PRACTICAL ECOLOGY
ecological restoration & consulting

Bushfire Risk Assessment

Tatura Structure Plan

February 2022

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Report by Daniel Casullo
Cover image: Looking north-west into the proposed reserve

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Contents

TABLES

FIGURES

MAPS

1. INTRODUCTION

Practical Ecology have been commissioned by Greater Shepparton City Council to provide a bushfire risk assessment for the area within the Tatura Structure Plan to act as a guide for the future development of the site.

1.1 Background

The *Greater Shepparton Housing Strategy 2011* (GSHS) was designed to guide the long-term identification and provision of residential land within the City of Greater Shepparton and was incorporated into the Greater Shepparton Planning Scheme in 2012 under amendment C93. This amendment included the framework plan for the township of Tatura west of Shepparton.

Due to a high number of rezoning requests from landowners to provide for residential development, council have opted for a higher-level structure plan which will incorporate recommendations from the structure plan to provide information on appropriate densities for future residential development, identify all appropriate regional infrastructure required to support residential development and outline the cost of this infrastructure.

Multiple background reports are required to inform this process (traffic impact, water management, native vegetation, structure plan layout, etc.) which also includes an assessment of the bushfire risk which will be detailed in the following report.

As much 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 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
- A review 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 is located within Tatura and is approximately 787 ha and situated on a largely flat topography. The area is composed primarily of open farmland amongst scattered dwellings along with some low-density residential development surrounding the western end of Ferguson Road. Internal access within the site is currently limited due to the private land present although could be easily implemented through the development process due to the lack of vegetation and flat topography. Additionally, adequate access is provided along all site boundaries.

The site is located on the outskirts of the inner development within Tatura which than gives way to open farmland extending outwards for many kilometres. The Shepparton Regional Park is located approximately 14 km to the east of the site and consists of vegetation following the Goulburn River.

No bushfires have occurred onsite according to the available databases. Small bushfires have occurred between 2013-2020 within the Regional Park to the east of the site. Multiple prescribed burns have occurred within this same area between 2009-2017. Potential fire runs from the north-west or south-west would cross primarily Grassland vegetation as per AS3959-2018 on a flat topography. These potential landscape grassfires are likely to be largely buffered by the existing road network external to the site and therefore pose minimal risk. There is however the potential for short yet fast fire runs occurring within the site so these need to be taken into consideration through the potential development process.

The subject site was split into 15 Areas to determine individual risk and hazard outcomes. The risk has been considered low for all areas due to the main risk being of a lower intensity grassfire which would likely be buffered by the existing road network. The hazard has also been considered low for all areas excluding Area 13 which has been deemed Moderate. Area 13 contains denser Forest type vegetation within Cussen Park which could see localised fire impact on the adjacent land, primarily through ember attack.

Despite the absence of the BMO the areas within the site were considered against Clause 53.02 as a benchmark for bushfire safety. All of the conditions within the clause can be easily addressed thanks to the minimal vegetation present both onsite and within the surrounding landscape. The adjoining road network provides sufficient access along the boundary of the site and the provision of development will see the implementation of an internal road network.

Due to the presence of the Bushfire Prone Area (BPA) throughout the majority of the site, bushfire risk needs to be considered at the planning level under Clause 13.02-1S Bushfire Planning. The site is very well positioned to meet the requirements of this strategy. The area consists largely of open farmland and has a similar managed terrain on all sides. A fire approaching would likely be of a lower intensity grassfire whereby the existing road network would act as a fuel break and immensely aid in suppression efforts. The BAL-12.5 construction standard can be easily achieved throughout the entirety of the site with only minor setbacks required from the vegetation within Cussen Park (Area 13), from the proposed reserve in the north-eastern corner of the site depending on the level of management anticipated (Area 14) and from the vegetation within Area 7 (if it is to be retained). These setbacks will be in accordance with Table 4 as detailed in the following report.

2. 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.

There were some limitations to this assessment as a result of the site conditions. Since the majority of the site is within private land composed largely of farmland there was limited access throughout and therefore the majority of the site assessment was conducted from surrounding road reserves.

Additionally, due to the majority of area within the site being of private land and due to the minimal vegetation present we were unable to conduct any fuel load assessments. We will use all available resources to make up these limitations and provide the best possible results and recommendations addressing bushfire risk.

2.1 Landscape assessment

The bushfire hazard landscape assessment provides information on the bushfire hazard more than 150 m away from the Growth Area. The surrounding landscape is displayed on Figure 1 and the bushfire conditions are displayed on Map 2.

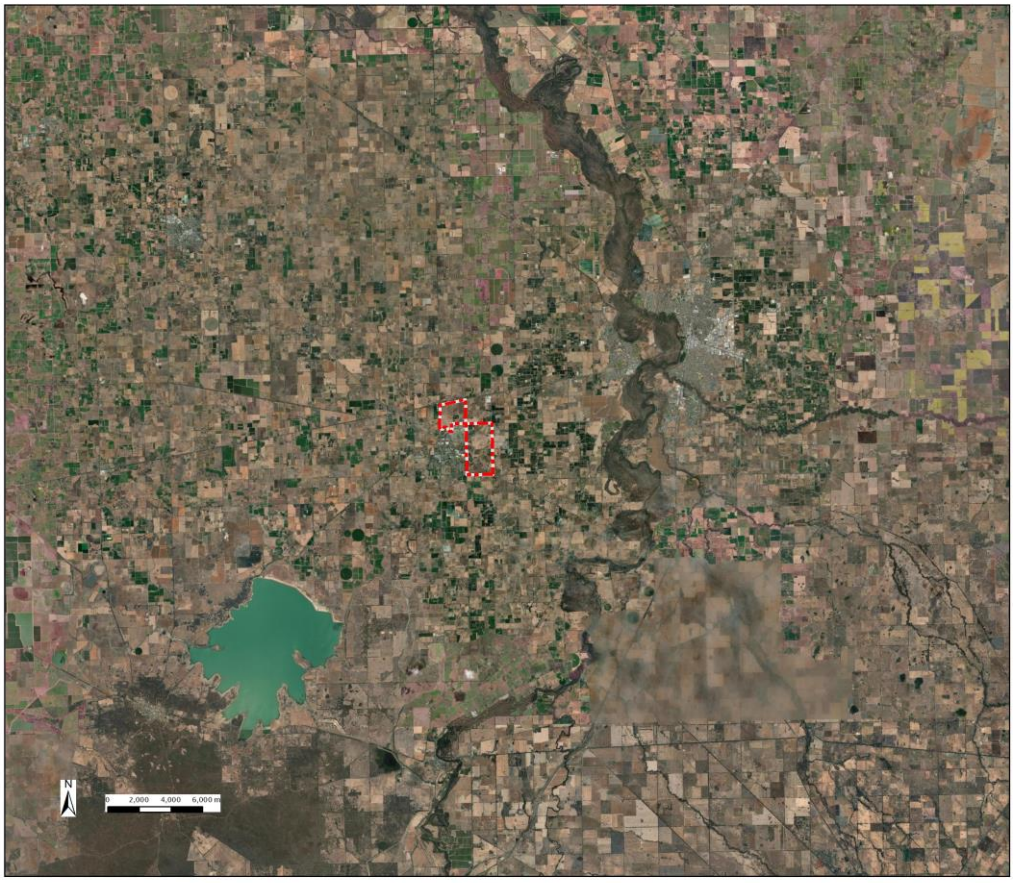


Figure 1. Landscape surrounding the site

2.1.1 Local landscape

The subject site is located immediate to farmland to the north, east and south. A small patch of vegetation is located adjacent to the Midland Highway to the north of the site within a privately owned lot although this vegetation is surrounded by farmland and subsequently poses a minimal threat. The farmland within these adjacent lots consists of a mixture of managed pasture and orchard plantations.

To the west of the site adjacent to Dhurringile Road contains the denser development within the Tatura Township. The Hill Top Golf and Country Club is located between Dhurringile Road and Pyke Road and contains some fragmented vegetation interspaced with lengths of mown lawn. The Public Park and Recreation Zone is present to the east of the golf course within Cussen Park. This area contains patches of vegetation along the waterway interspaced with mown lawn.

Moving further south into Tatura the land is dominated by higher density residential and commercial development including some park and recreation areas. Further south beyond O'Reilly Road the land transitions to low density residential development which sees the provision of larger lot sizes containing comparatively more managed vegetation.

2.1.2 Wider landscape

The site covers the area on a flat topography to the north and east outside of the higher density inner development within Tatura. The site is surrounded by farmland in all directions for many kilometres consisting of both pasture and orchard plantation. The Shepparton Regional Park is located approximately 14km to the east of the site. This Park follows the Goulbourn River to the north and south and consists of both Woodland and Forest type vegetation. The inner development is located just beyond this area approximately 19 km to the east of the site

2.2 Bushfire history

Map 1 below details the bushfire conditions and history

No Bushfires have occurred onsite according to the available databases.

Relatively small-scale Bushfires have occurred between 2013-2020 within the Shepparton Regional Park to the east of the site. This area is approximately 14 km from the site and follows the length of the Goulburn River with some patches of vegetation exceeding 1.5 km in width. Prescribed burns have also occurred within this area from 2009-2017.

2.3 Landscape bushfire scenarios

During bushfire season, bushfires are propelled by powerful hot north-westerly winds from central Australia before a south-westerly change occurs. This south-westerly change brings cooler, humid winds from the Southern Ocean which can reduce bushfire intensity or result in less intense bushfires approaching from the south-west.

The most likely approach for fire is from the north and north-west due to winds from this direction being more common in high fire risk conditions. Provided the landscape context the site is at most risk from grassfires which can start earlier in the day and travel up to three times faster than a bushfire.

Fire runs from the north-west outside of the site boundaries can be in excess of 3km and would cross primarily Grassland type vegetation on a flat topography. Despite the potential for long fire runs from the north west, the presence of the Midland Highway is likely to act as a fuel break and immensely aid in suppression efforts. Additionally, grassfires produce far less embers than bushfires and consequently the risk of a grassfire impacting beyond the Midland Highway from this aspect is reduced. However, the vegetation present within the private property to the north of the site and within the road reserve could pose a threat as this denser vegetation has a higher fuel load capable of producing comparatively more embers.

Shorter grassfire runs could also occur between the Midland Highway through to Pyke Road on the eastern half of the site. This could see potential impact to the south of Pyke Road as this road is much smaller in width and may consequently not deter ember spotting as well as the Midland Highway, particularly if grass heights have not been managed.

Fire runs from the south-west can be in excess of 2km and would transect Grassland type vegetation within the nearby farmland. These grassfire runs are likely to be largely buffered by Dhurringile Road and Murton Road where emergency service vehicles are likely to suppress the fire prior to impact occurring onsite.

Given the size of the site, there is the potential for short sharp grass fire runs occurring within the site. This potential threat should be considered through staged development to ensure appropriate buffers are maintained.

2.4 Landscape typology

Planning Practice Note 65 provides a typology of bushfire landscapes (see Table 1).

The landscape can be best described as a Type 1 due to the minimal vegetation present within the broader landscape (excluding Grassland). Therefore, Extreme bushfire behaviour is not possible

Table 1. Landscape typology as presented in Planning Practice Note 65 (DTPLI 2014)

Type 1	Type 2	Type 3	Type 4
- **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.**	- 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.	- 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.	- The broader landscape presents an extreme risk. - Evacuation options are limited or not available.

2.4 Victorian Fire Risk Register (VFRR)

The risk and threat ratings recorded within the VFRR are displayed on Map 3 and Map 4

The VFRR has only categorized a small portion of land within and nearby to Area 12. This area has been considered of medium risk and can be likely attributed to the surrounding Grassland vegetation and Forest vegetation within Area 13. The risk is however reduced considering the lower intensity nature of grassfires and the surrounding road network acting as a buffer. The patch of Forest vegetation with Area 13 is also comparatively small and not connected to any larger parcel of vegetation within the broader landscape. The threat is also considered medium due to the minimal vegetation present within the classified areas.

3. BUSHFIRE HAZARD SITE ASSESSMENT

The bushfire hazard site assessment provides information on the bushfire hazard within the Growth Area and within 150m of the boundary as per the requirements of the Bushfire Management Overlay. The assessed bushfire conditions and the results of this assessment are displayed on Map 2, Map 3 and Map 4.

3.1 Subject Site

Refer to Map 2 and Table 2 for the results of the vegetation and slope assessment as per Australian Standards 3959-2018: Construction of Buildings in Bushfire Prone Areas.

The subject site is composed primarily of open paddocks which can be considered Grassland vegetation as per AS3959-2018 with scattered dwellings present throughout. A small patch of Woodland vegetation is present within the sites north-eastern corner; this area will form a reserve as part of the proposed development plan. Low-density residential development is present adjacent to Dhurringile and Ferguson Road, along the western portion of the site. This area is composed of both existing and soon to be established residential development. A patch of Woodland vegetation is present to the south of Moyola Gardens Retirement Village, this patch follows the natural water line. Fragments of Forest vegetation are also present within Cussen Park, these patches are interspaced with mown lawn.

We were unable to perform a Fuel Hazard Assessment within the site due to limited access and the fact that it was not strictly required for an area of this kind. The majority of the vegetation present is open paddocks which are either managed or can be considered standard Grassland as per AS3959-2018. We were able to observe the Forest and Woodland type vegetation from the nearby road reserves and were able to determine that they were in line with the standards put forth within AS3959-2018.

Table 2. Bushfire hazard site assessment

Location	Centre	North-eastern corner & South	West	Centre & West
Vegetation type	Grassland	Woodland	Forest	Low Threat
Effective slope (up/down)	Flat	Flat	Flat	Flat
Effective slope (degrees)	0-2°	0-2°	0-2°	0-2°

3.1.1 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 ground story 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 Cussen Park although is fragmented and interspaced by strips of mown lawn (see Figure 14).

3.1.2 Woodland

Woodland vegetation as per AS3959-2018 also consists of a canopy layer of between 10-30m tall (can be less than 10m) with foliage cover of between 10-30%. Elevated fuel layers are often also present but at significantly lower density than observed in Forest vegetation. The key difference between Forest and Woodland vegetation is Forest support fires in the canopy. This requires a dense canopy layer and elevated fuel layer so vegetation can be considered Woodland if the canopy density is greater than 30% but there is very little to no elevated fuels. Woodland vegetation is present to the south of the retirement village and follows the water course within private land (see Figure 8).

3.1.3 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%. The majority of the site is composed of managed pasture which is considered as Grassland type vegetation as per AS3959-2018 (see Figure 2)

3.1.4 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. Areas of low threat include the existing residential development within Tatura and the land within the construction stages of development (see Figure 9 and Figure 5). The existing golf course was also considered of low threat due to the fragmented nature of the small patches of vegetation which are interspaced with stretches of mown lawn (see Figure 12).

3.2 Access conditions

The existing road network sees main road access adjacent to much of the site's boundaries. Dhurringile Road runs through the centre of the site and provides access along the eastern boundary of the top half of the site and also along the western boundary of the sites bottom half. The Midland Highway is present adjacent to the northern boundary in which Dhurringile Road can be accessed from in addition to Tatura-Undera Road along the site's western boundary. Murton Road provides access along the southern boundary of the site which adjoins Bayunga Road running along the eastern site boundary.

Internal access within the site is currently limited due to the private land although Ferguson Road runs through the centre of the eastern half of the site. Due to the largely flat topography, minimal vegetation present and the surrounding main road network, road access could be easily implemented within the site to ensure sufficient access and egress for emergency service vehicles

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 current risk and hazard from each part of the assessment area (parts are divided based on current usages, management and the developments present. 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 the requirements under the BMO respectively.

4.1 Site analysis

Considering all of the results above we can divide the growth areas based on the conditions and usage observed and determine the risk posed to each zone and the hazard it poses to the surrounding areas. Tatura was divided into 15 numbers zones which are described in detail below and provided on Map 3 and Map 4.

Area 1

Location	North-western portion of the site
Risk category	Low
Hazard category	Low
Details	Primarily composed of managed pasture with some scattered dwellings (see Figure 2). The Area is flanked to the north, east and west by main roads. This area adjoins to the small patch of Woodland vegetation within Area 14 and also to the denser patch of Forest vegetation within Area 13. The risk is considered low as a grass fire from the north-west or south-west would be largely buffered by the Midland Highway and Tatura-Undera Road respectively. The Woodland vegetation within Area 14 will be managed as a reserve as part of the proposed development plan so the risk is reduced. The Forest vegetation with Area 13 is also fragmented and interspaced with mown lawn and therefore poses minimal risk. The hazard is also considered low due to the minimal vegetation present within the area that would likely see a lower intensity grass fire if ignition were to occur.

Photos	 Figure 2. Managed pasture

Area 2

Location	South of Pyke Road
Risk category	Low
Hazard category	Low
Details	Similar to Area 1, composed largely of managed pasture with some scattered dwellings present (see Figure 3). This area is flanked by open farmland to the north, east and south. Low density development is present to the west. The risk is considered low due to potential grass fires approaching from the north-west being buffered by Pyke Road. The hazard is also considered low due to the minimal vegetation present within the area that would likely see a lower intensity grass fire if ignition were to occur.
Photos	 Figure 3. Managed pasture

Area 3

Location	Southern portion of the site, south of Ferguson Road
Risk category	Low
Hazard category	Low
Details	Similar to Area 2, composed largely of managed pasture with scattered dwellings present throughout along with the Toolamba–Echuca railway line (see Figure 4). The area is flanked by open farmland to the north, east and south and low–density residential development to the west. The risk is considered Low as the only credible threat is from a grassfire from the south–west which would be largely buffered by Dhurringile Road. The hazard is also considered low due to the minimal vegetation present.
Photos	 Figure 4. Managed pasture.

Area 4

Location	East of Dhurringile Road
Risk category	Low
Hazard category	Low
Details	Consist of low–density residential development and land in the construction stages of low–density development (see Figure 5). The area is flanked by Grassland to the north, east and south. Denser development is present to the west within inner Tatura. The risk is considered low as grassfire runs from either aspect are either highly unlikely or impossible due to the surrounding development. The hazard is also considered low due to the minimal vegetation present.

Photos	 Figure 5. Residential construction area

Area 5

Location	East of Dhurringile Road
Risk category	Low
Hazard category	Low
Details	Similar to Area 4 and consists of Low-density residential development although flanked by development on all sides (see Figure 6). The risk and hazard are both considered low due to the surrounding development acting as a buffer from potential fire runs and due to the minimal vegetation present within the Area.
Photos	 Figure 6. Low density development.

Area 6

Location	Corner of Ferguson and Dhurringile Road
Risk category	Low
Hazard category	Low
Details	Consists of the Moyola Gardens Retirement Village (see Figure 7). This area is flanked by development to the north, east and west. A relatively small patch of vegetation is present to the south of the area within the waterway. The risk is considered low as the area is situated amongst established development. The hazard is also considered low due to the minimal vegetation present.
	 Figure 7. Residential development within the Retirement Village

Area 7

Location	South of Ferguson Road, adjacent to Toolamba-Echuca railway line
Risk category	Low
Hazard category	Low
Details	Consist of both managed pasture on private land and Woodland type vegetation located within the Urban Floodway Zone (see Figure 8). This area is flanked by low density development to the north and south, open farmland to the east and the inner development of Tatura to the west beyond Dhurringile Road. The risk is considered low due to the area being largely surrounded by established development. The hazard is also considered low despite the present vegetation due to its small area and lack of connectivity to any other patch of vegetation in the broader landscape.

Photos	 Figure 8. Woodland vegetation.

Area 8

Location	South-western corner
Risk category	Low
Hazard category	Low
Details	Consists of low-density residential development (see Figure 9). This area is flanked by the vegetation within Area 7 to the north, managed pasture to the east and south and the established higher density development within Tatura to the west. The risk is considered low as grass fire runs from the south are the only credible threat and these would be largely buffered by Murton Road. The hazard is also considered low due to the minimal managed vegetation present.
Photos	 Figure 9. Low-density residential development.

Area 9

Location	South-western corner, west of Dhurringile Road
Risk category	Low
Hazard category	Low
Details	Consists of both low-density residential developments south of O'Reilly Road which then transitions to higher density development further north (see Figure 10) Commercial development is also present north of the railway line which sees an area of maintained lawn. This area is surrounded by development to the north, south and west. Managed pasture is present to the east along with the patch of vegetation within Area 7. The risk is considered low due to the surrounding development. The hazard is also considered low due to the minimal vegetation present.
Photos	 Figure 10. Low Density residential development

Area 10

Location	Along the western boundary, between Mactier Street and the golf course
Risk category	Low
Hazard category	Low
Details	Consists of higher density residential development within inner Tatura (see Figure 11). This area is flanked by the gold course to the north, low-density development to the east and south-east. The risk is considered low due to the surrounding development. The threat is also considered low due to the minimal vegetation present.

Photos	 Figure 11. Higher density residential development

Area 11

Location	Western boundary, north of Ponting Street
Risk category	Low
Hazard category	Low
Details	Consists of the Hill Top Golf and Country Club (see Figure 12). This Area is surrounded largely by residential development with the exception of managed pasture to the north-east. The risk is considered low due to the surrounding development. Despite the present vegetation the hazard is also considered low as this vegetation is heavily fragmented and interspaced by areas of mown lawn.
Photos	 Figure 12. Vegetation within the Golf and Country club.

Area 12

Location	Surrounds the northern portion of the golf course
Risk category	Low
Hazard category	Low
Details	Consists of higher density residential development (see Figure 13). This area is flanked by managed pasture to the north, east and west. The golf course is present to the north. The risk is considered low as potential fire runs from the north-west would be of lower intensity grassfires and would be largely buffered by Pyke Road. The hazard is also considered low due to the minimal vegetation present
Photos	 Figure 13. Higher density residential development.

Area 13

Location	South of Pyke Road within Cussen Park
Risk category	Low
Hazard category	Moderate
Details	Consists of fragments of Forest type vegetation within Cussen Park (see Figure 14). This area is flanked by managed pasture to the north and west. Residential development is present to the east and south. The risk is considered low due to potential grass fire runs being buffered by the surrounding road network. The hazard is considered moderate as the Area does contain fragments of denser Forest type vegetation. If a grass fire approaching from the south-west were to impact Cussen Park, the fragments of denser vegetation could increase fire intensity and push further south-west to impact the site south of Pyke Road. Despite this, the hazard is reduced due to the comparatively small size of the patch of vegetation and the surrounding road network acting as a buffer.

Photos	 Figure 14. Forest type vegetation within Cussen Park.

Area 14

Location	North-eastern corner
Risk category	Low
Hazard category	Low
Details	Consists of Woodland type vegetation that will be managed as a reserve as part of the proposed development plan (see Figure 15). This area is surrounded by managed pasture adjacent to the existing road network. The risk is considered low as potential fire runs from the north-west would be buffered by the Midland Highway. Fire runs from the south-west with an ignition occurring within the site could potentially see impact to the area although the risk is reduced as this would be a lower intensity grassfire. Despite the present vegetation the hazard is also considered low as the area is proposed to be managed as a reserve and additionally the area does not adjoin to any larger patches of vegetation within the landscape.
Photos	 Figure 15. Woodland vegetation within the proposed reserve.

Area 15

Location	North of the Midland Highway
Risk category	Low
Hazard category	Low
Details	Consists of low-density residential development amongst some fragmented vegetation (see Figure 16). This area is surrounded by managed pasture. The risk is considered low as potential fire runs from the north-west or south-west are buffered by the existing road network. The hazard is also considered low as the Midland Highway would act as a fuel break and minimise the likelihood of fire impact through to the site.
Photos	 Figure 16. Low-density residential development within fragmented vegetation.

4.2 Legislation and policy

In order to provide an assessment of the bushfire risk which can be utilised by council and by future developers seeking planning applications, the assessment of the bushfire risk needs to be considered against the current bushfire legislation.

Due to the presence of Bushfire Prone Area throughout the majority of the site, bushfire risk needs to be considered at the planning level under Clause 13.02-1S Bushfire Planning. The Bushfire Management Overlay is not present within the site although serves as an excellent benchmark for bushfire safety which includes the incorporation of Clause 53.02. We will assess the site under both clauses.

4.2.1 Clause 53.02

Clause 44.06 Bushfire Management Overlay states that applications within the BMO must meet the requirements of Clause 53.02 unless a specific overlay of the BMO states otherwise (through exemption or alternative measures). 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 53.02-4.1 – 4.3 apply 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. These applications also have to be considered under Clause 13.02-1S (see section 4.2.2 for further details).

Clause 53.02-4.4 has been considered appropriate for this site as much of the land is within Farming Zone (FZ) and will be subject to subdivision through the proposed development process.

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.

We will focus on the Approved Measures of Clause 53.02-4.4; these are detailed in Table 3 below. The response under the Approved measures detailed below are in the context of the entire site, these measures are generally applied to smaller parcels of land so we have aimed to make our response most relevant where possible.

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	An application to subdivide land, other than where AM 5.2 applies, demonstrates that each proposed lot is capable of meeting: • The defendable 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	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 defendable space in accordance with: - 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. The bushfire attack level that corresponds to the defendable space provided in accordance with Table 2 to Clause 53.02-3 must be noted on the building envelope • Defendable space wholly contained within the boundaries of the proposed subdivision. • Defendable Space may be shared between lots within the subdivision. Defendable space for a lot may utilize communal areas, such as roads, where that land can meet the requirements for defendable space. • Vegetation management requirements in accordance with Table 6 to implement and maintain the defendable 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

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 can be easily met due to the minimal risk present within the surrounding landscape. The main risk is of grassfires given the landscape context which can spread quickly although generate comparatively less embers and burn at a lower intensity. The existing perimeter road network of the site would also act as a buffer from these fire runs. The forest vegetation within Cussen Park does pose a risk although the fragmented nature of the vegetation is unlikely to harbour a full fire front. This risk will additionally be reduced through the application of setbacks in accordance with AS3959:2018. The site is also located on the edge of Tatura where refuge can be sought within the inner development.

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

The bushfire hazard is largely of grassland both within and external to the site. Some small patches of vegetation are present within the site including the Woodland vegetation within the proposed reserve in the north-eastern corner and the patch further south within Area 7. These smaller patches do not connect to any larger areas of vegetation within the landscape and therefore the applicable setback would provide sufficient separation from the hazard. It is assumed that the proposed development would see the incorporation of a road network that would provide immediate access and egress for emergency service vehicles whilst also create a setback/fuel break from the patches of vegetation within the site.

Site Assessment

Approved Measure 5.2 contains the site requirements to be met for new subdivision applications along with additional requirements regarding layout and management of properties (see below for the details).

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 defendable 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 defendable space provided in accordance with Table 2 to Clause 53.02-5 must be noted on the building envelope
- Defendable space wholly contained within the boundaries of the proposed subdivision.
- Defendable Space may be shared between lots within the subdivision. Defendable space for a lot may utilize communal areas, such as roads, where that land can meet the requirements for defendable space.
- Vegetation management requirements in accordance with Table 6 to implement and maintain the defendable space required under this approved measure.
- Water supply and access that complies with AM 4.1

BAL Assessment

The vegetation observed within the 150m assessment area was Grassland, Forest and Woodland. Slopes within this area were predominately level. As per AS3959-2018, Table 4 provides the distances required to meet the defendable space requirements for BAL-12.5.

Table 4. Classified vegetation present at Tatura

Vegetation type	Woodland	Forest	Grassland
Slope (up/down)	Level	Level	Level
Slope (degrees)	0-2°	0-2°	0-2°
Defendable space required for BAL 12.5 (m)	33	48	19

The Forest vegetation within Cussen Park (Area 13) is the greatest hazard to the site and requires the largest setback. A road reserve may not provide the required setback if development is to be placed to the north of this area. A public space such as a playground etc could be implemented to achieve the required setback. The Woodland type vegetation within Area 14 will form a reserve as part of the proposed development plan. Depending on the extent of management within this area it could be considered a maintained public reserve and therefore exempt from requiring a setback.

The required setback from the Grassland vegetation external to the site would likely be achieved through the provision of road reserves with possibly a slight setback in some areas. Considering the size of the site the development will be staged and therefore patches of grassland vegetation will remain for periods of time. A setback from this vegetation will have to be put in place throughout this period to ensure adequate separation is attained at all times.

Figure 17. BAL levels (CFA 2012)

If the Woodland vegetation within Area 14 is to be managed to defendable space standards, as with any public space proposed within the site, they will have to meet the requirements as set out within Table 6 to Clause 53.02-5 which details the following:

- 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.

Unless specified in a schedule or otherwise agreed in writing to the satisfaction of the relevant fire authority.

Water supply and access requirements

Approved Measure 4.1 details the requirements for water supply and access and is referenced under Approved Measure 5.2. This is a requirement for applications under the BMO and is therefore not specifically required for the proposed lots within the site. **The below serves purely as a benchmark for bushfire safety**

AM 4.1
A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person's unit, industry, office or retail premises is provided with: • A static water supply for fire fighting and property protection purposes specified in Table 4 to Clause 53.02-5. • Vehicle access that is designed and constructed as specified in Table 5 to Clause 53.02-5. The water supply may be in the same tank as other water supplies provided that a separate outlet is reserved for fire fighting water supplies.

Water requirements are determined through the size of the property and whether or not a hydrant is present (see Table 5 below for the details).

Table 5. Static water supply requirements (Clause 53.02-5, table 4)

Lot sizes (m^2)	Hydrants	Effective capacity (litres)	Fire authority fittings and access required
Less than 500	N/A	2,500	No
500-1,000	Yes	5,000	No
500-1,000	No	10,000	Yes
1,001 and above	N/A	10,000	Yes

Note 1: A hydrant is available if it is located within 120 meters of the rear of the building
Note 2: Fittings must be in accordance with the published requirements of the relevant fire authority

The access requirements are also based on similar principles where the length dictates the associated requirements (see Table 6 below). These requirements are stipulated within the BMO and are therefore not specifically required for properties within the site. **The below serves purely as a benchmark for bushfire safety**

Table 6. Access requirements (Clause 53.02-5, table 5)

Length	Requirements
Length of access is less than 30 metres	There are no design and construction requirements if fire authority access to the water supply is not required under AM4.1.
Length of access is less than 30 metres	Where fire authority access to the water supply is required under AM4.1 fire authority vehicles should be able to get within 4 metres of the water supply outlet.

Length of access is greater than 30 metres	The following design and construction requirements apply: • All-weather construction. • A load limit of at least 15 tonnes. • Provide a minimum trafficable width of 3.5 metres. • Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically. • Curves must have a minimum inner radius of 10 metres. • The average grade must be no more than 1 in 7 (14.4%) (8.1°) with a maximum grade of no more than 1 in 5 (20%) (11.3°) for no more than 50 metres. • Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.
Length of access is greater than 100 metres	A turning area for fire fighting vehicles must be provided close to the building by one of the following: • A turning circle with a minimum radius of eight metres. • A driveway encircling the dwelling. • The provision of other vehicle turning heads – such as a T or Y head – which meet the specification of Austroad Design for an 8.8 metre Service Vehicle.
Length of access is greater than 200 metres	Passing bays must be provided at least every 200 metres. • Passing bays must be a minimum of 20 metres long with a minimum trafficable width of six metres.

Note 1: The length of access should be measured from a public road to either the building or the water supply outlet, whichever is longer.

4.2.2 Clause 13.03-1S

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, the assessment utilises AS3959:2018 among other policy guidelines documents so this strategy can be considered addressed. The remaining strategies are discussed below.

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.

This strategy is very broad but focuses on ensuring that this ideal is at the forefront of any development when considering bushfire safety. Overall, the fact that this assessment is being performed and is addressing this Clause means that the protection of human life has been considered. As detailed previously, the entirety of the site has been deemed of low risk and it is therefore considered acceptable to direct population growth in such an area. Additionally, the site is located on the outskirts of the inner development of Tatura where refugee can be readily sought via the existing road network.

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.

Section 2 and Section 3 use the best available science and data to determine the bushfire risk at the scales detailed above. The application of the BMO is not necessarily required as no large areas of vegetation are present within the site although it has been used as a benchmark for bushfire safety. The CFA has been engaged within initial stages and their input has been taken into consideration throughout the reporting process. Additionally, they will be consulted in order to review this assessment and the recommendations.

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. • 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. This strategy is designed to prevent subdivisions and other developments which result in people congregating in large numbers from being constructed in dangerous locations. The primary means of achieving this is a blanket ban on developments where BAL-12.5 as per AS3959-2018 cannot be attained by every development within an area.

Overall, the site is well positioned to meet the requirements of this strategy. The area is large and is not only predominately managed farmland but has similarly managed terrain on most sides. The vast majority of the site is capable of meeting the BAL-12.5 construction standard with only a few minor setbacks required as detailed previously. Additionally, the Bushfire Prone Mapping does not cover the entirety of the structure plan area. This consequently allows for areas assessed as BAL-LOW which are present between Pyke Road and the development surrounding Howley Court. Areas assessed as BAL-LOW can also be found within the inner development of Tatura, to the south and west of the structure plan area.

The provision of development will likely see the clearance of large areas of Grassland type vegetation within the site which intern will further reduce the risk at large and potentially allow for larger areas assessed as BAL-LOW if the Bushfire Fire Prone mapping of the area is to be reassessed. The enforcement of the relevant bushfire protection measures will also further reduce the risk, particularly to settlement located nearby to retained vegetation.

Considering this, placing higher density development across the entirety of the site can be considered safe since as the chances of a fire approaching, even under prevailing conditions is very low and reduced further by the surrounding road network acting as a fuel break. Additionally adequate access is available through the surrounding road network which can adjoin to an internal road network. It is however recommended that the land immediate to the site boundaries, including potential road reserves should be routinely managed in order to maintain minimal fuel loads. Due to the landscape

context, there is a significant amount of Grassland type vegetation as per AS3959: 2018 which is also present adjacent to the site boundaries. These patches of vegetation should be managed to ensure grass heights do not exceed 10cm in height, particularly in the bushfire season.

In comparison to other townships within Greater Shepparton, Tatura can be considered one of the most suitable townships for development from a bushfire perspective. As detailed previously, likely fire runs would be of lower intensity grassfires which would be buffered by the existing road network and potentially through existing development. Comparatively, other nearby townships are located adjacent to the riparian vegetation along the Goulburn River and therefore potential expansion of this townships pose a higher risk from a bushfire perspective. The nearby township of Toolamba is located immediate to riparian vegetation along the Goulbourn River and a short distance to the same stretch of vegetation to the south. An expansion of this township would see a greater risk through ember attack and potentially fire front impact. Similarly, the township of Murchison is located immediate to the riparian vegetation along the Goulbourn River and a short distance from patches of vegetation to the west. Any additional development within this township would be at higher risk from ember attack and potential fire front impact. The township of Mooroopna is also located immediate to this same stretch of riparian vegetation. Expansion of the township to the north or south would see development adjacent to the main bushfire threat. Expansion to the west also still poses a risk through ember attack.

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 is composed largely of exotic pasture with the exception of Area 14 and Area 7. Area 14 contains what seems to be indigenous trees and will form a reserve as part of the proposed development plan so this area is unlikely to see much impact. Area 7 contains vegetation along the waterway which may be impacted depending on if it is retained or not. Either way this area is comparatively small and in context would not see 'unacceptable biodiversity impacts'.

4.3 Recommendations

After considering the bushfire risks and hazards present along with the requirements of the relevant legislation and policy, we can conclude that the implementation of standard density residential development within the site is suitable. As stated previously, there is minimal vegetation within the site or within the broader landscape which sees a low-risk categorisation for all areas within the site. Additionally, the site adjoins to the east of the existing settlement within Tatura which avoids impact from the highest risk aspects for bushfire approach. The site has sufficient access via the existing road network and through the provision of development which will see implementation of an internal road network.

The site does contain some comparatively small patches of vegetation including a potential reserve within the north-eastern corner, although these patches do not connect to any larger areas of vegetation within the landscape, they can still pose a threat and should be taken into consideration. Prospective development must allow for the appropriate setback from the Forest vegetation within Cussen Park to ensure the BAL-12.5 construction standard can be met in accordance with Table 4.

The same must also be taken into consideration for the vegetation within Area 14 (the proposed reserve), Area 7 (if the vegetation is to be retained) and from the Grassland vegetation external to the site.

These required setbacks, particularly for the grassland vegetation external to the site, will be largely met through the existing perimeter roads and/or provision of perimeter roads through development. Perimeter roads should adjoin to roads within the settlement that lead away from the hazard to ensure safe egress for occupants within the nearby lots. These roads should then adjoin to the broader road network within the settlement. Road widths are to comply with those of the relevant fire authority (DELWP 2020).

In areas that the road reserve does not meet the required setback, additional separation will be required. Open public space such as a park reserve can be integrated into the settlement interface, the vegetation within these areas or any other vegetated public open space will have to be bushfire responsive with routine fuel management occurring as to ensure a bushfire risk is not created over time. The same should apply for the road reserve covering the permitter of the site, either side of this reserve should be routinely managed to further reduce the risk within the settlement interface.

As to ensure bushfire risk on the settlement interface is managed into the future, a planning scheme amendment that enables new development within the settlement interface must note a condition that development cannot be located within the required setback area. This will ensure that buildings cannot be constructed within the setback area and increase the risk to the building itself and the greater settlement area. Planning scheme amendments can also incorporate section 173 agreements if a site-specific amendment is proposed. This ensures that if land within the designated setback area is to be privately owned, there is assurance that the management requirements of the land within the setback are upheld. The use of public open space as a setback such a as a public reserve is ideal as it would also ensure a high level of certainty around routine management within the interface.

Incremental change is an issue in settlement planning as the bushfire risk can be increased over time if appropriate measures are not enforced. As detailed previously, vegetation management requirements through planning approvals will provide certainty of management occurring, particularly within the settlement interface. Additionally, as potential development is likely to be staged, the relevant setback from the grassland vegetation should be implemented as to mitigate the impacts of potential short yet fast grass fire runs that can occur within the site.

5. REFERENCES

CFA (2012) *Planning for Bushfire Victoria - Guidelines for Meeting Victoria's Bushfire Planning Requirements*. Country Fire Authority.

CFA (2014a) *Standard Permit Conditions Bushfire Management Overlay*. Country Fire Authority, Victoria.

CFA (2014b) *Water Supply Requirements (Bushfire Management Overlay)*. Country Fire Authority, Victoria.

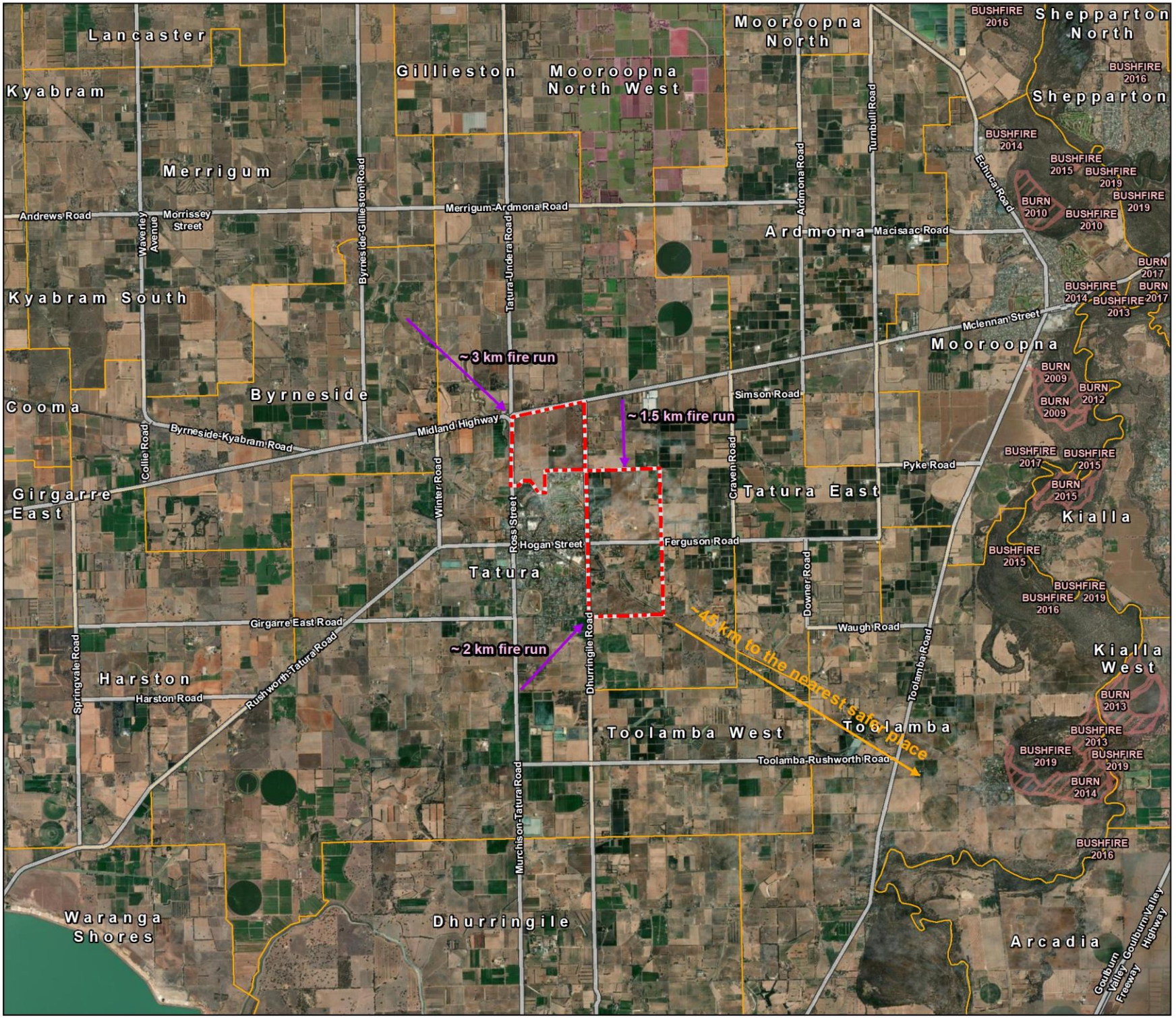
CFA (2014c) *Access Requirements (Bushfire Management Overlay)*. Country Fire Authority, Victoria.

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) *AS3959-2018 Construction of buildings in bushfire-prone areas (incorporating Amendment Nos 1 and 2)*. Fourth edition (reissued incorporating Amendment 1 June 2019 and reissued incorporating Amendment 2 December 2020) ed. SAI Global, Sydney.

Appendix 1. Maps



Bushfire Hazard
Landscape management
Tatura Structure Plan

Legend

- Subject Site
- Localities
- Major Roads
- Neighbourhood Safer Place
- Potential bushfire scenarios

Fire History

Bushfire

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

Planned Burn

- Planned Burn Pre 1980
- Planned Burn 1980 onwards

Details

Date: 30/09/2021
Version: 1
Aerial photography from Nearmap (Jul 2021).

N

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Scale 1:80,000 (Page size A3)

Disclaimer

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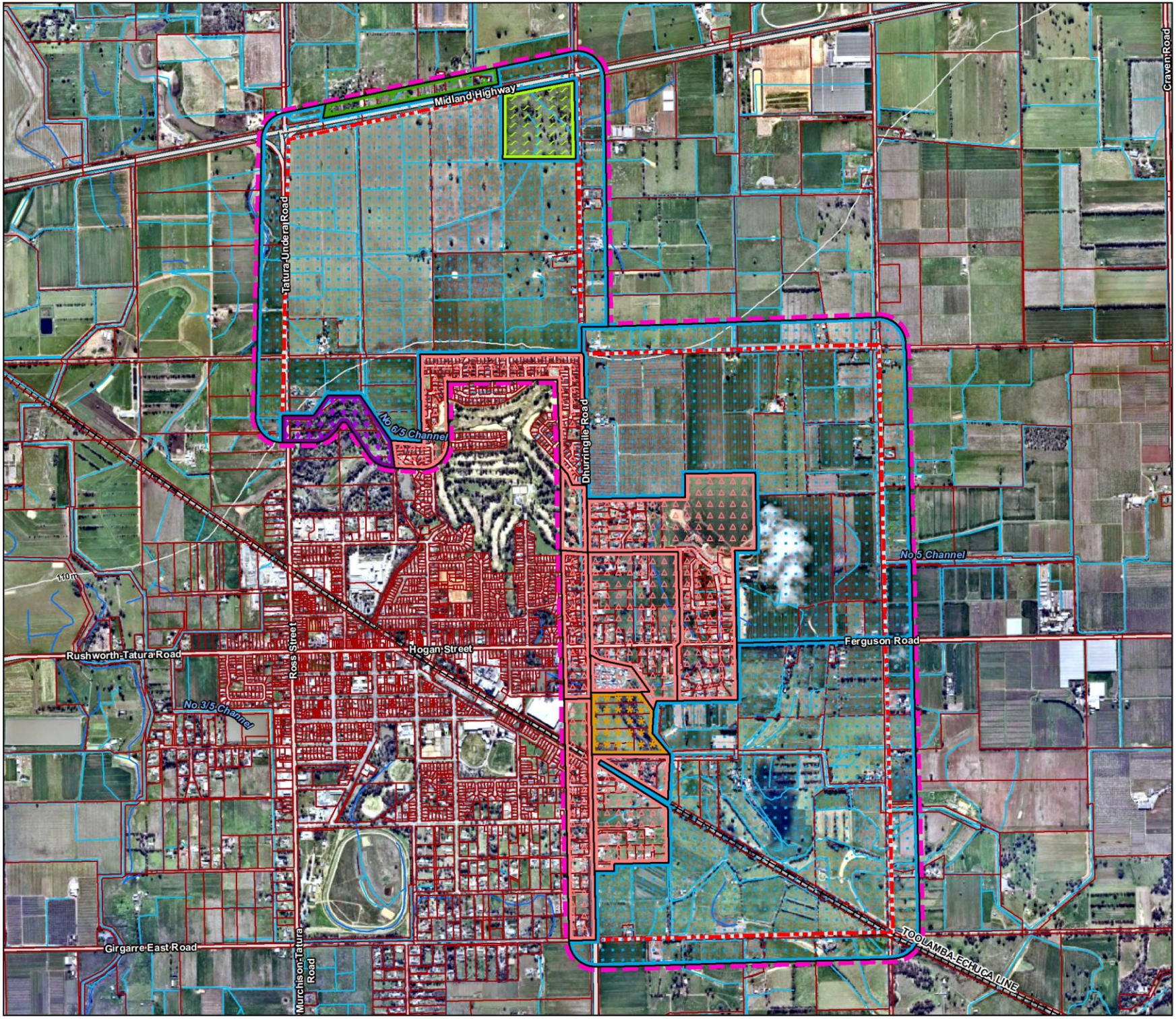

Observed bushfire conditions

Tatura Structure Plan

Legend

- Subject Site
- Assessment Area (150m)
- Parcels
- Contours (10m)
- Constructed watercourse
- Natural watercourse
- Railways

Observed conditions

- Grassland on managed paddocks
- Managed residential and urban areas
- Woodland vegetation amongst developed areas
- Woodland vegetation within proposed reserve
- Woodland vegetation on private land
- Forest vegetation on public land

Details

Mapping by: Ali Nia
Date: 7/02/2022
Version: 1
Aerial photography from Nearmap (Jul 2021).

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Scale 1:20,000 (Page size A3)

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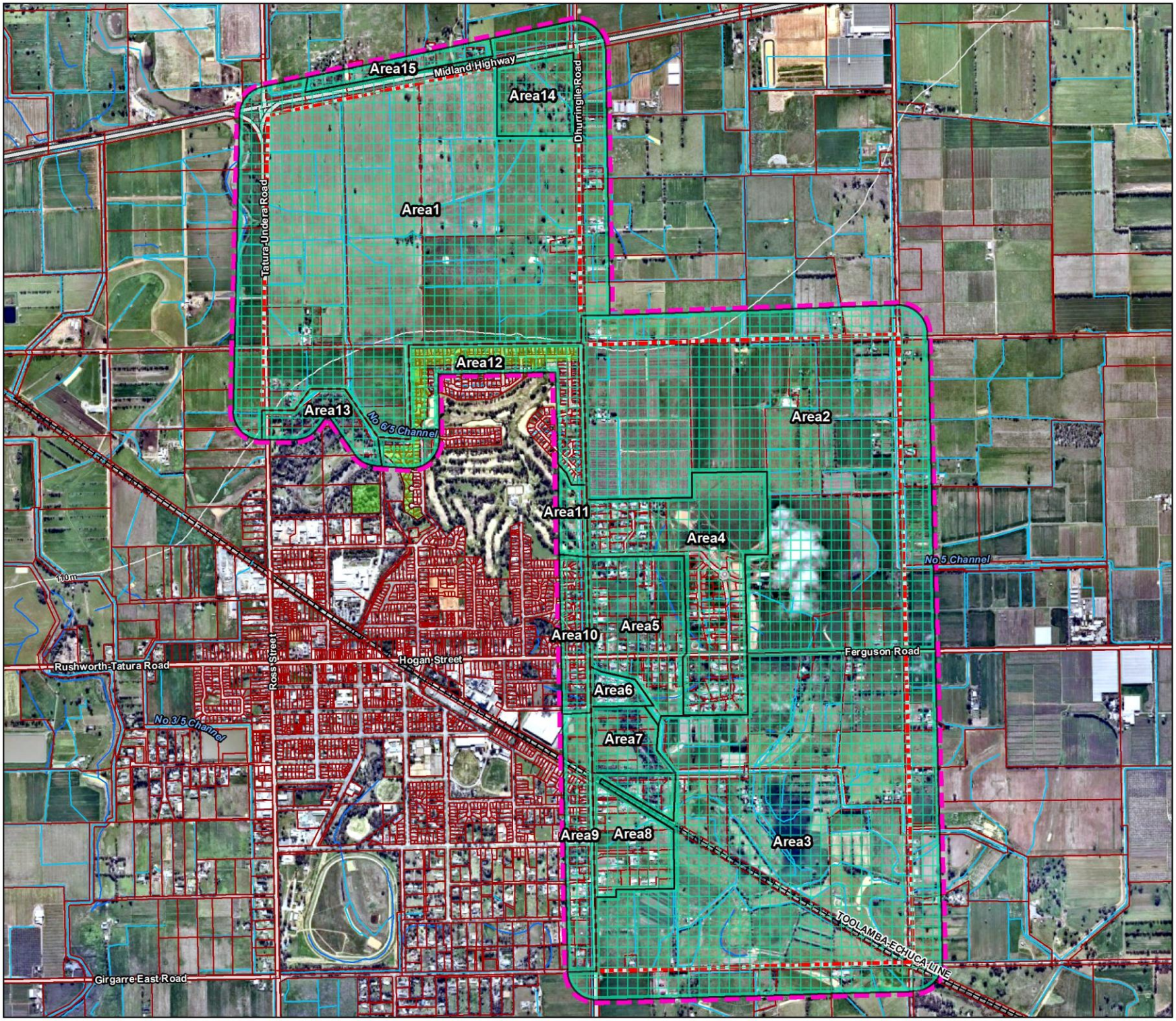

Bushfire risk

Tatura Structure Plan

Legend

- Subject Site
- Assessment Area (150m)
- Parcels
- Contours (10m)
- Constructed watercourse
- Natural watercourse
- Railways

Risk rating

- Low

VFRR risk rating

- Low
- Medium
- High
- Very High
- Extreme

Details

Date: 18/10/2021
Version: 1
Aerial photography from Nearmap (Jul 2021).

N

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Scale 1:18,740 (Page size A3)

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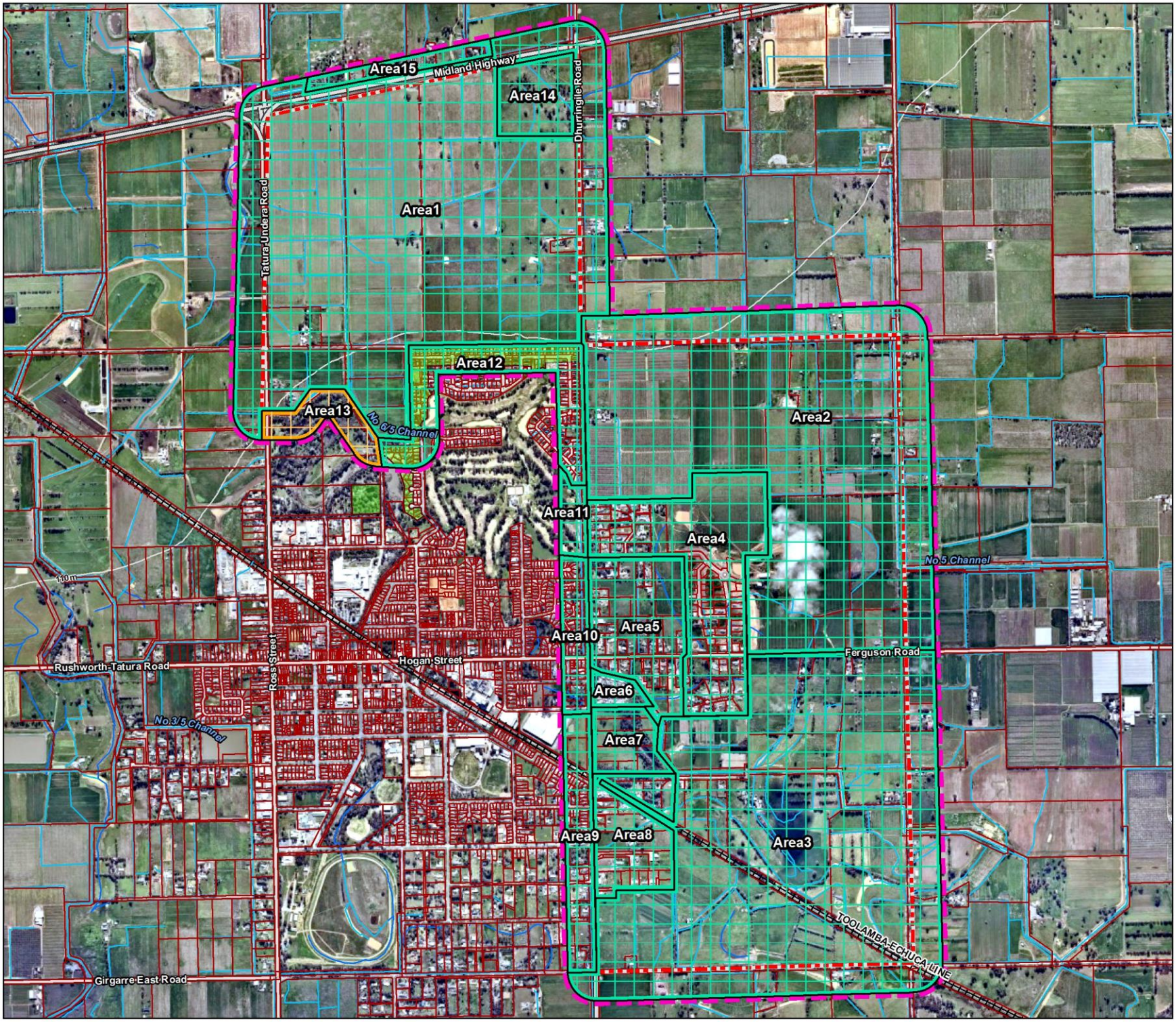

Bushfire hazards

Tatura Structure Plan

Legend

- Subject Site
- Assessment Area (150m)
- Parcels
- Contours (10m)
- Constructed watercourse
- Natural watercourse
- Railways

Hazard rating

- Low
- Moderate

VFRR threat rating

- Medium
- High
- Very High

Details

Date: 18/10/2021
Version: 1
Aerial photography from Nearmap (Jul 2021).

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