

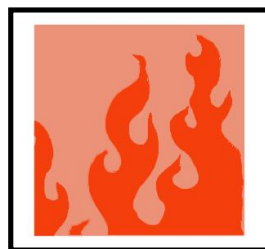
# LAND REZONING PROPOSAL

LOT 2 DP569505

44 MIDDLE ARM ROAD

MIDDLE ARM. NSW. 2580

## STRATEGIC BUSH FIRE STUDY



Prepared by SOWDES  
26 April 2023

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## List of Abbreviations that may be used throughout this report

APZ	Asset Protection Zone
AS 3959	AS3959 - 2018 Construction of Buildings in Bush Fire Prone Area
BAL	Bush Fire Attack Level
BCA	Building Code of Australia
BFSA	Bush Fire Safety Authority
BPMs	Bush Fire Protection Measures
CC	Construction Certificate
DA	Development Application
DCP	Development Control Plan
EP&A ACT	Environmental Planning & Assessment Act (1979)
FDI	Fire Danger Index
IPA	Inner Protection Area
LEP	Local Environmental Plan
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection (2019)
RF Act	NSW Rural Fires Act (1997)
RF Reg	NSW Rural Fires Regulation (2008)
RFS	NSW Rural Fire Service
RHF	Radiant Heat Flux
ROS	Rate of Spread
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose

*It is acknowledged that certain parts of this report contain images and directly quoted information from a range of sources including but not limited to; Planning for Bush Fire Protection (2019), Planning for Bush Fire Protection (2006), AS3959 (2018) Construction of Buildings in Bushfire Prone Areas, and a range of other NSW Rural Fire Service resources and publications.*

## Executive Summary.

This *Strategic Bush Fire Study* has been prepared in support of a submission to the Goulburn Mulwaree Council for the rezoning of a parcel of land identified as Lot 2 DP569505 – 44 Middle Arm Road, Middle Arm from its current zoning of 'RU6 – Transition' to 'R2 – Low Density Residential'. The land rezoning opportunity has been identified in the *Urban and Fringe Housing Strategy* undertaken on behalf of the Goulburn Mulwaree Council by Elton Consulting which was adopted by Council in July 2020. The development site contains portions of land that are designated as bush fire prone hence this submission has been undertaken in accordance with the criteria of both the Goulburn Mulwaree Council and the New South Wales Rural Fire Service's (NSW RFS) publication titled "Planning for Bush Fire Protection" (2019).

This report provides an independent assessment of the proposed rezoning of the site and suitability for future residential development with regard to protection of life and property, the potential impact on services and infrastructure within bush fire prone areas, and follows the relevant guidelines and information requirements from Chapter 4 'Strategic Planning', and Chapter 5 'Residential and Rural Residential Subdivisions' of the NSW RFS's publication "Planning for Bush Fire Protection" (2019) (PBP). The submission of a *Strategic Bush Fire Study* to the NSW Rural Fire Service for assessment of the land rezoning proposal also satisfies the Ministerial Directions obligations under the Section 9.1 of the Environmental Planning and Assessment Act (1979) – Direction 4.4 Planning for Bush Fire Protection.

The subject site is located on the eastern aspect of the Middle Arm Road traffic corridor which heads north from the city of Goulburn – approximately 715 metres from the current 60 kph speed limited zones upon entering the city. Middle Arm Road is a Council maintained sealed road system that services many rural holdings and smaller lifestyle allotments between the city of Goulburn and outlying localities such as Middle Arm, Roslyn, and Tarlo.

The development site is a single parcel of land that averages 570 metres in length and 215 metres in width and is effectively shaped as a parallelogram that covers an area of approximately 11.92 hectares. The property presently supports an existing dwelling and ancillary buildings and infrastructure that is bound by a defined curtilage within the eastern half of the site, and the remainder of the holding has historically and is currently used for light grazing by a small number of cattle. Council utilities such as reticulated water supply, gravity sewer, and interallotment stormwater drainage do not extend to the holding, however a future subdivision of the land would seek to extend the reticulated water to the site, whilst gravity sewer and interallotment stormwater drainage would also be provided.

Access to the development property is from an existing entrance located in the southwestern corner of the site which also doubles-up as an access to the adjoining property to the immediate east (identified as Lot 3 DP569505) via a registered 20 metre wide Right of Carriageway along the southern boundary. The northwestern corner of the property is burdened by an easement for the Moomba to Sydney high-pressure natural gas and ethane supply lines that runs diagonally across the site, and to the immediate south of the gas supply lines is an optic fibre cable that runs parallel but at slightly variable distances off the edge of the easement. In the adjoining land to the immediate south is a 20 metre wide easement running parallel to the entire length of the property that houses the 'Southern Highlands to Goulburn Emergency Water Supply' pipeline. A 1.50 metre round maintenance and inspection pit associated with the water supply line is located within the road reserve just outside the property boundary line - approximately 5 metres from the southwest corner of the site.

The topography within the central portion of the development property has a general fall from the south toward the north at relatively constant grades that average less than 5° with a diagonal crossfall in the eastern half of the site from the southeast to the northwest, and in the western third of the site from the southwest to the northeast. There is an overall elevation difference of 23 metres between the higher southeastern corner (677 mAHD) and the lower northwestern corner (654 mAHD) over an effective distance of 650 metres. The vegetation formations within the site are dominated by historically improved pastures and natural grasses in the grazing paddocks, established and managed lawns and gardens within the dwelling curtilage, and a scattering of native and exotic trees within the eastern half and along the southern boundary.

A proposed subdivision design has been prepared to complement the land rezoning proposal which would realise a potential 93 residential allotments varying in size from 709m<sup>2</sup> to 1,195m<sup>2</sup>, an internal road network, stormwater drainage and water quality management reserves, and several areas of open space, revegetation, and public recreation. The existing dwelling and curtilage would be decommissioned, two existing dams would be decanted and filled, and the existing Right of Carriageway along the southern boundary would be removed in favour of an access to Lot 3 DP569505 via the new internal road system. Future development of the northwest corner within the immediate vicinity of the existing high-pressure gas and ethane lines and the optic fibre cable has been avoided and will form part of the land dedicated to open space and stormwater management.

This Strategic Bush Fire Study is effectively divided into three main sections; the first being an overview and the triggers for the rezoning submission, a detailed description of the development property and surrounding landscape, and a general discussion on how the proposal meets or deviates from the provisions of both the Goulburn Mulwaree Council's Development Control Plan and the NSW Rural Fire Service guidelines; the second section is an assessment of the proposed

land rezoning submission in accordance with the requirements of Chapter 4 - '*Strategic Planning*' and Table 4.2.1 of "Planning for Bush Fire Protection" (2019); and the third section being an assessment of the proposed subdivision with regard to the acceptable solutions of Chapter 5 - '*Residential and Rural Residential Subdivision*' and Tables 5.3a, 5.3b, and 5.3c also of "Planning for Bush Fire Protection" (2019).

The following key summaries apply to the development and are detailed in the following pages:

- The proponent is seeking to rezone the land to 'R2 – Low Density Residential' in accordance with Section 4.4.1 of the *Urban and Fringe Housing Strategy* study and in doing so establish the basis upon which to undertake a subdivision of the land that will create a total of 93 residential allotments - each with a minimum Lot size of 700m<sup>2</sup> and seeking residential dwelling permissibility.
- The development property is set to a mix of grassland, improved pastures and managed lands and is surrounded by adjoining land holdings that comprise similar vegetation structures. The terrain across the development site has a general fall from the south toward the north at average grades of less than 5° with some minor variations encountered in surface micro-relief and grades.
- The proximity of the development site and the potential Lot yield would not warrant a need to increase the provision of existing emergency service facilities or capabilities, nor would the number of Lots being the subject of this assessment, and even allowing for the potential of additional land rezoning to similar Lots sizes within adjoining properties in the Middle Arm development precinct place a significant impact on the ability of local emergency services to undertake their functions. Rezoning of the site and surrounding lands to residential land use would invariably transform the existing unmanaged grassland vegetation environment to fully managed lands thereby reducing the overall bush fire threat and risks.
- In addition to the residential Lots the proposed subdivision will create a network of new roads that will provide access around virtually the entire perimeter of the site plus an inter-connecting road system, and there will be several reserves dedicated for stormwater drainage and water quality treatment measures, open space, biodiversity values and vegetation management.
- Future subdivision of the site will include fully serviced Lots with a reticulated water supply throughout along with gravity sewer and interallotment stormwater drainage infrastructure. The water supply system will be installed to meet the requirements of the Council's engineering standards – including design layout and achieving minimum pressures and flow rates. The reticulated water supply infrastructure will also need to meet the provisions of "AS2419.1.2021 - *Fire hydrant installations System design, installation and commissioning*" in relation to hydrant outlet spacing and locations.

- In relation to the land rezoning proposal and the future subdivision development it may be prudent for the Goulburn Mulwaree Council and the NSW Rural Fire Service to consider early in the assessment process to exclude the entire developed site from the mapped bush fire prone lands as the vegetation structure and classification will be significantly different under a change in land use which will be dominated by managed lands and roads. By recognising this change of land use and vegetation structure early in the assessment and approval process it will avoid unnecessarily burdening future Lot owners with bush fire protection measures that may not have any significant long-term benefits.

Whilst this report has based its determinations and recommendations on a proposed subdivision design that has primarily been prepared to support a Planning Proposal for the rezoning of the subject site it is recognised that in accordance with the provisions of Section 100B of the Rural Fires Act once the land is rezoned a separate subdivision assessment may be required for submission and determination by the NSW Rural Fire Service which will incorporate any planning and development controls considerations that may be generated during the rezoning process.

It is considered that the Planning Proposal for the rezoning of the land from RU6 – ‘*Transition*’ to ‘*R2 – Low Density Residential*’ and a subsequent subdivision of the land to create new residential allotments plus an internal access road network will generally be able to satisfy the requirements of Planning for Bush Fire protection (2019), in particular the ‘acceptable solutions’, ‘performance requirements’ and ‘specific objectives’ contained in Chapter 5 of the publication. It is further considered that each of the newly created Lots associated with a future subdivision of the land will be able to support a complying development for residential developments undertaken in bush fire prone land in accordance with Chapter 7 – ‘*Residential Infill Development*’ of Planning for Bush Fire Protection (2019) if deemed necessary at the time of lodging a formal development application to Council.

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26 April 2023



Figure 1. Recent aerial view of the development property showing the nature of the vegetation formations within and surrounding the site. The captured area has a general fall from the south-southeast to the north.

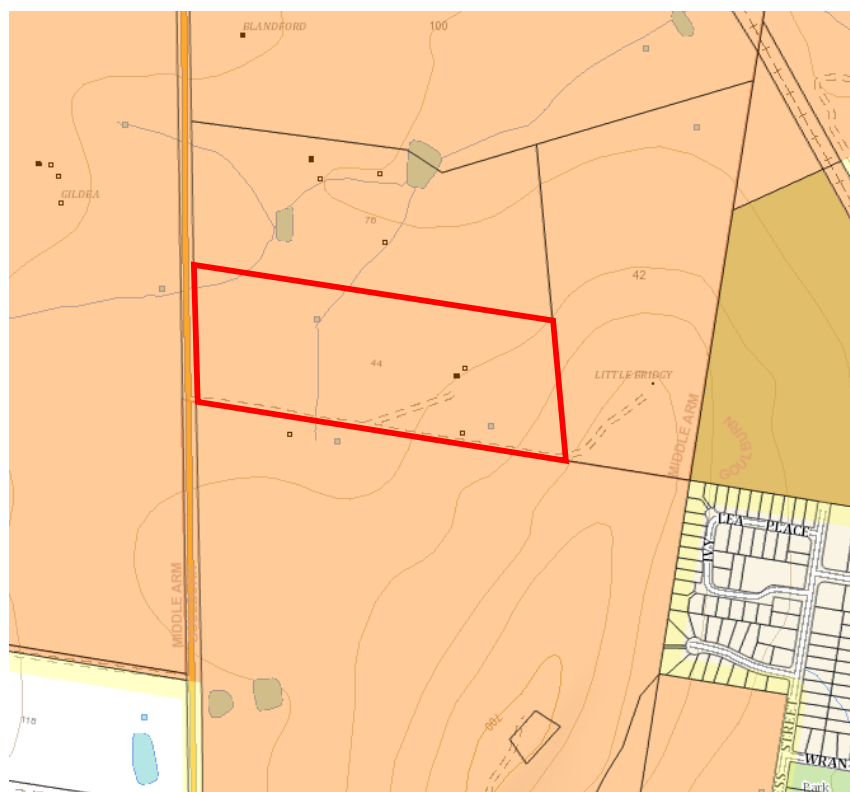


Figure 2. Goulburn Mulwaree Council Bush Fire Prone Lands map of the development property and surrounding holdings showing the extent of 'Category 3' (grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands) vegetation formations that burden the site.



## 1/. Overview of the Rezoning Submission, Description of the Land and Proposed Subdivision.

The Goulburn Mulwaree Council commissioned *Elton Consulting* to undertake an *Urban and Fringe Housing Strategy* study for the urban centres of both Goulburn and Marulan which was completed and adopted by Council in July 2020. To gain an appreciation of how the aforementioned study triggers the submission of the land rezoning application being the subject of this assessment the following extracts have been taken directly from the completed report to provide context;

*"This Urban and Fringe Housing Strategy (Strategy) investigates and identifies areas suitable for the provision of additional housing to assist Goulburn Mulwaree Council (Council) meet the housing demands generated by expected continued population growth.*

*The Strategy has been prepared in response to both the limited supply of residential land available to meet the short and medium term needs of the community and the directions of the South East and Tablelands Regional Plan 2036.*

*The scope of the Strategy includes looking at the urban areas of Goulburn and Marulan and identifying opportunities for an additional recommended 3,500 dwellings over the next 18 years to 2036. The Strategy also considers land for large lot residential development (typically greater than 2ha and often referred to as rural residential development) particularly on the urban fringe of Goulburn.*

*Growth across the LGA has been strong over the past decade increasing by 14 percent. In Marulan population growth has been significant with an increase in population between 2006 and 2016 of 27 percent.*

*With the Goulburn Mulwaree LGA expected to reach between 33,350 and 37,202 residents by 2036, approximately 5,000 to 7,000 additional residents are expected. Given the drivers of growth include proximity to economically viable regions and affordable housing, these growth rates may increase over time if prices in Sydney and the ACT continue to rise. Advances in technology and improvements in transport, for example higher speed rail, may further stimulate growth.*

*The majority of recent growth has been through residential subdivisions in Goulburn and Marulan. These new subdivisions have typically provided R2 Low Density Residential zoned land with a minimum lot size of 700sqm. The market responded well to these releases driving demand for additional land as the currently zoned land nears full utilisation."*

The development property is located on the northern outskirts of the city of Goulburn and is identified within the *Urban and Fringe Housing Strategy* study as a locality suitable for rezoning to 'R2 -Low Density Dwelling' to help meet future land and housing demands. The property which falls within the *Middle Arm* development precinct and is currently zoned 'RU6 – Transition' has been identified within the study with an overall potential yield of 8.55 Lots per hectare for Lot sizes not less than 700m<sup>2</sup> in area – however these numbers do not necessarily take into consideration a reduction in potential Lot yield associated with the proximity of major utility infrastructure.

The development property is located along Middle Arm Road approximately 715 metres north from the speed limited zone upon entering the city when travelling south, and whilst not directly benefited from existing Council maintained utilities and services it is in an ideal location to leverage off existing reticulated water supply and gravity sewer infrastructure that presently extends to the edge of the city limits within the Middle Arm Road traffic corridor. Extension and connection of these services to the development site does not require any significant engineering requirements.

#### 5/6 - Middle Arm constraints and opportunities

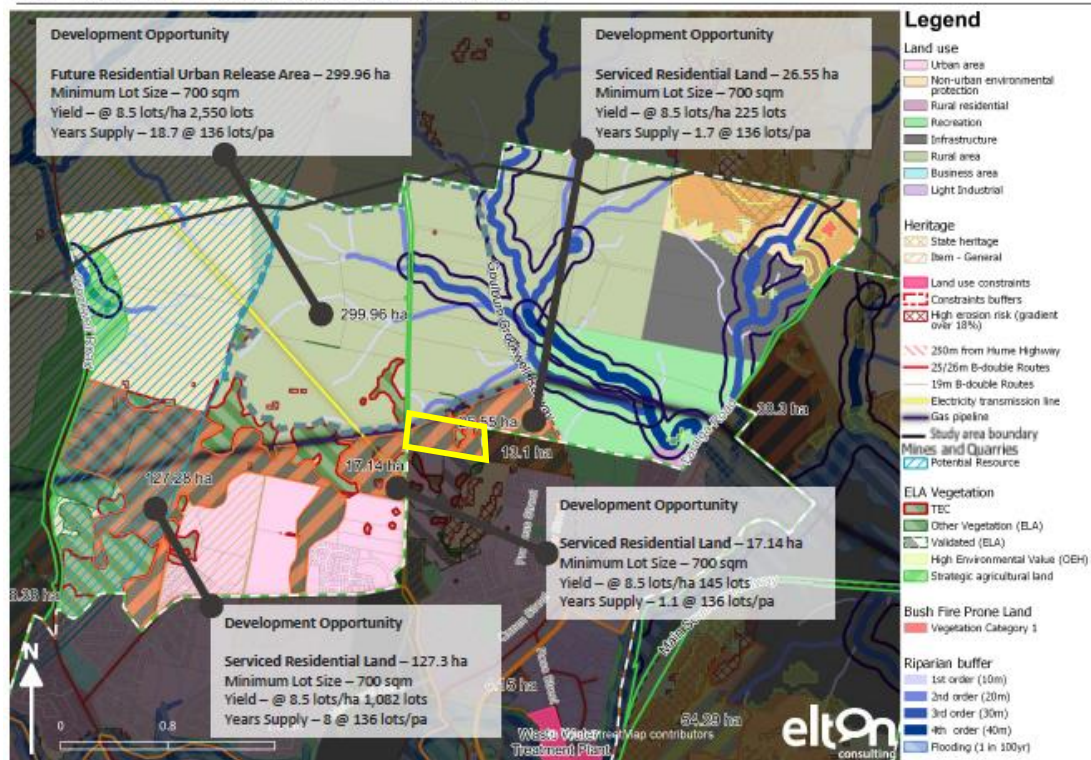


Image from the *Urban and Fringe Housing Strategy* report prepared by Elton Consulting showing the 'Middle Arm' development precinct and identified land rezoning opportunities. The boundary of the development site is highlighted by the solid yellow line in the centre of the image.

The proponent is seeking to rezone the land in accordance with Section 4.4.1 of the *Urban and Fringe Housing Strategy* study and in doing so establish the basis upon which to undertake a subdivision of the land. The site is burdened by two separate and adjacent 'major' inground utilities that run diagonally across the northwest corner of the site: the Moomba to Sydney high-pressure natural gas and ethane supply lines, and an optic fibre communication cable that lies to the southern side of the gas lines. The location of these utilities largely regulates the potential subdivision design and Lot sizes within this portion of the site due to various constraints and permissible activities within specified distances around the associated easements. A triangular area commencing from the northwestern corner and measuring 165 metres along the northern boundary and 103 metres along the western boundary (approximately 8,400m<sup>2</sup>) is effectively sterilised for residential development purposes due to the inground utilities, however the same area has been identified as part of an open space setting for community enjoyment.

Whilst not a direct constraint, the Southern Highlands to Goulburn water supply line which is designed to transfer raw water from the Wingecarribee Dam during periods of extreme drought is located within a 20 metre wide easement that runs parallel and for the full length of the southern boundary of the property. A 1.50 metre diameter concrete inspection and maintenance pit associated with the water supply line is located in the road reserve just outside the alignment of the western boundary – 5 metres from the southwest corner of the current holding.

Approximately 150 metres along the southern boundary from the southwest corner of the property is an access gate to the water supply easement. An access gate will be retained but moved approximately 70 metres further to the east where a new entry will be provided at the junction of proposed 'Road 03' and 'Road 04' within the new subdivision layout.

The proposed subdivision design will seek to create the following: a total of 93 residential Lots that will range in size from 709m<sup>2</sup> to 1,195m<sup>2</sup>; several reserves for stormwater drainage and water quality measures; areas for vegetation management and open space; and a network of new internal roads. An existing dwelling and several rural structures within the eastern portion of the site will be demolished and therefore all new Lots will be seeking residential dwelling permissibility.

The development site is bordered by the Middle Arm Road which runs north – south along the western boundary. Middle Arm Road is a Council maintained bitumen sealed formation that services many rural holdings to the north and provides an important transport link to the city of Goulburn from localities such as Middle Arm, Roslyn, and Tarlo that lie to the north of the city. The Middle Arm Road traffic corridor is also regularly used by cyclists and runners due to its general width, alignment, and long sight distance characteristics that support such activities.

The existing dwelling within the site is currently accessed via an unsealed carriageway that enters the property from the southwestern corner off the Middle Arm Road traffic corridor. The carriageway which averages 3 metres in width lies within a 20m metre wide Right of Carriageway easement that runs for the entire length of the southern boundary and benefits the adjoining property to the immediate east - Lot 3 DP569505. Approximately 260 metres along the length of the carriageway there is a fork in the formation that deviates off the to the northeast and directly services the existing dwelling. Whilst the access easement is 20 metres wide the alignment of the carriageway along the entire length of the southern boundary leading up to Lot 3 DP569505 is generally very close to the boundary fence – so much so that the centreline of the formation is never more than about 6 to 7 metres off the fence line. From the point where the carriageway branches off to the existing dwelling a row of trees has been established between the carriageway formation and the curtilage associated with the dwelling to provide an element of privacy screening from the vehicular traffic heading into the adjoining property to the east. The trees which are sown about 8 metres off the southern boundary fence are comprised of a mixture of species including radiata pines and wattles, however most of the trees are an introduced native species – Paddy's River Box (*E. macarthurii*). Additional rows of conifers and screening trees have been established around the perimeter of several small paddocks adjacent to the access carriageway leading to the adjoining property to the east, and along the access carriageway leading up to the existing dwelling.

The terrain throughout the development property is fairly homogenous with a general fall from the south to the north at relatively minor grades that average less than 10°. The central portion of the site falls from the south to the north at less than 5° whilst the eastern half of the site has a crossfall from the southeast to the northwest, and the western third of the site has a crossfall from the southwest to the northeast. There is an overall elevation difference of 23 metres between the higher southeastern corner (677 mAHD) and the lower northwestern corner (654 mAHD) over an effective distance of 650 metres.

The development property is burdened by two defined drainage corridors; one that travels south – north through the central portion of the site, and the other that flows diagonally across the northwestern corner – just to the north of the high-pressure gas supply lines. The head of the centre drainage line commences from the overflow path of a small sized dam within the neighbouring property to the south and follows a natural depression through the development site – eventually draining into a small and shallow dam near to the northern boundary. Overflow from this dam continues along the defined drainage depression and discharges into the neighbouring property to the north.

The second drainage depression enters the development site approximately 50 metres south of the northwest corner post along the western boundary. This particular drainage line commences in the adjoining lands on the western side of the Middle Arm Road traffic corridor and after surface water runoff associated with the catchment passes through a series of dams it passes under the roadway via three 750mm diameter concrete pipes. Surface water that passes through the piped culverts enters the site and flows diagonally along the alignment of the natural gas pipeline easement and before exiting along the northern boundary and draining into a dam within the neighbouring property to the north. The two identified drainage depressions are essentially separate from each other and do not merge until much further north of the development site.

There is a second dam within the development property located in the higher southeast quarter. This dam is not associated with any defined or mapped drainage system however it does serve the purpose of collecting surface water runoff from upslope sources to the east and southeast and preventing it from directly flowing across the residential precinct within the site. Along the eastern half of the property's southern boundary a drainage channel has been formed between the edge of the access carriageway and the boundary fence line. This channel intercepts surface water runoff originating from the southeast and there are two 300mm diameter piped culverts spaced approximately 75 metres apart under the carriageway that direct some of the runoff into the dam. Flows within the drainage channel that bypass the drainage culverts simply continues along the southern boundary to the west where eventually the channel ceases and thereafter becomes broad overland flow across the carriageway near to where the formation forks and services the existing dwelling. This flow merges with the overflow from the dam to the south.

Surface water runoff from the neighbouring property to the east and some of the land within the development site is directed into the second dam via a broad and relatively flat drainage berm that has been formed along the 665.60 to 665.30 contour lines that runs diagonally across the site and directs the runoff into the eastern corner of the dam.

A second berm that runs parallel to the aforementioned system is located slightly further downslope to help manage surface water runoff around the dwelling precinct from other upslope sources, however it is not directed into the dam as it is too low in the terrain profile. Overflow from the second dam and the discharge from the lower drainage berm are generally directed to flow toward the north via natural depressions and around the dwelling precinct however during periods of extended rain or large storms this source of water does enter the house paddock and surrounding curtilage.

The vegetation formations throughout the property which has historically been used for grazing by sheep and cattle are dominated open paddocks of improved pastures and native grasslands, however over the past 5 or so years the property has seen less pasture improvement and only light grazing. The grazing paddocks are regularly raked and slashed to manage the height of the grasses, and some of the cut matter is retained for future feed stocks. Scattered throughout the eastern portion of the site and still within some of the grazing paddocks is a mix of native and exotic tree species, whilst the eastern section of the southern boundary is lined with a discontinuous row of an introduced species of native eucalypt (*E. macarthurii* - Paddy River Box Gum) that acts as both a wind break and privacy screen from the unsealed driveway that serves as access to the adjoining property to the east. The adjoining property to the immediate east which is effectively upslope has a discontinuous row of old radiata pine trees along the common boundary - again to act as both a wind break and privacy screen - with a scattering of endemic eucalypt trees further upslope and to the east.

The residential precinct within the site is set to established lawns and gardens within a defined house paddock and curtilage. Scattered throughout the managed lands are a variety of native and exotic trees and shrubs that provide a formal appearance to the site. The outer southern and western paddocks that form part of the curtilage and either side of the main access driveway are lined with established rows of cypress trees that provide screening from the prevailing winds and an element of privacy from the traffic along the southern boundary associated with the neighbouring property.

The surrounding landscape in adjoining lands is comprised of similar land uses and vegetation types, many with established residential dwellings surrounded by managed lands, and open paddocks of either improved pastures and/or native grasslands that are used for grazing purposes.

## **Future Subdivision Proposal.**

The proposed subdivision design will seek to create the following: a total of 93 residential Lots that will range in size from 709m<sup>2</sup> to 1,195m<sup>2</sup>; several reserves for stormwater drainage and water quality measures; areas for vegetation management and open space; and a network of new internal roads.

The location of the existing easements for high-pressure gas supply and optic fibre cable in the northern portion of the site significantly influences the design of the future subdivision, including Lot layout and road locations. There are certain restrictions related to permissible activities around and near both easements, the most limiting of which is generally associated with the high-pressure gas and ethane supply line as it is the wider of the two and has very specific and documented controls.

The design of the proposed subdivision development has allowed for an increased separation distance for residential dwellings from the gas supply easement amongst other measures, and a pre-lodgement meeting has been held with APA Group – being the asset maintenance agency to discuss the potential risks, the integrity of the assets in the general vicinity of the development site, and proposed mitigation measures. A 'Safety Management Study' (SMS) report has been prepared by an accredited private facilitator in consultation with APA and the proponents (video meeting, Friday 21<sup>st</sup> March 2023) and it is concluded that the development can be undertaken in its current proposed layout without imposing any significant risks on the pipeline assets or to future landowners.

The proposed subdivision design allows for the formation of a new internal road system that will junction off Middle Arm Road which runs parallel to the western boundary of the property. The proposed road system will comprise a single entrance road that ends at a tee-intersection approximately 230 metres inside the boundary to form a looped perimeter road around the majority of the northern and southern boundaries.

Prior to the tee-junction a smaller looped access road will junction off the entrance road at a chainage of approximately 110 metres to service several of the proposed Lots, and it will join back onto the perimeter road system near to the northern boundary. A full perimeter road is not possible around the site due to existing high-pressure gas and optic fibre services that traverse across the northwest corner, however where a perimeter road does not exist access can be gained to all boundaries of the property from the adjoining land holdings.

It is noted that the adjoining lands on both the northern and southern aspects of the site are rural holdings with access to the respective common boundaries available through these properties if required. An existing Right of Carriageway easement along the southern boundary of the development property benefiting the adjoining property to the east will be removed in favour of improved access along the proposed new internal road system which will therefore facilitate access along the common boundary between the two holdings for the benefit of firefighting purposes.

The proposed subdivision design will rely on a single entrance access road due to existing major gas, communications, and water supply inground infrastructure constraints that burden both the northwest and southwestern corners of the property. The development site is comprised of and effectively surrounded by open grassland vegetation formations on all aspect hence the likelihood of prolonged isolation or road closure during a bush fire event is deemed to be very low. It is further recognised that the adjoining land to the south is already zoned as 'R2 – Low Density Residential' and therefore able to be developed for residential infill purposes, whilst the lands to the north and west which are currently zoned 'RU6 – Transition' are also included in the 2020 *Urban and Fringe Housing Strategy* for potential future residential land use. At a strategic planning scale, future development of the subject site and surrounding land to meet residential housing demands will provide an expanded network of roads for access and egress purposes.

A future subdivision of the site will include fully serviced Lots with a reticulated water supply throughout along with gravity sewer and interallotment stormwater drainage infrastructure. The water supply system will be installed to meet the requirements of the Council's engineering standards – including design layout and achieving minimum pressures and flow rates. In this matter it is noted that there is an existing water reservoir located approximately 410 metres to the south of the development site that has a base level that is 30 metre higher than the highest point within the development site – which is the southeast corner near to the proposed Lot 93. The reticulated water supply infrastructure will also need to meet the provisions of "AS2419.1.2021 - *Fire hydrant installations System design, installation and commissioning*" in relation to hydrant outlet spacing and locations.

The proposed subdivision design has identified the main sources of natural overland flow that affect the site and accordingly has included dedicated reserves for the purposes of drainage at strategic locations. In particular, it is proposed that a formed drainage swale will be constructed within the reserve for the perimeter road – 'Road 04' along the southern boundary to intercept and direct surface water runoff from the southern and southeastern aspects to a dedicated drainage channel to be formed parallel to one of the internal road corridors – 'Road 03'. The drainage channel is 8 metres wide and is aligned where the overflow from the dam in the neighbouring property to the south effectively enters the development site. The drainage channel will also be used for water quality treatment purposes that will include specific construction features and plantings of certain grasses, rushes, and sedges that will also double-up to form part of the landscaping features.

The proposed new Lots will be connected to an inter-allotment stormwater drainage system that will help manage runoff from hardstand areas and surface water that may enter or affect the individual sites, and the internal road system will have a network of pits and pipes designed in accordance with the relative engineering standards for safe the management of stormwater through the site. All stormwater runoff that is generated within or passes through the site – with exception of the drainage system across the northwest corner, will be managed within an end-of-line wetland treatment device. The proposed wetland is located in the lower northern portion of the site adjacent to the high-pressure natural gas and optic fibre utilities which is a part of the site that is effectively not suitable residential dwelling purposes.



The wetland will replace the existing lower dam and form a significant part of the water quality treatment measures associated with the development as well as providing detention measures to ensure that the post-development peak flow rates do not exceed those of the pre-development conditions for a range of rainfall events.

A vegetation buffer zone will be created along the entire length of the southern boundary, and the portion of the northern boundary between the edge of the wetland drainage reserve and the northeast corner. These buffer zones will be 3 metres wide commencing from the boundary line and will be used as areas for replacement planting and relocation of existing trees that are to be disturbed. Additional areas dedicated for landscaping, re-vegetation, and open spaces includes the drainage reserve running parallel to proposed 'Road 03'; the wetland reserve; a 12.75 metre wide buffer zone between the western boundary and proposed Lots 1, 19, and 20; a strip of land to the south of the high-pressure gas and ethane supply line easement that will vary between 13 and 10 metres wide, the area immediately above the high-pressure gas and ethane supply line easement, and the far northwest corner of the site to the north of the high-pressure gas and ethane supply line easement.

The total area identified for landscaping, re-vegetation and open space around the perimeter of the site and across the northwestern corner but excluding the main drainage corridor and wetland reserve is 1.105 hectares. The main drainage corridor and the wetland reserve will occupy another 6,570m<sup>2</sup> and these areas will be utilised for growing lower forms of plants species such as tall grasses, sedges, and rushes that are normally associated with macrophyte zones and riparian corridors.



## **2/. An Assessment of the proposed land rezoning in accordance with Chapter 4 – ‘Strategic Planning’ of Planning for Bush Fire Protection (2019)**

A Strategic Bush Fire Study for the rezoning of land for residential and human habitation purposes is an opportunity to undertake a preliminary risk assessment to identify and minimise or reduce the potential for creating development situations that expose the occupants of the land to an increased exposure from a bush fire event.

The information sought by the Strategic Bush Fire Study is intended to identify at the preliminary planning stage land areas within the proposed rezoning application that are either unsuitable or not conducive for residential or special fire protection purposes developments due to the surrounding vegetation, terrain, bush fire history, access and egress provisions, and/or the availability of utilities and resources – in particular emergency services.

The submission of a Strategic Bush Fire Study for consideration by the NSW Rural Fire Service also fulfills the Ministerial Directions obligations under the Section 9.1 of the Environmental Planning and Assessment Act (1979) – Direction 4.4 Planning for Bush Fire Protection.

An assessment of the proposed land rezoning as identified in the *Urban and Fringe Housing Strategy* that was commissioned and adopted by the Goulburn Mulwaree Council addresses the specific information requirements of Chapter 4 – ‘Strategic Planning’ of Planning for Bush Fire Protection (2019) with site specific responses to Table 4.2.1 addressed in the following section. It is concluded through an assessment of the site conditions against the matters for consideration within Table 4.2.1 of Chapter 4 of Planning for Bush Fire Protection (2019) that the proposed land rezoning and future subdivision of the site will have an inherently ‘Low’ risk and therefore can support residential development within Bush Fire Prone Lands.



ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS	DEVELOPMENT SPECIFIC RESPONSES
<b>Bush fire landscape assessment</b>	A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	<ul style="list-style-type: none"> <li>• The bush fire hazard in the surrounding area, including: <ul style="list-style-type: none"> <li>○ Vegetation</li> <li>○ Topography</li> <li>○ Weather</li> </ul> </li> </ul>	<p>At the time of the site assessment the vegetation formations throughout the property which is presently and has historically been used for small-scale agricultural purposes was set to a mix of grasslands and improved pastures that had been recently slashed, with well-established and maintained lawns and gardens within a defined residential curtilage.</p> <p>Scattered throughout the eastern portion of the site is a mix of native and exotic tree species, whilst the eastern section of the southern boundary is lined with a discontinuous row of an introduced species of native eucalypt (<i>E. macarthurii</i> - Paddy River Box Gum) that acts as both a wind break and privacy screen from the extended driveway that serves as access to the adjoining property to the east.</p> <p>The adjoining property to the immediate east which is effectively upslope has a discontinuous row of old radiata pine trees along the common boundary - again to act as both a wind break and privacy screen - with a scattering of endemic eucalypt trees further upslope and to the east.</p> <p>The surrounding landscape in adjoining lands is comprised of similar land use and vegetation types, many with established residential dwellings surrounded by managed lands, and open paddocks of either improved pastures and/or native grasslands.</p> <p>The terrain through the central portion of the development site has a general fall from the south to the north at average grades of less than 5°.</p>

			<p>Within the eastern half of the site there is a crossfall from the southeast to northwest, and in the western third there is a crossfall from the southwest to the northeast – both at grades of less than 5°.</p> <p>Externally, the terrain rises on the southern, eastern, and western aspects, whilst the fall continues to the north but begins to plateau-out to be less than 3° within the neighbouring property.</p> <p>The Goulburn geographical weather patterns are cold winters (~11.5°) with moderate to hot summers (~28°), the prevailing winds are typically from the west-southwest, rainfall average is 620mm, and humidity is generally low.</p>
		<ul style="list-style-type: none"> <li>• The potential fire behaviour that might be generated based on the above;</li> </ul>	<p>The potential for large-scale fire events of a nature that would be deemed a 'high-risk' is relatively low given the nature of the vegetated grasslands, cropping and rural activities, and generally well managed residential curtilages within the surrounding and adjoining properties.</p> <p>The greatest threat of bush fire activity would from the western and southwestern aspects where the dominant summer winds tend to originate, however the vegetation formations between the current extent of urban development on the northern outskirts of the city and the subject site is dominated by open grasslands that subsequently would not generate high radiant heat levels.</p> <p>An advancing fire front from these aspects during the drier summer months where the grasses can become 'hayed-off' might represent a slightly heightened fire threat – however the immediate threat would not be elevated above a 'medium risk'.</p>

		<ul style="list-style-type: none"> <li>Any history of bush fire in the area;</li> </ul>	<p>There is no recorded bush fire history that directly affects the site or surrounding area for the past 25 years. The nearest recorded fire referenced through the 'NSW National Parks &amp; Wildlife Service – Fire History' portal occurs greater than 10 kilometres from the development site.</p>
		<ul style="list-style-type: none"> <li>Potential fire runs into the site and the intensity of such fire runs; and</li> </ul>	<p>The proposed subdivision design for the site relies on the Middle Arm Road traffic corridor to provide a separation in vegetation structures for an advancing fire front that may emanate from the western and southwestern aspects. Internally, a perimeter road partially around the site in combination with existing access from adjoining properties to the north, south and east provide adequate and suitable opportunities to suppress and limit fire runs into the development site.</p> <p>It is noted that the vegetation formations that surround the property are dominated by grasslands on all aspects with the exception of the eastern aspect where the vegetation assessment as a 'worst case' fire threat is classified as 'open woodlands' which is based on the large separation distances between tree canopies.</p>
		<ul style="list-style-type: none"> <li>The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.</li> </ul>	<p>The development site is bordered by the Middle Arm Road traffic corridor along the western boundary which is a bitumen sealed formation that is constructed to local Council engineering standards and is maintained by the local Council.</p> <p>The Middle Arm Road traffic corridor provides suitable access to adjoining holdings to the west of the development site.</p>

			<p>In the adjoining property to the immediate south there is a 20 metre wide easement corridor running parallel to the boundary for the entire length of the subject site that houses the 'Southern Highlands to Goulburn Emergency Water Supply' pipeline.</p> <p>Access to the easement and the infrastructure within is required at all times for inspection and maintenance purposes, hence the southern aspect of the site will effectively be accessible at all times, and any regrowth or unwanted vegetation will be managed.</p> <p>A future subdivision of the land will effectively transform the existing grassland vegetation regimes that dominate the landscape with a realistic expectation that development of residential dwellings within the individual Lots over the course of time will provide an improved management of the vegetation by way of established gardens, lawns, and public open spaces (asset protection zones) that in turn would reduce the overall risk of fire ignition and/or spread to adjoining land holdings.</p> <p>Future subdivision development of the subject site would also require the extension of the Council's reticulated water supply to service the new Lots. The reticulated water supply would be designed and installed in accordance with AS2419.1:2021 - 'Fire Hydrant Installations - Part 1: System Design, Installation &amp; Commissioning' which would significantly assist with any future firefighting efforts.</p>
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Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	<ul style="list-style-type: none"> <li>• The risk profile of different areas of the development layout based on the above landscape study;</li> </ul>	The development property is comprised of relatively homogenous vegetation formations and topographical features therefore rezoning to 'R2 – Low Density Residential' land use will ultimately reduce the risk and likelihood of a sustained bush fire within the current holding and surrounding areas. The development of smaller Lot sizes will facilitate greater management of the vegetation through the creation and maintenance of managed lands and asset protection zones within the smaller residential holdings.
		<ul style="list-style-type: none"> <li>• The proposed land use zones and permitted uses;</li> </ul>	The subdivision proposal is solely for residential dwelling purposes and <b>does not</b> include any provision for other land uses such as schools, commercial or industrial precincts, special fire protection purpose developments, or critical services infrastructure.
		<ul style="list-style-type: none"> <li>• The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and</li> </ul>	A future subdivision of the development property for the purposes of satisfying future housing demands within the city is deemed to be the most appropriate use of the site. Any constraints relating to residential land development were previously identified within the original <i>Urban and Fringe Housing Strategy</i> submission which conversely also identified sites suitable for residential dwelling development purposes – which includes the subject site. A detailed assessment to identify and manage any potential infrastructure constraints, topographical features, and surrounding vegetation structures that specifically burden the site have been incorporated within the proposed design of the subdivision, and these have greatly influenced the final layout and possible land use options.

			It is noted that the proximity of the high-pressure gas lines and optic fibre cables within the northwest corner of the site immediately eliminates certain types of development opportunities due to perceived risks.
		<ul style="list-style-type: none"> <li>• The impact of the siting of these uses on APZ provision.</li> </ul>	<p>The proposed subdivision design for the site incorporates perimeter roads around the majority of the holding which satisfies the requirements for the NSW Rural Fire Service regarding access for firefighting purposes. The perimeter road network in combination with the greater internal road system and the requirement for maintenance of vegetation over the existing easements also offer a default asset protection zone for the new residential allotments from the vegetation formations within the adjoining lands. All internal Lots will be expected to manage vegetation as an asset protection zone for the benefit of all adjoining Lots.</p> <p>The northwest corner of the site must remain free of unwanted plant growth due to the need for ongoing access to the high-pressure gas lines and optic fibre cables, and this area has been identified as a community open green space within the development proposal which will therefore be a managed parcel of land.</p>
<b>Access and egress</b>	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	<ul style="list-style-type: none"> <li>• The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile;</li> </ul>	<p>The development site is located approximately 715 metres north for the current speed limited zones within the city of Goulburn which means that the travel time for emergency services to reach the development site would be extremely short durations – in the order of minutes.</p> <p>Conversely, the travel time in an emergency evacuation situation for residents within the future development of the site would also be short durations – even allowing for a degree of traffic congestion.</p>

			<p>The existing road network that borders the development property in combination with the proposed internal road network which is effectively continuous provides adequate access and egress options for emergency evacuation - if required.</p> <p>A separate Traffic Management Report prepared by <i>Positive Traffic Pty Ltd</i> (Ref: PT22061r01) concludes that the additional traffic generation for the proposed subdivision development would not be an adverse impact on the current road network, and as such there would be no need to undertake any upgrades to these roads apart from the formation of suitable turning provisions at the entrance to the site.</p>
		<ul style="list-style-type: none"> <li>• The location of key access routes and direction of travel; and</li> </ul>	<p>Access to the development site will be from the Middle Arm Road traffic corridor that runs parallel to the western boundary in a north – south alignment with a new tee-intersection entrance to be constructed approximately midway along the length of the western boundary.</p> <p>The Middle Arm Road traffic corridor is presently sign-posted with a 100kph speed limit along the frontage of the development property however any future land development of the property would seek to include a restricted speed limit of no more than 60kph extending from the existing speed limited zone on the edge of the city to a point at least adjacent to the northwest corner of the development site. In this matter it is noted that the entire length of Middle Arm from the outskirts of the city and north beyond the development site are identified within the 2020 <i>Urban and Fringe Housing Strategy</i> for potential future residential land use.</p>



			The internal road network will be formed in corridors that have a minimum width of 15, 18, and 20 metres with the sealed portion for all roads being at least 9 metres wide between kerbs.
		<ul style="list-style-type: none"> <li>The potential for development to be isolated in the event of a bush fire.</li> </ul>	<p>The development property is located on the northern outskirts of the city of Goulburn and therefore any future subdivision development of the site would effectively extend the edge of the city's limits to the northern boundary of the current holding. The proximity of the development property to the city and the network of existing roads ensures that the site would not become isolated in a bush fire event.</p> <p>It is also noted that the vegetation formations that lie between the city and the development site are dominated by open grasslands which represents a low to medium bush fire threat hence the likelihood of a prolonged fire front is very small.</p>
<b>Emergency services</b>	An assessment of the future impact of new development on emergency services.	<ul style="list-style-type: none"> <li>Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/brigades; and</li> </ul>	<p>The proposed land rezoning of the site to residential land use is not expected to result in an increase in demand for bush fire emergency services or support infrastructure as the amount of land area that immediately fronts bush fire prone lands will effectively reduce, and the extension of services such as water supply plus the transition of grasslands to managed lands within the development precinct will help to reduce any risks. The future subdivision of the land will result in urbanisation of the existing land area which will effectively provide an element of reduced fire risk once the majority of the Lots are developed as the transition in vegetation formations from grasslands to managed lands will have a corresponding reduction in the amount of bush fire prone lands that may need protecting.</p>

		<ul style="list-style-type: none"><li>• Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.</li></ul>	Based on the proposed subdivision design for the development property the provision of perimeter roads around the majority of the site in combination with the internal road network and the extension of reticulated water supply throughout the development precinct will offer greater vehicular access and improved water resources for active firefighting purposes if required.
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<b>Infrastructure</b>	An assessment of the issues associated with infrastructure and utilities.	<ul style="list-style-type: none"> <li>The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and</li> </ul>	<p>Future subdivision of the site will include fully serviced Lots with a reticulated water supply throughout. The water supply system will be installed to meet the requirements of the Council's engineering standards – including design layout and achieving minimum pressures and flow rates. In this matter it is noted that there is an existing water reservoir located approximately 410 metres to the south of the development site that has a base level that is 30 metre higher than the highest point within the development site – which is the southeast corner near to the proposed Lot 93. The reticulated water supply infrastructure will also need to meet the provisions of "AS2419.1.2021 - <i>Fire hydrant installations System design, installation and commissioning</i>" in relation to hydrant outlet spacing and locations.</p>
		<ul style="list-style-type: none"> <li>Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.</li> </ul>	<p>The northwest corner of the development site is burdened by the Moomba to Sydney high-pressure gas and ethane supply lines which are identified as a potential risk for the development without any controls in place.</p> <p>The design of the proposed subdivision development has allowed for an increased separation distance for residential dwellings from the gas supply easement amongst other measures, and a pre-lodgement meeting has been held with APA Group – being the asset maintenance agency to discuss the potential risks, the integrity of the assets in the general vicinity of the development site, and proposed mitigation measures.</p>

			<p>A 'Safety Management Study' (SMS) report has been prepared by an accredited private facilitator in consultation with APA and the proponents and it is concluded that the development can be undertaken in its current proposed layout without imposing risks on the pipeline assets and without significant risk to future landowners.</p> <p>It is noted that the 'depth of cover' over the sections of gas supply lines that travers through the site are between 800mm and 900mm.</p>
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<b>Adjoining land</b>	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	<ul style="list-style-type: none"> <li>• Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.</li> </ul>	<p>It reasonable to conclude that subdivision of the development property would not have any adverse impact on adjoining properties as the site is bordered by Middle Arm Road along the western boundary, a 20 metre wide easement for water supply along the southern boundary, and the neighbouring lands to the immediate north and east are set to existing small rural residential allotments. The nearest residential dwelling within the adjoining properties is located to the east and it is approximately 135 metres from the nearest boundary associated with the development site.</p> <p>The development property is located on the northern outskirts of the city of Goulburn which is essentially already highly urbanised and developed. It is noted that a development application for a separate 47 Lot residential subdivision on existing 'R2 – Low Density Residential' zoned land that is currently set to large Lot lifestyle uses and located approximately 700 metres to the south of the development site has recently been submitted to the Goulburn Mulwaree Council hence a future subdivision of the subject site would effectively complement existing land use in the general area.</p>
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### **3/. An Assessment of the Proposed Subdivision of Land in Accordance with Chapter 5 – 'Residential and Rural Residential Subdivision Planning' of Planning for Bush Fire Protection (2019).**

A subdivision of land for residential purposes is designated as 'integrated development' in accordance with Section 4.46 of the EP&A Act. As integrated development a formal application must be submitted to the NSW Rural Fire Service under Section 100B of the RF Act seeking a 'Bush Fire Safety Authority' for the proposed development which will assess the proposal for compliance with PBP and the combined bush fire protection measures aimed at the protection of life and property. A 'Bush Fire Safety Authority' (BFSA) requires assessment of the development against set criteria as set out in Clause 44 of the Rural Fires Regulation (2008).

The information requirements to be assessed within a 'Bush Fire Safety Authority' must at a minimum include the following:

**1. A description of the property**

- provide Lot No., DP of subject land
- street address with locality map
- zoning of subject land and any adjoining lands
- staging issues, if relevant, and description of the whole proposal
- aerial or ground photographs of subject land including contours and existing and proposed cadastre

**2. Identification of any significant environmental features - these could include the presence of:**

- riparian corridors
- SEPP 14 – Coastal Wetlands, SEPP 26 Littoral rainforests, SEPP 44 – Koala Habitat
- areas of geological interest
- environmental protection zones or steep lands (>18°)
- land slip or flood prone areas
- national parks estate or various other reserves.

**3. Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant**

- details of some threatened species can be found on the web  
([www.environment.nsw.gov.au](http://www.environment.nsw.gov.au))
- past and/or present studies or surveys for the area (eg local environment studies)
- documentation supplied to council in relation to flora and fauna

**4. Details of Aboriginal heritage known to the applicant**

- past surveys and information held by the DEC.

**5. A bush fire assessment for the individual Lots that addresses –**

- the classification of vegetation out to 140 metres from the development
  - o provide a structural description consistent with the identification key in Keith D (2004) and PBP.
  - o identify any past disturbance factors and any future intended land uses that could alter the vegetation classification in the future.

- an assessment of the effective slope to a distance of 100 metres
  - o usually 5m contours will suffice for subdivisions, 10 metres should be used only if there has not been a survey undertaken by a registered land surveyor.
  - o the effective slope is the slope under the vegetation assessed as being a hazard in relation to the development and not the slope within the asset protection zone.
- asset protection zones (including any management arrangements, any easements including those contained on adjoining lands)
- siting and adequacy of water (in relation to reticulation rates or where dedicated water storage will be required)
- capacity of public roads (especially perimeter roads and traffic management treatments)
- whether public roads link to fire trails and have two way access
- adequacy of access and egress
- adequacy of maintenance plans (eg; landscaping) and emergency procedures (especially SFPP developments)
- construction standards to be used (where non-conformity to the deemed-to-satisfy arrangement is envisaged, which aspects are not intended to conform)
- adequacy of sprinkler systems (only as an adjunct to other passive controls).

**6. An assessment of how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 5 of PBP.**

It is considered that Items 1, 2 and 5 listed above have been adequately addressed within the earlier sections of the Strategic Bush Fire Study, hence they do not specifically need to be repeated again.

Items 3 and 4 are addressed by reports prepared by others and can be referenced directly for detailed assessment. It is noted that the 'Preliminary Biodiversity Development Assessment Report' prepared by Hayes Environmental (dated May 2023) addressed Item 3 (*Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant*) and in doing so identified that there was likely to be some impact on local box-gum woodlands within the northeastern portion of the site. Chapters 7 and 8 of the report address the impacts and proposed offsets such as areas of re-planting within the site that should be adopted. It is also noted that some trees particularly around the southern and northern boundaries of the site will need to be removed to facilitate the construction of perimeter roads and access requirements for bush fire protection purposes. The 'Aboriginal Cultural Heritage Assessment Report' undertaken by Black Mountain Projects Heritage Consultants and dated May 2023 addresses Item 4 - *Details of Aboriginal heritage known to the consultant*. In this matter it is noted that there were no items of Aboriginal Heritage significance found on the site.

The following Table addresses Item 6 from the information requirements and provides an assessment of the how the development as a whole complies with the acceptable solutions, performance requirements, and relevant specific objectives of Chapter 5 – 'Residential and Rural Residential Subdivision Planning' of Planning for Bush Fire Protection (2019)'.



**Table 3a. An assessment of how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 5 of PBP (2019)**

ASSET PROTECTION ZONES		
Performance Criteria	Acceptable Solutions	How Does the Development Comply
The intent may be achieved where:		
Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m <sup>2</sup> on each proposed lot.	APZ's are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	The proposed subdivision has considered the requirement of providing suitable asset protection zones for each Lot such that the nominated dwelling sites would not be exposed to a radiant heat level exceeding BAL-29. At the time of lodging a subdivision application for the rezoned land it is recommended that a submission be made to the NSW Rural Fire Service for the existing bush fire prone land maps to be amended to exclude the entire development site to avoid the future need to assess each individual Lot for bush fire protection measures.
APZ's are managed and maintained to prevent the spread of a fire towards the building	APZ's are managed in accordance with the requirements of Appendix 4, and in particular in accordance with the requirements of 'Standards for Asset Protection Zones (RFS 2006). ***	The subdivision design ensures that all Lots that are potentially burdened by bush fire prone lands are provided with a suitable area for the establishment of an asset protection zone in accordance with the requirements. All future Lots would be required to demonstrate provision of a suitable asset protection zone at the time of lodging a formal application to Council for the construction of a residential dwelling.
The APZ's are provided in perpetuity	APZ's are wholly within the boundaries of the development site	The proposed Lot boundaries, building setbacks and asset protection zones have been considered in the design of the subdivision to ensure that all asset protection zones are within the individual allotments and therefore eliminating any need to register restrictions on the title of neighbouring Lots for the establishment of such.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised	The APZ's are located on lands with a slope less than 18°	The development property does not have any slopes that exceed 15° and therefore all proposed Lots will comply with this condition



LANDSCAPING		
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Landscaping is in accordance with Appendix 4	All future Lots would be required to provide a detailed landscaping plan that is suitable for developments in bush fire prone areas at the time of lodging a formal application to Council for the construction of a residential dwelling. The landscaping plan would be an effective tool to ensure compliance with this provision.
	Fencing is constructed in accordance with section 7.6.	

\*\*\* [http://www.rfs.nsw.gov.au/data/assets/pdf\\_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf](http://www.rfs.nsw.gov.au/data/assets/pdf_file/0010/13321/Standards-for-Asset-Protection-Zones.pdf)

PUBLIC ROADS		
Performance Criteria	Acceptable Solutions	How Does the Development Comply
The intent may be achieved where:		
Firefighting vehicles are provided with safe, all-weather access to structures.	Property access roads are two-wheel drive, all-weather roads	All roads, both existing and proposed are bitumen sealed all-weather surfaces that are suitable for all types of vehicle movements
	Perimeter roads are provided for residential subdivisions of three or more allotments	<p>The proposed subdivision design allows for the formation of a new internal road system that will junction off Middle Arm Road which runs parallel to the western boundary of the property. The proposed road system will comprise a single entrance road (Road 01) that ends at a tee-intersection with Road 03 approximately 230 metres inside the boundary to form a looped perimeter road around the majority of the northern and southern boundaries. Prior to the tee-junction a smaller looped access road (Road 02) will junction off the entrance road at a chainage of approximately 110 metres to service several of the proposed Lots, and it will join back onto the perimeter road system near to the northern boundary. A full perimeter road is not possible around the site due to existing high-pressure gas and optic fibre services that traverse across the northwest corner, however where a perimeter road does not exist access can be gained to all boundaries of the property from the adjoining land holdings.</p> <p>It is noted that the adjoining lands on both the northern and southern aspects of the site are rural holdings with access to the respective common boundaries available through these properties if required. An existing Right of Carriageway easement along the southern boundary of the development property benefiting the adjoining property to the east will be removed in favour of improved access along the proposed new internal road system which will therefore facilitate access along the common boundary between the two holdings for the benefit of firefighting purposes.</p>

	Subdivisions of three or more allotments have more than one access in and out of the development;	<p>The proposed subdivision design will rely on a single entrance access road due to existing major gas, communications, and water supply inground infrastructure constraints that burden both the northwest and southwestern corners of the property. The development site however is comprised of and effectively surrounded by open grassland vegetation formations on all aspect hence the likelihood of prolonged isolation or road closure during a bush fire event is deemed to be very low.</p> <p>It is further recognised that the adjoining land to the south is already zoned as 'R2 – Low Density Residential' and therefore able to be developed for residential infill purposes, whilst the lands to the north and west which are currently zoned 'RU6 – Transition' are also included in the 2020 <i>Urban and Fringe Housing Strategy</i> for potential future residential land use. At a strategic planning scale, the future development of the subject site and surrounding land holdings to meet residential housing demands will provide an expanded network of roads for access and egress purposes – if the subject land is still mapped as comprising bush fire threat vegetation structures.</p>
	Traffic management devices are constructed to not prohibit access by emergency services vehicles	There are no specific traffic management or calming devices proposed within the development site
	Maximum grades for sealed roads do not exceed 15° and an average grade of not more than 10° or other gradient specified by road design standards, whichever is the lesser gradient	The proposed new internal access road will have finished surface grades of less than 10° and therefore satisfy this condition.
	All roads are through roads	The proposed subdivision design allows for a network of inter-connecting roads that provide continued movement throughout the site without any dead-end formations.

	Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end	Not applicable to the proposed subdivision development.
	Where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road	All internal roads will be formed with a roll-top kerb and gutter.
	Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system	Not applicable as the existing vegetation formations are open grasslands.
	One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	Not applicable to the proposed subdivision development.
The capacity of access roads is adequate for firefighting vehicles.	The capacity of perimeter and non-perimeter road surfaces and any bridges / causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges / causeways are to clearly indicate load rating	All existing roads presently satisfy this condition, and the proposed internal access road will also meet the criteria as it will be bitumen sealed. The proposed crossing of a drainage corridor that traverses through the centre of the site will be constructed to Council's road engineering requirements which includes suitable load bearing capacity to facilitate heavy vehicle loads.

There is appropriate access to water supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression	Hydrant outlets associated with the new reticulated water supply will be installed outside the trafficable areas of the new road system.
	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - <i>Fire hydrant installations System design, installation and commissioning</i>	Hydrant outlets and spacing will be in accordance with AS2419.1:2021 - <i>Fire hydrant installations System design, installation and commissioning</i> which is the current version of the standard.
	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available	Not applicable as the proposed reticulated water supply and hydrant distribution will be sufficient for firefighting purposes.

PERIMETER ROADS		
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	Are two way sealed roads	<p><b>The existing road system along the western boundary of the site satisfies all applicable acceptable solution provisions.</b></p> <p>The internal perimeter roads will be bitumen sealed with a width of at least 9 metres between kerbs within a 15, 18, or 20 metre wide dedicated road reserve.</p> <p>Street-side parking will be parallel to the kerb, and the hydrant outlets over the water mains will be in the verges between the edge of the kerb and gutter system and the property boundary lines.</p> <p>The proposed internal perimeter roads are all through roads, and there is a network of inter-connecting roads at regular intervals of less than 500 metres.</p> <p>The geometric road design satisfies both local Council engineering and AustRoad requirements and therefore satisfy this condition. All roads will have vegetation clearances of at least 4 metres in the vertical plane.</p>
	Minimum 8 metre carriageway width kerb to kerb	
	Parking is provided outside of the carriageway width	
	Hydrants are located clear of parking areas	
	Are through roads, and these are linked to the internal road system at an interval of no greater than 500 metres	
	Curves of roads have a minimum inner radius of 6 metres	
	The maximum grade road is 15° and average grade of not more than 10°	
	The road crossfall does not exceed 3°	
	Minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches, is provided	

NON-PERIMETER ROADS		
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Minimum 5.5 metre carriageway width kerb to kerb	The internal non-perimeter roads will be bitumen sealed with a width of at least 9 metres between kerbs within a 15, 18, or 20 metre wide dedicated road reserve.
	Parking is provided outside of the carriageway width	
	Hydrants are located clear of parking areas	Street-side parking will be parallel to the kerb, and the hydrant outlets over the water mains will be in the verges between the edge of the kerb and gutter system and the property boundary lines.
	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500 metres;	
	Curves of roads have a minimum inner radius of 6 metres	The proposed internal perimeter roads are all through roads, and there is a network of inter-connecting roads at regular intervals of less than 500 metres.
	The road crossfall does not exceed 3°	
	a minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches, is provided.	The geometric road design satisfies both local Council engineering and AustRoad requirements and therefore satisfy this condition. All roads will have vegetation clearances of at least 4 metres in the vertical plane.

PROPERTY ACCESS		
Performance Criteria	Acceptable Solutions	How Does the Development Comply
The intent may be achieved where:		
Firefighting vehicles can access the dwelling and exit the property safely	<i>Note: There are no specific access requirements in a urban area where an unobstructed path (no greater than 70 metres) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles (i.e. a hydrant or water supply).</i>	All proposed Lots within the development site will be able to satisfy this condition.
	In circumstances where this cannot occur, the following requirements apply	
	Minimum 4 metre carriageway width	Not applicable
	In forest, woodland and heath situations, rural property access roads have passing bays every 200 metres that are 20 metres long by 2metres wide, making a minimum trafficable width of 6 metres at the passing bay;	
	A minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches	
	Provide a suitable turning area in accordance with Appendix 3;	



	Curves have a minimum inner radius of 6 metres and are minimal in number to allow for rapid access and egress	
	The minimum distance between inner and outer curves is 6 metres	
	The crossfall is not more than 10°	
	Maximum grades for sealed roads do not exceed 15° and not more than 10° for unsealed roads	
	A development comprising more than three dwellings has access by dedication of a road and not by right of way	
	<i>Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</i>	

SERVICES – WATER, GAS & ELECTRICITY		
Performance Criteria	Acceptable Solutions	How Does the Development Comply
The intent may be achieved where:		
WATER SUPPLIES		
Adequate water supplies is provided for firefighting purposes.	Reticulated water is to be provided to the development where available	The proposed subdivision development will be serviced by the Council's reticulated water supply which will be extended from the northern edge of the city.
	A static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed	Not applicable as all Lots will be serviced by the reticulated water supply.
	Static water supplies shall comply with Table 5.3d.	
Water supplies are located at regular intervals; and the water supply is accessible and reliable for firefighting operations	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2021	Hydrant outlets and spacing will be in accordance with AS2419.1:2021 - <i>Fire hydrant installations System design, installation and commissioning</i> which is the current version of the standard.
	Hydrants are not located within any road carriageway	Hydrant outlets will be installed in the road verges between the kerb and gutter system and the property boundaries.
	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads	All reticulated water supply design and supply flows and pressures will need to be in accordance with the Council's engineering requirements and the relevant clauses of AS2419.1:2021 - <i>Fire hydrant installations System design, installation and commissioning</i> .
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005	
The integrity of the water supply is maintained	All above-ground water service pipes are metal, including and up to any taps	To be undertaken as a matter of compliance at the time of residential dwelling development.
	Above-ground water storage tanks shall be of concrete or metal	Not applicable as all Lots will be serviced by the reticulated water supply.

ELECTRICITY		
Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings	Where practicable, electrical transmission lines are underground.	The development property is presently serviced by an overhead power transmission line that runs through the centre of the site to service the existing dwelling. Future subdivision of the property will need to undertake a full electricity demand and design model to assess the capacity of the existing supply provisions, and where necessary upgrade or undertake additional supply augmentations. The design of the mains power supply should be in accordance with the supply authority's requirements for developments in bush fire prone areas and where possible and practical incorporate underground services.
	Where overhead electrical transmission lines are proposed: - lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and - no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 <i>Guideline for Managing Vegetation Near Power Lines</i> .	

GAS		
Location of gas services will not lead to ignition of surrounding bush land or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with 'AS 1596 – 2014 – <i>The Storage and Handling of LP Gas</i> ' and the requirements of relevant authorities. Metal piping is to be used.	It is envisaged that any future subdivision development of the land will include an extension of the reticulated gas supply from the northern edge of the city along Middle Arm Road.  The connection of the reticulated gas supply to the individual dwellings will be in accordance with the relevant plumbing and gas standards.
	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation.	
	Connections to and from gas cylinders are metal.	
	Polymer sheathed flexible gas supply lines are not to be used.	
	Above-ground gas service pipes are metal, including and up to any outlets.	

#### 4. Conclusion.

It is the formal assessment of this report that the proposed rezoning of the subject property from existing RU6 – 'Transition' to R2 – 'Low Density Residential' land use and the subsequent subdivision of land to create 93 separate residential allotments within lands identified as Lot 2 DP569505 – 44 Middle Arm Road at Middle Arm will generally be able satisfy the requirements of 'Planning of Bush Fire Protection (2019)'.

It is further considered that any potential future residential development undertaken within the proposed Lots once the subdivision is registered and the Lots created will be able to comply with the acceptable solutions, performance requirements, and specific objectives provisions of Chapter 7 – '*Residential Infill Development*' of Planning for Bush Fire Protection (2019), Planning for Bush Fire Protection (2019) – Addendum November 2022, and "AS3959 - 2018 Construction of Buildings in Bush Fire Prone Areas" if applicable.

In relation to the land rezoning proposal and the future subdivision development it may be prudent for the Goulburn Mulwaree Council and the NSW Rural Fire Service to consider early in the assessment process to exclude the entire developed site from the mapped bush fire prone lands as the vegetation structure and classification will be significantly different under a change in land use which will be dominated by managed lands and roads. By recognising this change of land use and vegetation structure early in the assessment and approval process it will avoid unnecessarily burdening future Lot owners with bush fire protection measures that may not have any significant long-term benefits.

Following rezoning of the land, registration of the subdivision, and creation of the individual Lots any subsequent development within each of the proposed Lots may be required to provide an independent bush fire hazard assessment that addresses the requirements of the appropriate standards and legislation at the time of a formal development application to Council if it is deemed that the Lot is located within mapped bush fire prone lands.