

8. Appendices

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A Practical Ecology Bushfire Assessment

Bushfire Risk Assessment

Wangaratta South-West Precinct (W-1 d)



April 2023

Bushfire Risk Assessment Wangaratta South–West Precinct (W–1d)

April 2023

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PE project number: WAN 3393
PE file location: R:\Wangaratta\Wangaratta
bushfire settlement planning

Version	Date	Author	Reviewer	Notes
0.0	25/05/2022	Daniel Casullo	Julian Drummond	Draft for internal review
0.1	30/05/2022	Daniel Casullo	Justin Britt Darren Viney	Draft for client review
0.2	10/01/2023	Julian Drummond	Justin Britt	Updated in response to Council and CFA comments.
1.0	14/04/2023	Julian Drummond		Final for submission

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1. INTRODUCTION

Practical Ecology have been commissioned by the Rural City of Wangaratta to provide a bushfire risk assessment as to inform the Wangaratta Low Density and Rural Residential Strategy in order to guide future development in a bushfire responsible manner.

1.1 Background

The Rural City of Wangaratta (RCOW) has recently adopted a Low Density and Rural Residential Strategy (herein referred to as the Strategy) which aims to deliver lifestyle living opportunities in four key areas across the Municipality being the Wangaratta Urban fringe, Commuter towns of Oxley and Milawa, and also the King Valley – Moyhu. A Municipal Wide Bushfire Strategy was undertaken as part of this project and underpinned the major directions of the Strategy. The Wangaratta south-west precinct (W-1d) was identified as having a moderate bushfire risk through this assessment due largely to its proximity to the Warby Ranges relative to other potential sites identified within the Wangaratta Low Density and Rural Residential Strategy.

Due to the assessed moderate bushfire risk, further subdivision and development of the Low-Density Residential Zone (LDRZ) and Rural Living Zone (RLZ) was discouraged in the south-west precinct (W-1d) unless it can be demonstrated that the subdivision and development of the land and the implementation of appropriate bushfire protection measures will achieve no net increase in bushfire risk to existing and future residents, property, community and infrastructure. This statement forms part of the required response as per Clause 13.02-1s which will be addressed throughout this report and specifically within Section 6.1.3.

As the entirety of the site is located within the Bushfire Prone Area (BPA), it is subject to the planning implications enforced under Clause 13.02-1S. The Bushfire Management Overlay (BMO) is not present within the site although the objectives and strategies of Clause 44.06 Bushfire Management Overlay and Clause 53.02 Bushfire Planning have still been taken into consideration as a benchmark for bushfire safety. We have addressed these requirements in the following report which include sections detailing the Bushfire Hazard Site Assessment, Bushfire Hazard Landscape Assessment and Bushfire Risk Assessment.

Clause 13.02-1S's objective is to strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life. While it does not list strict requirements and decision guidelines, it contains multiple strategies which need to be considered when determining bushfire risk in planning. One of these strategies, 'Use and development control in a Bushfire Prone Area', dictates which developments within Bushfire Prone Areas need to consider bushfire risk as part of their planning permission:

- Subdivisions of more than 10 lots.
- Accommodation.

- Child care centre.
- Education centre.
- Emergency services facility.
- Hospital.
- Indoor recreation facility.
- Major sports and recreation facility.
- Place of assembly.
- Any application for development that will result in people congregating in large numbers.

Since the expected development can be considered under one or more the above categories, this assessment seeks to determine the bushfire risk to the site and evaluate it against the requirements of Clause 13.02-1S to ensure it can proceed safely.

1.2 Scope

In order to provide a detailed assessment of the bushfire risk and provide the best possible solutions and options for any future development, this project encompassed the following:

- An assessment of the site and the area within 150m of the boundary to determine the vegetation classifications and slopes as per Australian Standards 3959-2018: Construction of Buildings in Bushfire Prone Areas (AS3959-2018).
- A review of the access and egress conditions around and within the site and of the vegetation and other infrastructure within the assessment and any hazard that may be present.
- A review of the wider landscape including bushfire history, potential bushfire conditions under prevailing conditions and potential refuges
- An assessment of the determined bushfire risk against Clause 44.06 Bushfire Management Overlay and Clause 53.02 Bushfire Planning (while the BMO does not apply within site, these measures form an excellent benchmark for bushfire safety).
- An assessment of the determined bushfire risk against the individual strategies of Clause 13.02-1S how well they are met across various areas of the site and surrounding areas.
- A list of recommendations for the subject site based on the determined bushfire risk and the strategies of Clause 13.02-1S.

1.3 Executive Summary

The subject site consists of higher density Rural Living Zone – Schedule 1 (RLZ1) in the north which is characterized by small and/or ‘hobby farm’ style developments. The Rural Living Zone – Schedule 2 (RLZ2) is present to the south of RLZ1 and is dominated by open farmland. The site is bound by Warby Range Road to the east, Gravel Pit Road to the south and Reith Road to the east.

The Assessment areas was divided into areas based on the usage and the risk/hazard present. Grassland vegetation as per AS3959–2018 is present within the site and within the neighboring properties within the 150m assessment area. Forest vegetation was present within road reserves of all perimeter roads and within Areas 6, 17 and 18.

The existing development within the RLZ1 to the north was considered as a mixture of Low Threat and Grassland surrounding the existing development. The entire assessment area was on relatively level terrain. In order to adhere to a BAL–12.5 construction standard as per AS3959–2018 as required under Clause 13.02–1S, a setback of 19m is required from Grassland vegetation and a setback of 48m is required from the Forest vegetation.

The wider landscape is considered of lower risk as the main threat is from Warby Ranges to the west which is separated from the site through open farmland which would account for the transition to a lower intensity grassfire approaching the site although embers from this terrain could threaten dwellings. This risk is further reduced through the present perimeter roads acting as a buffer.

After considering the bushfire risks and hazards at the landscape and site scale against the strategies of Clause 13.02–1S and the requirements/decision criteria of Clause 53.02, we are then able to inform rezoning options in the context of bushfire risk. Our recommendations are summarised below:

- the western half of the currently zoned RLZ2 has the capacity for conversion to RLZ1, with a recommended subdivision size of 2ha (following consultation with a planner and review of other legislative requirements). This development would be similar to the character of the existing RLZ1 to the north.
- the eastern half of the land currently zoned RLZ2 has the capacity for conversion to LDRZ with a recommended subdivision size of 1ha (following consultation with a planner and review of other legislative requirements). This minimum size can be reduced if the adjacent RLZ1 areas are implemented first and reduce the risk to areas adjacent.
- the land east of Aminya Road within the existing RLZ1 has the potential to accommodate higher density LDRZ style development with a subdivision size of 1ha or smaller as detailed above. This is however dependent on the application of a perimeter road along the northern boundary as there is currently no separation between existing development and Grassland to the north.
- Land management is required within new properties to ensure the proposed lots are lower risk than the existing farmland. This will need to be enforced through an overlay as the BMO does not apply to the site.

- Setbacks will be required in subsequent subdivisions to ensure proper separation is obtained and BAL-12.5 can be achieved for each new lot through a selection/combination of setbacks within lots, road reserves and public land.
- The road network within this site needs to be responsive to the bushfire risk. Development overlays and similar measures can be used to ensure roads suitable for emergency vehicles are present including boundary roads where possible around any retained bushfire hazards. Existing road reserves can be utilised for this purpose but will need to meet CFA standards.

The rezoning can be used to ensure the lot sizes are appropriate and keep both the population and the development types appropriate for the bushfire hazards present. Other responses within broader bushfire policy are the setback, management and access requirements which can be addressed through a Development Design Overlay schedule or similar. Each new subdivision will need to provide a similar assessment against Clause 13.02-1S but this schedule and the zoning should assist in streamlining this process and ensuring all development are appropriately laid out and managed.

There was however some uncertainty regarding the Forest classification within road reserves as the fuel load aligns with the Forest classification of AS3959-2018 although it is patchy and could be considered Woodland in some instances. Since these roadsides will be retained and conserved then Forest may be the best default response in regards to setbacks however the separation requirements within the legislation can be limited to 'sufficient separation for BAL-12.5' so each development can respond to the vegetation which is present.

2. BUSHFIRE HAZARD SITE ASSESSMENT

This section seeks to review the bushfire risk present onsite and within 150m of the site boundary. Map 1 provides an overview of the subject site and Map 2 provides the details of the Bushfire Hazard Site Assessment area.

2.1 Subject site

An overview of the subject site is presented on Map 1.

The subject site is bound by Warby Range Road to the west, Gravel Pit Road to the south and Reith Road to the east, all of which contain vegetation within the road reserve and are covered by the Vegetation Protection Overlay – Schedule 2 (VPO2). The site consists predominately of open farmland with scattered dwellings throughout. Higher density development is present within the most northern portion of the site, zoned RLZ1.

This sees development characterised by small ‘hobby farm’ type development with scattered patches of vegetation and an internal road network. The RLZ 2 is present south of this area and consists of larger lot sizes primarily of open farmland. A property on the western half of this area does however consist of a higher density of vegetation with a thick band surrounding the property boundary.

2.2 Vegetation and topography

Refer to Map 2 and Table 1 for the results of the vegetation and slope assessment as per Australian Standards 3959–2018: Construction of Buildings in Bushfire Prone Areas (AS3959–2018) (Standards Australia 2018).

The entire assessment area is on level terrain. Grassland as per AS3959–2018 is present throughout the site and within the 150m assessment area. The higher density rural living zone to the north contains a mixture of Low Threat and Grassland vegetation amongst the existing residential development. Forest vegetation is present within the road reserve of all perimeter roads surrounding the subject site and within Shanley Street running through the centre of the site. Forest vegetation is present lining the boundary of a property within the southern extent of the site.

Table 1. Bushfire hazard site assessment

Location	Across the entire assessment area	Within road reserves, drainage lines and private property
Vegetation type	Grassland	Forest
Effective slope (up/down)	Level	Level
Effective slope (degrees)	0–1°	0–1°

2.2.1 Forest

Forest vegetation as per AS3959–2018 consists of a canopy layer between 10–30m high (can be taller) with foliage cover of between 30–70%. There is also an elevated fuel layer of shrubs along with groundstory fuels (grasses and herbs). This vegetation is typically dominated by Eucalypts but also includes Pine plantations and denser covering of exotic trees. Forest vegetation is present within the perimeter road reserves surrounding the site and on Shanley Street (see Figure 1 and Figure 2).

Forest vegetation is also present lining the boundary of a property within the southern extent of the site (see Figure 3) and adjacent to the north–eastern boundary of the site (see Figure 4). There is however some uncertainty around this classification as general the fuel load aligns with the Forest classification under AS3959–2018 although is patchy and could be regarded as Woodland as per AS3959–2018 in some instances.

2.2.2 Grassland

Grassland vegetation as per AS3959–2018 is dominated by grass and herb species and can contain canopy and elevated fuel layers of varying heights as long as the foliage cover is less than 10%. Grassland is present throughout the entirety of the site and assessment area (see Figure 5)

2.2.3 Low Threat Vegetation

Low Threat vegetation as per AS3959–2018 consists of vegetation managed to minimal fuel conditions including maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and wind breaks. Low Threat vegetation is present surrounding existing residential development although the properties are large enough that some areas could be considered Grassland (see Figure 6 and Figure 7).

2.3 Photographs of the site and assessment area



Figure 1. Forest vegetation along Warby Range Road

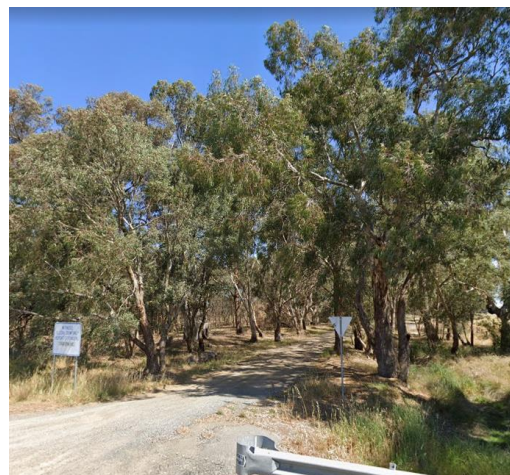


Figure 2. Forest vegetation along Reith Road



Figure 3. Forest vegetation within private property to the south



Figure 4. Forest vegetation within private property to the south



Figure 5. Grassland vegetation west of Warby Range Road



Figure 6. Low Threat areas along Colson Drive



Figure 7. Low Threat areas along Colson Drive

3. BUSHFIRE HAZARD LANDSCAPE ASSESSMENT

The bushfire risk to the site was considered at the landscape scale to develop an understanding of the likely conditions which threaten the site and then the local and site scales to determine the impact these conditions would have. The results of this assessment are presented below.

3.1 Landscape overview

The bushfire hazard landscape assessment provides information on the bushfire hazard more than 150 m away from the site. The results of this assessment are presented on Map 3 and Map 4 and further details are provided below.

3.1.1 Local landscape

The adjacent landscape is presented on Map 3 and Figure 8

Farming Zone (FZ) surrounds the site to the north and west and consists largely of open paddocks. Farming zone is also present to the east of the site although consists of comparatively smaller lots before a transition to the Public Park Resource Zone (PPRZ) and Public Conservation Resource Zone (PCRZ) along the vegetated Three Mile Creek. The zoning of this area indicates that the fuel load will remain in perpetuity. Further east the landscape transitions into higher density development throughout Wangaratta. The RLZ2 extends to the south of the site and transitions shortly thereafter back to FZ. This area consists predominately of open farmland.

Warby Ranges is present to the west of the site. The majority of this vegetated landscape is located within the PCRZ and the Rural Conservation Zone (RCZ) so there can be some assurance that this fuel load will remain in perpetuity.

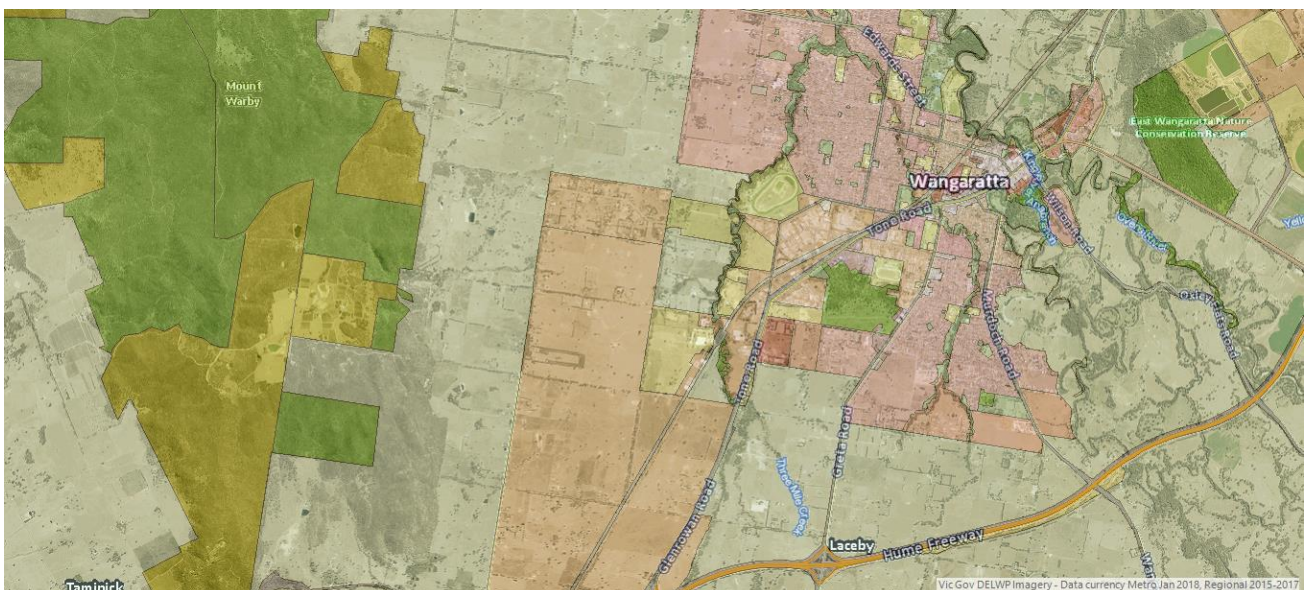


Figure 8. Zoning of adjacent land

3.1.2 Wider landscape

The wider surrounding landscape is presented on Map 4 and Figure 9.

The conditions observed at the local landscape level are reflected in the conditions at the wider landscape level. The site is located between Warby Ranges to the west and the established Township of Wangaratta to the east. The Owens River and Reedy Creek are located further to the east of Wangaratta and transect the landscape between Wangaratta and Wangaratta North. Open farmland is present to the north and south of the site and extends for many kilometres.

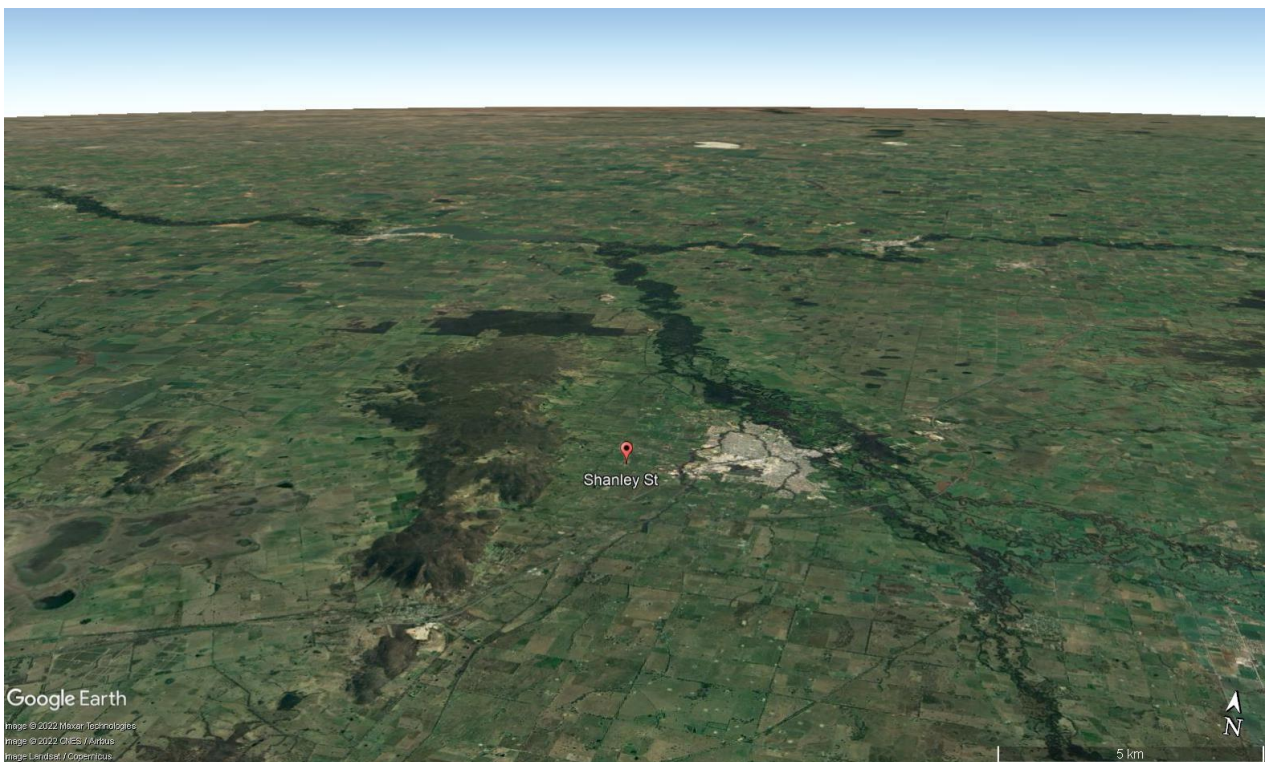


Figure 9. Wider surrounding landscape

3.2 Bushfire history

No Bushfires have impacted the site according to the available databases. Bushfires have occurred throughout the Warby Ranges to the west with the nearest occurring in 1989 roughly 1km from the site's western boundary. More recently, bushfires have occurred in 2015, 2017 and 2018 within Warby Ranges although were smaller comparatively. Prescribed burns have occurred throughout this same area between 2012–2019.

3.3 Landscape bushfire scenarios

During bushfire season, fires are propelled by powerful north–westerly winds before a south–westerly change occurs. This change brings cooler, more humid winds from the Southern Ocean but since the site is more than 200km from the ocean, these winds can be expected to propel similar bushfires and/or turn existing bushfires to the north–east which can result in larger fires forming as the terrain behind the existing front is reignited. Provided the landscape context, the site is at most risk from grassfire which can start earlier in the day and travel up to three times faster than a bushfire.

Fire runs from the north–west could see ignition within Warby Ranges and then progress into the Grassland vegetation to the east. A grassfire could impact the site from this aspect although Warby Range Road would act as a buffer from this aspect and significantly aid in suppression efforts. Fire runs from the north can be in excess of 1.5km and could progress through to the site as no significant buffer is currently present.

Grassfire could propagate through the vegetation surrounding the existing residential development in the north of the site although Colson Drive would act as a buffer from further fire progression and aid in suppression efforts. Fire runs from the south–west could see ignition within Warby Ranges and then progress through Grassland vegetation further north–east. Fire runs from this aspect are however likely to be suppressed prior to impact to the site considering the road network present acting as a buffer.

3.4 Shelter and refuge options

The nearest Neighbourhood Safer Place is located approximately 13.6km to the south of the site at Glenrowan Recreation Reserve. However, considering the amount of development present within Wangaratta, in the event of a bushfire it would be advised to travel east into the township to move away from Warby Ranges and surrounds as this would be the most likely location for a bushfire to be/move through.

2.4 Landscape typology

Planning Practice Note 65 provides a typology of bushfire landscapes (see Table 2).

This landscape can be considered a Type 2 despite the potential for bushfire to approach from multiple aspects. The vegetated areas to the west are separated from the site by open farmland so the only risk will be from embers from Warby ranges or through a lower intensity grassfire. The immediate access to the perimeter roads such as Warby Range Road and the amount of managed farmland and developed terrain within Wangaratta shortly to the east contributes to considering this as a Type 2 Landscape over a Type 3.

Table 2. Landscape typology as presented in Planning Practice Note 65 (DTPLI 2014)

Type 1	Type 2	Type 3	Type 4
<ul style="list-style-type: none"> - There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation). - Extreme bushfire behaviour is not possible. - The type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property. - Immediate access is available to a place that provides shelter from bushfire. 	<ul style="list-style-type: none"> - The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site. - Bushfire can only approach from one aspect and the site is located in a suburban, township or urban area managed in a minimum fuel condition. - Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area. 	<ul style="list-style-type: none"> - The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site. - Bushfire can approach from more than one aspect. - The site is located in an area that is not managed in a minimum fuel condition. - Access to an appropriate place that provides shelter from bushfire is not certain. 	<ul style="list-style-type: none"> - The broader landscape presents an extreme risk. - Evacuation options are limited or not available.

4. BUSHFIRE RISK ASSESSMENT

In order to provide a detailed analysis of the bushfire conditions and the appropriate responses for future developments, we need to examine the site, the current risk and hazard from each part of the assessment area (parts are divided based on vegetation classification and location). These sections then need to be considered against the current bushfire policy, specifically Clause 13.02–1S Bushfire Planning and Clause 53.02 Bushfire Planning which address general bushfire concerns and provides a viable benchmark for bushfire safety.

Based on this, we can identify any likely hurdles which may be encountered by future planning applications in regards to Bushfire Prone Areas and provide recommendations accordingly. Since the site is outside of the BMO, an application can follow the recommendations of this assessment and potentially address all of the bushfire concerns but an individual assessment is still recommended to account for any unique features proposed by future developments.

4.1 Site analysis


Considering all of the results above, we can divide the site and the surrounding assessment area based on the recorded conditions and current usage to determine the risk posed to each zone and the hazard it poses to adjacent zones. The ratings for the risk and the hazard are detailed below:

- **Low Risk/Hazard:** Both the risk to this area from adjacent or external hazards and the hazard generated if this area were ignited are considered to be negligible. Little to no action should be required to manage the risk or the hazard outside of meeting the strategies of Clause 13.02–1S which can be easily accommodated.
- **Moderate Risk/Hazard:** The risk and hazard are still considered to be manageable but there is the potential of a bushfire event threatening this area and the potential for this area to threaten adjacent areas when ignited. Any issues here can be addressed through the strategies of Clause 13.02–1S but additional caution is advised when considering applications within or adjacent to these areas.
- **High Risk/Hazard:** The determined risk to an area is considered to be above the manageable threshold and/or the hazard being generated is considered to be too high for the adjacent areas to be expected to accommodate. Unlike Moderate where the risk and hazard can be addressed through Clause 13.02–1S, High risks and hazards will require additional specialised actions to reduce the rating to Moderate and should be considered more under the requirements of the BMO. These additional actions will be detailed in the recommendations if or when they're required.

4.2 Results

The defined areas are displayed on Map 2 and a discussion of these areas is presented below.

4.2.1 Area 1

Location	Open farmland between RLZ1 and Shanley Street
Risk category	Low
Hazard category	Moderate
Details	This area contains open farmland considered as Grassland vegetation. The risk is low as the area is surrounded by perimeter roads which would act as buffer from approaching grassfire. The hazard is considered Moderate as if ignition occurred in this area it could spread to the north or south under prevailing conditions and impact the adjacent areas.
	 <p>Figure 10. Grassland vegetation north of Shanley Street</p>

4.2.2 Area 2

Location	Open farmland between Shanley Street and Gravel Pit Road
Risk category	Moderate
Hazard category	Low


<p>Details</p>	<p>Grassfire approaching from the open farmland surrounding this area would likely be buffered off of the perimeter roads. The Forest vegetation within Area 17 does however pose a risk as ignition within this area could see fire progression into the surrounding Grassland fuel. The hazard is considered low as the perimeter roads would act as a buffer from grassfire progressing from this area.</p>
<p>Photos</p>	<div data-bbox="651 577 1289 1048" data-label="Image"> </div> <p data-bbox="635 1059 1305 1093">Figure 11. Grassland vegetation north of Gravel Pit Road.</p>

4.2.3 Area 3


<p>Location</p>	<p>RLZ1 within the northern extent of the site around Coulson Drive</p>
<p>Risk category</p>	<p>Moderate</p>
<p>Hazard category</p>	<p>Moderate</p>
<p>Details</p>	<p>This area contains higher density hobby farm type development with scattered patches of vegetation throughout that could be considered as Forest or Woodland as per the standard. The risk is considered moderate as grassfire approaching from the north could impact the site as no buffers are present. The hazard is considered moderate due to the patches of vegetation present that could propagate grassfire into Area 1. This hazard is reduced however provided the vegetation maintenance occurring within these lots.</p>

<p>Photos</p>	 <p>Figure 12. Low threat area surrounding existing development</p>
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4.2.4 Area 4


<p>Location</p>	<p>Farmland to the east of Reith Road and north of Shanley Street</p>
<p>Risk category</p>	<p>Moderate</p>
<p>Hazard category</p>	<p>Low</p>
<p>Details</p>	<p>This open farmland area is located west of the riparian vegetation throughout Three Mile Creek. A grassfire from the north would likely be buffered by Racecourse Road although bushfire within the creek could see a transition to grassfire further west and impact this area. Prevailing conditions would push a fire here away from the site so this and the presence of Reith Road reduce the hazard to low.</p>
<p>Photos</p>	 <p>Figure 13. Managed vegetation to the east of Reith Road</p>

4.2.5 Area 5


Location	Grassland north of the site boundary
Risk category	Moderate
Hazard category	Moderate
Details	This Grassland area is adjacent to the residential development within Area 3. Grassfire from the north could impact this area which could then progress further south and impact Area 3 since there is no road separating them.
Photos	 <p>Figure 14. Grassland vegetation north of the site</p>

4.2.6 Area 6


Location	North-eastern extent of assessment area
Risk category	Moderate
Hazard category	Moderate
Details	This patch of Forest vegetation could see impact via a grassfire approaching from the north or north-west. This could see a transition to a higher intensity bushfire although progression to the south would a transition back to a lower intensity grassfire. This could however impact existing development within Area 3. This is however unlikely as under prevailing conditions progression would be buffered by Reith Road.

<p>Photos</p>	 <p>Figure 15. Forest vegetation north of the site</p>
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4.2.7 Area 7


<p>Location</p>	<p>North-west of site boundary</p>
<p>Risk category</p>	<p>Moderate</p>
<p>Hazard category</p>	<p>Low</p>
<p>Details</p>	<p>A fire run from the north-west could impact this area as no real buffers are present. The hazard is low however as progression further south east would be buffered by Warby Range Road.</p>
<p>Photos</p>	 <p>Figure 16. Grassland west of the site</p>

4.2.8 Area 8


Location	Corner of Shanley Street and Warby Range Road
Risk category	Moderate
Hazard category	Low
Details	Grassland vegetation on open farmland. The risk is considered moderate as fire runs from the north west can transect the landscape relatively unimpeded. The surrounding road network does however act as a buffer from fire runs progressing into the site.
Photos	 <p>Figure 17. Grassland vegetation amongst open farmland</p>

4.2.9 Area 9


Location	Grassland vegetation between Shanley street and Gravel Pit Road, west of the site
Risk category	Moderate
Hazard category	Low
Details	Grassland vegetation within open farmland. Grass fire could impact this area from the west as no buffers are present. The hazard is low however as Warby Range Road would act as a buffer if grassfire were to approach the site.

<p>Photos</p>	 <p>Figure 18. Grassland vegetation west of Warby Range Road</p>
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4.2.10 Area 10

<p>Location</p>	<p>Open farmland east of Reith Road</p>
<p>Risk category</p>	<p>Moderate</p>
<p>Hazard category</p>	<p>Low</p>
<p>Details</p>	<p>A grassfire approaching from the east could see impact to this area although is unlikely to happen as fire progression from this aspect is less common under prevailing conditions. The hazard is considered low as fire is unlikely to impact adjacent areas due to the road network acting as a buffer.</p>
<p>Photos</p>	 <p>Figure 19. Grassland vegetation to the south-east of Reith Road</p>

4.2.11 Area 12


Location	Open farmland south of Gravel Pit Road
Risk category	Moderate
Hazard category	Low
Details	Grassland within open farmland that could see impact from a largely unimpeded fire run from the south. The hazard is considered low as the road network would act as a buffer from fire progression impacting any other area.
Photos	 <p>Figure 20. Grassland vegetation south of Gravel Pit Road</p>

4.2.12 Area 13


Location	Warby-Range Road reserve
Risk category	Moderate
Hazard category	Moderate
Details	Forest vegetation is present within this road reserve and extends further to the west at one point along the drainage line. The risk is considered moderate as a grassfire coming from the north-west could ignite this fuel. Warby-Range Road would act as a fuel break although ember attack could allow for ignition within the fuel load on the other side of the road then into the site.

<p>Photos</p>	 <p>Figure 21. Forest vegetation along Warby-Range Road</p>
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4.2.13 Area 14


<p>Location</p>	<p>Gravel Pit Road</p>
<p>Risk category</p>	<p>Moderate</p>
<p>Hazard category</p>	<p>Moderate</p>
<p>Details</p>	<p>Forest vegetation within the road reserve of Gravel Pit Road. The vegetation along this length is patchy with some areas denser than others. The risk is considered moderate as a grassfire from the south-west could see ignition to this fuel load and then allow fire to propagate into the site through ember attack although this scenario would be mostly restricted to under extreme conditions. The hazard is reduced due to Gravel Pit Road acting as a fuel break.</p>
<p>Photos</p>	 <p>Figure 22. Forest vegetation along Gravel Pit Road</p>

4.2.14 Area 15

Location	Reith Road along the eastern site boundary
Risk category	Moderate
Hazard category	Moderate
Details	<p>Forest vegetation within the road reserve of Reith Road. The risk and hazard are considered moderate as grass fire could impact the fuel load within the road reserve and propagate fire into the site. The riparian vegetation within Three Mile Creek to the east does extend relatively close to the eastern site boundary which does pose some risk.</p> <p>South of Shanley Street Reith Road transitions to a dirt road and little management appeared to be occurring within this area which does raise the hazard. It is assumed that this road would be upgraded if the proposed rezoning goes ahead. The hazard is however reduced as fire runs from the west are less likely under prevailing conditions and potential fire runs are shorter from this aspect provided the proximity of development within Wangaratta further east.</p>
Photos	 <p>Figure 23. Forest vegetation along Reith Road</p>

4.2.15 Area 16

Location	Shanley Street running through the centre of the site
Risk category	Moderate
Hazard category	Moderate


<p>Details</p>	<p>Forest vegetation within the road reserve of Shanley Street. The risk and hazard are considered moderate as short grassfire runs from the north-west or south-west could see ignition to this fuel load and potentially aid in transmission to adjacent areas. If rezoning is to occur however and allow for higher density development with more managed land then the risk from approaching grassfire will be significantly reduced.</p>
<p>Photos</p>	<div style="text-align: center;">  </div> <p style="text-align: center;">Figure 24. Forest vegetation along Shanley Street</p>

4.2.16 Area 17

<p>Location</p>	<p>South-western corner of the site</p>
<p>Risk category</p>	<p>Moderate</p>
<p>Hazard category</p>	<p>Moderate</p>
<p>Details</p>	<p>This area comprises a single lot with a mixture of Forest vegetation along the boundary and Grassland through the centre. The risk is considered moderate as if ignition were to occur south of Shanley Street than a grassfire could impact the site. The hazard is also considered moderate as the increased fuel load within this area does pose a risk and could generate embers under unfavourable conditions. The hazard is however reduced due to the surrounding open farmland which would see a transition to a lower intensity grassfire.</p>

<p>Photos</p>	 <p>Figure 25. Forest vegetation along the perimeter of the area</p>
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4.2.17 Area 18

<p>Location</p>	<p>East of Reith Road and south of Shanley Street</p>
<p>Risk category</p>	<p>Low</p>
<p>Hazard category</p>	<p>Moderate</p>
<p>Details</p>	<p>Consists of a mixture of Forest vegetation within the drainage line and Grassland through the centre. The risk is considered low as fire runs are restricted to approach from the east and south which are less likely under prevailing conditions and will be relatively short due to the road network and surrounding development. The hazard is considered moderate as if ignited this area could propagate fire into the road reserve and potentially cause ember attack into the site. The hazard is however reduced given the fragmented nature of the fuel load and inability for fire runs to generate in intensity.</p>
<p>Photos</p>	 <p>Figure 26. Forest vegetation within the drainage line</p>

5. LEGISLATION AND POLICY

In order to provide an assessment of the bushfire risk, which can be utilised by Council or by future developers seeking planning applications, the assessment of the bushfire risk needs to be considered against the current bushfire legislation. Under the BMO, applications need to be considered against Clause 53.02 while some applications within Bushfire Prone Areas need to be considered against Clause 13.02–1S (see Section 1.1 for the details).

The BMO does not cover any of the site however the BPA covers the whole site. Properties within Bushfire Prone Areas normally don't require a planning response but if one is required under Clause 13.02–1S, Clause 53.02 can be used as a benchmark for bushfire safety so we will consider the entire site under both clauses. The logic regarding the sections of these clauses being applied and if/how the site meets these requirements is detailed below.

5.1 Clause 13.02–1S Bushfire Planning

As mentioned previously, Clause 13.02–1S's objective is to strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life. It contains multiple strategies which need to be considered as part of any bushfire planning application either through the BMO or through separate assessment. These strategies include:

- Protection of human life,
- Bushfire hazard identification and assessment,
- Settlement Planning,
- Areas of biodiversity conservation value,
- Use and development control within a Bushfire Prone Area, and
- Policy guidelines and documents

The use and development control within a Bushfire Prone Area is detailed in Section 1.1 and states the types of development which need to be considered at the planning level within a Bushfire Prone Area so this has already been addressed. Additionally, this document will seek to inform the current municipal management plans and utilises AS3959–2018 among other bushfire policy documents so this strategy can also be considered addressed. The remaining strategies are discussed below.

5.1.1 Protection of human life

Protection of Human Life

Give priority to the protection of human life by:

- Prioritising the protection of human life over all other policy considerations.
 - Directing population growth and development to low-risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.
 - Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision-making at all stages of the planning process.
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This strategy is very broad, but focuses on ensuring that this ideal is at the forefront of any development when considering bushfire safety. This strategy, along with Settlement Planning, are also utilised to ensure higher risk areas are not developed over lower risk ones. Overall, the fact that this assessment is being performed and is addressing this clause means that the protection of human life has been considered.

The landscape typology has been identified as landscape type 2 risk which is considered of lower risk. Additionally, the proximity of the site to the established township of Wangaratta ensures the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire. This does not mean that safety is guaranteed but, if bushfire risk and proper access for emergency services is considered through the design process (potentially through a development overlay or similar) then the risk present can be easily mitigated.

The Warby Ranges to the west of the site poses the main landscape risk although the site is separated from this area by roughly 1.5km. A bushfire progressing from this aspect would transition to a lower intensity grassfire and likely be suppressed prior to impact to the site, particularly considering the road network in place acting as a buffer. The vast majority of the site and surrounding landscape is of open farmland which accounts for Grassland type vegetation. Any new development will need to respond to the adjacent residential areas so we have assurance that the fuel levels will not increase.

It can be assumed that through the proposed development the majority of the Grassland fuel load will be managed and the continuity of the fuel load disrupted which would see an overall reduction in risk. This leaves the Grassland external to the site and the Forest fuel load within the road reserves to be considered which can be responded to via the appropriate setbacks and access requirements. The correct zoning will ensure lot sizes which can respond appropriately so this development can easily respond to the bushfire risk and meet this strategy.

5.1.2 Bushfire hazard identification and assessment

Bushfire hazard identification and assessment

Identify bushfire hazard and undertake appropriate risk assessment by:

- Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard.
- Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the Building Act 1993 or regulations made under that Act.
- Applying the Bushfire Management Overlay in planning schemes to areas where the extent of vegetation can create an extreme bushfire hazard.
- Considering and assessing the bushfire hazard on the basis of:
 - Landscape conditions – meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site;
 - Local conditions – meaning conditions in the area within approximately 1 kilometre from a site;
 - Neighbourhood conditions – meaning conditions in the area within 400 metres of a site; and,
 - The site for the development.
- Consulting with emergency management agencies and the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures. Ensuring that strategic planning documents, planning scheme amendments, planning permit applications and development plan approvals properly assess bushfire risk and include appropriate bushfire protection measures.
- Not approving development where a landowner or proponent has not satisfactorily demonstrated that the relevant policies have been addressed, performance measures satisfied or bushfire protection measures can be adequately implemented.

Sections 2 and 3 use the best available science and data to determine the bushfire risk at the scales detailed above and the requirements of the BMO have been applied here in detail (despite not being required here) so overall, this assessment addresses this strategy. The CFA have been consulted on this development plan and the recommendations being made and their concerns have been addressed so we can consider this strategy met.

5.1.3 Settlement planning

Settlement Planning

Plan to strengthen the resilience of settlements and communities and prioritise protection of human life by:

- Directing population growth and development to low-risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018).
- Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS 3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2018) where human life can be better protected from the effects of bushfire.
- Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.

Settlement Planning

- Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reduce bushfire risk overall.
- Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.
- Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.
- Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS 3959-2018.

This strategy is the most important one which needs to be addressed by this assessment. When considering the rezoning of this area, we need to account for the bushfire risk and whether the development that the rezoning will permit can be carried out. As this proposal is for residential zoning, we need to consider the population increase the area can support while remaining at an acceptable risk level and ensure that future residential subdivisions (being the next step from a planned perspective) can/will provide all of the required setback to achieve BAL-12.5.

As detailed in Section 5.1.1 above, the landscape risk has been assessed as low within the main bushfire hazard being the Warby Ranges to the west which is separated from the site by open farmland. This would see a reduction in fire intensity as it transitions to grass fire and would likely be suppressed prior to impacting the site. Embers from the Warby Ranges igniting adjacent paddocks and fuel load within the site does pose a risk although this is mitigated through perimeter roads acting as a buffer and through implications of rezoning which would see a higher degree of vegetation management within the site.

The hazards identified within the site and immediate landscape can be mitigated to an acceptable level through appropriate setbacks and through a bushfire responsive road layout design. Additionally, Shanley Street and Gravel Pit Road provide access into BAL-LOW areas within Wangaratta to the east although the intensification of residential density will likely warrant an upgrade to these roads. The setbacks can be accounted for at this stage either through the type of residential zoning ensuring there is adequate space available or having design overlays in place which will require this setback to be incorporated into lot design or proposed public space.

In summary, the rezoning as recommended within Section 6.1 is considered acceptable as to provide a transition between lower density and higher density development in response to the main bushfire hazard to the west. Alternative options have been assessed through the Municipal Wide Bushfire Assessment which identified the subject site as having a moderate risk. Lower density development ensured through Rural Living Zone or Low-Density Residential Zone will ensure the population does not become too high immediately adjacent to bushfire hazards and encourage open, managed terrain which will mitigate bushfire risk.

Having a Design and Development Overlay schedule or similar overlay in place will also ensure that the correct separation is achieved and ensure BAL-12.5 is attainable on each property. This will be a minor issue for the low-density residential zoning since the larger properties can easily incorporate the required setbacks but, if future rezoning allows for the greater density, this overlay will ensure that the appropriate setbacks are incorporated into the designs. This will not be for a significant period since the surrounding area means only low-density zoning is suitable at present but if future expansion means this area has more access and can accommodate a higher population, the risk will be addressed.

These planning controls will ensure that the bushfire risk will be addressed in perpetuity. Additional assessments will be required for subsequent subdivisions but the proposed low-density zoning will ensure that nothing which will increase the population too high or result in designs which cannot provide BAL-12.5 for each property will not be considered. In addition, allowing higher density residential areas (still within low-density zoning) closer to Wangaratta where the risk is lower will open the door for higher density residential development in the future if/when the risk is reduced with the confidence that this strategy has been addressed.

5.1.4 Areas of high biodiversity conservation value

Areas of high biodiversity conservation value

Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are of high biodiversity conservation value.

The site consists primarily of exotic pasture with no conservation value. There may however be some native grasses throughout so assessment prior to development should be considered. Indigenous vegetation may also occur within the drainage line moving to the east of the site just north of Shanley Street, this area should be considered if development is likely to impact. These areas are however comparatively small and development would not see unacceptable biodiversity impacts and/or can plan around these features.

The main concern is the higher risk areas which have conservation value such the roadside vegetation which is covered by the Vegetation Protection Overlay – Schedule 2. As stated above, we’re proposing lower-density residential zones and overlays to either provide properties large enough to accommodate setbacks or ensure setbacks are included in future designs. These vegetation patches have been identified by this assessment (Areas 13 and 14) as one of the vegetation patches which requires a setback so we’ve accounted for the fact that this vegetation will be retained.

Upgrades will likely be required along these roads to ensure proper access for emergency services and future residents but, since there are setbacks proposed from this vegetation, any impacts can be restored with the knowledge that we’re not increasing the bushfire hazard to adjacent areas. Since the higher value conservation values have been accounted for in this assessment, we have assurance that this strategy has been met.

5.2 Clause 53.02 Planning for Bushfire

As stated previously, this property is not within the BMO and does not need to comply with Clause 44.06 BMO or Clause 53.02 Planning for Bushfire. The proposed rezoning does need to comply with Clause 13.02-1S and the 'Bushfire hazard identification and assessment' strategies of this Clause lay out several points which are covered within Clause 53.02's criteria.

This Clause also contains the measures required to achieve BAL-12.5 for all proposed developments which is vital for the 'Settlement Planning' strategies of Clause 13.02-1S so reviewing the potential rezoning against this Clause can assist in determining if and how this rezoning should proceed. The required responses under this Clause are based on the application types and include:

- **Clause 53.02-3 Dwellings in existing settlements** applies to single dwellings on properties within residential zonings (Neighbourhood Residential Zone, General Residential Zone, Residential Growth Zone, Urban Growth Zone, Low Density Residential Zone, Township Zone or Rural Living Zone). These applications can make certain assumptions regarding the landscape risk and available services so they do not require a landscape scale assessment and have much simpler application requirements.
- **Clause 53.02-4 Bushfire Protection Objectives** applies to all other developments except subdivisions. These measures are designed to review the landscape and local conditions with greater scrutiny since, unlike existing settlements, whether or not the landscape risk is acceptable or if particular amenities such as suitable access are available is not known.
- **Clause 53.02-4.4 Subdivision Objectives** refers to subdivisions and employs aspects of 4.1 - 4.4 even if the application is within an existing settlement since the application needs to consider whether the proposed change in usage and/or population density can be accommodated by existing systems.

Clause 53.02-4.4 has been considered appropriate for this site as it will be subject to subdivision during the following planning stages and the rezoning proposed now will need to address the subsequent requirements.

To fulfil the purpose, and allow application of Clause 53.02, objectives, measures to address the objectives, and decision guidelines are detailed within the Clause. These are defined below:

- **Objectives.** An objective describes the outcome that must be achieved in a completed development.
- **Approved measures (AM).** An approved measure meets the objective.
- **Alternate measures (AltM).** An alternative measure may be considered where the responsible authority is satisfied that the objective can be met. The responsible authority may consider other unspecified alternative measures.

- **Decision guidelines.** The decision guidelines set out the matters that the responsible authority must consider before deciding on an application, including whether any proposed alternative measure is appropriate.

A summary of the subdivision objectives relevant to this area is provided in Table 3.

Table 3. Approved measures to meet Clause 53.02–4.4 Subdivision Objectives

Clause 53.02–4.4 Subdivision objectives		
To provide lots that are capable of being developed in accordance with the objectives of Clause 53.02.		
To specify at the subdivision stage bushfire protection measures to develop a lot with a single dwelling on land zoned for residential or rural residential purposes.		
Measure	Requirement	Applicable
AM5.1	<p>An application to subdivide land, other than where AM 5.2 applies, demonstrates that each proposed lot is capable of meeting:</p> <ul style="list-style-type: none"> • The defensible space in accordance with Table 2 Columns A, B or C and Table 6 Clause 53.02–5. • The approved measures in Clause 53.02–4.1 and Clause 53.02–4.3. 	No – 5.2 applies
AM5.2	<p>An application to subdivide land zoned for residential or rural residential purposes must be accompanied by a plan that shows:</p> <ul style="list-style-type: none"> • Each lot satisfies the approved measure in AM 2.1. • A building envelope for a single dwelling on each lot that complies with AM 2.2 and provides defensible space in accordance with: <ul style="list-style-type: none"> – Columns A or B of Table 2 to Clause 53.02–3 for a subdivision that creates 10 or more lots; or – Columns A, B or C of Table 2 to Clause 53.02–3 for a subdivision that creates less than 10 lots. <p>The bushfire attack level that corresponds to the defensible space provided in accordance with Table 2 to Clause 53.02–3 must be noted on the building envelope</p> <ul style="list-style-type: none"> • Defensible space wholly contained within the boundaries of the proposed subdivision. • Defensible Space may be shared between lots within the subdivision. Defensible space for a lot may utilize communal areas, such as roads, where that land can meet the requirements for defensible space. • Vegetation management requirements in accordance with Table 6 to implement and maintain the defensible space required under this approved measure. • Water supply and access that complies with AM 4.1 	Yes – requires consideration
AM 5.3	An application to subdivide land to create 10 or more lots provides a perimeter road adjoining the hazardous vegetation to support firefighting.	Yes – requires consideration
AM 5.4	A subdivision manages the bushfire risk to future development from existing or proposed landscaping, public open space and communal areas.	Yes – requires consideration

5.2.1 Landscape assessment

Subdivision applications utilise Approved Measure 2.1 and 2.2 from Clause 53.02–4.1 to determine if the risk from the surrounding landscape can be mitigated to an acceptable level. These measures are provided in detail below.

AM 2.1

The bushfire risk to the development from the landscape beyond the site can be mitigated to an acceptable level.

This measure focuses on the factors outside of the site which cannot be changed and links back to the considerations under Clause 13.02–1S as to whether the development of the site is appropriate. As stated previously, the main bushfire hazard is the Warby Ranges to the west of the site which is roughly 1.5km away so a fire front directly from this area cannot occur as it would transition to a lower intensity grass fire which would move faster but be easier to contain.

The main hazard will be from embers igniting Grassland onsite or on paddocks to the east which can send a grassfire towards the site. Warby Range Road provides an existing fire break from fire approach from the north–west. Embers igniting Grassland onsite could cause a grassfire although the provision of development would see more managed land and an internal road network which would mitigate this risk.

AM 2.2

A building is sited to ensure the site best achieves the following:

- The maximum separation distance between the building and the bushfire hazard.
- The building is in close proximity to a public road.
- Access can be provided to the building for emergency service vehicles

This approved measure has less of an application at this stage since there are no plans for the subdivision but it should be considered to ensure the BAL–12.5 separation is present. The Forest vegetation within the road reserves of Warby Range Road, Gravel Pit Road, Reith Road and Shanley street will require a 48m setback to adhere to a BAL–12.5 standard.

Access to a public road is required under this approved measure and Approved Measure 5.3 also requires a perimeter road. This is provided by Warby Range Road to the west, Gravel Pit Road to the south and Reith Road to the west. There is currently no perimeter road along the northern boundary of the site however Coulson Drive provides for access to this existing residential area. Additionally, the proposal will involve an internal road network which will ensure adequate access for all residents.

Future subdivision layouts can ensure adequate access is provided into Wangaratta to aid evacuating residents in the event of a bushfire within Warby Ranges to the west. This will need to be addressed through their own bushfire risk assessments under Clause 13.02–1S or it can be addressed through a Design and Development Overlay for the rezoned areas.

5.2.2 Site assessment

Approved Measure 5.2 also contains the details for addressing site specific hazards with residential subdivisions which should be considered as part of the potential rezoning. The points relevant to this assessment are highlighted below.

AM 5.2

An application to subdivide land zoned for residential or rural residential purposes must be accompanied by a plan that shows:

- Each lot satisfies the approved measure in AM 2.1.
- A building envelope for a single dwelling on each lot that complies with AM 2.2 **and provides defensible space in accordance with:**
 - **Columns A or B of Table 2 to Clause 53.02–5 for a subdivision that creates 10 or more lots; or**
 - Columns A, B or C of Table 2 to Clause 53.02–5 for a subdivision that creates less than 10 lots.
- **The bushfire attack level that corresponds to the defensible space provided in accordance with Table 2 to Clause 53.02–5 must be noted on the building envelope**
- **Defensible space wholly contained within the boundaries of the proposed subdivision.**
- **Defensible Space may be shared between lots within the subdivision. Defensible space for a lot may utilize communal areas, such as roads, where that land can meet the requirements for defensible space.**
- **Vegetation management requirements in accordance with Table 6 to implement and maintain the defensible space required under this approved measure.**
- Water supply and access that complies with AM 4.1

Column A of Table 2 to Clause 53.02–5 are the requirements for BAL–12.5 which are expanded on further in the BAL assessment below. Defensible space is not normally enforceable here as the site is outside the BMO but can be included in some form through the recommended Design and Development Overlay along with the setbacks required to achieve BAL–12.5. This should also allow Approved Measure 5.4 to be met. Details regarding land management are also provided below.

Table 4 details the conditions within the 150m assessment area to detail the required defensible space for BAL–12.5 as per AS3959–2018.

Table 4. Defensible space and BAL assessment

Vegetation	Forest	Grassland	Low Threat
Forest Fire Danger Index	100	100	100
Slope (up/down)	Level	Level	Level
Slope (degrees)	0–1°	0–1°	0–1°
Defensible space for BAL 12.5 (m)	48	19	N/A
Defensible space for BAL 19 (m)	35	13	N/A
Defensible space for BAL 29 (m)	25	9	N/A

As mentioned previously, we're currently recommending Rural Living Zone (RLZ) or a similar zoning which requires larger lots on the western side of the development area which should be able to accommodate the required setbacks and provide a larger, lower-population, managed area separating more populated areas from unmanaged areas. The eastern side of the development area can support Low-Density Residential Zone (LDRZ) because of this buffer but a lower population is still advised at present.

The RLZ proposed within the western half of the site will mean large lot sizes which will be able to provide the 48m setback required from the Forest vegetation within the road reserve of Warby Range Road, Shanley Street and Gravel Pit Road. The proposed LDRZ within the eastern half of the site will require the same 48m setback from the Forest vegetation within the road reserves of Shanley Street, Reith Road and Gravel Pit Road and from the patch of Forest adjacent to the north-eastern corner of the site boundary.

This setback can be potentially adhered to through the incorporation of a managed open space such as a managed park reserve or similar. Future subdivisions will need to perform their own assessments against Clause 13.02-1S which should address this and/or a Design and Development Overlay or similar can be used. Vegetation within such an open space will have to adhere to defensible space management standards as detailed below. As development is likely to be staged, setbacks for the fuel loads within the immediate area will need to be responded to throughout the entire process.

The fuel load throughout the road reserves varies with some areas denser than others although generally aligns with the Forest classification as set out within AS3959-2018. The CFA have been consulted and it has been determined that this classification is appropriate provided the width of the vegetation and the landscape context. It is also understood that some road reserves have the capacity for fuel management which once conducted may enable a change in the vegetation classification and therefore a reduction in the setback. This will be subject to further assessment once conducted.

The proposed zoning and overlays will ensure all subsequent subdivision designs ensure BAL-12.5 can be obtained within each property. Some options to be factored into the zoning and overlay schedule include:

- Requiring perimeter roads around lots as opposed to a central cul-de-sac. This can utilise existing roads and would create a setback as well as a staging area for emergency services.
- Minimum lot sizes (as previously discussed) can ensure that there is enough space for setbacks within each property and setback can be required from the boundaries to account for offsite vegetation (we've seen similar requirements for rural residential areas to create an open farmland aesthetic).
- Vegetation management standards can be enforced through development plan overlays to ensure defensible space is present. Rural activities can also be allowed/encouraged on larger properties (horse yards, orchards, etc.) to create more managed and/or low threat terrain.

Higher BAL ratings can potentially be obtained if the landowner desires it (see Figure 27 for a summary of the BAL ratings) but the zoning and overlays required to establish subdivisions and develop residential areas will ideally make this unnecessary.

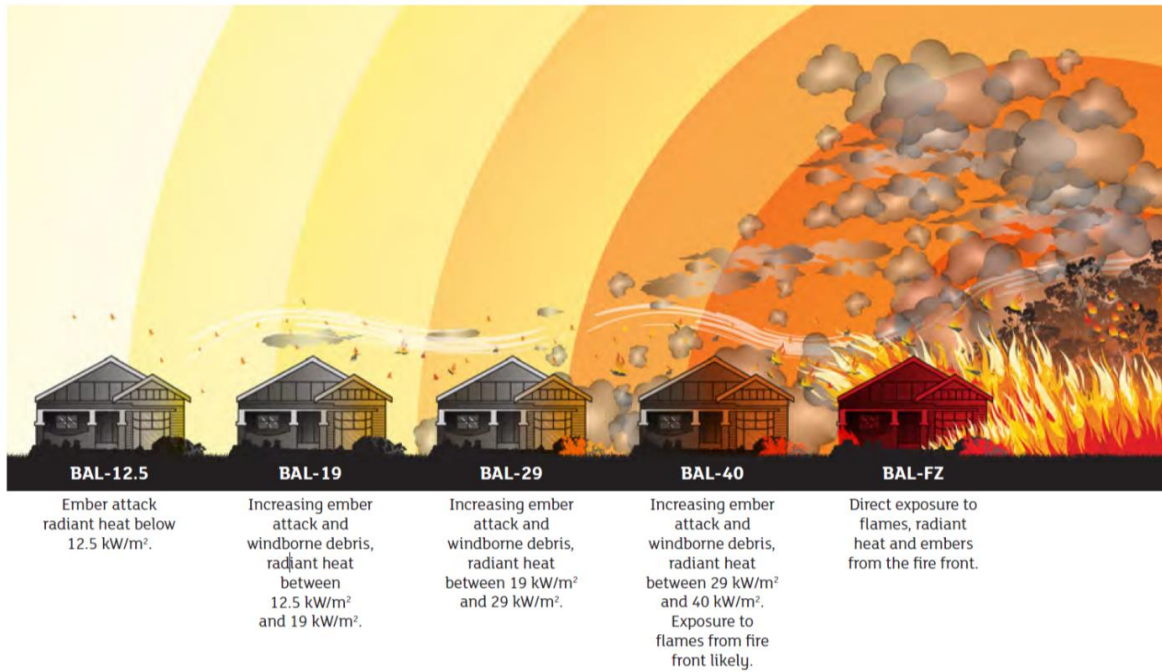


Figure 27. BAL levels (CFA 2012)

Table 6 to Clause 53.02–5 requires that defensible space is provided and is managed in accordance with the following requirements:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3m of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

6. RECOMMENDATIONS

Based on the assessment of Clause 13.02–1S and Clause 53.02 above, we have provided the following recommendations in regards to the proposed rezoning within the development area.

6.1 Zoning and overlays

The areas recommended for rezoning are provided below and displayed on Map 5.

As detailed within Section 1.1, It is understood that council is seeking advice on bushfire risk in regard to the potential rezoning of the land within the site. Specifically, the potential for the intensification of the existing rural living zoned land and or conversion to low density residential zoning. After considering the bushfire risks and hazards at the landscape and site scale against the strategies of Clause 13.02–1S and the requirements/decision criteria of Clause 53.02 we can inform the potential to, and associated risks of, re zoning for higher density residential purposes.

Through analysis it has been determined that the western half of the currently zoned RLZ2 has the capacity for conversion to RLZ1, with a subdivision size of 2 ha. This development would be similar to the character of the existing RLZ1 to the north. The implementation of this zoning has been considered safe due to the following reasons:

- Lower-density residential areas mean a lower population so fewer people are being exposed to whatever threat is adjacent to the developed areas and emergency services don't have to deal with a large number of people evacuating or defending their homes.
- Larger lots mean more managed terrain but fewer structures which increases the buffers available and provides a lot of open terrain where a fire can be confronted and contained.
- Placing lower-density residential or similar in boundary areas encourages certain types of developments which can be encouraged/enforced through a Design and Development Overlay Schedule which are lower risk (houses with large managed gardens, hobby farmers, stables and horse paddocks, etc.).
- Larger lot sizes will have the capacity to meet the required 48m setback from the vegetation within road reserves. In addition, restricting the lot size to 2 ha also means there is less chance of unmanaged vegetation being present on a property due to the size and distance to onsite infrastructure.
- Perimeter roads surrounding this area at all aspects would create separation and act as a buffer particularly from the road reserve and the exiting RLZ1 to the north
- Road layout (as detailed above) and hydrants will need to conform to emergency safety standards regardless of whether the BMO is present or not so we're creating an open lower risk space with all of the amenities required to fight a bushfire

Through analysis it has been determined that the eastern half of the land currently zoned RLZ2 has the capacity for conversion to LDRZ with a recommended subdivision size of 1 ha. Smaller lot sizes (0.2, 0.4 or 0.6 ha) can be considered within the LDRZ once the RLZ1 areas are established to reduce any outstanding risks and following discussion with the CFA regarding the population increase the area can safely accommodate. It is also possible that 1 ha lots can be considered early with the option of smaller lot sizes in the future.

This proposed rezoning is considered safe due to the following reasons:

- The higher density development within this area will be buffered from potential grass fire runs from the north-west or south-west by the proposed RLZ1 to the west
- Perimeter roads between the LDRZ and the RLZ1 will provide a buffer from any grassfire threat potentially occurring within the proposed RLZ1 to the west and the existing RLZ1 to the north.
- An internal road layout (as detailed above) and hydrants will need to conform to emergency safety standards which will provide for additional buffers and immediate access and egress for occupants.
- The area is in close proximity to the development within Wangaratta (approximately 1 km) with areas which can be considered as BAL-LOW.
- Dwellings will require a setback of 48m from the forest vegetation within the road reserves

Through analysis it has been determined that the land east of Aminya Road within the existing RLZ1 has the potential to accommodate higher density LDRZ style development as detailed above. This is however dependent on the application of a perimeter road along the northern boundary as there is currently no separation between existing development and Grassland to the north. This is considered safe due to the following reasons:

- The higher density development within this area will be buffered from potential grass fire runs from the north-west or south-west by the RLZ1 to the west and provides additional separation from Warby ranges to the west.
- Aminya Road would act as a buffer from any grassfire threat occurring within the existing RLZ1 to the west.
- A perimeter road along the northern boundary of the area would act as a fuel break from grassfire approach from the north or north-west.
- The required 48m setback from the patch of Forest to the north and from the Forest vegetation within the road reserve will prove for adequate separation from these hazards. The undeveloped land within the north-eastern corner of the site which appears to cover the drainage line will require a 19m setback from if it is unable to meet the requirements of defensible space.

The recommended area to be changed to LDRZ is shown on Map 5 based on the existing parcel boundaries. The existing RLZ1 along the northern boundary will remain RLZ1 but the eastern side

could potentially be LDRZ in the future depending on the proposed usage of the properties to the north. If these properties are to be rezoned through a similar application, then we'll have some assurance that the bushfire risk from the north will be addressed and we can consider LDRZ since the RLZ1 will address the remaining risk to the west, if not then it would be best to keep the current zoning.

The south-eastern corner of the site may warrant similar treatment if the properties to the south are not going to be rezoned in a similar manner to the site but we're placing LDRZ here at present for the following reasons:

- A south-westerly bushfire will be much lower intensity than a north-westerly bushfire.
- A bushfire approaching from the south-west would be intercepted by Warby Range Road and Gravel Pit Road along with managed areas along the North-Eastern Railway Line so it is far more likely to be controlled.
- Gravel Pit Road provides an existing break along with immediate access to defend properties on this side.
- Setbacks from the Forest vegetation can still be incorporated despite the smaller lot size.

Whether or not this is considered appropriate will need to be considered by the CFA. If it is not considered appropriate now then it can be an option at a later date since one of the main reasons a large uniform lot size is recommended is so more subdivision is an option later if/when the bushfire risk is reduced by adjacent development.

It should also be noted that the lot sizes are recommendations based on the current subdivision requirements for these zoned under the Wangaratta Planning Scheme and smaller lot sizes can be considered as mentioned above. They will need to be considered by a planner before being implemented as this assessment is only considering the requirements from a bushfire risk perspective and other factors need to be considered. Keeping the majority of these lots at this size however is recommended as per the reasons given above.

In addition to the recommended rezoning which can be used to ensure the lots are the appropriate size and the population does not increase to unacceptable levels, a Design and Development Overlay (DDO) schedule can be placed over the entire site to ensure additional bushfire safety requirements are addressed by future subdivision applications. This overlay can include, but not be limited to:

- Management standards for properties to ensure fuel management is occurring despite the BMO not being present to enforce it.
- The need for BAL-12.5 setbacks from adjacent bushfire hazards so that this BAL rating can be achieved by each new lot. It is best to keep this open since each subdivision will also need to address Clause 13.02-1S and provide BAL assessments and can therefore provide setbacks appropriate for the vegetation present. This can be met through setbacks on proposed lots, road reserve and managed land.
- The need for perimeter roads around proposed subdivisions. This can potentially utilise existing roads adjacent to or within the site (see Section 6.2 for further details).

Other requirements can be incorporated into this schedule to account for other requirements (amenity, required infrastructure and utilities, ecological requirements, etc.) as long as they do not impede the ability for new subdivisions to provide adequate bushfire safety.

The CFA have confirmed the presence of Forest along several road reserves which requires 48m of defendable space for BAL-12.5 while the Grassland areas on the various surrounding paddocks require 19m for BAL-12.5. These distances can be easily factored into setbacks through perimeter roads, larger lots and managed parkland and/or can be addressed broadly within the DDO to simply state that BAL-12.5 separation is required to account for the potentially changing classification as development continues.

6.2 Road Layout

Ensuring that the existing surrounding roads are upgraded and suitable for both emergency services and for the increased population is essential. We also need to have established requirements for new roads being placed which can either be enforced through the proposed DDO schedule or through each new subdivision's assessment against Clause 13.02-1S. Details regarding the potential layout of roads within the site and the adjacent areas is provided in the sections below.

6.2.1 Perimeter Roads

Perimeter roads are the preferred design outcome on the settlement interface and where a site abuts or is near a bushfire hazard as a perimeter road enables a no fuel area to form all or part of the interface. Perimeter roads also enable development to 'front' the bushfire hazard and therefore orient the rear away from it. Existing roads can serve this purpose but future design requirements should consider the island of properties surrounded by roads as opposed to lots accessed via a single access and cul-de-sac.

The rear of lots is often where introduced fuels create a localised bushfire hazard. It is recommended that perimeter roads are utilised around each area proposed for rezoning as detailed above although this can be incorporated into subsequent design requirements. This will create a buffer between areas as to avoid the progression of a grassfire moving west to east from areas proposed for low density development into areas of higher density development. It will also reduce the setbacks required within lots which will make the lots much easier to sell and build on.

6.2.2 Access and Egress

Section 2.3 of the *Design Guidelines for Settlement Planning at the Bushfire Interface (June 2020)* details access and egress design implications that should be considered throughout the road network design process. Design of access and egress in settlement planning ensures that people living close to the interface can move away from the hazard to a safer place. This also allows fire-fighting units to advance towards a bushfire. Elements of an effective road network include:

- Spacing of roads leading away from the hazard are no more than 120m apart (on average)
- Design road widths to meet planning scheme requirements and those of the relevant fire authority
- At least two different roads leading away from the hazard should be available to each lot
- Ensuring travel to and from a location is not alongside a bushfire hazard and providing multiple access and egress routes within developed areas to minimise the use of perimeter roads in the event of a bushfire/grassfire
- Effectively connecting roads to the broader road network within the settlement



Figure 28. Access and egress on the settlement interface (DELWP 2020)

6.3 Conclusion

In conclusion, the bushfire risks present across the site can be addressed through the proposed low-density residential zoning which can ensure the development type within this area will remain appropriate for the bushfire hazards present. Lower-density residential development will create a low-population buffer around more populated areas with open managed spaces and sufficient access so that both the new residential areas and the City of Wangaratta can be protected from an oncoming bushfire.

The outstanding bushfire risk generated from the adjacent areas and the need for bushfire protection measures within the new residential areas can be addressed through a DDO schedule or similar which will detail the requirements for setbacks from retained vegetation, ensuring BAL-12.5 can be obtained on each new lot, there is fuel management in place and there are perimeter roads present. Having these mechanisms in place now will ensure that all subsequent planning stages account for these hazards and the bushfire risk from this area remains low.

7. REFERENCES

- CFA (2012) *Planning for Bushfire Victoria – Guidelines for Meeting Victoria's Bushfire Planning Requirements*. Country Fire Authority.
- DELWP (2020) *Design Guidelines – Settlement Planning at the Bushfire Interface*. Department of Environment, Land, Water and Planning
- DTPLI (2014) *Practice Note 65: Preparing and Assessing a Planning Application under the Bushfire Provisions in Planning Schemes, July 2014*. Department of Transport, Planning and Local Infrastructure, Government of Victoria, Melbourne.
- Standards Australia (2018) *Australian Standard 3959–2018 Construction of buildings in bushfire-prone areas (incorporating Amendment No. 1)*. SAI Global, Sydney.

Appendix 1. Maps

Map 1. Subject Site Wangaratta



Legend

- Subject Site
- Parcels
- Contours (10m)
- Natural watercourse
- Railways

Details

Mapping by: Ali Nia
 Date: 5/23/2022
 Version: 1
 Aerial photography from Nearmap (Nov. 2021).
 Data Source: Base layers courtesy of VicMap,
 Copyright © State of Victoria.

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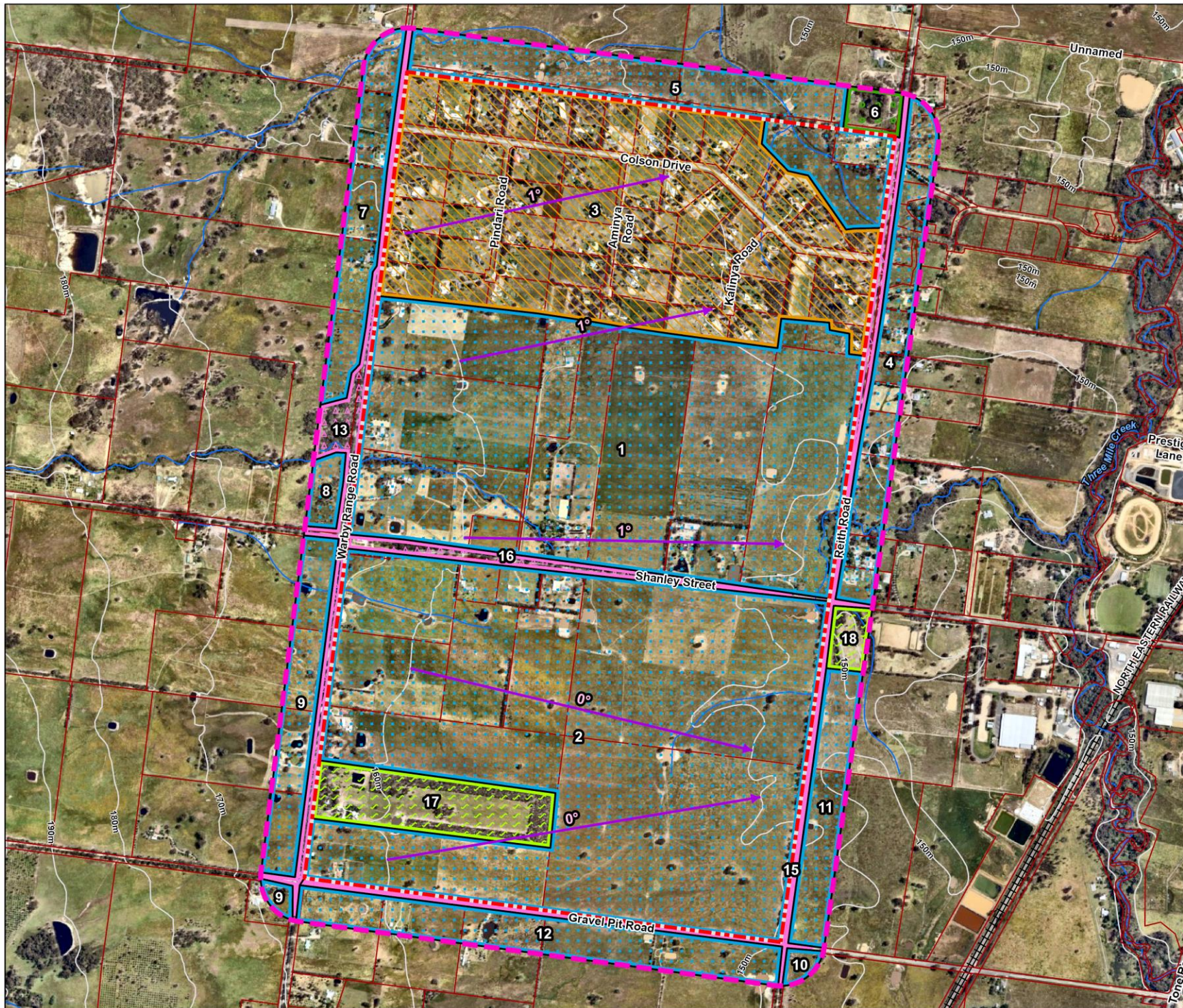
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Disclaimer
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 p: (03) 9484 1555 e: enquiries@practical-ecology.com.au

Map 2. Bushfire Hazard Site Assessment Wangaratta



Legend

- Subject Site
- Assessment Area (150m)
- Parcels
- Contours (10m)
- Natural watercourse
- Railways
- Calculated Slope from Contours

Classified Vegetation

- Forest
- Grassland
- Forest & Grassland
- Forest in Road Reserve
- Low Threat & Grassland

Details

Mapping by: Ali Nia
 Date: 5/23/2022
 Version: 1
 Aerial photography from Nearmap (Nov. 2021).
 Data Source: Base layers courtesy of VicMap,
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0 100 200 300 m







Scale: 1:12,500 (Page size A3)

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Map 3. Local Context Wangaratta


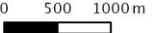


Legend

-  Subject Site
-  Parcels
-  Contours (10m)
-  Constructed watercourse
-  Natural watercourse
-  Railways

Details

Mapping by: Ali Nia
 Date: 5/23/2022
 Version: 1
 Aerial photography from Nearmap Esri World Imagery.
 Data Source: Base layers courtesy of VicMap,
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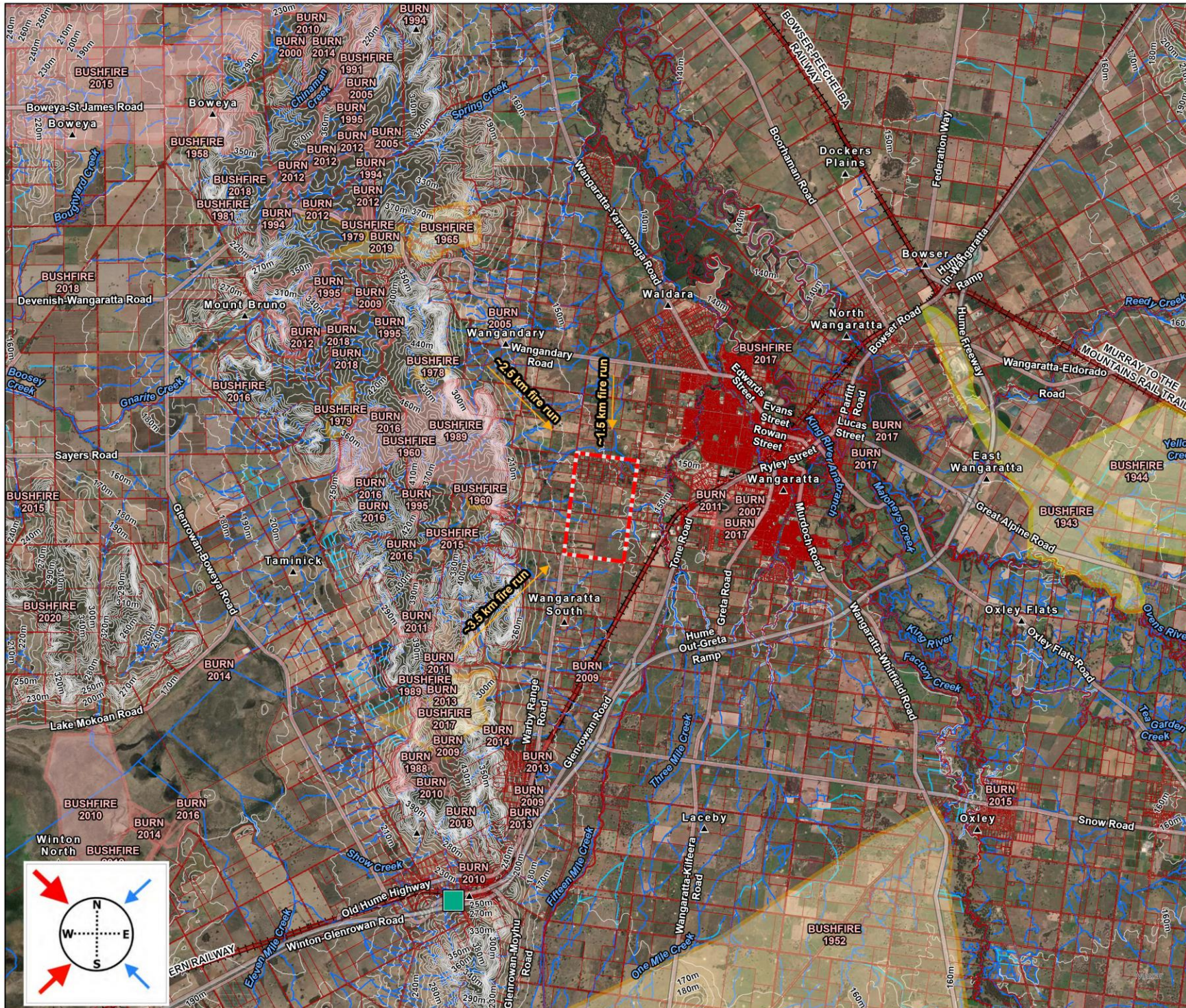
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Map 4. Bushfire Hazard Landscape Assessment Wangaratta



Legend

- Subject Site
- Parcels
- Contours (10m)
- Constructed watercourse
- Natural watercourse
- Railways
- Potential Fire Run
- Town centre
- Neighbourhood Safer Place

Fire History

Bushfire

- Bushfire Pre 1950
- Bushfire 1950–1979
- Bushfire 1980 onwards

Planned Burn

- Planned Burn Pre 1980
- Planned Burn 1980 onwards

Details

Mapping by: Ali Nia
 Date: 5/25/2022
 Version: 1
 Aerial photography from Nearmap Esri World Imagery.
 Data Source: Base layers courtesy of VicMap,
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0 1000 2000m

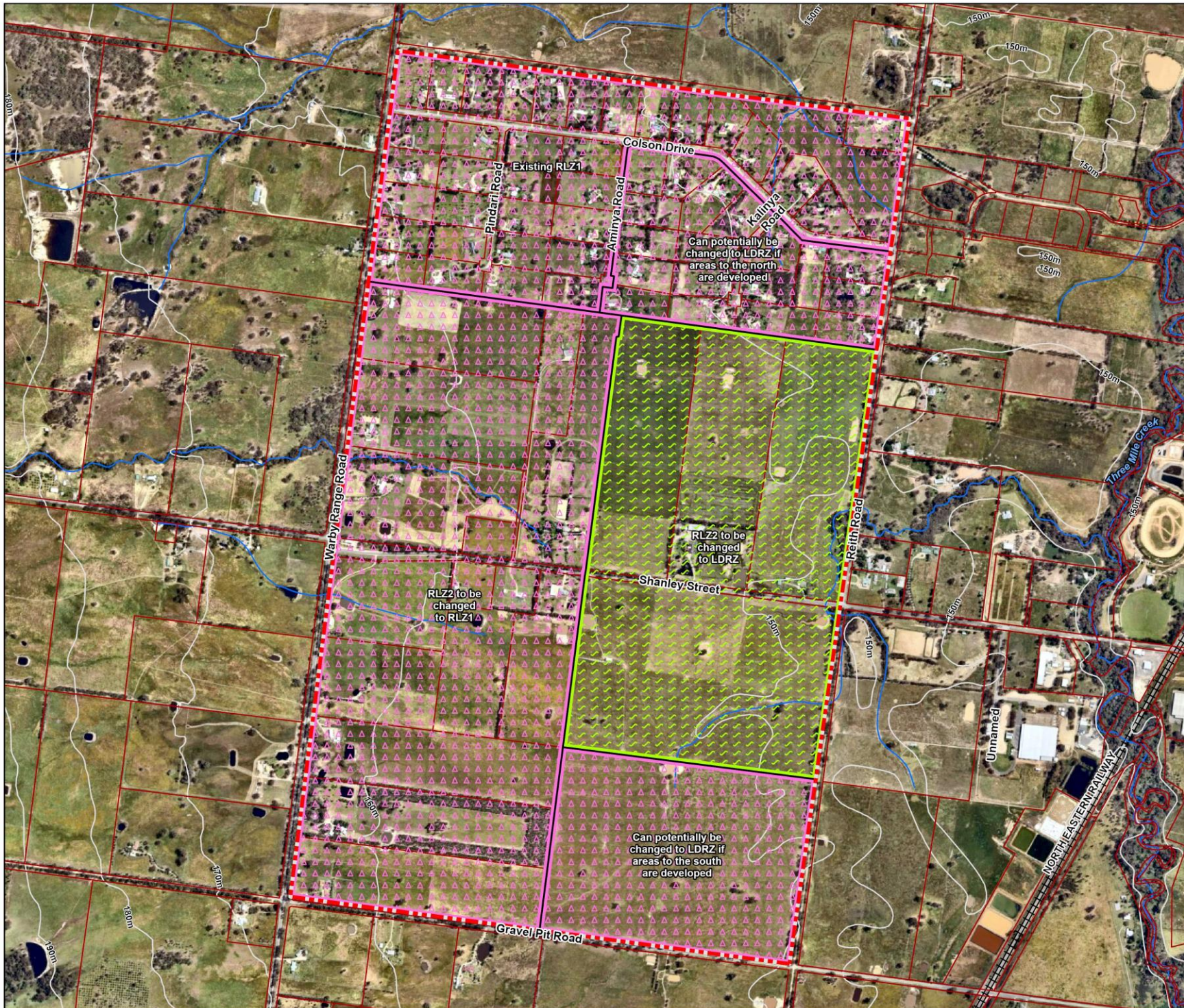
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Disclaimer






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Map 5. Recommended zoning layout
Wangaratta



Legend


-  Subject Site
-  Parcels
-  Contours (10m)
-  Natural watercourse
-  Railways

Recommended zoning layout


-  Rural Living Zone - Schedule 1 (RLZ1)
-  Low Density Residential Zone (LDRZ)

Details

Mapping by: Ali Nia
 Date: 10/01/2023
 Version: 1
 Aerial photography from Nearmap (Nov. 2021).
 Data Source: Base layers courtesy of VicMap,
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Scale: 1:11,936 (Page size A3)



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B Country Fire Authority – Letter of Advice



cfa.vic.gov.au

Our patron, Her Excellency the Honourable Linda Dessau AC, Governor of Victoria

CFA Fire Prevention and Preparedness
8 Lakeside Drive Bunwood East Vic 3151
Email: firesafetyreferrals@cfa.vic.gov.au

CFA Ref: 23000-77569-122498

2 December 2022

Justin Britt
Rural City Of Wangaratta
PO BOX 238
WANGARATTA VIC 3677

Dear Justin

LETTER OF ADVICE

Proposal: Wangaratta Low Density and Rural Residential Strategy
Location: Wangaratta South

Thank you for providing CFA with the opportunity to comment on the further work being undertaken for the *Low Density and Rural Residential Strategy*, prepared by Urban Enterprise which was adopted by Council December 2021.

CFA understands that Council adopted the Strategy in part, with the exception of the areas identified within Wangaratta, and is undertaking work to investigate alternative areas around Wangaratta.

As part of this work, you have sought our comment on the *Bushfire Risk Assessment for Wangaratta South – West Precinct (W-1d)* prepared by Practical Ecology dated May 2022. CFA has reviewed the Bushfire Assessment and can provide the following comments:

In principle, the proposed location for additional growth is reasonable, subject to the appropriate identification and implement of bushfire protection measures. Subject to appropriate design, the subject site would be able to accommodate a number of lot sizes down to 2000 sqm.

There are some items relating to bushfire policy that remain outstanding, such as:

- The extent of bushfire protection measures to be implemented and where they will apply:
- The link of the Bushfire Assessment to broader bushfire policy within Clause 13.02-1S: and
- How the Strategy will be updated to reflect the findings of the Bushfire Assessment.

Practical Ecology has also requested CFA provide guidance in relation to sections on the forest classification which require a 48m setback, given that there are some sections of this that the consultant believes could be considered woodland in some instances.

A site inspection concurs that the majority of the treed area meets the forest classification with some sparser areas in patches that may act similar to woodland in the event of a fire. These do not appear to have been mapped separately. CFA notes the nature and arrangement of the roadside vegetation in and around the forested areas may present difficulties in ongoing vegetation management.

Council should consider and an appropriate setback for permanent hazards that meets the 48m recommended by Practical Ecology and is also consistent with councils position for similar development areas to the north of this location.

If you wish to discuss this matter in more detail, please do not hesitate to contact either Luci Johnston, Land Use Planning Coordinator on 9262 8672 or Manager Community Safety on 0417 160 556.

Yours sincerely,



Darren Viney
Manager Community Safety
CFA North East Region

C. North East Catchment Management Authority – Letter of Advice

North East CMA Ref No. : NECMA-F-2022-00475
Applicant Ref. : Email enquiry 28/10/2022
Date : 14 December 2022

Justin Britt
Rural City of Wangaratta
PO Box 238
Wangaratta Vic 3677
Via email: j.britt@wangaratta.vic.gov.au

Dear Justin,

Flood enquiry location
Wangaratta Low Density and Rural Residential Strategies
Areas Wang W1-D and W1-C (North West)



**NORTH EAST
CATCHMENT
MANAGEMENT
AUTHORITY**

Level 1, 104 Hovell Street
Wodonga VIC 3690
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Wodonga VIC 3689
Ph: 1300 216 513
Fax: 02 6043 7601
Website: www.necma.vic.gov.au
Email: necma@necma.vic.gov.au
ABN 53 229 361 440

With apologies for the long delay due to flooding, I refer to your enquiry of 28 October 2022, received at the North East Catchment Management Authority (the Authority) on 28 October 2022 in relation to additional areas for consideration under Low Density and Rural Residential Strategy (LDRR) for Wangaratta. It is understood that Council seeks information on additional areas beyond those on which the Authority provided advice in April and July 2019 (our ref NECMA-F-2019-00096).

The North East CMA gives the following comments on the enquiry.

Wang W1-D

- The identified area is bounded by Gravel Pit Road (south), Warby Range Road (west), North of Colson Drive (north), Reith Road (east).
- The existing LSIO on the southern part of Reith Road is based on the Wangaratta Flood Study 1% AEP mapping and reflects the breakout from Three Mile Creek near Glenrowan Road / Delloro Road (refer Figure 1).
- The western part of the area is relatively elevated terrain on the lower slopes of the Warby Ranges (above approximate RL 151 m AHD) (refer Figure 2 and Figure 3).
- Lower lying land in the eastern part of W1-D (within approximately 500 m of Reith Road) is of low relief and is likely prone to impeded drainage and inundation from local runoff (refer Figure 3 and Figure 4).
- There is a drainage depression to the north of Colson Drive which is likely to experience poor drainage and seasonal inundation.
- Mapped waterways draining from the Warby Ranges terminate at the toe of the Warby Ranges slopes, just north and south of Shanley Street and are likely to contribute to broader flooding in the eastern part of the site.
- North East CMA holds no specific flood information or mapping in this area (beyond that in the Wangaratta Flood Study along Reith Road between Gravel Pit Road and Shanley Street).
- As a minimum it is recommended that any development in this area should give due consideration to local drainage paths and drainage conditions (which may be substantially altered by new roading and subdivision works).
- Inclusion of appropriate retardation and stormwater management measures, consistent with VPP Clause 56.07-4 Stormwater management objectives – Standard C25, to avoid detrimental impact on downstream waterways and properties would be required.
- A local flood assessment would be warranted to inform development planning, particularly for the eastern part of the area (i.e. within 500 m of Reith Road).

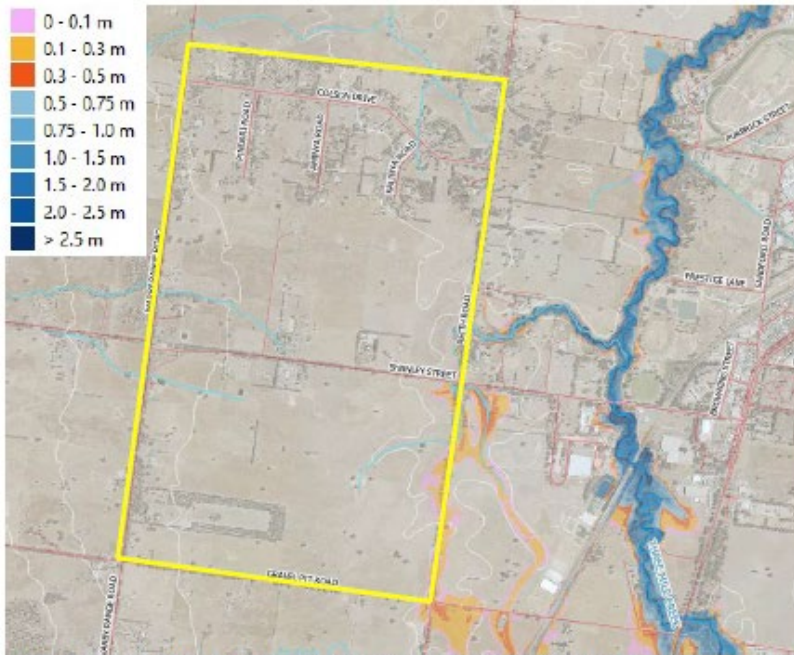


Figure 1 Area Wang W1-D – Wangaratta flood study 1% AEP depth mapping showing Three Mile Creek breakout along Reith Road to the south of Shanley Street

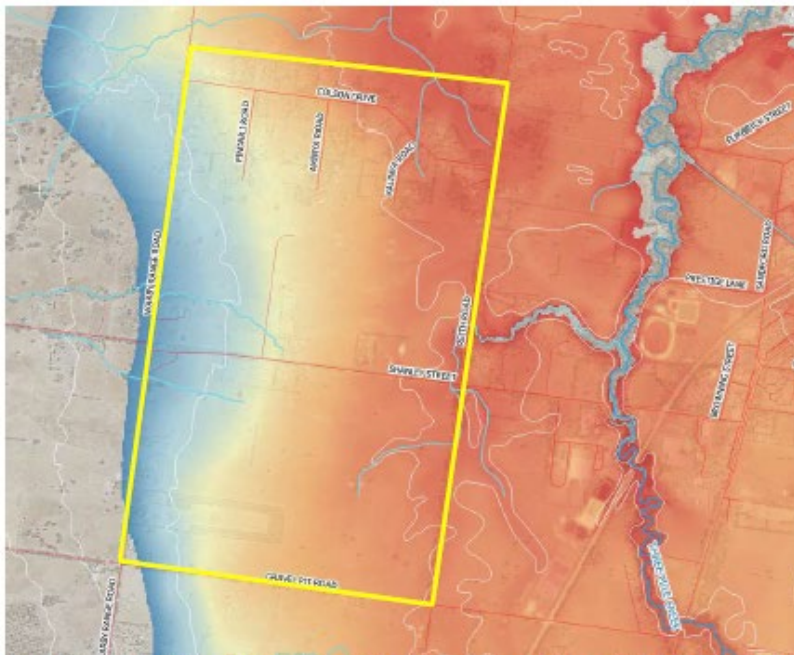


Figure 2 Area Wang W1-D – 10 m DEM (from contours), shaded RL 147-165 m AHD indicating the generally low lying land in the eastern part of Area Wang W1-D

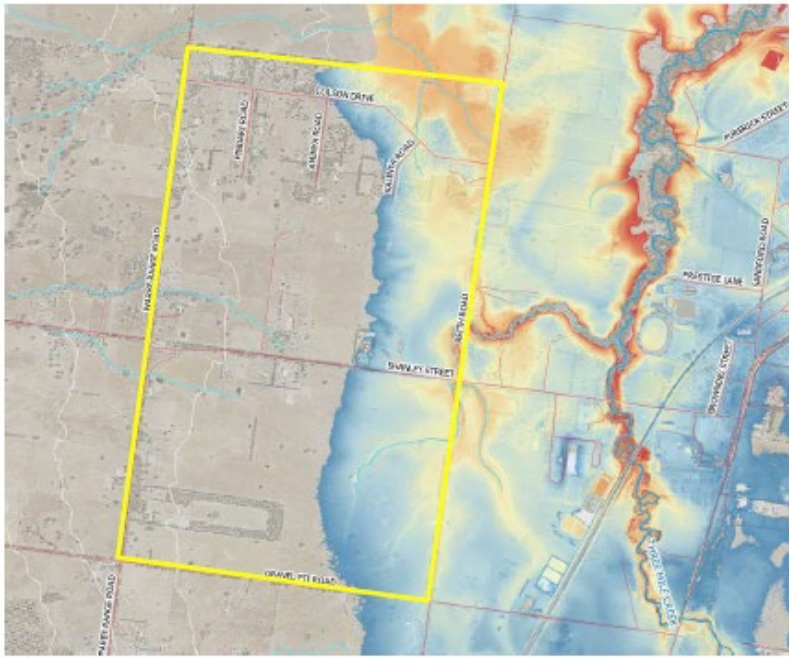


Figure 3 Area Wang W1-D – LiDAR RL 147-151 m AHD, highlighting the low lying depressions in the eastern part of the site

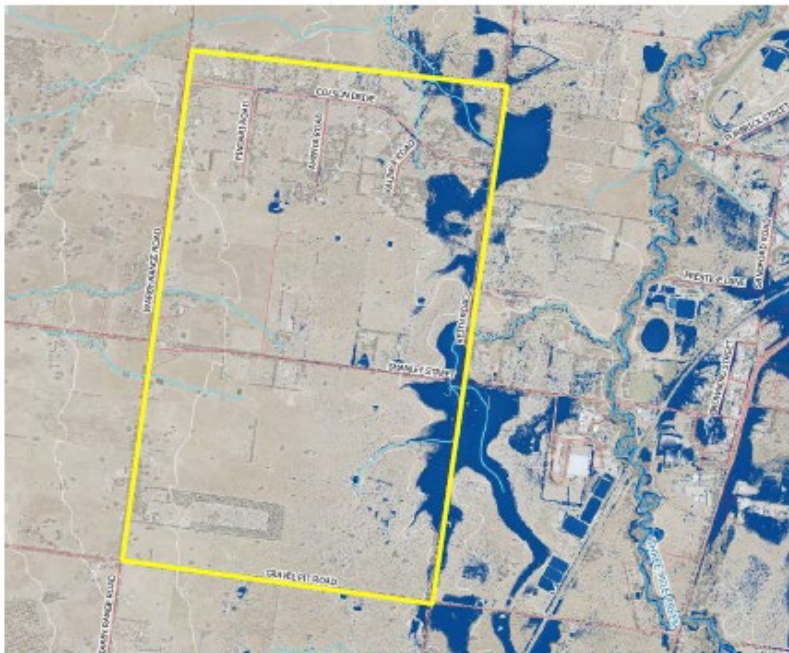


Figure 4 LiDAR depression filling model – generally indicative of areas of impeded drainage (based on topography, not taking account of drainage infrastructure)

Wang W1-C (North west)

- The identified area is bounded by Jordans Lane (south), railway line (west), parcel boundary midway between Mason Street and Jordans Lane (north), Greta Road (east).
- The existing FO and LSIO on the Three Mile Creek (in the western part of the area) is based on the Wangaratta Flood Study 1% AEP (refer Figure 5).
- The area (excluding the lower ground around Three Mile Creek is of low relief and includes substantial drainage depressions (Figure 6).
- The drainage depressions do not have surface flow connection to Three Mile Creek (due to intervening higher ground) for flood events up to 0.5% AEP. There may be a connection via the drain along the south side of Jordans Lane however this would need to be confirmed by site survey.
- The drainage depressions are known to have experienced extensive flooding in previous local flood events (i. 1993, 2010 and 2016 in Figure 7, Figure 8 and Figure 9).
- The remainder of the site is of low relief and likely experiences poor drainage conditions.
- Any loss of storage within the drainage depressions would likely result in increased runoff and flood impact on adjacent land. Filling of these parts of the site is unlikely to be supported by the Authority and the existing depressions should be protected from development impact. Additional strategic guidance on protection of wetlands and waterways from development impact is provided throughout the VPPs.
- As a minimum it is recommended that any development in this area should give due consideration to local drainage paths and drainage conditions (which may be substantially altered by new roading and subdivision works).
- Inclusion of appropriate retardation and stormwater management measures, consistent with VPP Clause 56.07-4 Stormwater management objectives – Standard C25, to avoid detrimental impact on downstream waterways and properties would be required.



Figure 5 Area Wang W1-C (north-west) – Wangaratta flood study 1% AEP depth mapping along Three Mile Creek breakout along Reith Road to the south of Shanley Street

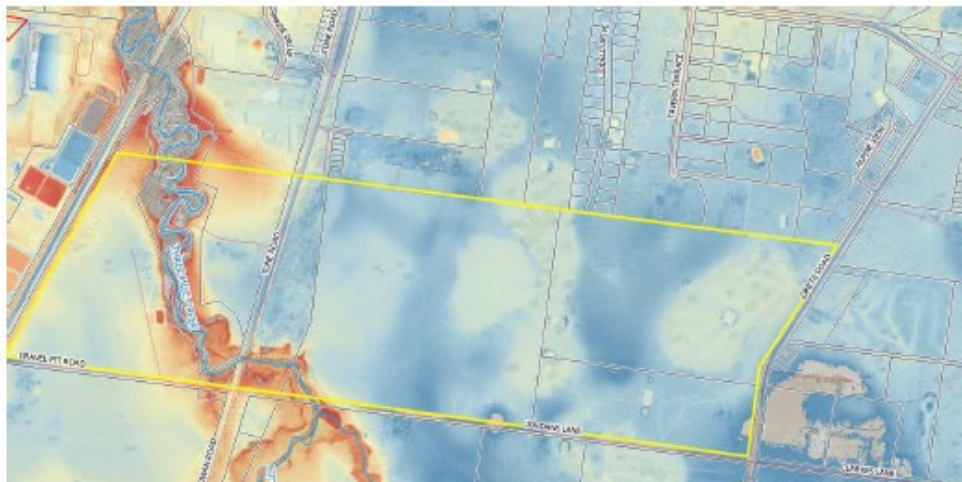


Figure 6 Area Wang W1-C (north-west) – Area contains substantial drainage depressions to the east of Three Mile Creek, visible in LiDAR (shaded RL 148.5-151.5 m AHD)

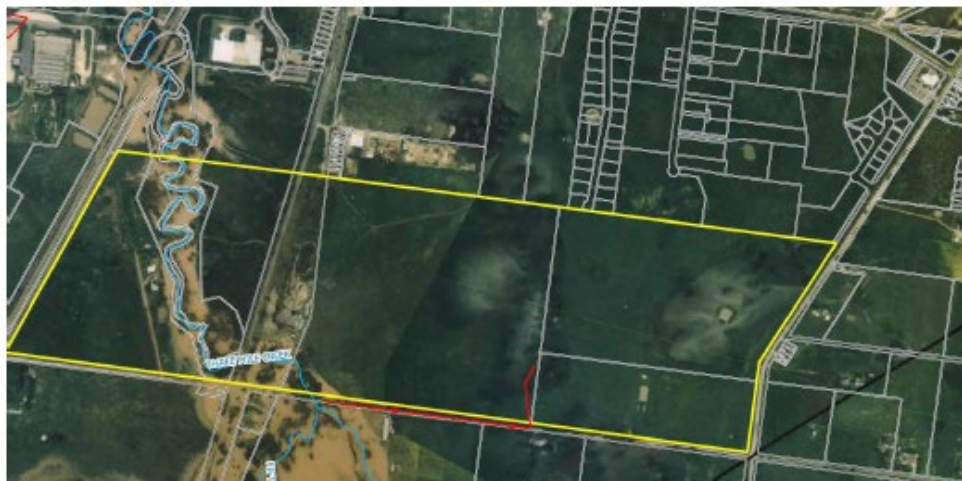


Figure 7 Area Wang W1-C (north-west) – 1993 aerial imagery

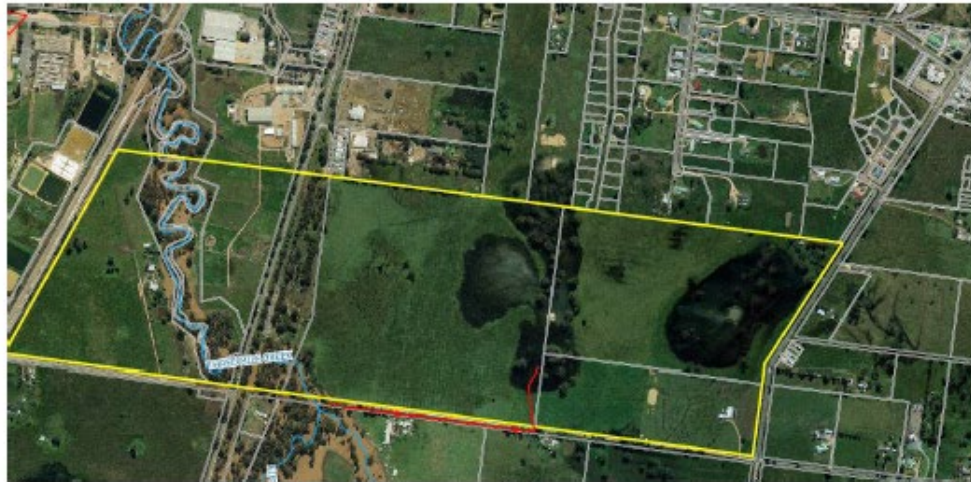


Figure 8 Area Wang W1-C (north-west) – 2010 aerial imagery

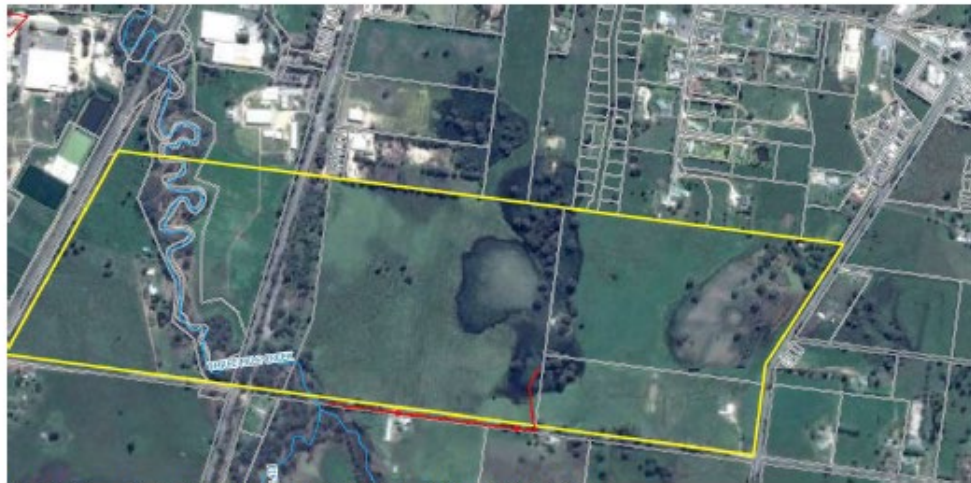


Figure 9 Area Wang W1-C (north-west) – 2016 aerial imagery

Climate change impact

- The current 1% AEP modelling from the Wangaratta Flood Study, as adopted in the FO/LSIO applied through amendment C81 do not include climate change impacts.
- Further assessment by Water Technology, based on current interim guidance in Australian Rainfall and Runoff indicates that the best available representation of 1% AEP with consideration of climate change impact is the 0.5% AEP as previously mapped – refer Figure 10 and Figure 11.

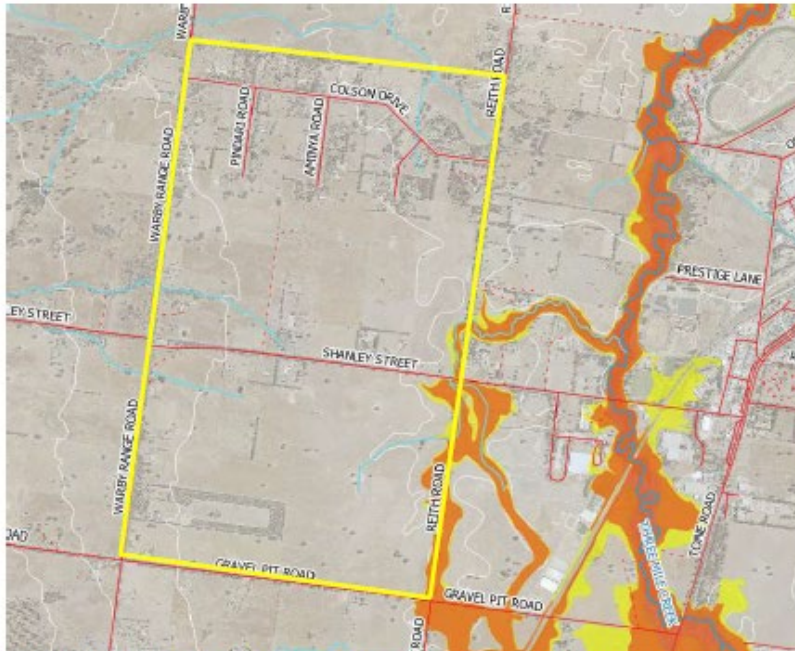


Figure 10 Area Wang W1-D – 1% AEP extent (orange) and 0.5% AEP extent (yellow)



Figure 11 Area Wang W1-C (north-west) – 1% AEP extent (orange) and 0.5% AEP extent (yellow)

Please note, this document contains flood level advice only and does not constitute approval or otherwise of any development at this location.

The Authority has provided this advice as preliminary information only and has been on the information you have provided. Any flood level advice provided is based on the most accurate information currently available and may change if new information becomes available.

The Authority can provide further information regarding any proposed development of the property in response to a planning permit application referred by the Rural City of Wangaratta in accordance with the *Planning and Environment Act 1987*.

Should you have any queries, please do not hesitate to contact Tim Loffler on 1300 216 513. To assist the Authority in handling any enquiries please quote NECMA-F-2022-00475 in your correspondence with us.

Yours sincerely,

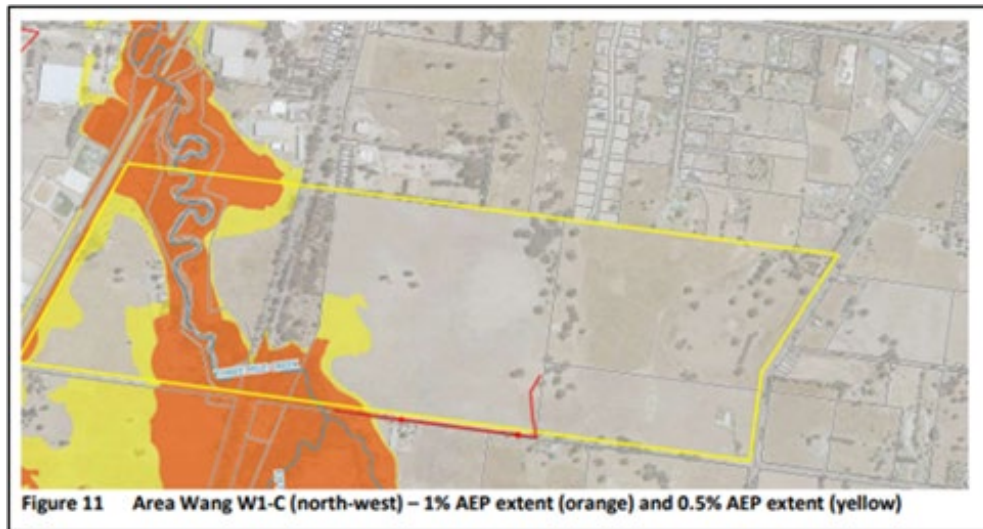
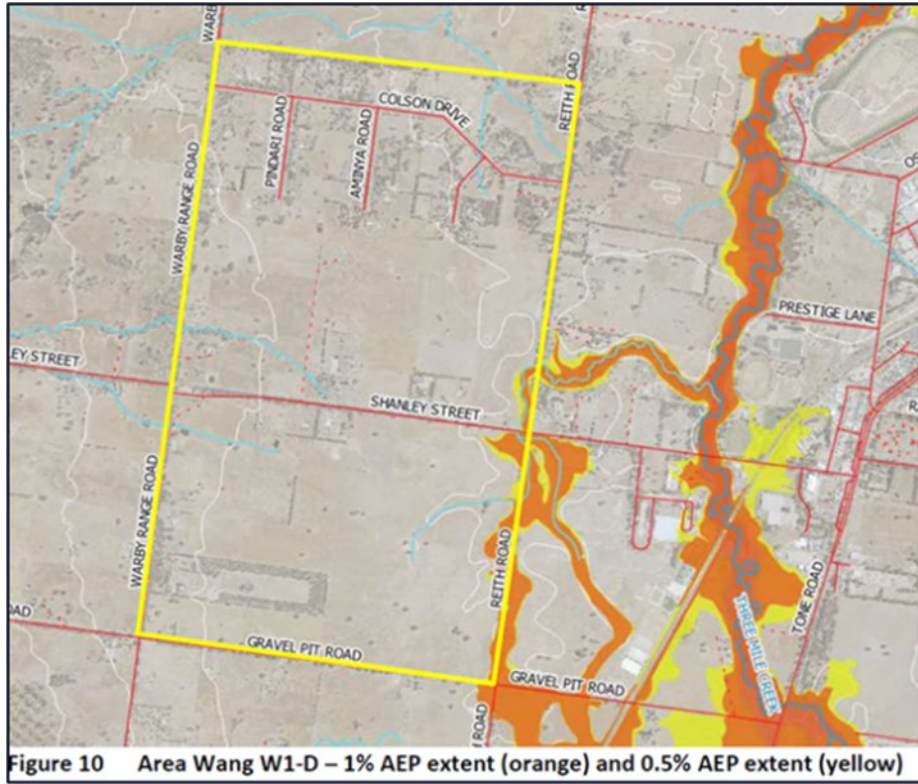


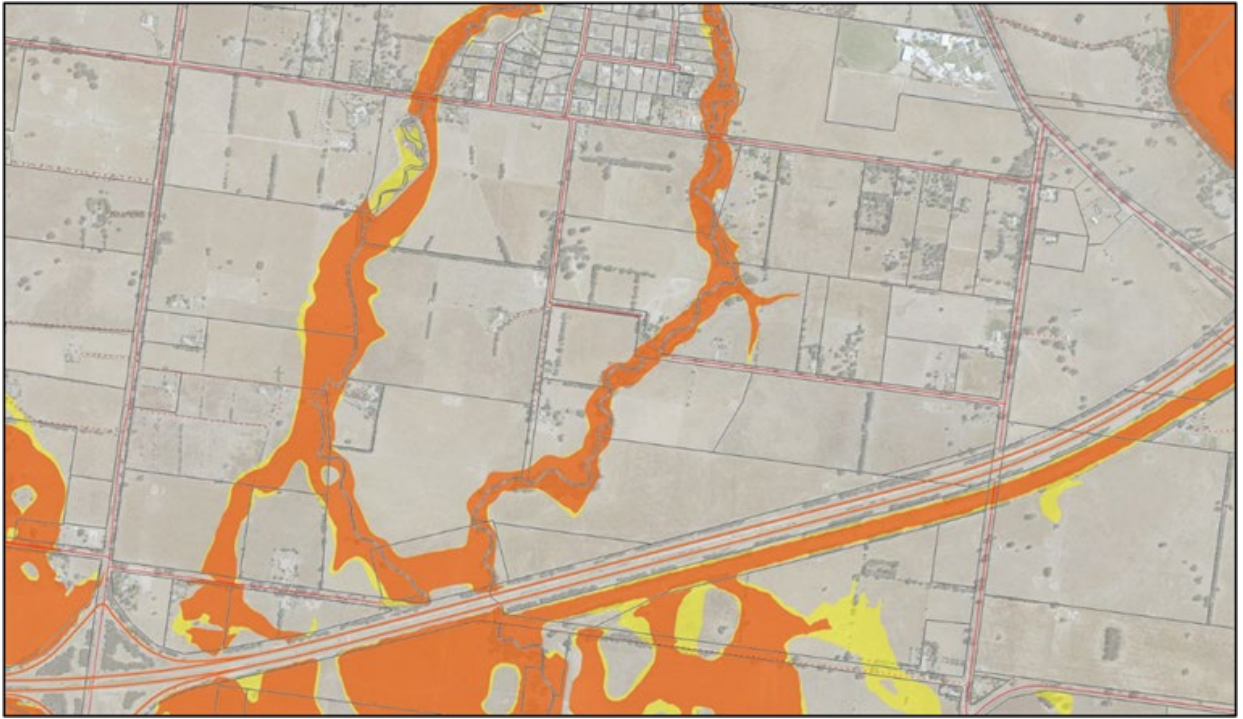
Tim Loffler
Manager Waterways and Floodplain Planning

Definitions and Disclaimers

1. The area referred to in this letter as the 'proposed development location' is the land parcel(s) that, according to the Authority's assessment, most closely represent(s) the location identified by the applicant. The identification of the 'proposed development location' on the Authority's GIS has been done in good faith and in accordance with the information given to the Authority by the applicant(s) and/or the Local Government Authority.
2. While every endeavour has been made by the Authority to identify the proposed development location on its GIS using VicMap Parcel and Address data, the Authority accepts no responsibility for or makes no warranty with regard to the accuracy or naming of this proposed development location according to its official land title description.
3. **AEP – Annual Exceedance Probability** – is the likelihood of occurrence of a flood of given size or larger occurring in any one year, expressed as a percentage (%) risk.
Please note that the 1% probability flood is not the probable maximum flood (PMF). There is always a possibility that a flood larger in height and extent than the 1% probability flood may occur in the future.
4. **AHD – Australian Height Datum** – is the adopted national height datum that generally relates to height above mean sea level. Elevation is in metres. Site levels to m AHD can be established by a licenced surveyor.
5. **NFPL – Nominal Flood Protection Level** – is the minimum height required to protect a building or its contents, which includes a freeboard (a minimum of 0.3 m unless otherwise detailed) above the 1% AEP flood level. Freeboard refers to a height above the defined flood level and is typically used to provide a factor of safety in the setting of floor levels for developments, to compensate for effects such as wave action and to provide protection from flooding which is marginally above the defined flood level.
6. No warranty is made as to the accuracy or liability of any studies, estimates, calculations, opinions, conclusions, recommendations (which may change without notice) or other information contained in this letter and, to the maximum extent permitted by law, the Authority disclaims all liability and responsibility for any direct or indirect loss or damage which may be suffered by any recipient or other person through relying on anything contained in or omitted from this letter.
7. This letter has been prepared for the sole use by the party to whom it is addressed, and no responsibility is accepted by the Authority with regard to any third-party use of the whole or of any part of its contents. Neither the whole nor any part of this letter or any reference thereto may be included in any document, circular or statement without the Authority's written approval of the form and context in which it would appear.
8. The flood information provided represents the best estimates based on currently available information. This information is subject to change as new information becomes available and as further studies are carried out.

Enlarged Version of the Precinct Areas and impacts of flooding:





W1-C (South) 1%AEP extent (Orange) and 0.5% AEP extent (Yellow)

D: Zone Comparison:

The following table provides an analysis of selected.

Use		Mixed Use Zone	Industrial 1 Zone	Industrial 3 Zone	Commercial 1 Zone	Commercial 2 Zone	Commercial 3 Zone
Existing Uses	Accommodation (excluding dwellings)	Permit Required (some exemptions)	Prohibited	Prohibited	No permit (subject to conditions -2m at ground floor)	Prohibited (other than Caretakers and Residential Hotel)	Prohibited
	Funeral Parlour	Permit Required	Permit Required	Permit Required	Permit Required	Permit Required	Permit Required
	Dwelling	No Permit	Prohibited	Prohibited	Permit required (conditions apply)	Prohibited	Permit required – maximum % of floor level can be specified. Can be prohibited if 0%
	Garden Supplies	Permit required	Permit Required	Permit Required	No Permit	No Permit	Prohibited
	Trade Supplies (Retail Premises)	Permit Required	Permit Required	Permit Required	Permit Required	No Permit	Prohibited
	Rural Industry (Machinery Workshop & Sales)	Permit Required	No Permit	Permit Required	Permit Required	No Permit	No permit subject to conditions.
	Residential Hotel / Motel	Permit Required	Prohibited	Prohibited	No Permit – subject to strict conditions	Permit Required	Permit required subject to conditions – very limited scope.
	Warehouse (not listed in 53.10)	Permit required	No Permit	No Permit (some exceptions)	Permit required	No permit	Permit required - (max floor area = 500sqm)
	Education Centre (inc Childcare / Kindergarten, Primary Secondary Schools / Tertiary and Employment Training Centres)	Permit Required	Permit Required – No Primary and Secondary Schools.	Permit Required – No Primary and Secondary Schools.	No Permit Childcare – subject to conditions	Permit Required	No Permit other than Primary & Secondary Schools.
Possible Uses	Industry (listed in Clause 53.10)	Prohibited	Permit Required	Permit Required	Prohibited	Permit Required	Permit Required
	Industry (non 53.10)	Permit req – other than materials recycling / transfer station.	No Permit	Permit Required	Permit Required	No Permit – subject to requirements	No Permit (subject to limitations)
	Office	No permit – up to 250sqm f/area	Permit Required-subject to floor area schedule	Permit required – subject to floor area schedule	No Permit – subject to floor area schedule	No permit	No Permit
	Retail (other than shop)	Permit Required	Permit Required	Permit Required	No Permit	Permit req	Prohibited with some exceptions
	Restricted Retail Premises	Permit Required	Permit Required	Permit Required	No Permit	Permit req	Prohibited
	Research and Development Centre (Industry)	Permit Required	No Permit	Permit required	Permit Required	Permit Required	Permit Required

Use	Mixed Use Zone	Industrial 1 Zone	Industrial 3 Zone	Commercial 1 Zone	Commercial 2 Zone	Commercial 3 Zone
Research Centre	Permit Required	Permit Required	Permit Required	Permit Required	Permit Required	No Permit
Shop (most forms)	No Permit – max floor area 150sqm	Prohibited (some exceptions)	Prohibited - because of conditions.	No Permit	No Permit	Permit Required (max floor area 200sqm)
Supermarket	Permit Required	Prohibited	Prohibited	No Permit	Permit Required – subject to conditions.	Prohibited
Warehouse (listed in 53.10)	Prohibited	Permit Required	Permit Required	Permit Required	No Permit	Permit Required (max floor area 500sqm)

Source: Victorian Planning Provisions & Wangaratta Planning Scheme.

E: Wangaratta Candidtate Area Comparison

The following table outlines a summary of the investigations in the Strategy and this report and provides a comparison against each other.

Criteria	W1-D (Additional Investigation Area)	W1-C (North West)	W1-C (South)
Precinct Description	<p>The area is generally bound by Warby Range Rd (West), Gravel Pit Road (South), Reith Road (East) and the Colson Drive RLZ subdivision (North).</p> <p>The area consists of a mix of a developed rural living subdivision (Colson Drive) to the north, which is characterised by lot sizes around 2ha and generally developed with dwellings and associated outbuildings.</p> <p>South of the Colson Drive subdivision the area contains a mix of rural living lots generally between 5 to 16ha, intermixed with larger lots properties up to 96ha in size that are supporting some level of agricultural activity.</p>	<p>The area is located on the northern side of Jordans Lane and bound by Greta Road (East) and the Tone Road Road reserve (West).</p> <p>A mix of land uses and zonings adjoining the area to the north including General and Low Density Residential and Mixed Use.</p> <p>Jordans Lane has no connection to Tone Road, including no formal road reserve. The area consists of three parcels with one dwelling located towards the corner of Jordans Lane and Tone Road.</p>	<p>The area is generally bound by Greta Rd (West), Hume Fwy (South), Wangaratta-Whitfield Road (East) and Clarkes lane (North).</p> <p>The area is currently zoned Farming Zone and contains a mix of several small agricultural properties and lifestyle properties. Lot sizes Are generally smaller along the Clarkes lane frontage and larger towards the Hume Fwy.</p> <p>The area is affected by a number of overlays that highlight flooding along the waterways within and also the Airport Environs Overlay which generally nominates the flight path from the Wangaratta Airport.</p> <p>A high-pressure gas transmission line transcends the precinct and is contained within an easement.</p>
LDRR V1 Strategy Recommendations and Conditions.	N/A – Draft LDRR did not recommend proceeding with area Wang W-1d.	<p>Short term outcome:</p> <p>Investigate and rezone to LDRZ, including the development of suitable planning controls to address:</p> <ul style="list-style-type: none"> • Mackay Casings strategic buffer (excluded from rezoning), • Flooding (taking into account climate change modelling) • Protection and incorporation of wetlands • Retention and protection of significant native vegetation. <p>Area within the Sth Wangaratta Strategic Buffer was excluded from any rezoning.</p>	<p>Short term Outcome:</p> <p>Investigate and prepare a precinct plan to confirm the extent of developable area for rezoning to a combination of LDRZ and RL, including development of suitable planning controls to address:</p> <ul style="list-style-type: none"> • Flooding (taking into account climate change modelling). • APA High Pressure Gas Transmission Pipeline and measurement lengths. • The Airport Environs Overlay. • Freeway environs interface • Drainage issues • Retention and protection of significant native vegetation • local access requirements.
Planning Scheme Requirements			
Zoning & Overlays	<p>Rural Living Zone:</p> <ul style="list-style-type: none"> • Schedule 1 (RLZ1) (approximately 1/3 Colson Drive area). • Schedule 2 (RLZ2) (approximately 2/3 of the area) 	<p>Farming Zone</p> <p>Overlays:</p> <ul style="list-style-type: none"> • Land Subject to Inundation (LSIO) & Flood Overlay (FO) south west corner. 	<p>Farming Zone</p> <p>Overlays:</p> <ul style="list-style-type: none"> • Land Subject to Inundation (LSIO) & Flood Overlay (FO) south west corner.

Criteria	W1-D (Additional Investigation Area)	W1-C (North West)	W1-C (South)
	<p>Overlays:</p> <ul style="list-style-type: none"> Land Subject to Inundation (LSIO) & Flood Overlay (FO) eastern portion. Vegetation Protection Overlay – Schedule 2 (VPO2) – all of the perimeter roads and Shanley Street. 	<ul style="list-style-type: none"> Design and Development Overlay – Schedule 6 	<ul style="list-style-type: none"> Design and Development Overlay – Schedule 6 (DDO6) Airport Environs Overlay (AEO)
Relevant Planning Policy	<p>Clause 11.03-6L-02: South Wangaratta Strategic Directions Plan</p> <ul style="list-style-type: none"> Require the 'agent of change' in the Mixed use Zone in Tone Road and Low Density Residential Zone in Mason Street to incorporate suitable separation distances to adjacent land. Protect the potential for long term industrial expansion to the south east of Shanley Street. Protect the operation of McKay Casings and the Wangaratta Saleyards by ensuring that a permit application or scheme amendment proposing to introduce or intensify a sensitive use on land within a strategic buffer identified below in the <i>Strategic Directions Plan</i> include an odour assessment which demonstrates the buffer can be satisfactorily reduced. 	<p>Clause 2.04: Wangaratta Regional City Plan</p> <ul style="list-style-type: none"> Future Investigation Area <p>Clause 11.03-6L-02: South Wangaratta Strategic Directions Plan</p> <ul style="list-style-type: none"> Require the 'agent of change' in the Mixed use Zone in Tone Road and Low Density Residential Zone in Mason Street to incorporate suitable separation distances to adjacent land. Protect the potential for long term industrial expansion to the south east of Shanley Street. Protect the operation of McKay Casings and the Wangaratta Saleyards by ensuring that a permit application or scheme amendment proposing to introduce or intensify a sensitive use on land within a strategic buffer identified below in the <i>Strategic Directions Plan</i> include an odour assessment which demonstrates the buffer can be satisfactorily reduced. 	<p>Clause 2.04: Wangaratta Regional City Plan</p> <ul style="list-style-type: none"> Future Investigation Area
Aboriginal Cultural Heritage Sensitivity	No identified areas of Sensitivity	Yes – Areas of mapped sensitivity exist in the precinct	Yes – Areas of mapped sensitivity exist in the precinct
Agricultural Versatility	High	High	High
Natural Hazards (Bushfire & Flood)			
Bushfire: Ability to meet Settlement Planning Policy at Clause 13.02-1S	<p>Yes, Practical Ecology report demonstrates the ability to meet the requirements of this Clause subject to the following criteria:</p> <ul style="list-style-type: none"> <i>Report concludes that a mix of RLZ 1 and LDRZ could be accommodated with some specific design requirements.</i> 	<p>Yes – Nexus Planning report assessed the W1-C precincts collectively and the Urban enterprise report outlines the recommendations in this manner too.</p> <p>Of the W1-C investigations areas, the north west was considered to have a higher bushfire risk and therefore was therefore recommended for LDRZ style of development only with a number of requirements including lot sizes of between 0.2 and 0.25ha.</p>	<p>Yes - this precinct was assessed as having the ability to meet the requirements and result in a low risk environment.</p> <p>This area is located on the lowest risk aspect of the urban centre of Wangaratta. This level of risk allowed for a combination of LDRZ and RLZ zoned land.</p>

Criteria	W1-D (Additional Investigation Area)	W1-C (North West)	W1-C (South)
	<ul style="list-style-type: none"> 48m setback from forest classified vegetation in the roadsides of Warby Range, Gravel Pit and Reith Rd and Shanley Street. Larger lots can be located on the western interface (RLZ1 (min 2ha). Perimeter roads are required, including perimeters between zone changes.. 		
Flooding	<p>Yes – Current Flood and Land Subject to inundation overlays along the eastern side of the precinct.</p> <p>Refer to additional information on 0.5% AEP to reflect the impacts of climate change on the existing 1% flood overlays is contained within his report.</p>	<p>Yes – Current Flood and Land Subject to Inundation Overlays are present within the south-west corner of the precinct given its proximity to the confluence of the Three- and Fifteen-Mile Creek systems.</p> <p>Refer to NECMA’s advice on wetland / depression areas located within their precinct and their role in storage.</p> <p>Refer to additional information on 0.5% AEP to reflect the impacts of climate change on the existing 1% flood overlays is contained within his report. Increase in the extent of flooding predicted.</p>	<p>Yes – Current Flood and Land Subject to Inundation Overlays are present within the precinct associated with flood activity on the One Mile Creek system and tributaries.</p> <p>Refer to additional information on 0.5% AEP to reflect the impacts of climate change on the existing 1% flood overlays is contained within his report.</p>
Land Use Compatibility			
South Wangaratta Strategic Buffer Clause 11.03-6L	<p>The eastern portion of the precinct (Sth of Colson Drive) is impacted significantly by the South Wangaratta Strategic Buffer (Clause 11.03-6L). Impacted land is zoned RLZ2.</p> <p>The current approved RLZ subdivision at Shanley Street does not accurately reflect the adopted buffer in Clause 11.03-6L-02.</p> <p>Pre-cautionary approach is required with this buffer. A recent odour event (2022) being emitted from the Casings facility should serve as a timely reminder of the importance of these buffers.</p> <p>There was a view to alter the wording of the strategy to support the softer approach under 11.03-6L for Precinct W-1C, however these recent events have highlighted the importance of taking a pre-cautionary approach with this buffer and its importance is elevated.</p> <p>PPN37 also has increased requirements around these buffers and EPA separation distances under Publication 1518.</p> <p>Overall, it is considered that generally rezoning within the buffer areas should be avoided and the policy settings of 11.03-6L should be strengthened to protect the industry.</p>	<p>The western portion of the site is impacted by the South Wangaratta Strategic Buffer (Clause 11.03-6L). Current LDRZ Strategy text – seeks to avoid rezoning this land.</p> <p>Refer to general comments in W-1D and the report.</p>	N/A

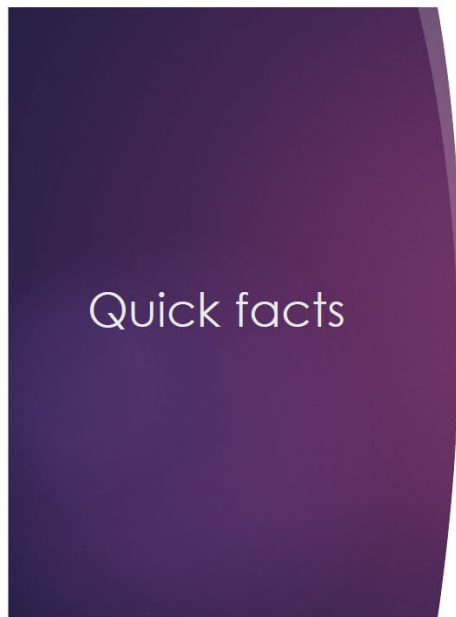
Criteria	W1-D (Additional Investigation Area)	W1-C (North West)	W1-C (South)
	Further discussion is contained within the report and the views of the EPA will be sought during any public consultation.		
Within Industrial Separation Distances EPA 1518h	Yes – the Sth Wangaratta Strategic Buffer (see above) replicate the requirements of EPA publication 1518 for the Rendering and Casings Works (1000m).	Yes – the Sth Wangaratta Strategic Buffer (see above) replicate the requirements of EPA publication 1518 for the Rendering and Casings Works (1000m).	N/A
Within Threshold Distances – Clause 53.10	Yes (Eastern portion) - See comments above on Sth Wangaratta Strategic Buffer as this represents controls under 53.10.	Yes (Western portion) - See comments above on Sth Wangaratta Strategic Buffer as this represents controls under 53.10.	N/A
Within the buffer of a landfill.	N/A	N/A	N/A
Potential Freight / Bypass Route Impacts	<p>Yes - Both Warby Range, Shanley Street and Gravel Pit Roads are listed as part of the potential components of the Freight route.</p> <p>The intersections of these roads and Shanley Street will be impacted. Impacts of noise, reservation & acquisition of land and vegetation removal will need to be considered.</p>	<p>Yes - Jordans lane is one of the possible East-West route of the potential Freight By-pass route.</p> <p>Jordans lane is currently an unsealed road that contains significant examples of native vegetation along it. The Jordans Lane road reserve does not extend through to Tone Road and significant alteration and bridging works will be required to connect this, Flooding activity is present in this area. Impacts of noise, visual amenity and the reservation & acquisition of land and vegetation removal will need to be considered.</p>	<p>Yes - Clarkes Lane is one of the possible East-West route of the potential Freight By-pass route.</p> <p>The intersections at Greta Road and Wangaratta Whitfield Road will also be impacted. Impacts of noise, reservation & acquisition of land and vegetation removal will need to be considered.</p>
Hume Fwy Interfaces	N/A	N/A	Yes – appropriate setbacks and sensitive uses would have to meet requirements of 18.01-2L-01 within 100m of the Hume Fwy Rd reserve.
Intensive Agricultural Buffers / Interfaces	N/A	N/A	N/A
APA – High Pressure Gas pipeline.	N/A	N/A	<p>Yes - the High-pressure pipeline dissects this precinct. APA submission to Version 1 contained conditions and the requirements of a Safety Audit in any future Structure Planning exercise.</p> <p>Creating a linear corridor of open space along the reserve and planning appropriately along ' the measurement length will need consideration to provide the greatest level of protection and also create a high level of amenity for the future precinct.</p>
Airport Environs Overlay & 25 ANEF & DDO6	N/A	<p>Yes – DDO6 – Height Obstacle Area 3.</p> <p>No significant impact – except for tall structures like mobile phone towers.</p>	<p>Yes AEO, DDO6 – Height Obstacle Area 1 and 2.</p> <p>Will require further consideration and possible limitations on the density of development within the</p>

Criteria	W1-D (Additional Investigation Area)	W1-C (North West)	W1-C (South)
			AEO. Version 1 of the Strategy indicated the use of Rural Living typologies within the AEO.
Presence of Ground Water contamination	<p>CFA training site in Shanley Street is listed as a site with contamination issues relating to the use of PFAS within fire fighting foam. In 2015 the EPA issued remedial notices across a number of CFA sites across Victoria including Wangaratta.</p> <p>CFA are required to continue to monitor PFAS levels on the site and in the surrounding area.</p> <p>It is unclear if this precinct is impacted by this issue and therefore referral during any public exhibition period should be made to the EPA seeking further advice on this matter.</p>	No known information.	No known information.
Land servicing capability			
Ability to service.	<p>Refer to TGM report (Version 1 Strategy)</p> <p>Refer to all agencies during any consultation.</p>	<p>Refer to TGM report (Version 1 Strategy)</p> <p>Refer to all agencies during any consultation.</p>	<p>Refer to TGM report (Version 1 Strategy)</p> <p>Refer to all agencies during any consultation.</p>
Conclusions:			
Discussion and conclusions	<p>The area is considered to have the potential from a bushfire perspective to be considered low risk subject to criteria within the report.</p> <p>However, when a wider lens is applied, it is considered that the proposed intensification of this area as outlined in the bushfire plan needs to consider additional factors in particular the recommended LDRZ on the easter side should not be progressed.</p> <p>Land within the Sth Wangaratta Strategic Buffer should remain as RLZ2 or be considered for back zoning to FZ to support the continued industrial uses in Sth Wangaratta.</p> <p>LDRZ in the south east corner of Colson Drive would largely be ad-hoc infill development and consistent with the problems experienced in Waldara that led to Council intervention via PSA C61.</p> <p>Any LDRZ redevelopment of Colson Drive should be considered as long term and considered in conjunction with planning for long term North West Growth Area as development of this area could afford Colson Drv greater bushfire protection through the creation of a perimeter</p>	<p>Revise recommendations to include updated NECMA advice and requirements of PPN37:</p> <ul style="list-style-type: none"> • Reduced development area – factor in lower lot yields. • Require retention of the mapped wetlands and depressions for storage and natural resource management. • Plan for 0.5%AEP as the flood level. • Consider vegetation controls as a way to protect significant trees. • Bypass / Freight route impacts. <p>Sth Wangaratta Industrial Buffers – need to strengthen the existing policy based on recent events.</p> <p>Refer to report for further discussion.</p>	<p>Revise recommendations to include:</p> <ul style="list-style-type: none"> • Consider drainage issues and NECMA comments on not filling in storage areas. • Revise expectations on lot yields. • Provide a mix of 2 and 4ha min lot sizes in RLZ area. • Plan for 0.5%AEP as the flood level. • Consider vegetation controls as a way to protect significant trees. • Consider taking a higher level of open space 10% to protect valuable assets (req 30 m setback creek lines, gas line and native vegetation) • Bypass / Freight route impacts. • Consider decreased densities within the Airport Environs Overlay. <p>Refer to report for further discussion.</p>

Criteria	W1-D (Additional Investigation Area)	W1-C (North West)	W1-C (South)
	<p>road on the norther side of the RLZ1Colson Drv subdivision.</p> <p>Overall, it is considered that there is an ability to consider rezoning the western portion of the precinct from RLZ2 (8ha min) to RLZ1 (2ha) and for this to extend beyond the previously recommended LDRZ to RLZ boundary.</p> <p>Therefore, an outline plan has been developed to demonstrate the possibility for the area and achieves the following:</p> <ul style="list-style-type: none"> • Reinforces this area as the Rural Living area of Wangaratta. • Allows for an increase in RLZ1 (2ha min) lots (off sewer). • Avoids significant development within the Strategic Industrial Buffer and area subject to inundation, including consideration of the 0.5%AEP event for climate change. • Allows subject to development of the L/term growth area the possible rezoning of land in Colson Drive (as marked to LDRZ) (0.2 – 1ha subject to servicing). • Noting that LDRZ would be ad-hoc infill development and would not render typical greenfield densities or lot yields. This could be a very difficult exercise like Waldara (C61) 		

F: LDRZ Outbuilding Analysis

An audit of planning permits for Outbuildings in the LDRZ has been undertaken between 1 January 2017 and 1 January 2022 and the findings are outlaid below in the following tables and graphs.



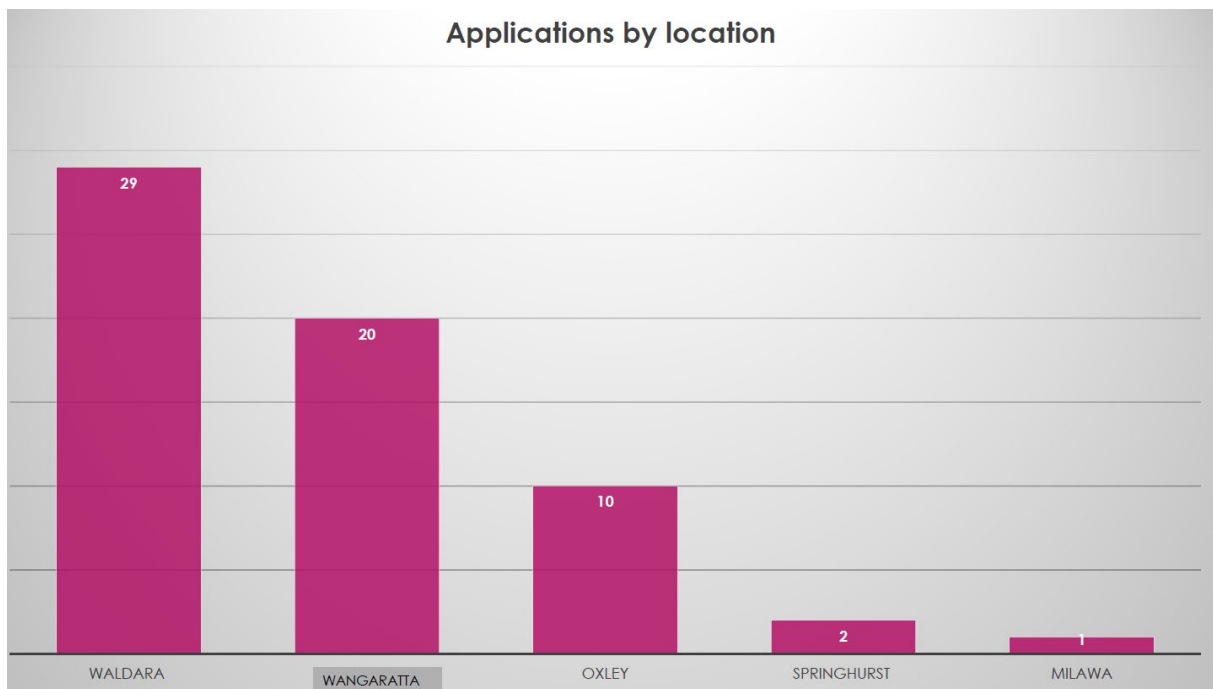
66 planning applications for Outbuildings over 80sqm.

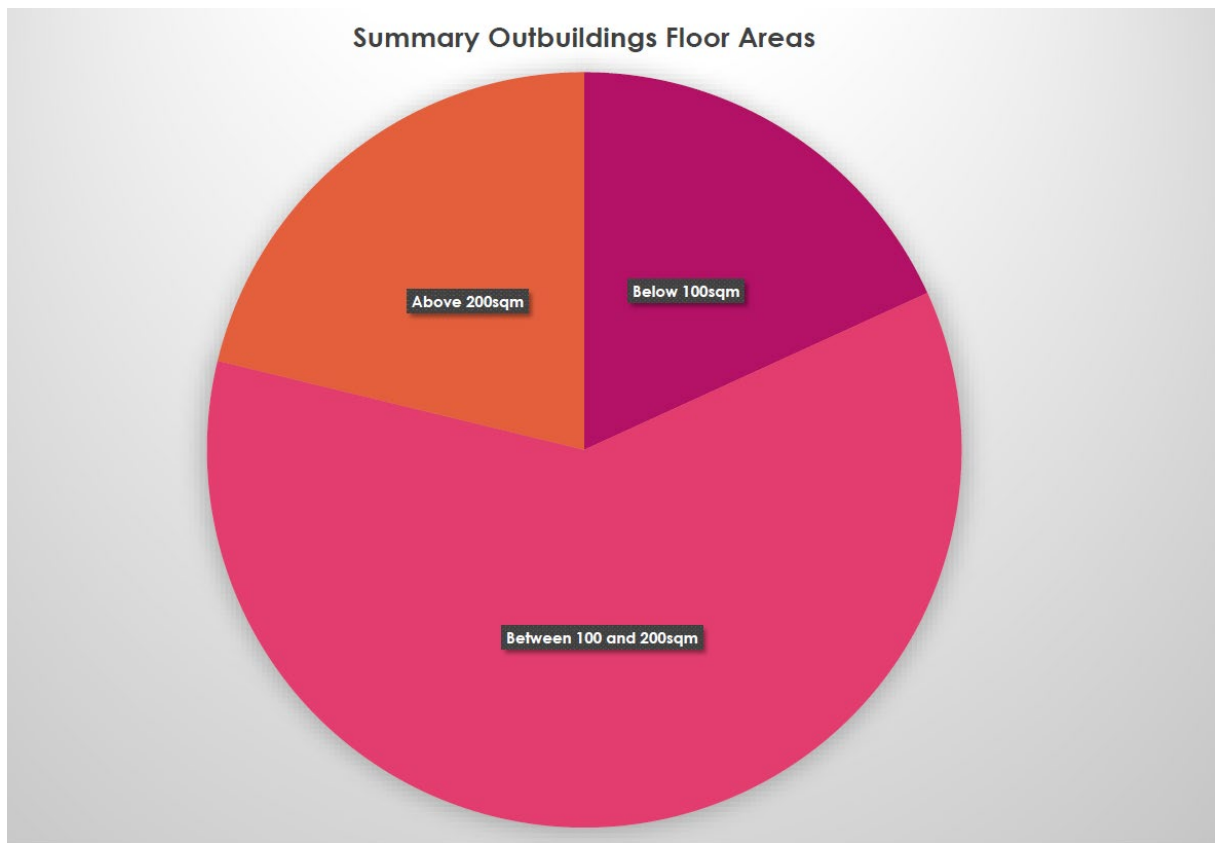
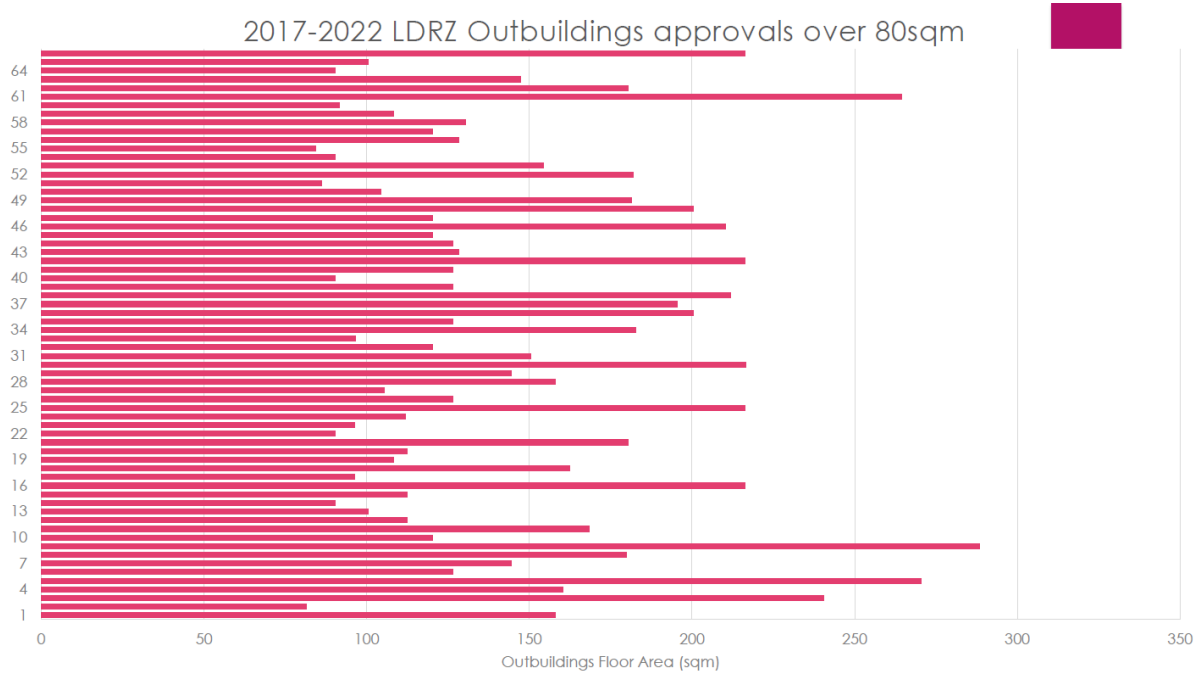
All but one approved

Average floor area of 146 square metres

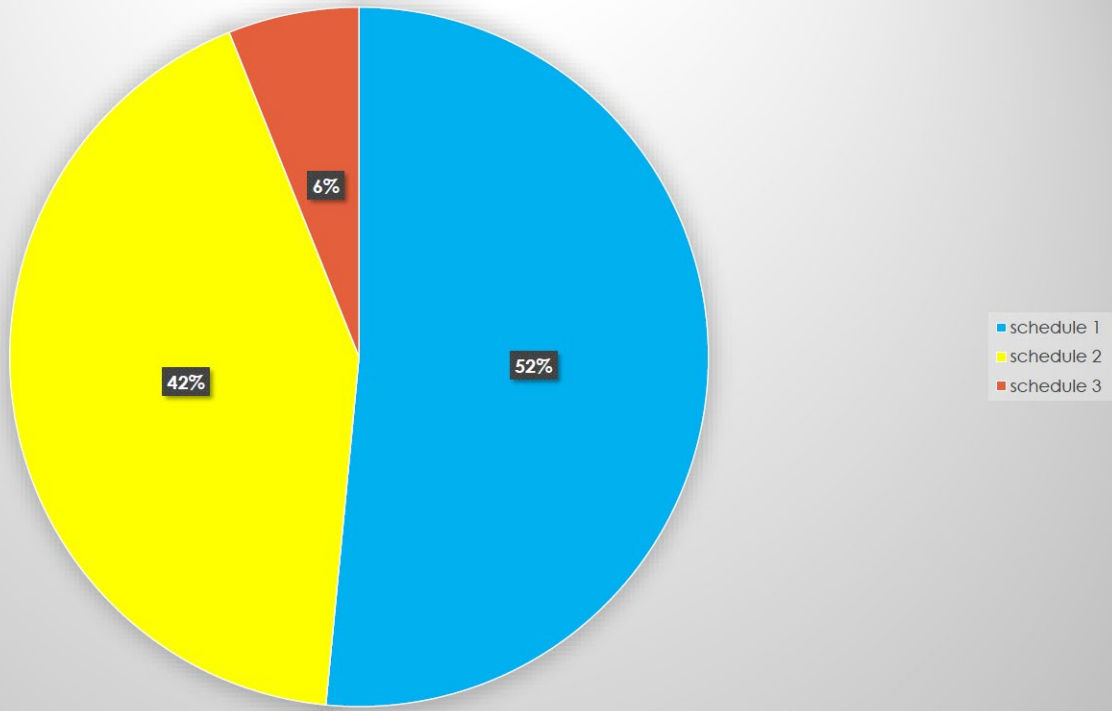
Average wall height of 3.386 metres.

Applications by location





2017-2022 LDRZ Outbuildings approvals by schedule



G: Draft Planning Policy

Local Planning Policy:

Clause 15.01-2L-xx

Building Design - Outbuildings in the Low-Density Residential Zone

Policy application:

This policy applies to all land within the Low Density Residential Zone.

Strategies

General:

- Support outbuildings that are used for purposes ancillary to the domestic use of the dwelling or the residential activities conducted on the property.
- Minimise the number of outbuildings on a lot, to reduce the scattered visual impact of buildings on the landscape.
- Design and size the building proportional to the dwelling and the overall lot size.
- The overall height of the building should not exceed the height of the dwelling.
- Designed to respect the existing neighbourhood character of the area.
- Avoid locating outbuildings over any easements.
- Design buildings to be of a human scale.
- Ensure design, scale, external colour and finishes of outbuildings respects the character of the area.

Siting and Design:

- Designed and sited behind the main dwelling on site.
- Locate outbuildings close to the dwelling.
- Ensure outbuildings utilise existing accessways provided for the dwelling, unless a second accessway to the outbuilding avoids or minimises earthworks and vegetation removal.
- Discourage outbuildings, other than a carport, from being located within the primary street frontage.
- Design outbuildings to minimise visual bulk and protect the amenity of adjoining and surrounding properties.
- Site outbuildings to reinforce and be respectful of the landscape and environmental and neighbourhood characteristics of the site and its surroundings.
- Locate buildings outside the Tree Protection Zone (TRZ) of any existing trees both native and exotic on and immediately adjoining lots to the site.

Setbacks and Wall Heights

Outbuildings should be designed to be setback from the side and rear boundaries 2 metres, plus 0.3 metres for every metre of height over 3.6 metres up to 6.9 metres, plus 1 metre for every metre of height over 6.9 metres.

Corner lots:

- Design the built form to address both frontages.
- Utilise landscaping to screen and integrate buildings into the surrounds.
- Avoid siting buildings with wall lengths that span a significant portion of a site's boundary.

- Avoid siting outbuildings on hill-tops and ridgelines except where they are screened from other properties and roads and will not be prominent in the landscape.
- Avoid outbuildings that have a greater floor space or height than the existing dwelling.

Policy guidelines

Consider as relevant:

- Locating outbuildings below the alignment of ridgelines to ensure silhouetting against the skyline does not occur and to allow buildings to blend into the natural landscape, with the elevated ridgeline providing the appropriate backdrop.
- Reducing the visual impact of the outbuilding from the adjoining and surrounding properties and from roads by:
 - Discouraging the use of reflective building materials such as zincalume and dark cladding.
 - Encouraging the use of light non reflective cladding.
 - Utilising mature screen planting to screen the built form.
 - Designing the building to incorporate levels of articulation to reduce and bulk.
- The views of the Council or relevant authority where an outbuilding is proposed to be located over an easement.
- Rural City of Wangaratta – Low Density Residential Outbuildings Design Guidelines.

Example - General Subdivision Design Policy Changes:

Subdivision Lot and Building Design:

Development should prioritise the use of passive design to maximise thermal comfort while minimising energy consumption for heating and cooling through the following:

- Optimising lot design and orientation to support optional building orientation.
- Optimising building envelop design to access winter warming sub, limit summer solar heat gain and access dominant cooling breezes.

Sustainable Transport:

- To ensure development supports sustainable transport patterns through the provision of transport infrastructure that prioritises active transport (walking and cycling etc).
- Encourage behavioural change to reduce transport related emissions and congestion through neighbourhoods that prioritise active transport.
- Support the creation of cool routes within subdivision design through the establishment of continuous canopy cover.

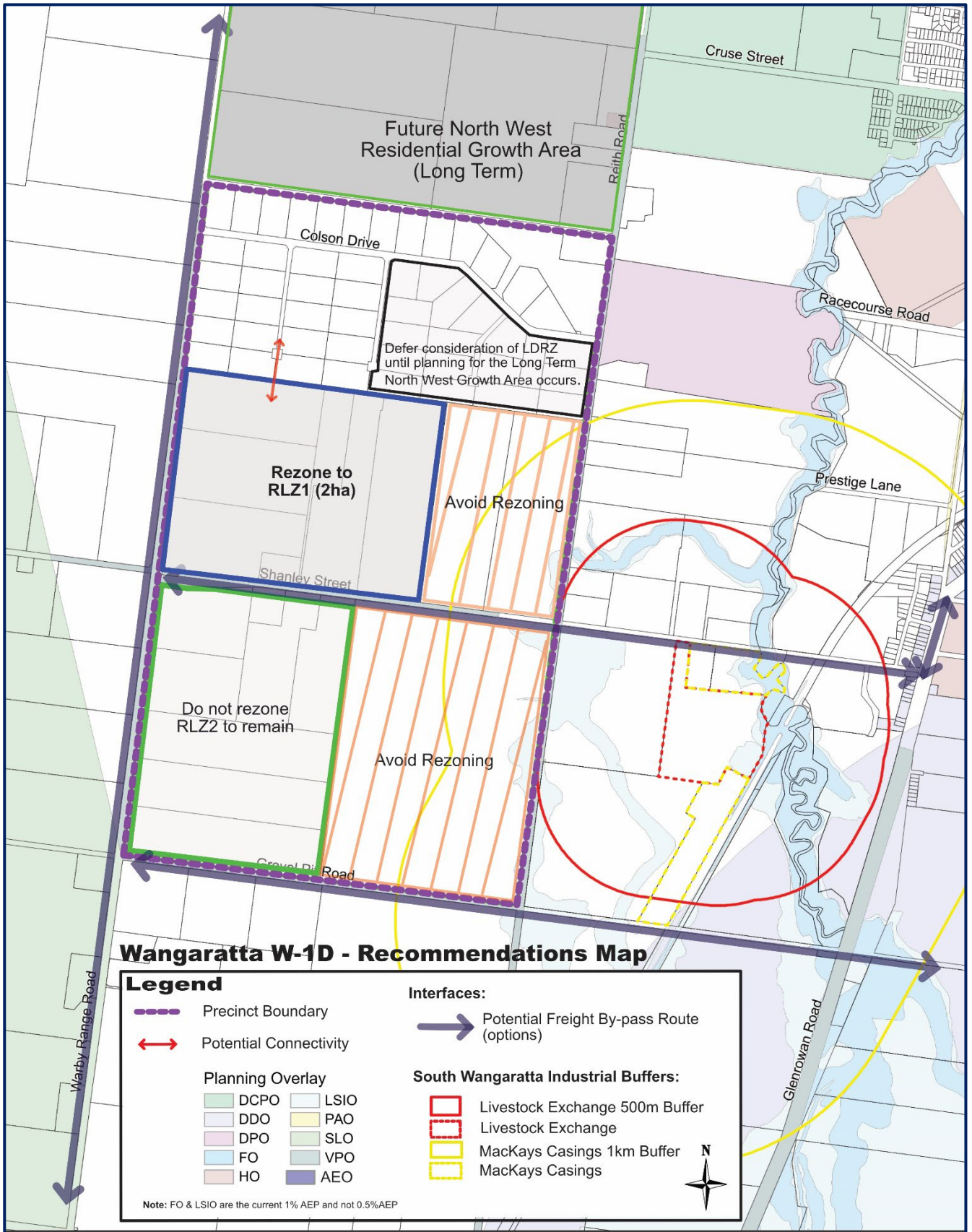
Integrated Water Management:

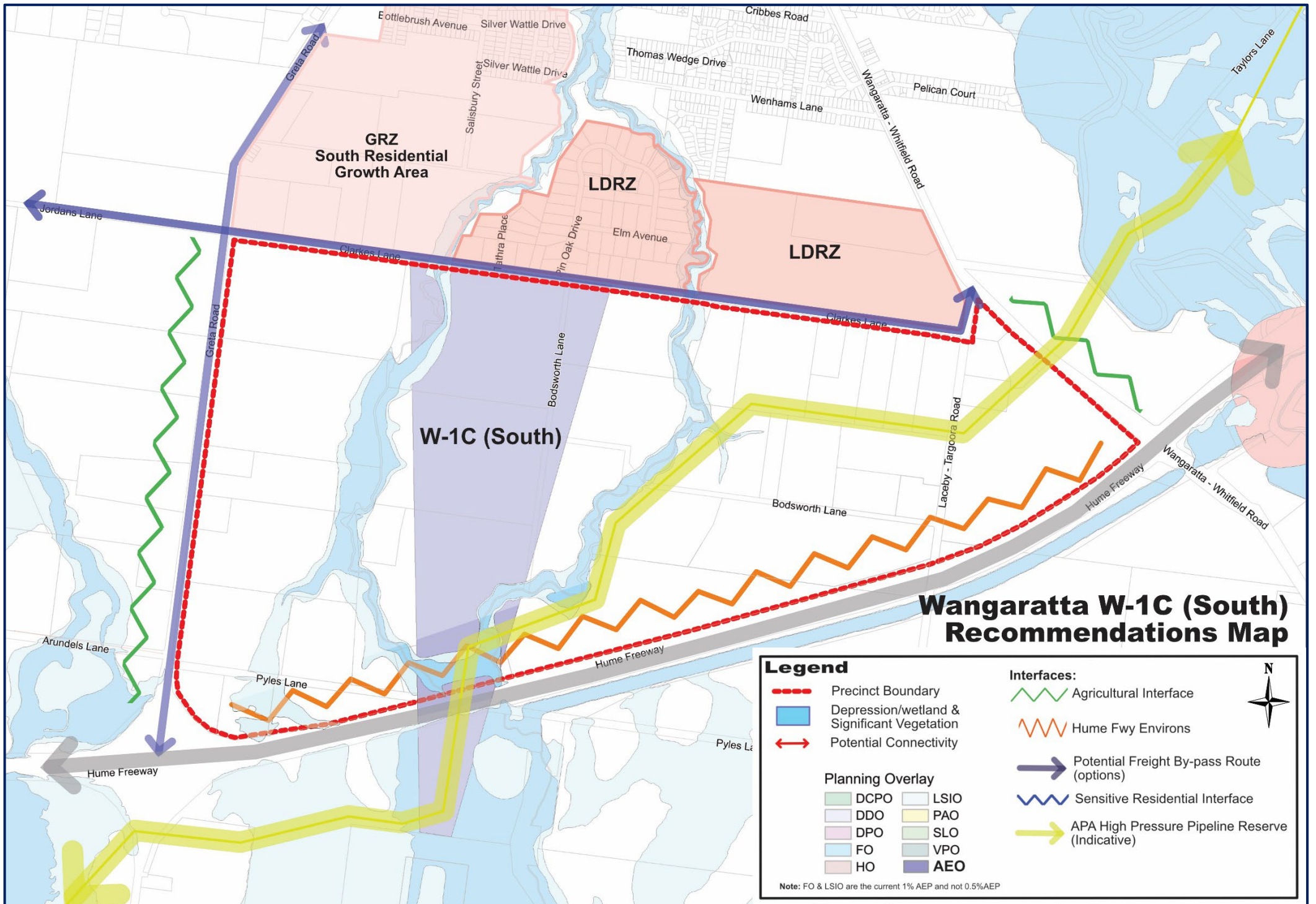
- To support development that minimise total operating potable water usage.
- To support development that reduces the amount of stormwater runoff onsite, and improves the quality of stormwater, and impacts for stormwater that leaves a development.
- To encourage development that supports innovation in the use and reuse of water.
- Design public spaces and landscaping to incorporate passive and active irrigation.

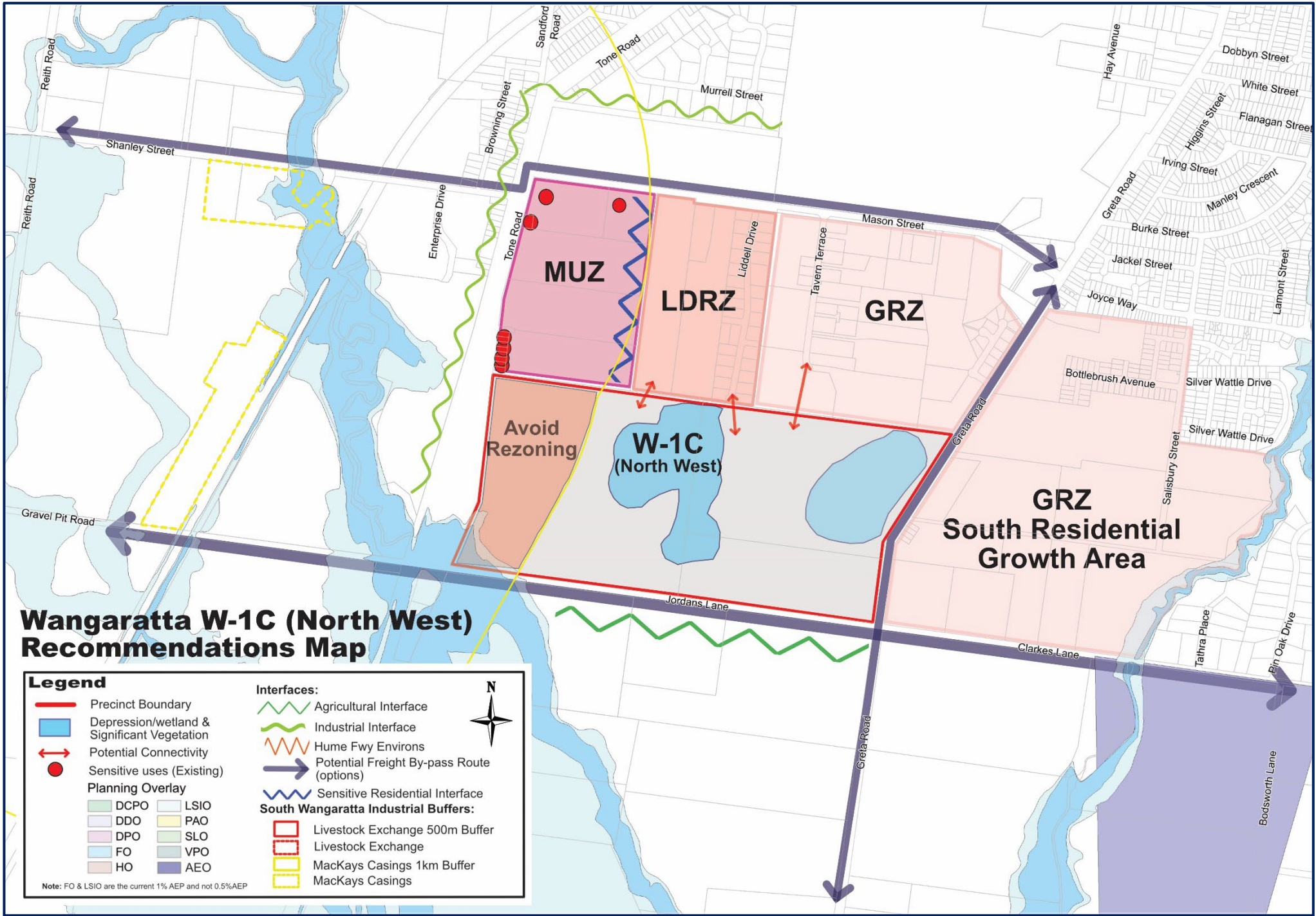
Infrastructure:

- Design development to protect existing landscape values on and adjoining the site, including canopy, vegetation and habitat for biodiversity.
- To support development that increases amenity, improves connection to surrounding natural landscapes and supports health and well being.
- To ensure landscaping proposed as part of development will be resilient to future climate conditions and bushfire and supports integrated water management and energy efficiency outcomes.

H: Recommendation Maps







Wangaratta W-1C (North West) Recommendations Map

