbn** as a result of any such damage.
8. You must immediately report any damage to the **nbn**™ network that you are/become aware of. Notification may be by telephone - 1800 626 329.
9. Except to the extent that liability may not be capable of lawful exclusion, **nbn** and its servants and agents and the related bodies corporate of **nbn** and their servants and agents shall be under no liability whatsoever to any person for any loss or damage (including indirect or consequential loss or damage) however caused (including, without limitation, breach of contract negligence and/or breach of statute) which may be suffered or incurred from or in connection with this information sheet or any plans (including Indicative Plans) attached hereto. Except as expressly provided to the contrary in this information sheet or the attached plans (including Indicative Plans), all terms, conditions, warranties, undertakings or representations (whether expressed or implied) are excluded to the fullest extent permitted by law.

All works undertaken shall be in accordance with all relevant legislations, acts and regulations applicable to the particular state or territory of the Location. The following table lists all relevant documents that shall be considered and adhered to.

State/Territory	Documents
National	Work Health and Safety Act 2011
	Work Health and Safety Regulations 2011
	Safe Work Australia - Working in the Vicinity of Overhead and Underground Electric Lines (Draft)

	Occupational Health and Safety Act 1991
NSW	Electricity Supply Act 1995
	Work Cover NSW - Work Near Underground Assets Guide
	Work Cover NSW - Excavation Work: Code of Practice
VIC	Electricity Safety Act 1998
	Electricity Safety (Network Asset) Regulations 1999
QLD	Electrical Safety Act 2002
	Code of Practice for Working Near Exposed Live Parts
SA	Electricity Act 1996
TAS	Tasmanian Electricity Supply Industry Act 1995
WA	Electricity Act 1945
	Electricity Regulations 1947
NT	Electricity Reform Act 2005
	Electricity Reform (Safety and Technical) Regulations 2005
ACT	Electricity Act 1971

Thank You,

nbn BYDA

Date: 25/06/2025

This document is provided for information purposes only. This document is subject to the information classification set out on this page. If no information classification has been included, this document must be treated as UNCLASSIFIED, SENSITIVE and must not be disclosed other than with the consent of nbn co. The recipient (including third parties) must make and rely on their own inquiries as to the currency, accuracy and completeness of the information contained herein and must not use this document other than with the consent of nbn co.

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Working near **nbn**TM cables

nbn has partnered with Dial Before You Dig to give you a single point of contact to get information about **nbn** underground services owned by **nbn** and other utility/service providers in your area including communications, electricity, gas and other services. Contact with underground power cables and gas services can result in serious injury to the worker, and damage and costly repairs. You must familiarise yourself with all of the Referral Conditions (meaning the referral conditions referred to in the DBYD Notice provided by **nbn**).

Practice safe work habits

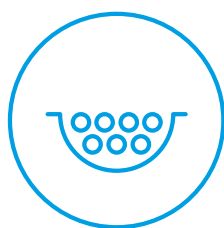
Once the DBYD plans are reviewed, the Five P's of Excavation should be adopted in conjunction with your safe work practices (which must be compliant with the relevant state Electrical Safety Act and Safe Work Australia "Excavation Work Code of Practice", as a minimum) to ensure the risk of any contact with underground **nbn** assets are minimised.



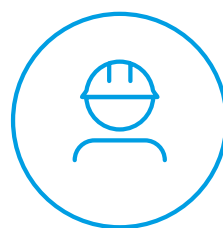
Plan: Plan your job by ensuring the plans received are current and apply to the work to be performed. Also check for any visual cues that may indicate the presence of services not covered in the DBYD plans.



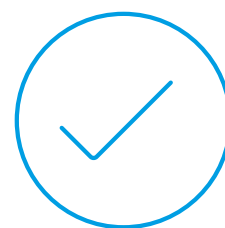
Prepare: Prepare for your job by engaging a DBYD Certified Plant Locator to help interpret plans and identify on-site assets. Contact **nbn** should you require further assistance.



Pothole: Non-destructive potholing (i.e. hand digging or hydro excavation) should be used to positively locate **nbn** underground assets with minimal risk of contact and service damage.

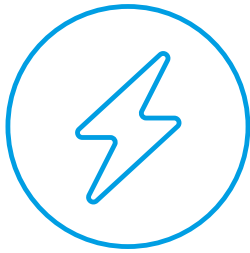


Protect: Protecting and supporting the exposed **nbn** underground asset is the responsibility of the worker. Exclusion zones for **nbn** assets are clearly stated in the plan and appropriate controls must be implemented to ensure that encroachment into the exclusion zone by machinery or activities with the potential to damage the asset is prevented.

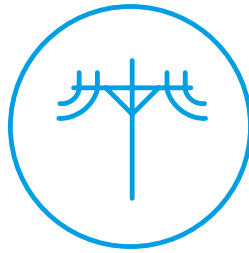


Proceed: Proceed only when the appropriate planning, preparation, potholing and protective measures are in place.

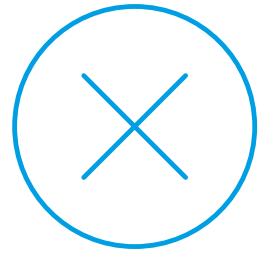
Working near **nbn**[™] cables



Identify all electrical hazards, assess the risks and establish control measures.



When using excavators and other machinery, also check the location of overhead power lines.



Workers and equipment must maintain safety exclusion zones around power lines.

Once all work is completed, the excavation should be re-instated with the same type of excavated material unless specified by **nbn**. Please note:

- Construction Partners of **nbn** may require additional controls to be in place when performing excavation activities.
- The information contained within this pamphlet must be used in conjunction with other material supplied as part of this request for information to adequately control the risk of potential asset damage.

Contact

All **nbn**[™] network facility damages must be reported online [here](#).
For enquiries related to your DBYD request please call 1800 626 329.

Disclaimer

This brochure is a guide only. It does not address all the matters you need to consider when working near our cables. You must familiarise yourself with other material provided (including the Referral Conditions) and make your own inquiries as appropriate.

nbn will not be liable or responsible for any loss, damage or costs incurred as a result of reliance on this brochure.

This document is provided for information purposes only. This document is subject to the information classification set out on this page. If no information classification has been included, this document must be treated as UNCLASSIFIED, SENSITIVE and must not be disclosed other than with the consent of nbn co. The recipient (including third parties) must make and rely on their own inquiries as to the currency, accuracy and completeness of the information contained herein and must not use this document other than with the consent of nbn co. Copyright © 2021 nbn co limited. All rights reserved.



To: [REDACTED]
Phone: Not Supplied
Fax: Not Supplied
Email: [REDACTED]

Dial before you dig Job #:	50505592	
Sequence #	257011025	
Issue Date:	25/06/2025	
Location:	35 Noble Court , Mount Rowan , VIC , 3352	

Indicative Plans are tiled below to demonstrate how to layout and read nbn asset plans

1

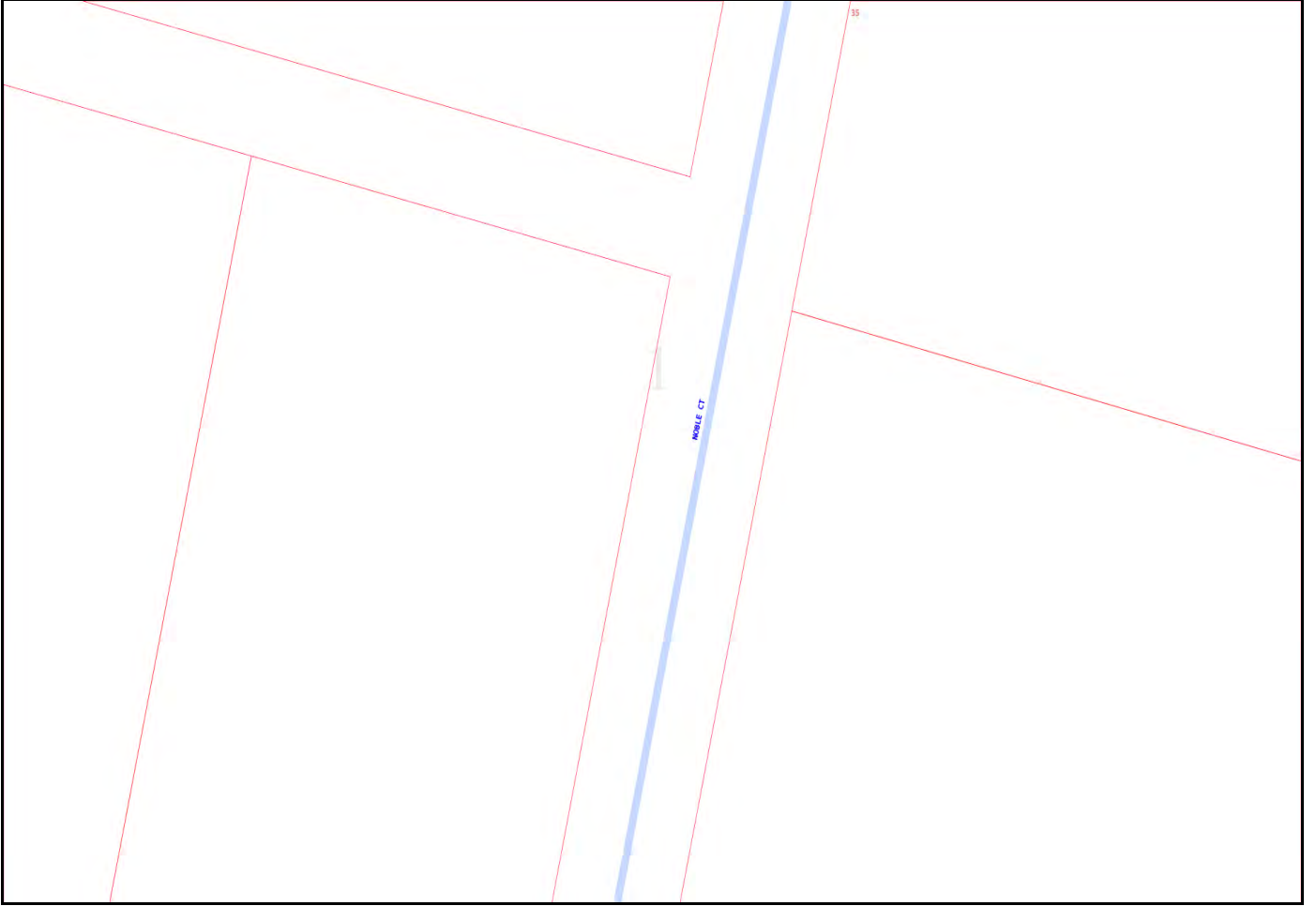
2

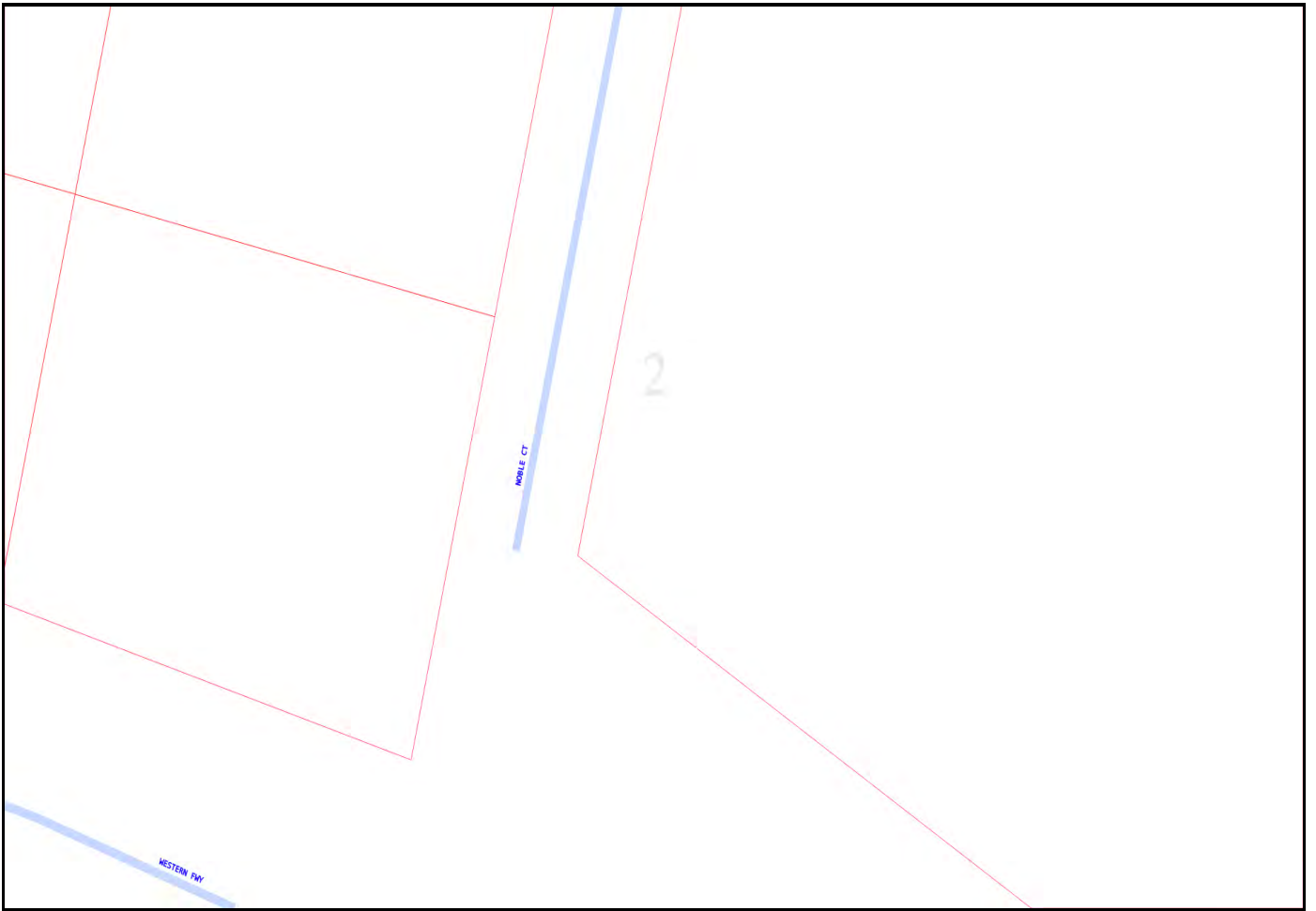


LEGEND



	Parcel and the location
	Pit with size "5"
	Power Pit with size "2E". Valid PIT Size: e.g. 2E, 5E, 6E, 8E, 9E, E, null.
	Manhole
	Pillar
	Cable count of trench is 2. One "Other size" PVC conduit (PO) owned by Telstra (-T-), between pits of sizes, "5" and "9" are 25.0m apart. One 40mm PVC conduit (P40) owned by NBN, between pits of sizes, "5" and "9" are 20.0m apart.
	2 Direct buried cables between pits of sizes, "5" and "9" are 10.0m apart.
	Trench containing any INSERVICE/CONSTRUCTED (Copper/RF/Fibre) cables.
	Trench containing only DESIGNED/PLANNED (Copper/RF/Fibre/Power) cables.
	Trench containing any INSERVICE/CONSTRUCTED (Power) cables.
	Road and the street name "Broadway ST"
Scale	0 20 40 60 Meters 1:2000 1 cm equals 20 m





Emergency Contacts

You must immediately report any damage to the **nbn**[™] network that you are/become aware of. Notification may be by telephone - 1800 626 329.

Referral
257011022

Member Phone
13 22 06

Responses from this member

Response received Wed 25 Jun 2025 1.09pm

File name	Page
Response Body	49
257011022 - Citipower Powercor Overview Plan.pdf	50
257011022 - Citipower Powercor Response letter.pdf	51
CitiPower Powercor UG Electricity Hazard Awareness Instructions.pdf	52

This referral has been successfully processed by CitiPower Ltd / Powercor Australia Ltd and the results are contained in the attached files.

Understanding your DBYD Response Files

- Read the "257011022 - Citipower Powercor Response letter.pdf" and the "CitiPower Powercor UG Electricity Hazard Awareness Instructions.pdf" documents for an overview of your impact on CitiPower/Powercor assets and your obligations
 - The remaining (PDF) attachments are detailed construction drawings within your area of works.
 - Attachments over 13MB are split into multiple emails (eg, Part 1 of X) - ensure you have all documents
-

Please DO NOT REPLY TO THIS EMAIL as it has been automatically generated and replies are not monitored.

Sequence No: 257011022

Date: 25 Jun 2025

Enquirer: Not Supplied

Contact:

Email:

Address:

Site Address: 35 Noble Court, Mount Rowan VIC

Activity: Planning & Design

Job Number: 50505592

If you require assistance, clarification or Permit to Works please contact [132 206](tel:132206).

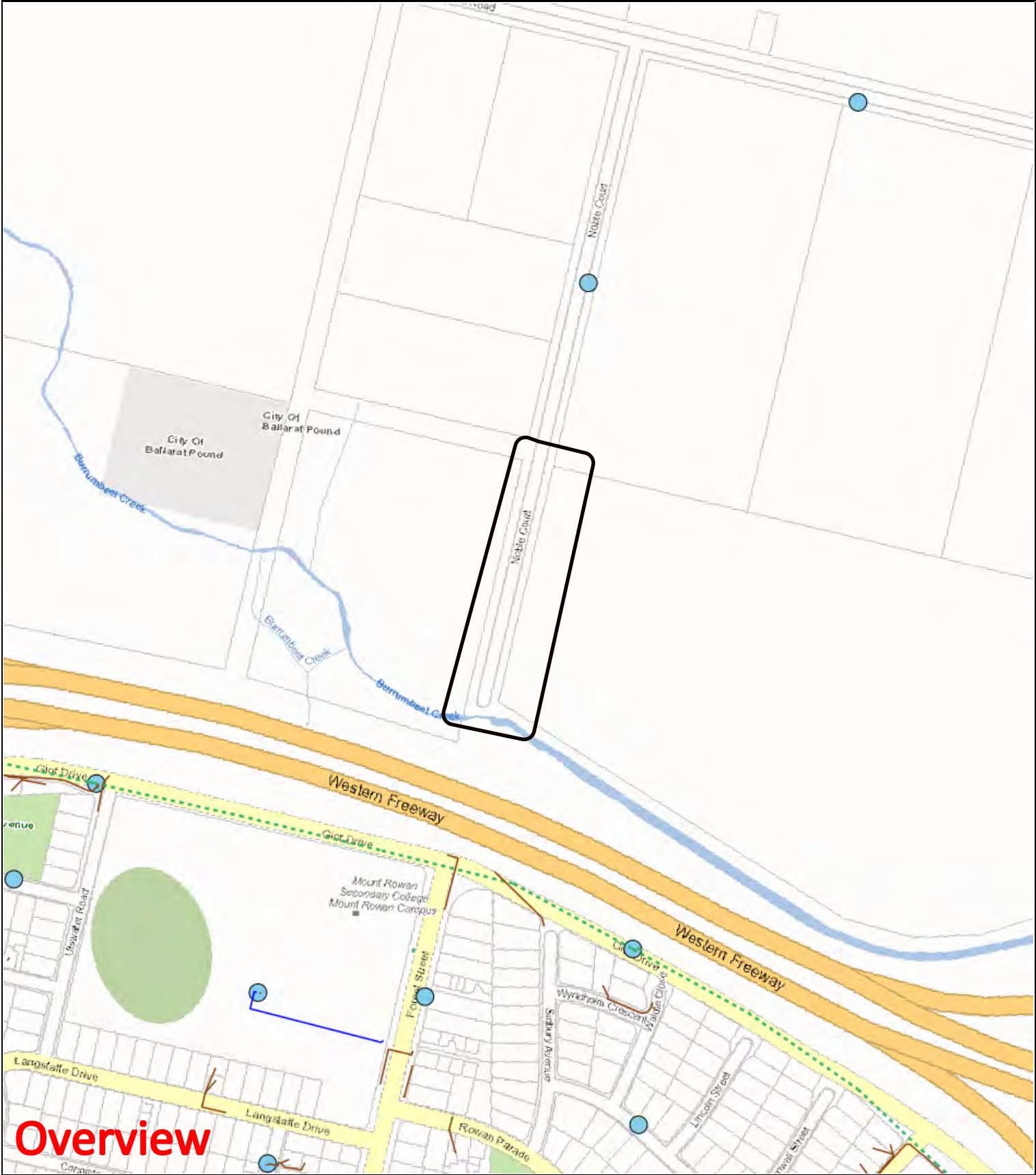
We thank you for your enquiry and appreciate your continued use of the "Dial Before You Dig" service.



Locality Map

257011022
35 Noble Court, Mount Rowan, VIC 3352

MAP IS A GUIDE ONLY - REFER TO CABLE PLANS FOR ACCURATE ASSET LOCATIONS



LEGEND:

DBYD Work Area	High Voltage Cable	Communication Cable	SWER Substation	Pole
Zone Substation	Low Voltage Cable	Earth Cable	Distribution Substation	

This map represents the location of the submitted DBYD Work Area and all CitiPower/Powercor responses are based on this location. It is the responsibility of the enquirer to ensure the accuracy of the DBYD Work Area.

Scale: 1:5000





Dial Before You Dig (DBYD) Electrical Asset Location Information

CitiPower/Powercor

Locked Bag 14090, Melbourne VIC 8001

General Enquiries Telephone: 132 206

To: (‘Enquirer’)

[REDACTED]

[REDACTED]

[REDACTED]

Enquiry Details

Utility ID	50020
Sequence Number	257011022
Enquiry Date	25/06/2025
Response	ALL CLEAR
Address	35 Noble Court Mount Rowan, VIC 3352
Location in Road	
Activity	Planning & Design

Enquirer Details

Customer ID	3177629
Contact	[REDACTED]
Company	Not Supplied
Email	[REDACTED]
Phone	[REDACTED]

Enquirer Responsibilities

This notification is valid for 28 days from the issue date. CitiPower/Powercor assets are critical infrastructure and great care must be taken to avoid asset damage and risk to public safety. The information supplied in the DBYD Response is intended to be indicative only. External parties should make their own enquiries to ensure the accuracy of the information, including but not limited to:

- Check that the location of the dig site indicated is correct, if not you must submit a new enquiry.
- Should your scope of works change or the plan validity dates expire, you must submit a new enquiry.
- If you do not understand the plans provided please contact CitiPower/Powercor prior to works commencing.
- Always perform an onsite inspection to establish the presence of assets.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.

Report any asset damage immediately on 132 206. Note: CitiPower/Powercor reserves the right to recover compensation for damages.

UNDERGROUND ELECTRICITY HAZARD AWARENESS INSTRUCTIONS



For CitiPower & Powercor Dial Before You Dig customers

Always complete a **Dial Before You Dig** request before you proceed with any work plans



If there are Underground Electricity assets identified within your work area please ensure that you carefully evaluate all of the information provided

If any part of your proposed works impacts on the **EXCLUSION ZONES** shown on the next page then before proceeding you must contact CitiPower/Powercor to determine if a **PERMIT TO WORK** is required and to organise a **SITE VISIT**

Site Visit/Permit To Work applications may be lodged at:

<https://www.citipower.com.au/working-with-us/suppliers/online-permit-applications/site-visit/>

If you need assistance to determine if you need a Site Visit please call:



CitiPower on 1300 301 101



Powercor on 132 206

Underground Electricity Asset Location Details Accuracy:

The Underground Electricity asset location details provided with this response are based on the best information available at the time

All reasonable care has been taken to ensure the accuracy of the information provided but complete accuracy cannot be guaranteed

Please be aware that the Underground Electricity Asset depths shown on the attached plans are accurate at the time of recording, however, due to works undertaken over the years by parties other than CitiPower/Powercor the Underground Electricity Asset depths may differ to those shown on the plans

**Contact with Underground Electricity Cables
can cause serious injury or death**

**If you observe any Underground Electricity Assets that do not
appear on the records provided**

Stop Work Immediately

and contact CitiPower/Powercor on the above numbers

UNDERGROUND ELECTRICITY HAZARD AWARENESS INSTRUCTIONS

For CitiPower & Powercor Dial Before You Dig customers

EXCLUSION ZONES

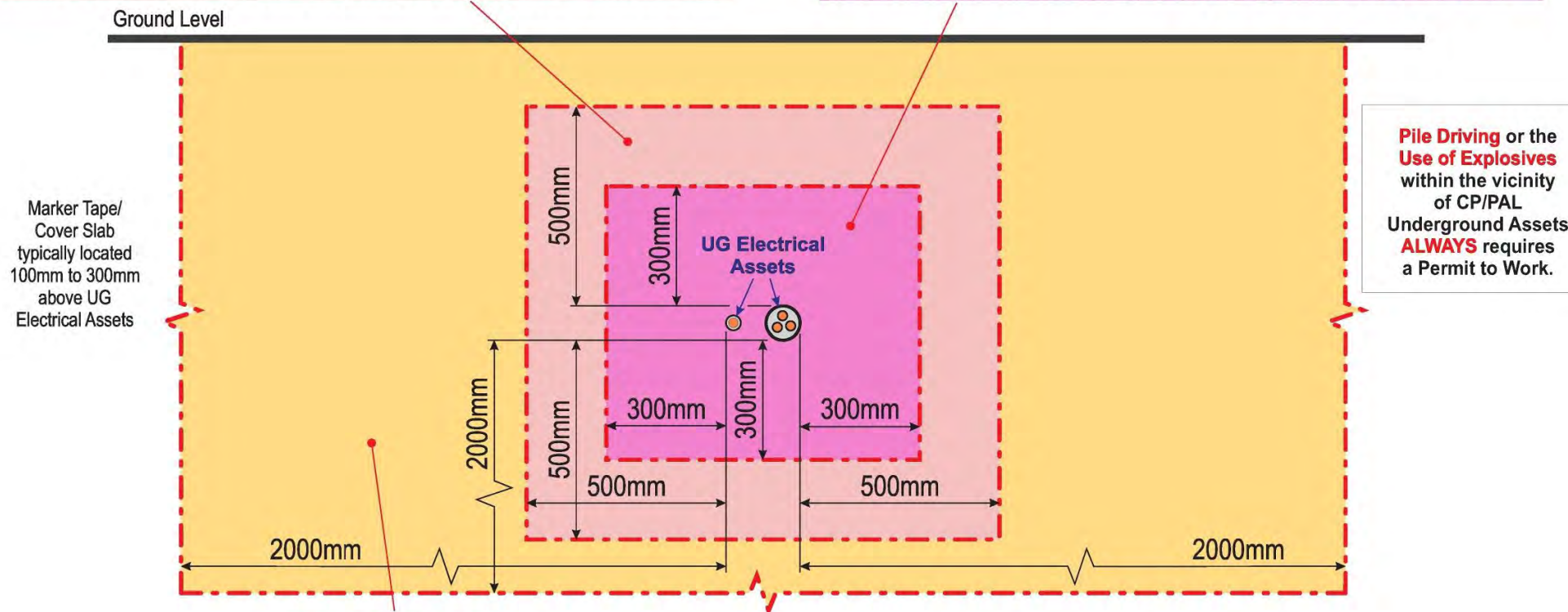


500mm Exclusion Zone Heavy Machinery & Mechanical Excavation

Heavy (Crawler Type) Machinery operation and Mechanical Excavation within a 500mm distance of Underground Electricity Assets requires a Permit to Work

300mm Exclusion Zone Hand Tools Only

All Excavation within a 300mm distance of Underground Electricity Assets requires a Permit to Work and must only be performed with Hand Tools



2000mm Exclusion Zone

Works within this area that require a Site Technical Assessment and may require a Permit to Work includes:

Pot Hole Boring Machine (Vertical Boring), Directional Boring Machine, Excavations Parallel to Underground Electricity Assets, Excavations Across Underground Electricity Assets

For Underground Electricity Asset location purposes:

Careful Excavation by hand may be performed under a Permit to Work above energised Underground Electricity Assets within the Exclusion Zone. Excavation must cease once either Marker Tape, Cover Slab or top of asset is located. All excavation must be performed BY HAND using only non-powered tools. No disturbance of the Marker Tape, the Protective Cover or the Asset is allowed. Any disturbance must be reported immediately to CitiPower/Powercor.

Excavation Below Underground Electricity Assets:

All excavation BELOW Underground Electricity Assets outside of the Exclusion Zone must ensure that there is no disturbance to the asset and that the area is restored to full pre-excavation integrity upon reinstatement.

Referral

257011026

Member Phone

1800 653 935

Responses from this member

Response received Wed 25 Jun 2025 11.32am

File name	Page
Response Body	55
Telstra Map Legend 4.0b.pdf	57
AccreditedPlantLocators 2025-01-08a.pdf	58
257011026.pdf	59
Telstra Duty of Care v32.0c.pdf	61

Attention: Chris Ford

Site Location: 35 Noble Court, Mount Rowan, VIC 3352

Your Job Reference: ESA LFG RA

Please do not reply to this email, this is an automated message -

Thank you for requesting Telstra information via Before You Dig Australia (BYDA).

This response contains Telstra information relating to your recent BYDA request.

Please refer to all enclosed attachments for more information.

Information for opening Telstra Asset Plans as well as some other useful contact information is noted in the attached documents.

Report Damage to Telstra Equipment: [Report damages to Telstra equipment - Telstra](#)

Please note:

When working in the vicinity of telecommunications plant you have a 'Duty of Care' that must be observed.

Ensure you read all documents (attached) - they contain important information.

Please also refer to the **Before you Dig Australia - BEST PRACTISE GUIDES and The five Ps of safe excavation**

<https://www.byda.com.au/before-you-dig/best-practice-guides/>, The essential steps that must be undertaken prior to commencing construction activities.

WARNING - MAJOR CABLES and/or OPTIC FIBRE IN THE AREA.

Phone 1800 653 935 for further assistance.

Note: In some areas Telstra fibre routes may be marked as "Amcom", as Telstra has purchased much of this infrastructure. If in doubt, please contact Telstra Plan services on the number above. Telstra plans and information are only valid for 60 days from the date of issue.

WARNING:

Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. The exact position of Telstra assets can only be validated by physically exposing them. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy. Further on site investigation is required to validate the exact location of Telstra assets prior to commencing work. A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the assets are protected during construction works. See the **Before You Dig Australia - BEST PRACTISE GUIDES and The five Ps of safe excavation** <https://www.byda.com.au/before-you-dig/best-practice-guides/>.

Please note that:

- it is a criminal offence under the *Criminal Code Act 1995* (Cth) to tamper or interfere with telecommunications infrastructure.
- Telstra will take action to recover compensation for damage caused to property and assets, and for interference with the operation of Telstra's networks and customers' services.

Telstra's plans contain Telstra's confidential information and are provided on the basis that they are used solely for identifying the location or vicinity of Telstra's infrastructure to avoid damage to this infrastructure occurring as part of any digging or other excavation activity. You must not use Telstra's plans for any other purpose or in a way that will cause Telstra loss or damage and you must comply with any other terms of access to the data that have been provided to you by Telstra (including Conditions of Use or Access).

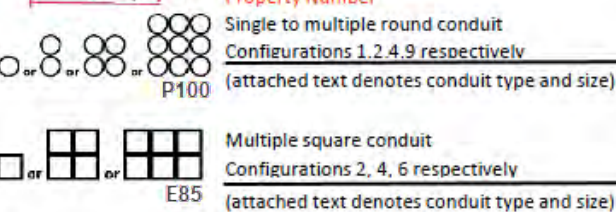
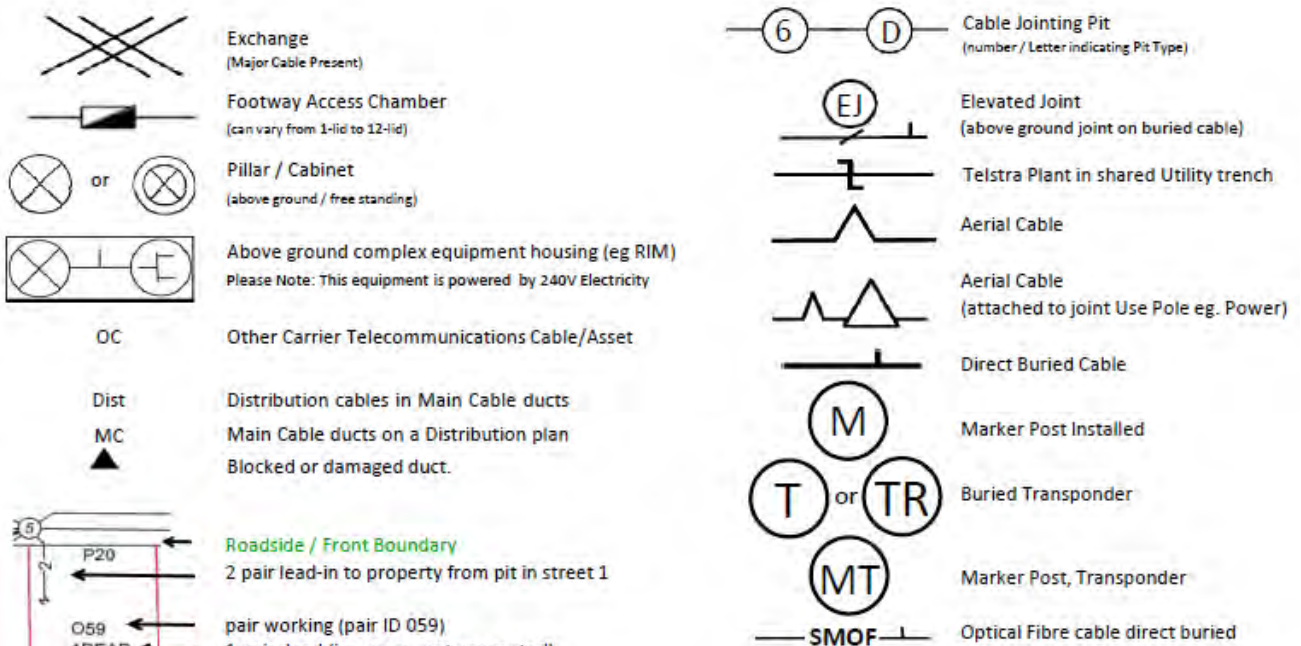
(See attached file: *Telstra Duty of Care v32.0c.pdf*)

(See attached file: *Telstra Map Legend 4.0b.pdf*)

(See attached file: AccreditedPlantLocators 2025-01-08a.pdf)

(See attached file: 257011026.pdf)

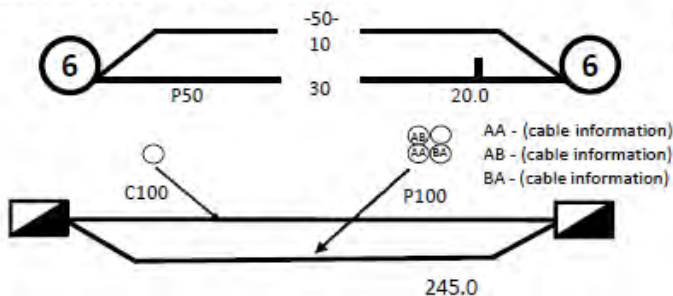
LEGEND



Some examples of conduit type and size:

A - Asbestos cement, P - PVC / Plastic, C - Concrete,
GI - Galvanised iron, E - Earthenware
Conduit sizes *nominally* range from 20mm to 100mm
P50 50mm PVC conduit
P100 100mm PVC conduit
A100 100mm asbestos cement conduit

Some Examples of how to read Telstra Plans



One 50mm PVC conduit (P50) containing a 50-pair and a 10-pair cable between two 6-pits, approximately 20.0m apart, with a direct buried 30-pair cable along the same route

Two separate conduit runs between two footway access chambers (manholes) approximately 245m apart. A nest of four 100mm PVC conduits (P100) containing assorted cables in three ducts (one being empty) and one empty 100mm concrete duct (C100) along

Protect our Network:

by maintaining the following distances from our assets:

- 1.0m Mechanical Excavators, Farm Ploughing, Tree Removal
- 500mm Vibrating Plate or Wacker Packer Compactor
- 600mm Heavy Vehicle Traffic (over 3 tonnes) not to be driven across Telstra ducts or plant.
- 1.0m Jackhammers/Pneumatic Breakers
- 2.0m Boring Equipment (in-line, horizontal and vertical)

For more info contact a [CERTLOC Certified Locating Organisation \(CLO\)](#) or
Telstra Location Intelligence Team 1800 653 935

Before you Dig Australia – BEST PRACTISE GUIDES

The five Ps of safe excavation

<https://www.byda.com.au/before-you-dig/best-practice-guides/>

OPENING ELECTRONIC MAP ATTACHMENTS –

Telstra Cable Plans are generated automatically in either PDF or DWF file types.
Dependent on the site address and the size of area selected.
You may need to download and install free viewing software from the internet e.g.



DWF Map Files (all sizes over A3)
Autodesk Viewer (Internet Browser) <https://viewer.autodesk.com/> or
Autodesk Design Review <http://usa.autodesk.com/design-review/> for
DWF files. (Windows PC)



PDF Map Files (max size A3)
Adobe Acrobat Reader <http://get.adobe.com/reader/>



Telstra BYDA map related enquiries email Telstra.Plans@team.telstra.com
1800 653 935 (AEST Business Hours only)



REPORT ANY DAMAGE TO THE TELSTRA NETWORK IMMEDIATELY

Report online - <https://www.telstra.com.au/forms/report-damage-to-telstra-equipment>

Ph: 13 22 03

If you receive a message asking for a phone or account number say:
“I don’t have one” then say “Report Damage” then press 1 to speak to an operator.



Telstra New Connections / Disconnections
13 22 00



Telstra asset relocation enquiries: 1800 810 443 (AEST business hours only).
NetworkIntegrity@team.telstra.com
<https://www.telstra.com.au/consumer-advice/digging-construction>

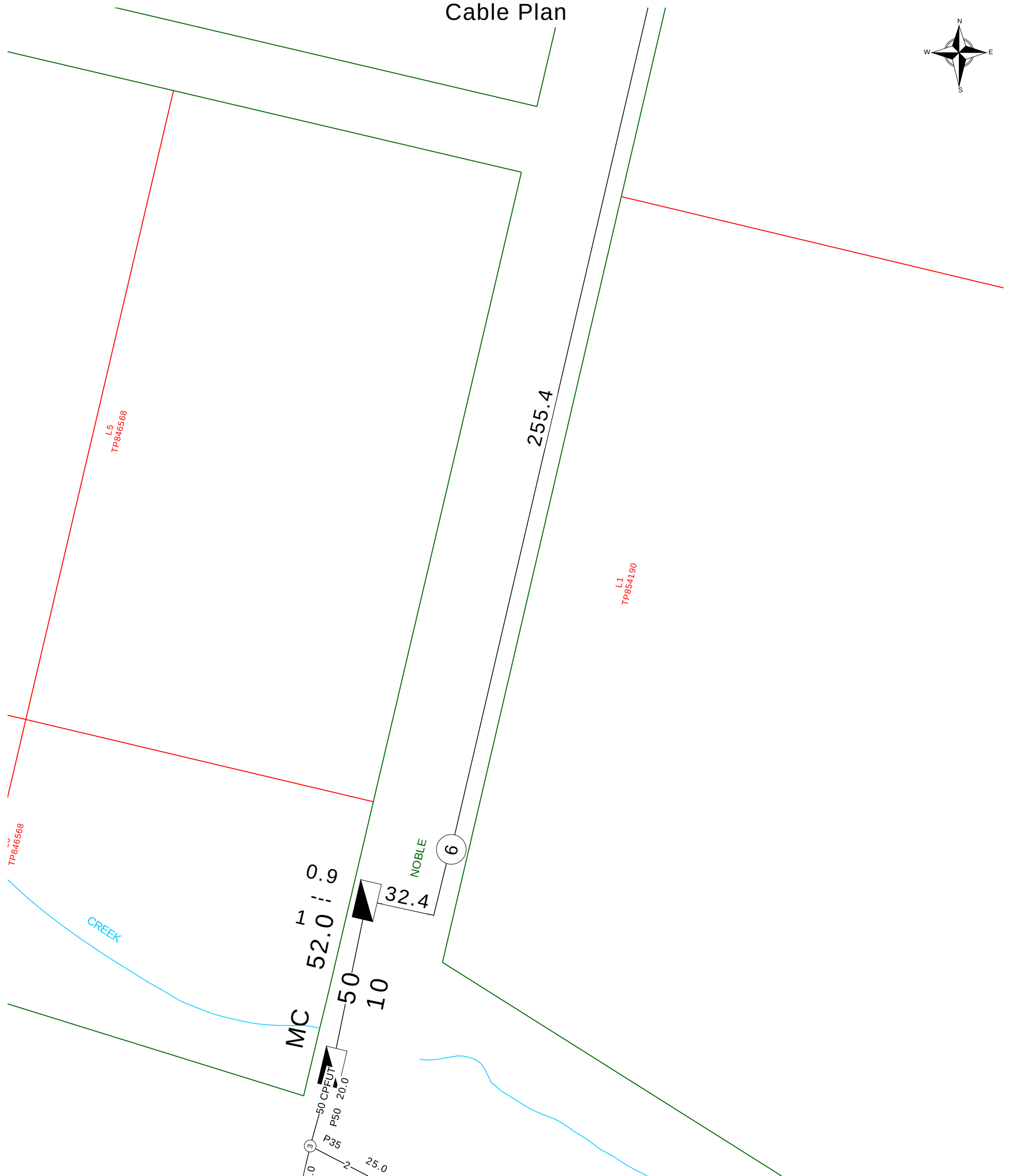


Telstra Aerial Assets Group (overhead network)
1800 047 909



CERTLOC Certified Locating Organisation (CLO)
certloc.com.au/locators/

Only Telstra authorised personnel and CERTLOC Locators can access Telstra’s Pit and Pipe Network.



Sequence Number: 257011026

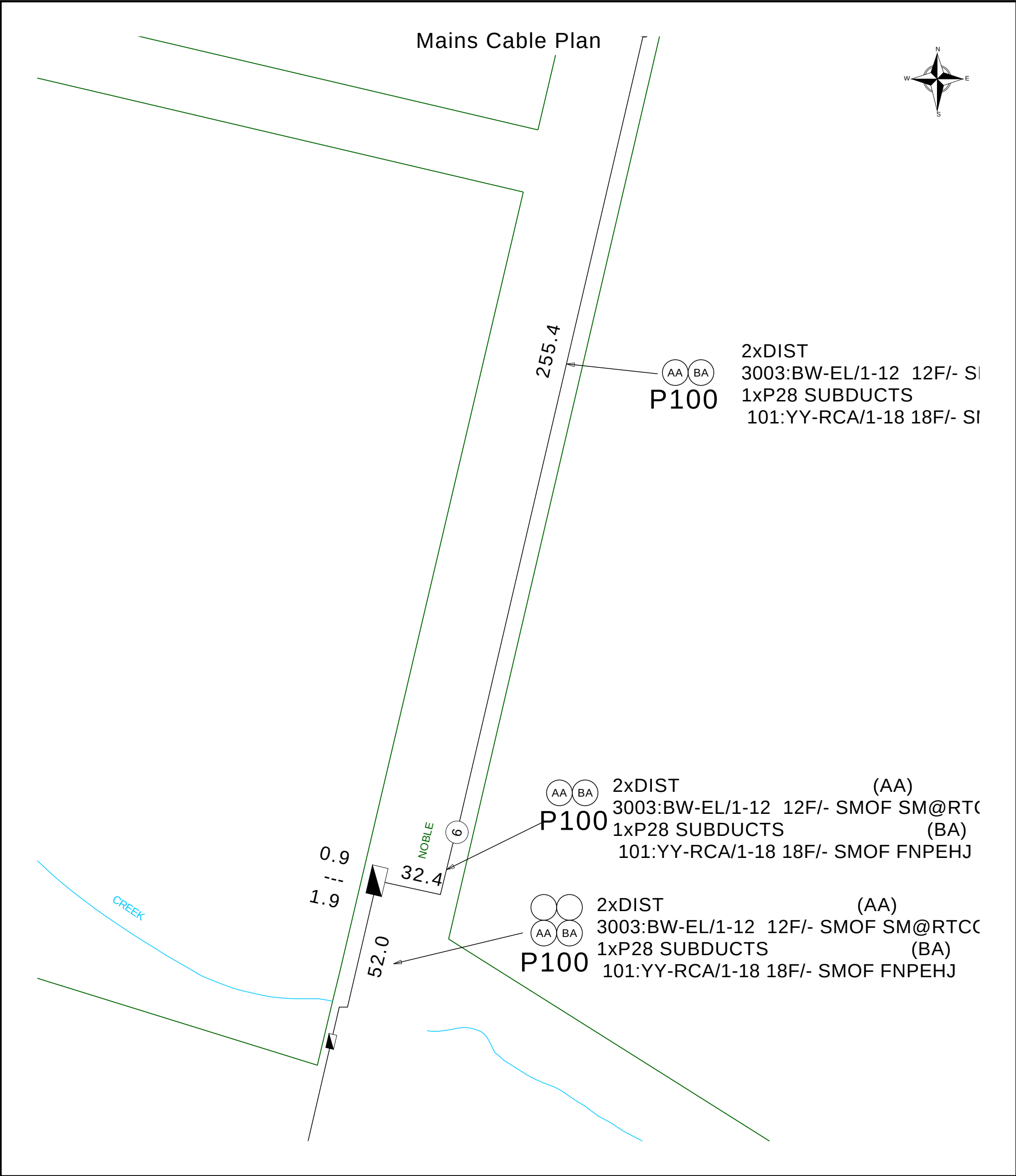
CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

Generated On 25/06/2025 11:29:37

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

Telstra plans and location information conform to Quality Level "D" of the Australian Standard AS 5488-Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. The exact position of Telstra assets can only be validated by physically exposing it. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy. Further on site investigation is required to validate the exact location of Telstra plant prior to commencing construction work. A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works.

See the Steps- Telstra Duty of Care that was provided in the email response.



	Report Damage: https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra Ph - 13 22 03 Email - Telstra.Plans@team.telstra.com Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries	Sequence Number: 257011026
TELSTRA LIMITED A.C.N. 086 174 781 Generated On 25/06/2025 11:29:38		CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

WARNING
Telstra plans and location information conform to Quality Level "D" of the Australian Standard AS 5488-Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. The exact position of Telstra assets can only be validated by physically exposing it. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy. Further on site investigation is required to validate the exact location of Telstra plant prior to commencing construction work. A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works.

See the Steps- Telstra Duty of Care that was provided in the email response.

Before You Dig Australia

Think before you dig

This document has been sent to you because you requested plans of the Telstra network through Before You Dig Australia (BYDA).

If you are working or excavating near telecommunications cables, or there is a chance that cables are located near your site, you are responsible to avoid causing damage to the Telstra network.

Please read this document carefully. Taking your time now and following the BYDA's Best Practices and 5 Ps of Safe Excavation <https://www.byda.com.au/before-you-dig/best-practice-guides/>

can help you avoid damaging our network, interrupting services, and potentially incurring civil and criminal penalties.

Our network is complex and working near it requires expert knowledge. Do not attempt these activities if you are not qualified to do so.

Disclaimer and legal details



*Telstra advises that the accuracy of the information provided by Telstra conforms to Quality Level D as defined in AS5488-2013.

It is a criminal offence under the Criminal Code Act 1995 (Cth) to tamper or interfere with telecommunications infrastructure.

Telstra will also take action to recover costs and damages from persons who damage assets or interfere with the operation of Telstra's networks.

By receiving this information including the indicative plans that are provided as part of this information package you confirm that you understand and accept the risks of working near Telstra's network and the importance of taking all the necessary steps to confirm the presence, alignments and various depths of Telstra's network. This in addition to, and not in replacement of, any duties and obligations you have under applicable law.

When working in the vicinity of a telecommunications plant you have a "Duty of Care" that must be observed. Please read and understand all the information and disclaimers provided below.

The Telstra network is complex and requires expert knowledge to interpret information, to identify and locate components, to pothole underground assets for validation and to safely work around assets without causing damage. If you are not an expert and/or qualified in these areas, then you must not attempt these activities. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers. Construction activities and/or any activities that potentially may impact on Telstra's assets must not commence without first undertaking these steps. Construction activities can include anything that involves breaking ground, potentially affecting Telstra assets.

If you are designing a project, it is recommended that you also undertake these steps to validate underground assets prior to committing to your design.

This Notice has been provided as a guide only and may not provide you with all the information that is required for you to determine what assets are on or near your site of interest. You will also need to collate and understand all information received from other Utilities and understand that some Utilities are not a part of the BYDA program and make your own enquiries as appropriate. It is the responsibility of the entities undertaking the works to protect Telstra's network during excavation / construction works.

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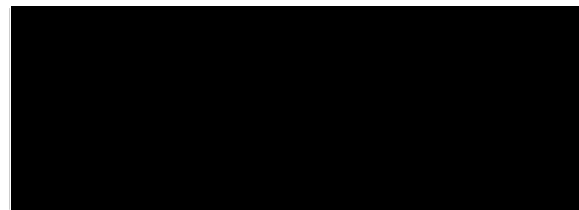
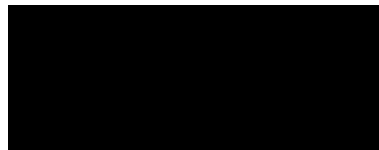
Level 1 and 2 Odour Risk Assessment

Project Number: 0423

Date: 20 October 2025

Document details	
Document title	North Ballarat Pastoral Pty Ltd
Document subtitle	Level 1 and 2 Odour Hazard Assessment
Project No.	0423
Date	20 October 2025
Version	1.0
Author	
Client Name	North Ballarat Pastoral Pty Ltd

Document history				
Version	Date	Author	Reviewed by	Comments
0.0	17/10/2025			Draft
1.0	20/10/2025			Final



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1 INTRODUCTION

Victoria has implemented Precinct Structure Plans (PSPs) as a strategic framework to guide the development of new communities and manage urban growth (VPA, 2021). In 2025, the City of Ballarat, located approximately 177 km (by car) northwest of Melbourne, adopted the Ballarat North PSP to support land development in response to a growing population within the Ballarat North precinct.

This planning initiative has led to increased proposed development across the precinct, including land owned by Ballarat Pastoral Pty Ltd (Ballarat Pastoral). Ballarat Pastoral owns 15 Olliers Road, 88 Olliers Road, and Noble Court, Ballarat North (the Site). Industrial land uses are located approximately 500 m to the southeast and 5.6 km southwest of the Site. These raise potential concerns in relation to residual emissions from these industrial processes resulting in the potential for dust and odour impacts.

Under the Environment Protection Act 2017, and specifically the General Environmental Duty, industries in Victoria are required to understand, manage, and mitigate the environmental risks they pose, including, emissions that may impact human health and the surrounding environment. EPA Publication 1949 – Separation Distance Guideline recognises, however, that despite compliance with the EP Act and the GED there is potential for residual emissions during normal operations and during minor upset conditions which have the potential to impact surrounding land use.

This report has been prepared to assess the potential for impact from the surrounding industrial land uses on the Site to determine whether there will be constraints on future development by Ballarat Pastoral.

2 PROJECT DESCRIPTION

2.1 Ballarat North Precinct Structure Plan

The Ballarat North PSP provides a framework for land use and development in areas allocated as the Urban Growth Zone (Clause 37.07 of the Ballarat Planning Scheme), or under any other provision of the Ballarat Planning Scheme that refers to this PSP.

The PSP envisions the transformation of non-urban land into connected, sustainable residential communities, incorporating diverse land uses, green open spaces, and the protection of local heritage (VPA, 2025).

Figure 2-1 provides an overview of the PSP area, with the Site delineated within its boundaries. According to Plan 2 in the Ballarat North PSP, the site is currently designated for mixed-use development, including but not limited to residential areas, roads etc. (VPA, 2025). Ballarat Pastoral intends to develop the site in alignment with the PSP's planned land uses. This assessment has been completed to determine whether the abovementioned land uses are appropriate within the relevant EPA legislation and guidelines.

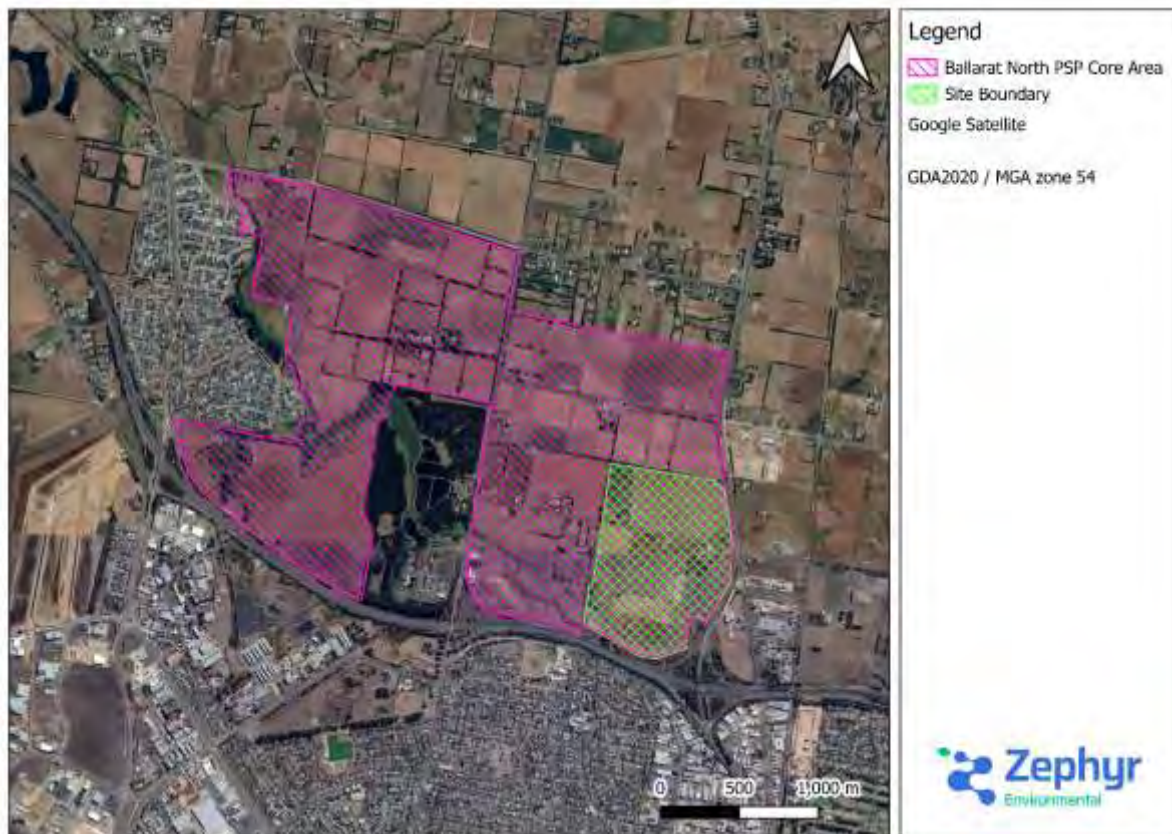


Figure 2-1 The Site within the Ballarat North PSP

2.2 Ballarat Pastoral Land

The Site is approximately 60 hectares (ha) with an estimated net developable area of 50 ha. The net developable area is broken up into four land uses including:

- Neighbourhood Activity Centre (NAC) (0.97 ha),
- Residential (36.59 ha),
- Roads/Mews (15.43 ha), and

- Non-Credited Open Space (0.24 ha).

Ballarat Pastoral has proposed an average of 16 dwellings per ha with an average lot size of 371.8 m².

The Precinct Structure Plan (PSP) is a strategic, long-term planning tool designed to guide the transformation of non-urban land into urban communities. It establishes a coordinated framework for future development, ensuring that land use, infrastructure, and services are planned in a way that supports anticipated population growth and creates sustainable, liveable neighbourhoods (VPA, 2025). Ballarat Pastoral's proposed development aligns with the objectives of the Precinct Structure Plan (PSP), as it envisions a new neighbourhood that incorporates multiple parks, open spaces, and designated activity centres. These elements support the PSP's goals of creating well-connected, sustainable, and green urban communities.

2.3 Existing Sources of Odour and Dust Impacting the PSP

In May of 2024, GHD was engaged by the Victoria Planning Authority (VPA) to prepare an Adverse Amenity Impact Assessment (AAIA) for the Ballarat North PSP (GHD, 2024). This report identifies existing industries within the PSP and a 2 km surrounding buffer that may generate air emissions, noise, or vibration, potentially affecting future land use and development within the Ballarat North PSP, including Ballarat Pastoral's Site. GHD's AAIA found medium and high-risk odour constraints for the Ballarat North PSP from the following nearby industries:

- Central Highlands Region Water Corporation, (high risk) 407 m separation distance
- Central Victoria Livestock Exchange (CVLX) (medium risk) 2000 m separation distance.

All other industries identified as having potential odour impacts within the PSP and surrounding buffer area were found to be either located outside their applicable separation distances (VIC EPA, 2024) or did not warrant further assessment. This includes Boral Asphalt, which at the time of the AAIA, was assessed under a 500 m buffer that did not encroach upon Ballarat Pastoral's development site.

At the conclusion of the AAIA, GHD recommended to the VPA to avoid locating future sensitive receptors within the recommended separation distances of potential odour emission sources. In relation to Ballarat Pastoral's proposed development, the site is located outside all relevant separation distance buffers, and as such, no further investigation was deemed necessary at the time.

As no other default separation distance overlaps the Site, only the potentially increased separation distance for Boral Asphalt has been considered further in this assessment.

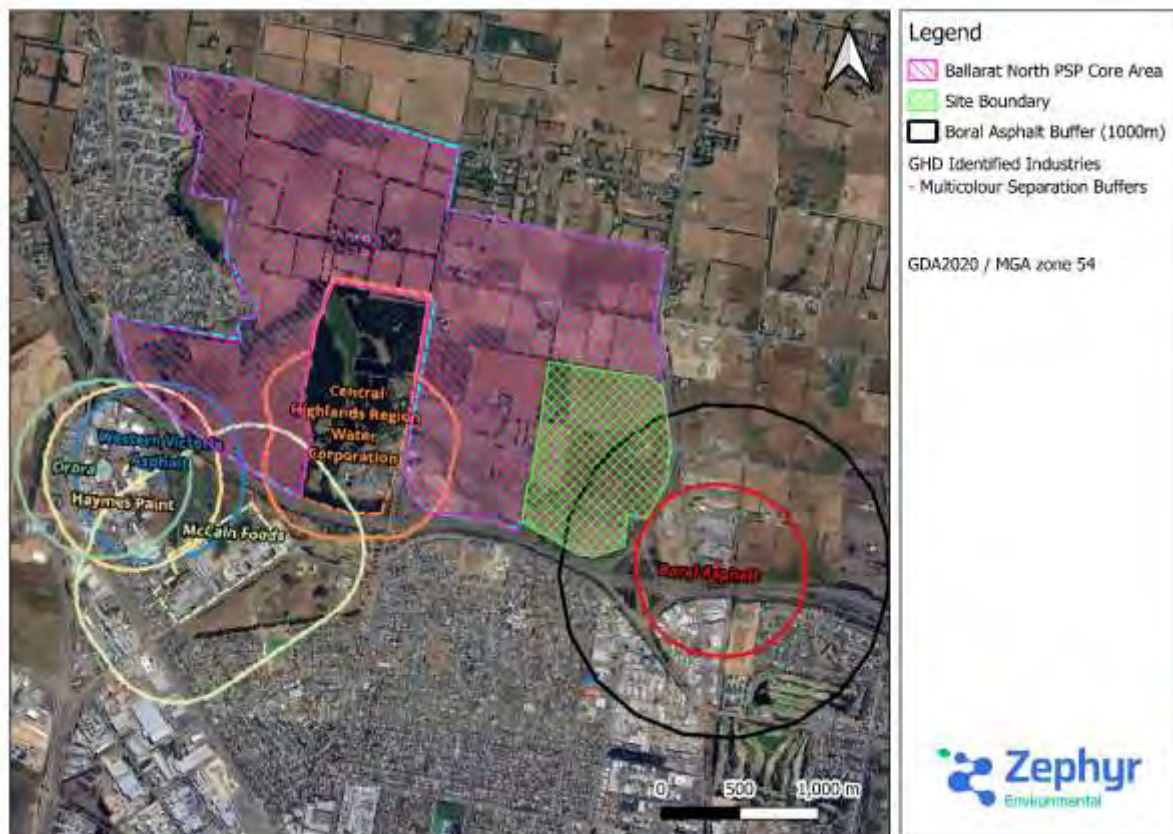


Figure 2-2 Increased Separation Distance Required for Boral Asphalt Plant as a Result of Proposed Increased Production

2.3.1 Dust Impacts

There are no identified sources that have separation distances for dust that impact the Site, and therefore dust has not been considered further in this assessment.

2.3.2 Odour Impacts

Currently, there are no standard separation distances for odour that overlap with the Site indicating that the risk of odour impact from surrounding industries is currently low.

Boral Asphalt's current production rate is less than 100 tonnes per week (t/week), which under EPA Publication 1949 requires a 500-metre separation distance to mitigate potential odour impact. This separation distance does not overlap the Site.

Boral has indicated that they would like to increase production beyond this 100-tonne threshold, an action that would necessitate an increase in the separation distance to 1000 metres under EPA Publication 1949. This expanded separation distance encroaches upon more than half of Ballarat Pastoral's proposed development site (Figure 2-4). In accordance with EPA Publication 1949, a risk assessment is required to support a variation to the recommended distance, enabling the safe progression of the development in accordance with the guidance detailed in Section 3.3.1.

It is considered that whilst there are several odour sources surrounding the PSP (Figure 2-4), only increased production at Boral Asphalt has the potential to result in a separation distance which overlaps the Site. Consequently, the Site is subject to potential impacts from only one industry and there are not multiple odour sources that require consideration.

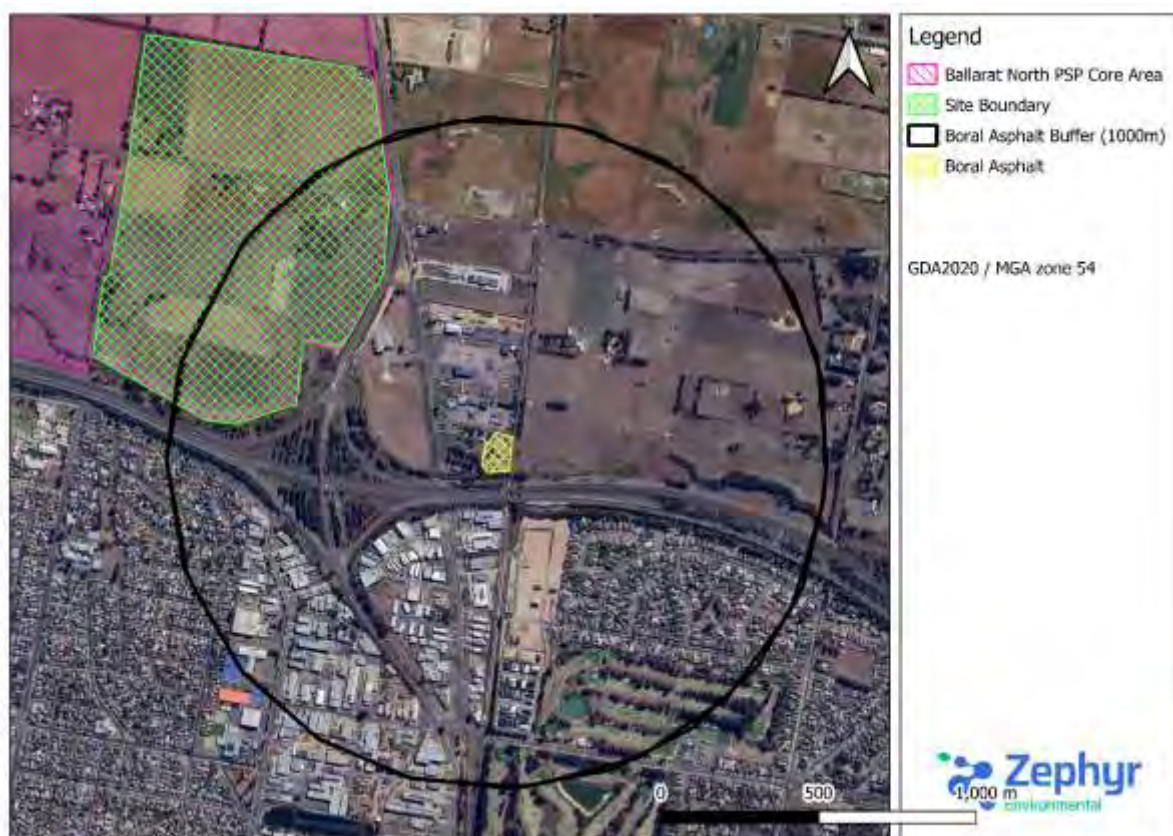


Figure 2-3: Boral Asphalt - Separation Distance in Accordance with EPA Publication 1949

3 RELEVANT LEGISLATION AND GUIDANCE

3.1 Planning Policy

The Ballarat City Council Planning Scheme incorporates the Victorian Planning Provisions (VPP). The VPP include several clauses which seek to maintain separation between industry and more sensitive land uses:

- Clause 13.06-1S relates to the protection of air quality by ensuring that wherever possible, suitable separation between land uses that reduce amenity and sensitive land uses.
- Clause 13.07-1S seeks to protect community amenity, human health and safety while facilitating appropriate commercial, industrial, infrastructure or other uses with potential adverse off-site impact. To achieve this, land use separation is included as a relevant strategy.
- Clause 17.03-1S (Industrial land supply), clause 17.03-2S (Sustainable industry) and clause 17.03-3S (State significant industrial land) deal with industry operation and availability of land for industry. These clauses include strategies to ensure appropriate buffer areas can be provided to sensitive land uses and to protect industrial uses from encroachment of sensitive land uses which would adversely affect the industry's viability.
- Clause 65.01 requires that, before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate, the effect on the environment, human health and amenity of the area.
- Clause 66.02 requires that Council refer the application to EPA where a development licence or operating licence is required under Part 4.3 of the Environment Protection Act 2017 or where the threshold distance in Clause 53.10 is not met.

Clauses 13.06-1S, 13.07-1S, 17.03-1S and 17.03-2S refer to EPA Publication 1949 as a relevant policy guideline.

The VPPs also include Clause 53.10, which includes a list of uses or activities which if not appropriately designed and located may cause offence or unacceptable risk to the neighbourhood. This clause specifies threshold distances applicable for various industry types. Clause 53.10 applies to the application for development of industrial use, not to the development of sensitive land in close proximity to existing industry sources and is therefore not applicable in this context and has not been considered further.

3.2 Environmental Legislation

The Environment Protection Act 2017 (the Act) came into effect on 1 July 2021. The Act endeavours to ensure that individual industries take responsibility for the risks they pose to the environment. At the centre of the Act is the General Environmental Duty (GED).

What is 'reasonably practicable' is defined in EPA Publication 1856 – Reasonably Practicable, and this assessment assesses the residual risk from the implementation of mitigation measures to determine the level of mitigation that is reasonably practicable to minimise residual risks to the surrounding land use.

With specific regard to air and odour emissions, *Environment Protection Regulations 2021* (the Regulations, 2021), *EPA Publication 1961 - Guideline for assessing and minimising air pollution in Victoria* (the Guideline (VIC EPA, 2022)) (EPA Victoria, 2022a), *Separation Distance Guideline* (VIC

EPA, 2024b) and *Publication 1883: Guidance for Assessing Odour* (VIC EPA, 2022) provide technical guidance and a framework for assessing and controlling risks associated with air pollution¹.

This section outlines key legislative instruments relevant to air quality and odour impacts from an asphalt and concrete batching plan on a residential subdivision.

3.2.1 Environmental Protection Act

Odour and atmospheric emissions are key environmental issues set out in the Act. It is included as a key definition for “environment”:

environment means—

- (a) the physical factors of the surroundings of human beings including the land, waters, atmosphere, climate, sound, odours and tastes; and*
- (b) the biological factors of animals and plants; and*
- (c) the social factor of aesthetics;*

Both odour and atmospheric emissions (including dust, smoke, fumes and gases) are also clearly defined as a form of “pollution”:

pollution includes any emission, discharge, deposit, disturbance or escape of—

- (a) a solid, liquid or gas, or a combination of a solid, liquid or gas, including but not limited to smoke, dust, fumes or odour; or*
- (b) noise; or*
- (c) heat; or*
- (d) a thing prescribed for the purposes of this definition.*

Section 25 of the Act (the Act, 2024) states the requirements in relation to risks of harm to human health and the environment from pollution and waste:

- (1) A person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable.*

3.2.1.1 General Environmental Duty (GED)

The General Environmental Duty (GED) is a cornerstone of the Act. Under section 25(1) of the Act, it mandates that all individuals and businesses in Victoria must minimise risks of harm to human health and the environment from pollution and waste.

Complying with the GED means taking proactive steps as well as employing good work practices to minimise the risk to human health and the environment, so far as reasonably practicable. Reasonably practicable means putting controls in place that are proportionate to the risk of harm.

EPA has released several publications outlining how a duty holder can assess the various risks and determine what is reasonably practicable for their individual project and circumstances:

¹ The Guideline also presents Air Pollution Assessment Criteria (APAC) for the assessment and management of emissions to air. These criteria supersede those in the State Environment Protection Policy (Air Quality Management) 2001 (SEPP AQM). These criteria are intended to be used within the broader management framework, effective from 1 July 2021, the central pillar of which is GED and minimising risk as far as reasonably practicable.

- EPA Publication 1741.1 – Industry guidance: supporting you to comply with the general environmental duty (EPA Victoria, 2020A); and
- EPA Publication 1856 – Reasonably practicable (EPA Victoria, 2020B)).

The GED applies both to the generator of the emissions and to the development of land to a more sensitive use which may be impacted by those emissions. Thus, under the GED the developer must consider the risk to the proposed development of other existing land uses and where that risk is elevated.

3.2.2 Environment Reference Standard

The GED, as outlined in Section 25 of the Environment Protection Act 2017, requires proactive measures to minimise environmental risks. Additionally, the Act requires EPA to consider the environmental values in the Environment Reference Standard (ERS) when reviewing operating licences and deciding whether to issue a development and operating licence exemption and prescribed permits.

The ERS is made under section 93 of the Environment Protection Act, 2017 and sets out the environmental values for ambient air that sustains life, health and wellbeing in addition to environmental values for other environments (ERS, 2021).

Table 2.2 of the ERS (ERS, 2021) provides indicators and objectives for the ambient air environment, which include concentration standards and averaging period for carbon monoxide, nitrogen dioxide, photochemical oxidants, sulfur dioxide, lead, particles as PM₁₀, particles as PM_{2.5} and odour. The ERS has been created for assessing and reporting on environmental conditions in Victoria. The ERS objective for odour is qualitative in nature and requires:

“An air environment that is free from offensive odours from commercial, industrial, trade and domestic activities”.

Table 4.2 of the ERS details the land categories that apply to the environmental values, this is provided as Figure 3-1.

		Parks and reserves	Agricultural	Sensitive use		Recreation / Open space	Commercial	Industrial
				High density	Other (lower density)			
Land dependent ecosystems and species	Natural ecosystems	✓						
	Modified ecosystems	✓	✓		✓	✓		
	Highly modified ecosystems		✓	✓	✓	✓	✓	✓
Human health		✓	✓	✓	✓	✓	✓	✓
Buildings and structures		✓	✓	✓	✓	✓	✓	✓
Aesthetics		✓		✓	✓	✓	✓	
Production of food, flora and fibre		✓	✓		✓			

Figure 3-1 The environmental values that apply to land use categories

For odour (aesthetics) odour impact is to be considered in parks and reserves, sensitive uses such as individual houses, recreation / open space and in a commercial setting. The environmental values do not apply to agricultural or industrial land use.

3.3 Relevant EPA Guidelines

As discussed in Section 3.1, EPA Publication 1949 is listed within the VPP as a relevant policy guideline. EPA Publication 1949 is supported in understanding the risk of odour impacts to the surrounding land use by EPA Publication 1883 – Guidance for assessing odour.

3.3.1 EPA Publication 1949 - Separation Distance Guideline (SDG)

EPA Publication 1949 - *Separation distance guidelines* (VIC EPA, 2024) published in August 2024, provide guidelines to help keep a safe distance between places that emit dust or odour and receptors by assisting planning decisions about land use around activities with potential offsite impacts.

3.3.1.1 Purpose of Separation Distances

EPA Publication 1949 states that:

“Separation distances are intended to accommodate both routine or day-to-day emissions and unintended offsite emissions. Where there is routine or day to day emissions from a premises, there may still be unintended offsite emissions experienced at or beyond the boundary of the source premises. Unlike routine emissions, unintended emissions are in addition to routine emissions and are often intermittent or episodic. They may occur due to:

- the nature of the operation
- minor changes in weather conditions
- minor accidents
- minor equipment failure.

Unintended offsite emissions may still happen even when an industry/activity is operating in accordance with all relevant statutory obligations, including minimising the risk of harm to human health or the environment from pollution and waste so far as reasonably practicable.

Separation distances are intended to allow unintended emissions to disperse, and in doing so, minimise human health and amenity risks for any nearby sensitive land uses”.

3.3.1.2 Definition of Threshold, Separation and Buffer Distances

Historically the terms threshold distance, buffer and separation distance have been used interchangeably within the planning system, however the EPA SDG clearly defines each of these terms:

Threshold distance - A trigger for further detailed assessment of potential adverse offsite impacts via a planning permit, based on a broader range of risks than those covered in the EPA SDG (odour and dust). For example, noise and hazardous air pollutants and referenced in Clause 53.10 of the VPP.

Separation distance - Distance between incompatible land uses where there is potential for adverse human health or amenity impacts, which typically occurs between an industrial (or sometimes commercial) land use and a sensitive land use and is used as a tool to determine whether the siting of a proposed land use or development is suitable in the context of surrounding land uses and measured according to Section 4 of the EPA SDG.

Buffer distance - Land used to separate or manage incompatible land uses, often industrial uses and sensitive uses, to ensure land use compatibility and avoid land use conflict. May contain multiple separation distances that respond to various risks to human health and amenity, for example, where a buffer is made up of separation distances that respond to odour, dust and landfill gas migration, the buffer will extend to the largest of these separation distances.

As this is land development not industrial development and as there is only one industry that has a separation distance that overlaps the Site (Figure 2-2), the term Separation Distance is the appropriate term to use under the definitions provided in EPA Publication 1949.

3.3.1.3 Consideration of Separation Distances in a Proposed Sensitive Use/Development

Figure 3-2 provides the decision-making pathway on the required level of assessment for industrial activities in close proximity to proposed sensitive land use. As shown in Figure 3-2 where:

- There is a single separation distance that does not overlap with another for the same type of risk (i.e. odour or dust) and that separation distance does not itself overlap the proposed sensitive land use, no further assessment is required.
- There is a single separation distance that does not overlap with another for the same type of risk (i.e. odour or dust) and that separation distance overlaps the proposed sensitive land use, a risk assessment may be completed to demonstrate the likely risk to the surrounding land use
- Multiple separation distances overlap for the same type of risk (i.e. odour or dust) in close proximity to the proposed sensitive land use a risk assessment is required.

As shown in Figure 2-2, the Separation Distance for the increased throughput at Boral Asphalt would overlap the Site. As this is a single source, and a single separation distance for odour a risk assessment to determine the likely risk is permitted under EPA Publication 1949.

To assess odour risk, EPA Publication 1949 recommends the use of EPA Publication 1883.

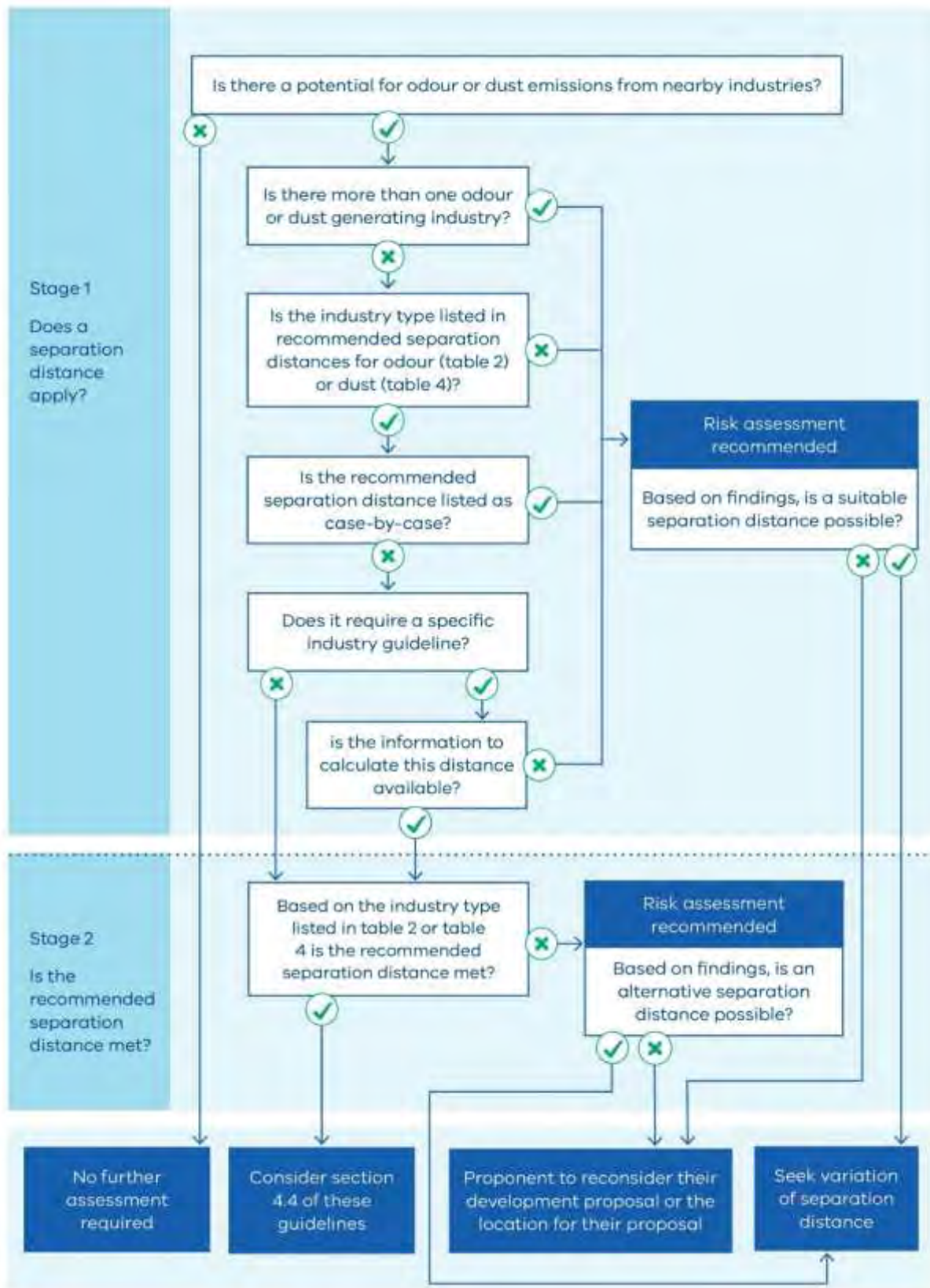


Figure 3-2: Separation distance decision-making process for odour or dust – proposed sensitive use/development (Figure 4 from EPA Publication 1949)

3.3.2 Publication 1883: Guidance for Assessing Odour

Publication 1883, issued by the Environment Protection Authority (EPA) Victoria, provides detailed guidance on assessing odour impacts. This document provides guidance for understanding how to evaluate the risk of odour emissions from industrial activities. The guidance takes into consideration the scale and complexity of the source and the receiving environment where odour impacts might occur.

Odour assessment in Publication 1883 provides a framework to investigate the risk of harm resulting from the operations at the facility. There are three levels of assessment, which progression through each level of assessment depend on the scale or complexity of the scenario.

- Level 1 assessment comprises of three tests, which include testing for the duration of emissions, prevailing wind direction towards the receiving environment and classification of source as a minor source of odour. If the level 1 assessment shows that the activity is low risk for odour, there is no need to proceed to a level 2 assessment. Otherwise, if any of the tests in Level 1 fails, Level 2 assessment must be completed.
- Level 2 assessment consists of information on the level of hazard of the odour source, the effectiveness of the exposure pathway and the sensitivity of the receiving environment. An interim risk score is obtained by using the Source-pathway-receiving environment tool (SPR). Depending on this score and the quality of the evidence used, the assessment either concludes or proceeds to a level 3 assessment.
- Level 3 assessment is usually needed for complex industries or scenarios or where there is more than one odour source under consideration. Level 3 assessment provides tools that can be used to support evidence of odour hazard risks for various industry sectors or activities. Using more tools ensures a more robust assessment, which strengthens the evidence and better supports decision making.

This assessment has considered a Level 1 and Level 2 assessment.

4 EXISTING CONDITIONS

As discussed in Section 2.3, there are no other sources of odour which have the potential to impact the Site other than the Boral Asphalt Plant where production increases to more than 100 tonnes per week. Once odour is emitted from a site, meteorology provides the pathway from source to receptor which can result in odour being detected. The following section provides a description of the existing climatic conditions of the local area.

4.1 Weather and Climate

The Site is located in the Ballarat North area of Ballarat Council. The climate zone of the area, based on temperature and humidity, is characterised by warm summers and cold, windy winters. The climate classification, based on seasonal rainfall in the area, is characterised as fairly uniform precipitation throughout the year, with slight increases in winter months and annual totals in the 600 to 800 mm range.

These climate conditions result in the Site, along with most of greater Melbourne, being found within a temperate – no dry season (warm summer) vegetation type (Köppen) climate classification.

The closest meteorological observation station is operated by the Bureau of Meteorology (BoM) at Ballarat Aerodrome (approximately 4 km west of the Site). Climatic averages and extremes have been recorded by the BoM at Ballarat Aerodrome (089002) meteorological station between the years 1908 to 2025.

Overall, the local area is characterised by:

- Average maximum temperature of 25.3°C in January
- Average minimum temperature of 3.2 °C in July
- Average maximum 9 am relative humidity of 90% in June and July
- Average minimum 3 pm relative humidity of 42% in January

A summary of the major climate statistics recorded at this site is provided below in Table 4-1.

Table 4-1: Mean climatic conditions for nearest Bureau of Meteorology observation station at Ballarat Aerodrome (089002)

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years	From	To
Mean maximum temperature (°C)	25.3	25.1	22.4	17.8	13.7	10.8	10.1	11.5	13.9	16.8	19.7	22.7	17.5	116	1908	2025
Mean minimum temperature (°C)	11	11.5	10.1	7.5	5.7	4	3.2	3.7	4.8	6.2	7.9	9.5	7.1	116	1908	2025
Mean rainfall (mm)	40.1	42.1	41.5	51.1	63.5	62.7	66.2	73.3	70.4	66.8	55.7	49.9	683.4	117	1908	2025
Decile 5 (median) rainfall (mm)	32.4	31.4	30.6	44.2	59	60.8	63.3	71.2	63.6	66	53	40	-	118	n/a	n/a
Mean number of days of rain ≥ 1 mm	4.9	4.6	5.8	8.1	10.9	12.2	13.7	14	12.5	10.9	8.7	7.2	113.5	117	1908	2025
Mean number of clear days	7.7	7.4	6.8	5.6	3.2	3	2.6	2.7	2.9	3.8	4	5.5	55.2	45	1957	2010
Mean number of cloudy days	10.2	8.2	11.5	14.1	18.1	18.5	19.2	18.9	16.1	16.5	15	13.9	180.2	45	1957	2010
Mean 9am temperature (°C)	17.2	17	15.1	11.9	8.9	6.4	5.6	6.6	9	11.6	13.7	15.8	11.6	98	1908	2010
Mean 9am relative humidity (%)	62	67	71	78	86	90	90	85	78	72	68	64	76	91	1908	2010
Mean 9am wind speed (km/h)	20.5	19.3	17.7	16.2	13.7	14.7	14.5	16.7	19.3	20.7	19.6	19.7	17.7	49	1957	2010
Mean 3pm temperature (°C)	23.4	23.5	20.8	16.5	12.6	9.9	9.1	10.3	12.7	15.2	18	20.9	16.1	97	1908	2010
Mean 3pm relative humidity (%)	42	44	48	57	69	76	75	70	63	59	54	47	59	91	1908	2010
Mean 3pm wind speed (km/h)	21.4	20.9	20	19.6	18.6	19.8	20.7	22	22.2	21.3	20.6	20.8	20.7	49	1957	2010

(Australian Government Bureau of Meteorology, 2025)

4.1.1 Wind Conditions

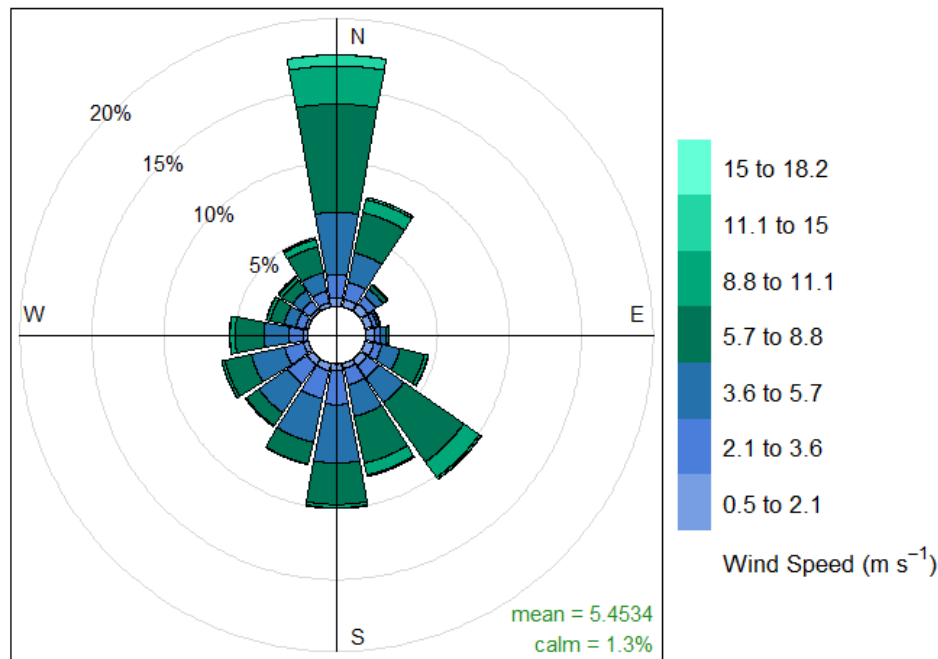
In completing a Level 1 and Level 2 assessment in accordance with EPA Publication 1883, knowledge of the local wind conditions is a key parameter for the assessment

The nearest Bureau of Meteorology station is Ballarat Aerodrome located approximately 3 km west of the Site. EPA Publication 1957 – *Guide to Air Pollution Modelling* states that observation locations within 5 km of the site can be considered representative.

Whilst atmospheric dispersion modelling is not being undertaken for this assessment the qualitative assessment under EPA Publication 1943 does require information on likely wind frequencies. The approach in the applicability of observational data contained in EPA Publication 1957 has therefore been adopted and the data from Ballarat Aerodrome for the period (2019 to 2023) used.

The following wind roses were created for the data from Ballarat Aerodrome:

- Period (2019 to 2023)(Figure 4-1)
- Seasonal wind roses (Figure 4-2).



Frequency of counts by wind direction (%)

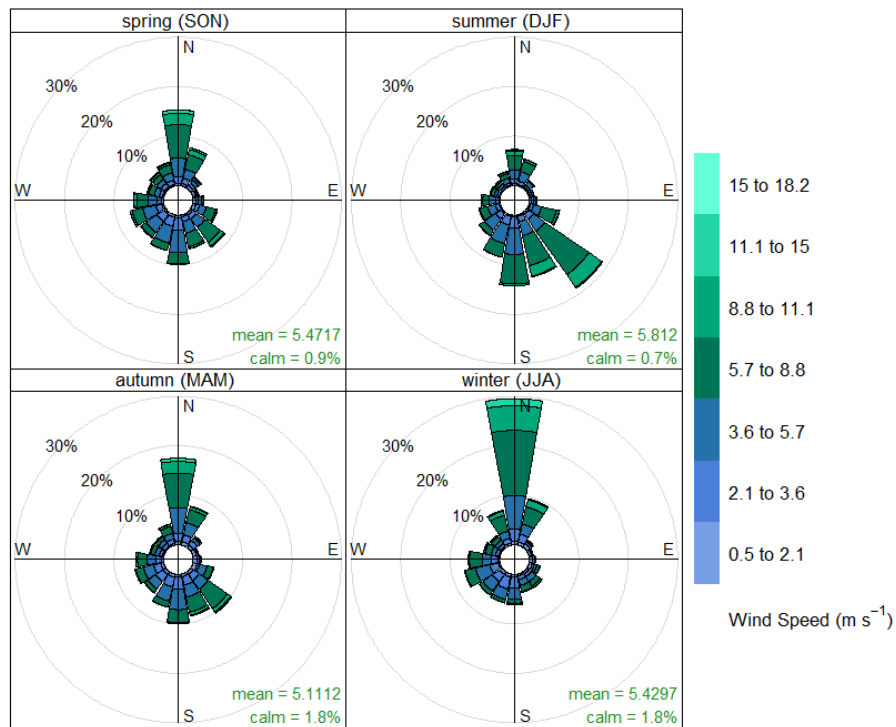
Figure 4-1: Wind Rose for Assessed Period 2019-2023

The wind roses for all years show a similar pattern in wind compared to the modelled period (2019-2023) with prevailing wind direction blowing from the north. There is an overall low frequency of winds blowing from the east.

Seasonal wind roses for the modelled years are presented in Figure 4-2:

- In spring, the pattern of winds is similar to the overall pattern for all modelled years.
- In summer, south-easterly winds are dominant, with winds from other quadrants having a lower frequency.
- In autumn, a similar pattern to spring is found.

- In winter, northerly winds are dominant, with winds from other quadrants having a lower frequency overall.



Frequency of counts by wind direction (%)

Figure 4-2: Seasonal Wind Roses at Site for the Period 2019 to 2023 Inclusive

5 ASSESSMENT OF RISK

In accordance with EPA Publication 1949, having identified that the only separation distance that overlaps the site is that for odour where the Boral Asphalt Plant increases production, an assessment of risk has been completed in accordance with EPA Publication 1883.

5.1 Assessment of odour risk from Boral Asphalt Plant

EPA Publication 1883 provides guidance for the assessment of odour (VIC EPA, 2022). At this stage a Level 1 and Level 2 odour risk assessment have been completed.

5.1.1 Level 1 Assessment

Within a Level 1 odour risk assessment completed in accordance with EPA Publication 1883 there are three tests:

- Test 1: to test the occurrence of odorous emissions
- Test 2: to test the odorous emissions towards the receiving environment dependant on the prevailing wind patterns
- Test 3: to test whether the source can be considered a minor odour source

5.1.1.1 Test 1: Duration of Emissions

Test 1 is used to examine the total number of hours in which an odour source could be emitting odour (usually hours of operation for the process or activity). The hours of operation of the Boral facility, located at 67 Old Midland Hwy, Mount Rowan VIC, was extracted from online information which indicated to be between Monday to Friday 8:00-15:00 and closed Saturday to Sunday.

Table 5-1 Test 1: Duration of Emissions

	Parameter	Value	Units	Does test Comply?
Do odorous emissions occur for less than 200 hours per year (< 2% of the time)?	Total hours per year	1827	Hours per year	NO
If the activity or operation occurs for less than 200 hours per year do individual activities or operations occur for less than 8 hours at a time?	Operational Period	7	hours per day	YES

One of the answers for this test indicated a non-compliance with the test; therefore, Test 2 was applied.

5.1.1.2 Test 2: Wind Direction

Test 2 is an estimation of the maximum time an order may impact an area based on time:

- Time odour sources are emitting (test 1) and
- Amount of time the wind conditions are directing emissions to the receiving environment.

This provides an understanding of the frequency with which the Site has the potential to be impacted by any odour released from the industrial site.

The receiving environment comprises of the Site to the northwest of Boral Asphalt plant. As described in Section 4, meteorological data was obtained for Ballarat Aerodrome. The wind quadrant where

wind would be flowing from the emission source towards the receiving environment corresponds to a direction of 258.75° and 348.75° (wind blowing towards). The result of this test is presented in Table 5-2.

Table 5-2 Test 2: Wind Direction Towards Receiving Environment

Wind Direction (°)	Frequency of wind blowing towards the Site	Frequency of operation X Frequency of wind blowing towards the Site ¹	Hours wind is Blowing Odour Towards Site ¹
258.75 - 281.25	1.7 %	0.35%	31
281.25 - 303.75	4.6%	0.95%	83
303.75 - 326.25	10%	2.13%	187
326.25 - 348.75	8.0%	1.67%	147

¹Frequency of operation

0.21 (equivalent to 1827 operating hours per year)

Test 2 states that where the frequency of potential odour impact is < 2 % (< 200 hours) then the risk is low. 2 % of the hours in a year is 175 hours and conversely 200 hours is 2.28 % of the year. There is therefore an error in the guidance in converting between these two values, this is shown clearly in Table 5-2. To provide a conservative assessment, the value of 2 % of the time has been taken as the threshold below which low risk is indicated.

Over the 5 years with available data (2019-2023), prevailing wind patterns did direct odorous emissions towards the Site more than 2% of the time (2.13%), and therefore Boral Asphalt a Level 2 assessment is required in accordance with EPA Publication 1883.

5.1.2 Level 2 Assessment

The Level 2 semi-quantitative risk assessment for odour combines:

- Hazard potential of the source (odour source score – OSS)
- Exposure pathway between the source and sensitive locations (odour pathway score – OPS)
- Sensitivity of the receiving environment (odour receiving environment score – ORS)

Scores were given for each part of the assessment utilising several tables which are replicated from Publication 1883 (VIC EPA, 2022). The worst-case score from each table is the score for that table with the values added together to provide the final score. The outcome of the Level 2 odour assessment based on the final score is:

- 1 to 7 – low risk: the risk of odour is low, proceed to reporting
- 8 or 9 – medium risk: borderline cases – there may be one element that can influence the score and tip it into a low or high score. In these cases, this should be explored further
- 10 to 11 – high risk: A level 3 assessment is recommended to fully understand risk.
- 12 – very high-risk: A level 3 assessment is not likely to demonstrate risk is acceptable but may provide further illustration on the nature of the risks and/or inform on odour mitigation measures.

This approach provides a very conservative assessment as each factor of odour potential is not equally weighted.

5.1.2.1 OSS

The highest score for any of the columns in each table counts as the score for that table which is then summed to provide the OSS. The score from Table 5-3 is then modified based on the degree of effectiveness of the odour controls as shown in Table 5-4. The adopted score in Table 5-4 reflects the control measure applied to the source.

Table 5-3: Odour Source Hazard - Test 1

Score	Activity type	Size of odour hazard	Offensiveness Potential
1	Low odour potential: Column 1, Appendix A	Small size: Materials usage hundreds of tonnes/m ³ per year Area sources of tens of m ²	Innocuous Most people would not be bothered by the odour; however, prolonged or frequent exposure may cause adverse reactions.
2	Moderate odour potential: Column 2, Appendix A	Medium size: Materials usage thousands of tonnes/m ³ per year Area sources of hundreds of m ² .	Unwelcome Unpleasant odour range: although not likely to be perceived as toxic or unsafe, these odours are usually unwelcomed for most people.
3	High odour potential: Column 3, Appendix A	Large size: Materials usage hundreds of thousands of tonnes/m ³ per year, or Area sources of thousands of m ² .	Unsafe Likely to trigger adverse responses as people are likely to perceive odour/s as unsafe or toxic. Most people would adversely react to these odour types.
4	Very high odour potential, Column 4 in Appendix A.		

The following reasons are provided for selecting these scores:

- Asphalt is listed in Column 2, Appendix A of EPA Publication 1883.
- The size of odour hazard is moderate, where materials usage corresponds to thousands of tonnes/m³ per year.
- The offensiveness potential is unwelcome as the source is strong but predominantly contained; although not likely to be perceived as toxic or unsafe, these odours are usually unwelcomed for most people.

As the highest score on Table 5-3 is 2, the score taken forward is 2.

The odour source hazard considers Table 5-3, which selected option is highlighted in blue.

Table 5-4: Odour Source Hazard - Test 2 - Odour control effectiveness weighting

	Degree of Effectiveness of Odour Controls		
Category	High:	Moderate:	Ineffective:
	- Tangible mitigation measures in place leading to little or no residual odour; releases only due to plant failure. - Fully enclosed operations with extraction and treatment equipment utilising best available technology and techniques.	- Some mitigation measures in place, but significant residual odour remains. - Some areas of the site may be controlled but there are areas not addressed. - There is a lack of maintenance or monitoring of equipment.	- Open air operation with no containment - Reliance solely on management techniques requiring human intervention - Composting technology not commensurate with risk of feedstock.
Weighting	-1	0	1

The following reason is provided for selecting this score:

- It is considered that the facility is compliant with the GED in having some mitigation measures in place to reduce the risk so far as reasonably practicable. Experience indicates that most asphalt plants with no sensitive use within the current separation distance the level of mitigation is limited. As the specific measures in place are currently unknown, this conservative position has been adopted.

It is noted that where Boral seeks a development licence (which would be required where production is greater than 100 tonnes per week) consideration would need to be given as to the proximity of the Ballarat PSP, and under the GED the risk would need to be reduced so far as reasonably practicable. Consequently, increased production may result in a higher degree of odour control, however that eventuality has not been considered further in this assessment.

The OSS score therefore remains at **2**.

5.1.2.2 OPS

The odour exposure pathway effectiveness considers the pathway between the source and the receptor using Table 5-5.

Table 5-5: Scores for Odour Exposure Pathway Effectiveness

Score	Distance	Meteorology	Terrain & Built Form	Hours of operation
1	Long distance: Receiving environment is kilometres or hundreds of metres from source.	Favourable: Winds rarely (<10 %) blow from source away from receiving environment.	Favourable: Highly built-up intervening zone with multiple non-sensitive uses that have no emissions of their own Densely forested Source is downslope of receiving environment (or located in a valley or quarry hole).	Low frequency: Emissions are rare and only occur if there is a significant upset or multiple lines of failure Emissions related to specific infrequent planned (monthly or annual) activities.
2	Medium distance: Receiving environment is tens to hundreds of metres from source Separation distance has not been met or only just met at the threshold distances.	Neutral: Even distribution of winds (10–20%) from source to receiving environment.	Neutral: Moderate vegetation Source is on same altitude as receiving environment Intervening land use zone contains other non-odorous industry or smaller businesses.	Moderate frequency: Emissions or operations not continuous, typically confined to business hours during the day Reasonably regular in frequency (once per day to several times per week).
3	Short distance: Receiving environment is adjacent to the source/site Distance well below (less than half) separation distances.	Unfavourable: High frequency (>20%) of winds from source to receiving environment.	Unfavourable: Flat cleared land Source is upslope of receiving environment, with isolated dwellings or structures in pathway. Receiving environment abuts source.	High frequency: Emissions continually occurring 24/7 or for long periods at a time (e.g., landfills, oil refineries, sewage treatment plants, etc.).

The following reasons are given for the selection of the scores in each column:

- The pathway of exposure is of medium distance as the proposed development is located approximately 590 m west of the asphalt production plant at its closest point (i.e. the receiving environment is not less than half the required separation distance which would put it in the higher category).

- The assessment of meteorology indicated the highest frequency of wind blowing towards any part of the Site (the receiving environment) occurs a maximum of 10–20% (specifically 10.2 %) of the time (Table 5-2).
- The surrounding terrain consists of moderate vegetation; the facility is on same altitude as receiving environment and intervening land use zone contains other non-odorous industry or smaller businesses.
- The hours of operation are of moderate frequency, with emissions or operations not continuous, typically confined to business hours during the day.

The OPS score is therefore **2**.

5.1.2.3 ORS

The Odour Receiving Score is the score given to the sensitivity of the land use for which the odour assessment is being completed. The table provided in the guideline also provides VPP Land use terms or nesting group numbers, however these have not been replicated as the general uses are considered sufficient for explanation.

Table 5-6: Scores receiving environment sensitivity

Score	Sensitivity	Uses
1	Low	▪ Industrial use or equivalent rural use (in the case of agricultural odours). No population nearby or uses are transient (e.g., state parks etc.). ▪ Exposure to odours can easily be avoided.
2	Medium	▪ Business areas: exposure can typically be controlled by mitigation at the receptor (incorporated health ventilation and air conditioning systems etc.). ▪ Receptors that are single dwelling or isolated rural dwellings receptor is business/commercial. ▪ Enjoyment of the outdoors: recreational activities, playing sport, populations can move on or plan around exposure.
3	High	▪ Built up area, towns, many dwellings with backyards and outdoor living areas. ▪ Rural residential, schools, childcare or apartments. ▪ Permanent populations where avoiding exposure is not possible.

The following reason is provided for selecting this score:

- The highest sensitivity was selected as the proposed development will be used as residential with permanent populations.

5.1.2.4 Level 2 assessment results

This Scores from the Level 2 assessment are as follows:

- OSS – 2 (not modified by mitigation)
- OPS – 2
- ORS – 3.

Table 5-7 provides the scores for a Level 2 assessment with the risk of odour impact from EPA Publication 1883.

Table 5-7 Level 2 Scores and potential risks listed in EPA Publication 1883

Score	Potential risk
1 to 7	low risk: the risk of odour is low, proceed to reporting.
8 or 9	medium risk: borderline cases – there may be one element that can influence the score and tip it into a low or high score. In these cases, this should be explored further
10 to 11	high risk: A level 3 assessment is recommended to fully understand risk.
12	very high-risk: A level 3 assessment is not likely to demonstrate risk is acceptable but may provide further illustration on the nature of the risks and/or inform on odour mitigation measures.

The total final score (OSS + OPS + ORS) is 7. Following Table 5-7, this indicates a low risk of odour impact with no further assessment required.

Given this low potential risk, in accordance with EPA Publication 1949, the separation distance can be varied and sensitive uses allowed in this location.

6 CONCLUSIONS

Zephyr Environmental Pty Ltd was engaged by Ballarat Pastoral Pty Ltd to consider the odour and dust risk to their Site located at 15 Olliers Road, 88 Olliers Road, and Noble Court, Ballarat North (the Site) which is located within the Ballarat North Precinct Structure Plan (PSP).

This assessment has considered:

- The potential for odour and dust impacts from surrounding existing industries.
- Cumulative odour sources in the area.
- Recommended separation distances.
- A detailed Level 1 and Level 2 odour risk evaluation.

As part of the planning for the Ballarat North PSP, GHD's 2024 Adverse Amenity Impact Assessment (AAIA) identified medium and high-risk odour sources within a 2 km buffer of the PSP area. At the time of writing of that report, Ballarat Pastoral's Site was located outside the recommended separation distances for all identified sources, including for Boral Asphalt. This indicated at the time of GHD's assessment that there was no adverse risk from dust or odour to the Site.

Currently the separation distance for Boral Asphalt does not overlap the Site due to the level of production at less than 100 tonnes per week. Boral have advised that they wish to increase production at their asphalt plant to greater than 100 tonnes per week, which under EPA Publication 1949 has a standard separation distance of 1,000 m. A separation distance of 1,000 m would overlap with more than half of Ballarat Pastoral's Site.

In accordance with EPA Publication 1949 which requires a risk-based assessment where a standard separation distance overlies land that is intended to be developed for sensitive use, an odour risk assessment was completed adopting the approach in EPA Publication 1883. The assessment of odour risk has been undertaken to determine whether a variation in the default separation distance is appropriate.

Based on the risk assessment completed under EPA Publication 1883, as required when considering land for sensitive use for which a separation distance exists in EPA Publication 1949, the residual risk of odour impacts to the Site from Boral Asphalt, is considered to be low. The findings support the suitability of the Site for residential development in accordance with the PSP's intended land uses.

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