

Item 10 Warialda Fire Plan Strategy

FILE REFERENCE

DELIVERY PROGRAM

GOAL: 1. A healthy and cohesive community

OUTCOME: 1.2 OUR COMMUNITY IS AN INVITING AND VIBRANT PLACE TO LIVE

STRATEGY: 1.2.2 A shared responsibility for community safety - OCD
- external

AUTHOR General Manager

DATE 6 February 2020

STAFF DISCLOSURE OF INTEREST Nil

IN BRIEF/ SUMMARY RECOMMENDATION

This report recommends the endorsement of the proposed Warialda Fire Plan Strategy.

BACKGROUND

The elected Councillors are very concerned about the high probability of catastrophic damage and possible loss of life if an uncontrolled bushfire was to commence around Warialda in the weather conditions recently being experienced within NSW.

Warialda is particularly vulnerable due to the high concentration of thick bushland surrounding the town. Indeed Warialda has been identified as one of the most vulnerable communities within NSW to bushfires.

A small Ad Hoc working party group was formed with northern Councillors, staff and SMK Consulting to develop a viable strategy to reduce, to a manageable level, the bushfire risk to the Warialda community.

Attached to this report is the resulting suggested strategy.

COMMENT

Gwydir Shire has followed the advice issued by the State Government and prepared its own Fire Plan for the town of Warialda.

On page 23 of the attached report the consultant notes:

Crown land management differs between land held under the 2018 Crown Licence and TSR land managed by Local Land Services (LLS). Council has the authority to manage the land subject to the 2018 Crown Licence. TSR adjoining the town area is controlled by LLS. Permission is required from LLS to undertake any clearing work within TSR.

The consultant also notes on page 26 (typos corrected):

The plan presented in Appendix 5 provides an outline of the recommended 150m managed vegetation zone. The difficulty with this zone is that it is

mostly crown land in the form of TSR or part of the Crown Lease held by Council. Current legislation would severely limit the potential for Council to undertake management within this zone due to the statutory limits controlling the departments who manage this crown land. This includes the Local Land Services and Crown Lands. At present, Council has no exemptions to undertake vegetation management within the crown land to achieve the required protection zone around Warialda.

*Obtaining permission to manage this Zone is considered an **urgent** and key outcome if Council is to achieve a suitable buffer around Warialda to be able to protect the town during a significant fire. To date, conversations with Local Land Services and Crown Lands has indicated a significant degree of process and legislative difficulty in allowing Council to obtain permission to establish a 150m wide management zone around the town due to statutory limitations resulting from current legislation including the Biodiversity Conservation Act 2016, the Local Land Services Act 2013 and it is assumed the Crown Land Management Act 2016.*

Without the necessary exemptions, these Acts and associated regulations prevent Council from achieving their Duty of Care to protect the township of Warialda from a forest fire event.

In order to implement this plan the following actions have been endorsed by the working party:

The Local State Member, The Hon. Adam Marshall, be forwarded a copy of the SMK Consulting Report with a request that he assists the Council to obtain the necessary exemptions required to undertake the works outlined in appendix 5; and;

That discussions commence with the Crown Lands Office and the Chair of the Local Land Services requesting the transfer of management of the Travelling Stock Routes identified in the Appendix 5 buffer to Council's management and future maintenance

CONCLUSION

This matter is considered to be an extremely important issue that requires urgent attention by the Shire's State Member.

OFFICER RECOMMENDATION

THAT the report be received and the Council endorses the following action:

The Local State Member, The Hon. Adam Marshall MP, and the Minister for Police and Emergency Services, The Hon. David Elliott MP, be forwarded a copy of the SMK Consulting Report with a request that The Hon. Adam Marshall MP assists the Council to obtain the necessary exemptions required to undertake the works outlined in appendix 5; and;

That discussions commence with the Crown Lands Office and the Chair of the Local Land Services requesting the transfer of management of the Travelling Stock Routes identified in the

Appendix 5 buffer to Council's management and future maintenance

ATTACHMENTS

AT- SMK report

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Gwydir Shire Council

Investigation of a Fire break around Warialda

Warialda Town Area

December 2019

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SMK

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1 Introduction

Gwydir Shire Council engaged SMK Consultants to assess the Fire Break around the town of Warialda. The following report presents an assessment of the current exposure of Warialda to a significant fire event and recommendations identified to improve the readiness of the town in the event of a fire.

Settlement in Warialda commenced in about 1837 after the Surveyor Alan Cunningham passed through the region on a journey between the Hunter Valley and the Darling Downs in Qld. History indicates that Warialda was the first gazetted town in the northwest slopes of NSW and during these early days, provided the administrative centre for a wide region.

The town has grown into a well-established centre for a large cropping and grazing region. Warialda has a population of approximately 1,300 people and is one of the two major towns in the Gwydir Shire, the other being Bingara. The town is settled within a relatively narrow valley landscape with the surrounds supporting extensive areas of Eucalypt, Cypress and Ironbark woodland.

1.1 Purpose of the Report

The purpose of this investigation is to review existing fire breaks around the Warialda town area and firefighting action plan and readiness in the event of a fire.

Once the existing fire breaks are quantified and assessed, the assessment aimed to determine additional work and appropriate actions required to develop appropriate fire breaks and logistics. Once these matters are determined, an action plan is required to rectify any deficiencies in the fire break and facilities and establish an ongoing plan of management for community actions and ongoing responsibilities. The outcome of the assessment will allow Council to improve the asset protection zone for residences, infrastructure within the Warialda town area and logistical requirements in the event of a fire.

1.2 Scope of Assessment

The scope of this assessment is limited to the town area. This includes land included under Zones IN1 – General Industrial, an area of R5 Large Lot Residential in the north west sector of the town, RE1 Public Recreation land, an area of RE2 Private Recreation (Golf Course), and RU5 Village. Areas of R5 to the east of the town area are outside of the scope of this report. Land Zoned as R5 along the Warialda Rail Road (Allan Cunningham Road) between the Gwydir Highway and Warialda Rail is outside of the report scope, along with Warialda Rail. Other land within the town area includes crown reserves. Some of these reserves are administered by Council and other area are administered by a range of government authorities.

The area of R5 to the east of Warialda is subdivided into 30 Ha or larger Lots and includes uncleared land used for lifestyle blocks. The R5 land between Warialda and Warialda Rail is located on mostly cleared grazing or cultivation land with a low bushfire risk.

This report included the following scope of works:

- Stage 1 – Investigate the requirements for a fire break around Warialda and prepare preliminary designs and options.
- Stage 2 – Identification of action plans for the town to prepare for a fire event including management of the surrounding fire break, identification of authorities responsible for land outside of Council control and identification of ongoing actions to maintain the fire break and requirements for the town to respond to a significant fire event.

2 Warialda Town Area

2.1 Locality

Warialda has been built within an enclosed valley of woodland. The town is mostly surrounded by crown reserves which have conserved the woodland and provide a key landscape feature for the town's amenity and character. As the town expanded over time, clearing has historically been limited to the minimum requirements, allowing the houses and infrastructure to have the woodland as part of their backyard. This is a feature of the town that has been identified as a significant social community asset and therefore important characteristic. Figure 1 provides an aerial image of Warialda which highlights the extent of development and the surrounding woodland areas.

The Warialda residential area is built on sloping land. The centre of town is traversed by Warialda Creek which has a general slope of 1.2% to the west. The northern side of Warialda Creek has a slope of between 3% and 4% rising from the creek to the north. The southern half of the town rises up from the creek at a slope of approximately 3.9% with the southern edge of the town area extending to the top of the hill within the surrounding woodland.

There are a series of gullies through the town area which act as remnant vegetation zones within the residential area. The northeast part of Warialda has a small gully running to the east of Market Street which links to Warialda Creek. A gully is located at the eastern end of Queen Street but is mainly outside of the existing residential area. All other small gullies and waterways have been incorporated in the built environment and stormwater system within the town area. The gullies are mostly retained as open woodland and part on the public park system within the town.

The western sector of Warialda includes mostly cleared open flat ground. Infrastructure along this western area includes the sewage ponds, Warialda Creek corridor which is mostly grassland, Racecourse Creek along the north western section of undeveloped residential lots, a cleared power line corridor to the west of West Street, sporting ovals along Mosquito Creek Road and the Warialda Golf Course in the north of Nicholas Street. This northwest sector has a power line corridor through Lot 7003 in DP1121864.

The northeast sector of the town extends into the edge of a woodland area. The woodland links onto a large area of undeveloped Lots and extends to the north along Fairford Road, covering approximately 1,200 hectares with a perimeter of approximately 18 kilometres. Land outside of this has been partially cleared for farming and grazing.

The southern edge of Warialda joins the Warialda State Conservation Reserve which is an extensive reserve of mostly tall woodland. This woodland is traversed by numerous narrow access tracks along the northern edge but only one main north-south track through the middle. The woodland covers an area of approximately 3,500 hectares of rolling hills.

The land surrounding the larger areas of woodland to the west of town has mostly been cleared and is now used for grazing of stock and some cultivation. An overall view of the landscape identifies two larger areas of woodland as the primary source of bush fires that would impact the town area.

There is an extensive network of travelling stock routes (TSRs) through and around the town area. These are administered by Local Land Services. The management of these areas includes issuing of grazing permits and some active vegetation management programs. TSR management within the town area can include input from Council as they also offer an informal recreation area for local residents.



Figure 1: 2018 Aerial Image of Warialda

2.2 Council Assets

The Warialda town area has a municipal water supply system which is piped to the majority of houses. The system source groundwater from four (4) bores located within the town area. The bores are fitted with electric pumps which pump water to three (3) main reservoirs. Two reservoirs are located on the southern edge of Warialda. The third reservoir system is located on the northern edge of the residential section of Warialda. All three reservoir systems are located on high ground and therefore can supply water to the town under gravity flow.

The water main system in Warialda extends through the majority of developed streets within the town to service houses and all facilities. The water main system has strategically located Fire Hydrants for use by Council and in the circumstances of a fire. The hydrants can be used to refill water tankers, clean the water mains or provide additional water in the event of a fire.

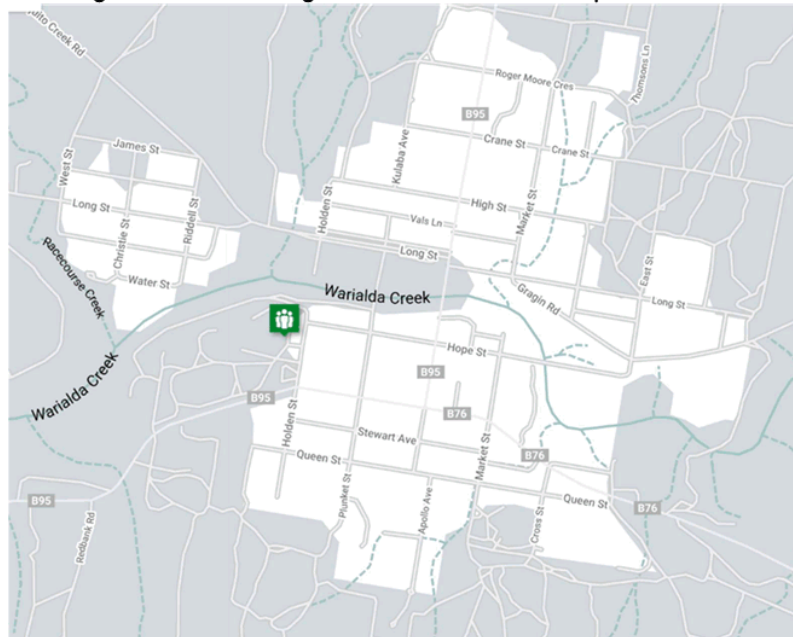
An aerial image of the water hydrant system is presented in appendix 1. Each hydrant is identified within the Council data base system.

It is noted that some signs referring to a **Neighbourhood Safer Place** have been erected. The visibility of these signs appears to be limited as none were identified during this investigation. An investigation of signage and public notification prepared by the South Australian Country Fire Service for rural towns in highly fire prone regions, provides a highly visible system that clearly marks evacuation points. The presence of such signs provides the public, including non-locals with clear directions to emergency evacuation points during a bushfire event. This provides a critical method of notification in circumstances where communication systems are lost.

NSW RFS and Council have selected the Captain Cook Park and adjacent cricket oval as the Neighbourhood Safer Place for Warialda. This is an open area of mown grass sporting ovals with one or more larger pavilion type building to provide shelter. The area is within the "Ember Impact" zone identified by the Warialda Bush Fire Survival Map as a result of the adjoining Warialda Creek which is identified as a "Flame Impact" Zone. The site has extensive short grass APZ surrounds which would minimise the potential of a direct fire hazard.

The following plan has been copied from the NSW RFS website for Neighbourhood Safer Places. To access this map requires the internet via either mobile phone, iPad type device or a computer. Such devices would be available if electricity and telecommunications are available during a fire.

Figure 2: NSW RFS Neighbourhood Safer Places Map for Warialda



An alternative site for the Neighbourhood Safer Place would be the Warialda Public School and oval, which is located within the “Be Aware” zone and adjacent to the main street precinct where the majority of services are available. This site is more isolated from the Ember Impact zone associated with Warialda Creek but has fewer public facilities such as a large pavilion for accommodation of services and evacuees.

The presence of large sign posts to identify the selected travel routes and location of the Warialda Neighbourhood Safer Place is limited at present. This needs to be improved to ensure that locals and non-locals can follow signs to the site in the event of a fire emergency where communications and visibility are limited. It is assumed that road signs could be erected in an emergency. This would depend on whether Council has such signs.

There is no Neighbourhood Safer Place on the northern side of Warialda Creek. It is noted that the Hospital and Aged Care facility has extensive APZs and the services (back-up power supplies) to continue operations in the event of losing power and water. This site would provide an alternative Safer Place on the north side of town in the event that the Stephen Street bridge was made inaccessible.

If equipment and facilities such as food, protective clothing (masks) and temporary shelter is to be provided by Council, it should be located at the Neighbourhood Safer Place.

It is noted that a main communication facility in Warialda located at the southern end of Holden Street adjacent to the southwest water reservoir, is located within the woodland. The structure has no APZ. There is a high risk that this would be burnt in a bushfire which may disrupt phone communications within Warialda. Any plans to maintain local communications

should assume that this facility would be lost in the event of a fire along the southern edge of Warialda.

2.3 Development within Zone R5 - Village

The majority of the village zone has been developed and occupied by houses and other infrastructure including the hospital, aged care facility and some municipal infrastructure. A large area of relatively undisturbed woodland remains within Zone R5 in the northeast sector of the town area. This includes land north of Long Street and to the east of Market Street. The woodland within the Zone R5 area incorporates an area of approximately 54 hectares of land that is mostly retained as crown land and administered by Council.

Large parts of the northwest sector in the Christie Street, Riddell Street and West Street region is subdivided but not developed for houses. The land is mostly used for small grazing paddocks and some cultivation.

R5 land to the west of the sewage ponds and Nicholson Street are not developed into small lots and support houses on larger parcels of land.

The majority of R5 Lots along the southern edge of the town are occupied by houses. Approximately six smaller R5 Lots remain unoccupied by houses along the southern boundary of R5 land. These Lots appear to be owned by the adjoining houses. They are partly cleared to provide alternative access to the adjoining houses. The High School is located within R5 zoning. The school area is mostly cleared and supports sporting ovals.

3 Statutory Matters

3.1 Gwydir Bush Fire Risk Management Plan

The Gwydir Bush Fire Management Committee prepared the "Bush Fire Risk Management Plan" (BFRMP) in 2010. This Plan was enacted and forms part of Council policy. Objectives of the BFRMP included:

- Reduce the number of human-induced bush fire ignitions that cause damage to life, property and the environment
- Manage fuel to reduce the rate of spread and intensity of bush fires, while minimising environmental/ecological impacts
- Reduce the community's vulnerability to bush fires by improving its preparedness; and
- Effectively contain fires with a potential to cause damage to life, property and the environment.

The BFRMP identified risks and a risk assessment process. The report identified Bush Fire Management Zones, mainly:

- Asset Protection Zones (APZ)
- Strategic Fire Advantage Zone (SFAZ)
- Land Management Zone (LMZ)
- Fire Exclusion Zone (FEZ)

The BFRMP resulted in preparation of a Fire Risk Management Plan for the Shire to identify Bush Fire Prone Land.

The BFRMP allows bush fire hazard reduction work to be carried out under the Bush Fires Act 1997, in accordance with planned activities to address the objectives as set out above. The use of fire for hazard reduction would require the authority (Council) to obtain a Bush Fire Hazard Reduction Certificate from NSW RFS.

3.2 NSW RFS

Part of the work of NSW RFS involves assisting with Bush Fire Planning. This can occur on an individual basis or through an authority such as Council and a Bush Fire Management Committee. Part of the work completed through NSW RFS and others to date includes a Bush Fire Preparation Map and a Community Protection Plan for Warialda.

The Bush Fire Preparation Map provides information identified for hazard reduction, property planning and preparedness for bush fire. A copy of the current plan is attached in Appendix 2. The plan presents an action list for local authorities. This identifies the agencies responsible for the action and the level of action required. Critical to this plan, various authorities based on land ownership are required to maintain strategic Fire Advantage Zones outlined in blue hatching on the plan. This covers the forest and grassy woodland that adjoins the perimeter of the town area. The plan also identifies a requirement to maintain a network of existing fire break access roads through the surrounding woodland. The primary roads are marked on the plan and have been identified onsite to remain in a cleared and accessible state. A large part of the land identified within this plan is managed by LLS as stock reserves. Council now administers part of other adjoining crown land. The remainder is held by the Crown as reserve land.

A second map has been prepared by NSW RFS as part of assistance provided to authorities. This map is presented as a Bush Fire Survival Map. The map is presented in Appendix 3. The mapping has identified areas that will be subject to various impacts in the event of a bush fire. The level of impact is summarised below:

- **Flame impact** – Properties directly impacted by fire as the proximity to the surrounding bush will mean that fire and embers will cause damage to the building.
- **Radiant heat impact** – Deadly levels of heat that will impact the property
- **Ember impact** – Impacts from lower levels of heat and significant embers
- **Be aware** – Wind-blown embers can impact the property

The mapping provides a risk assessment for a worst-case fire impact on Warialda. The extent of the zones is generally based on several factors, including vegetation in the adjoining area, slope and aspect of the buildings. The worst case for any building is under a wind or fire movement direction that will result in a fire coming as close to a building as possible. The Bush Fire Survival Map should be used to identify residences and buildings around the edge of Warialda that should be abandoned in the event of a bush fire.

3.3 Bush Fire Attack Level

A review of Warialda identified that the majority of the town area is not exposed to a risk of bush fire due to clearing and a lack of extended remnants of woodland. The review identified that the town perimeter has some bush fire risk due to the proximity of open woodland. In relation to risk, the standard terminology adopted consists of classification of bush fire attack level. This relates to the proximity of a building to the potential source of a fire. The following provides a diagrammatic explanation of Bush Fire Attack level and description of risk:



Source: Bushfire Prone Planning website, 2019

Bush Fire Attack Level

BAL	Description of risk
BAL – LOW	Lowest risk from a potential fire.
BAL – 12.5	Risk is primarily from potential embers during a fire.
BAL – 19	Moderate risk, particularly from embers and burning debris.
BAL – 29	High risk, particularly from embers, debris and heat.
BAL – 40	Very high risk. Likely to be impacted by embers, debris, heat and potentially flames.
BAL – FZ	Extreme risk. Directly exposed to the flames of a potential fire front.

These terms provide a minor duplication and complexity to the terms utilised in the Bush Fire Survival Map. The BAL terms should be utilised for planning purposes for development of houses and other infrastructure in the town area. The BAL terms should be highlighted to house owners during any discussions relating to bushfire preparations.

3.4 Asset Protection Zone (APZ)

Individual properties in NSW have a right to reduce bush fire risk through the RFS 10/50 Vegetation Clearing Code of Practice. The Code indicates the following:

In accordance with Part 4 Division 9 of the Rural Fires Act 1997, a landowner may carry out the following vegetation clearing work on their own land:

- the removal, destruction (by means other than fire) or pruning of any vegetation (including trees) within 10 metres; and
- the removal, destruction (by means other than fire) or pruning of any vegetation, (except for trees) within 50 metres of an external wall of a building containing habitable rooms that comprises or is part of residential accommodation.

The above measures relating to clearing within their own properties is generally considered exempt under the *Biodiversity Conservation Act 2016* (BC Act) which is the primary article of legislation controlling clearing in NSW. Residents are able to clear within their property boundary. They require permission from adjoining property owners to clear land on adjoining properties. Once outside of the 10m zone from any buildings within the property, only ground cover and shrubs can be cleared. The clearing or lopping of trees will be subject to the BC Act.

The town area of Warialda is included in the 10/50 Code area.

The NSW RFS has a standard process of calculating a minimum width for an APZ. The calculator indicates a minimum APZ of 10m for Warialda based on climate and woodland type in the surrounding area being "Woodland (grassy)". This increases to 20m for a "Forest".

According to NSW RFS, an APZ is defined as:

"Asset Protection Zone (APZ) is referred to as a fire protection zone. Aims to protect human life, property and highly values public assets and values. An area surrounding a development managed to reduce the bushfire fire hazard to an acceptable level. The width of the APZ will vary with slope, vegetation and construction level. The APZ, consisting of an area maintained with minimal fuel loads and, for subdivision, comprising a combination of perimeter road, fire trail, rear yard or a reserve, so that a fire path is not created between the hazard and the building."

4 Bush Fire Hazard Assessment

4.1 Northern Side of Warialda Creek

The eastern bypass road around Warialda has created a fire break consisting of a 22m to 25m clear zone through the woodland to the northeast of Warialda. This is not mapped in the Bush Fire Protection Map as the map was prepared prior to the road being installed. Once complete, the Bypass will provide an outer fire break for the town. The width exceeds the APZ requirement for a Forest Fire but not a "Special Fire Zone" (A Special Fire Zone includes an APZ to protect facilities such as Seniors Living, Tourist Facilities and Schools).

Figure 3: View of northern section of Bypass showing tall forest and clear zone



A second major fire break around the northern side of Warialda has been created by a power line corridor. The power line corridor has a clear width of approximately 17m to 25m. The corridor is subject to variations in shrub and groundcover regrowth and therefore the width varies according to the frequency of maintenance works. The power line passes through vegetation that can be described as tall forest and grassy woodland. The power line corridor would reduce the risk of a fire accessing the perimeter woodland around Warialda but would not stop a forest fire.

Figure 4: Typical clear zone along power line corridor. Historical fires have jumped this fire break due to low shrubs and cypress sucker growth within the corridor.



The network of fire break roads through the woodland on the northern side of Warialda has limited value in that their average width is less than 10m and trees overhang the whole road in many places. These roads could be used as access in the event of a fire.

The Golf course, Nicholson Oval and open cleared land along the western end of James and West Street area provide a clear zone with an APZ in excess of 60m for the northwest sector of Warialda. The area would be subject to mainly Ember Impact and only limited Radiant Heat impact in the event of a fire, assuming that the grass within the APZ is kept short by mowing or grazing. The houses in the central part of James Street would be considered to have a BAL – 29 or less.

Figure 5: West Street looking south along power line corridor with cleared link to Gwydir Highway



Houses at the northern end of Kulaba Avenue have a limited APZ width as the woodland has been retained in this part of Warialda. The majority of buildings have an APZ zone of 10m of clear ground within their property, but the trees extend within 20m. It is recommended that ground cover is controlled within 20m of all buildings and the surrounding woodland. The alternative is for Council to clear the west end of J. A. McGregor Drive (west of Stephen Street) and make a clear zone connection to the north end of Kulaba Avenue.

Properties along the northern edge of Warialda have been built within bushland. Most have APZs greater than 20m, but these zones include tall grass and shrub areas. Lot 370 in DP 704628 (15 JA McGregor Drive) is built within the woodland and has no APZ for a woodland fire.

Houses at the east end of Roger Moore Crescent have a road that is cleared around the outside of their properties which links to the south with Crane Street. The timber is tall; however, ground cover is mostly cleared. This road needs to be maintained as a clear zone by Council. The houses would be prone to High Radiant Heat during a Bush Fire Threat. The risk would be from a crown fire in the tall trees.

Figure 6: Looking north from Crane Street showing track around to Roger Moore Crescent.



The residence within Lot 2 DP61677 (134 High Street) has been built within the woodland area and has little or no APZ. The woodland extends into the building area within the property boundary, but the house has no surrounding ground cover at present. The proximity of the tall trees would increase a Bush Fire Threat to this residence to a "Flame Impact" level and/or a BAL – 40 risk. This is similar to the eastern three residences in Long Street which have an APZ zone in the backyards of 15m to 20m but have tall dense woodland in close proximity.

Figure 7: 134 High Street residence with limited APZ



The Warialda Hospital and Naroo Frail Aged Care Facility are included under special fire protection due to requirements for assisted evacuation and special needs of residents. The 2017 Bush Fire Survival Map has identified the hospital within an ember impact zone (BAL-19) but the Naroo facility had woodland closer to the eastern boundary and risk increased to potential flame impact (BAL-40) or higher.

Work has been done to increase the APZ between these two facilities. The following image shows the clear zone around Naroo which measures to over 60m between the natural woodland and the garden area on the eastern edge of the facility. This is considered as satisfactory but both properties would be at risk of ember impact if the adjoining woodland was on fire. The adjoining woodland connects to a large area of woodland and as discussed above, the available fire breaks are limited to small fires and not major fires.

Figure 8: Fire break around east and northern sides of Naroo Aged Care and Warialda Hospital



The remainder of northern Warialda residences are generally protected by municipal roads or have clear zones around the houses.

The prime infrastructure asset in northern Warialda is the electrical substation. The facility has 10m or more clear zones within the main substation area. The surrounding area consists of crown reserves administered by either Council or others. The area supports grass and shrub growth which would be prone to fire and difficult to access. The following images show the areas of concern in the middle of a drought. This highlights the uncontrolled growth that would present a risk of impact to this facility. Rough tracks are available to access these areas, but no formal fire break is present. Similar vegetation extends to the south to J A McGregor Street which would expose the Council depot to ember impact.

The Council depot would be a critical facility in the middle of a bush fire. The main building is approximately 70m from the closest area of woodland. This is considered to exceed the recommended APZ width. Equipment and minor buildings around the perimeter of the depot would be exposed to fire and heat impact under current vegetation conditions. It is recommended that a localised fire break is formed around the outside of the eastern security fence to allow fire control access in this area to protect flammable materials such as bitumen, diesel, plastic materials or waste oil storages.

Figure 9: Photos of reserve areas around Warialda Substation on Warialda Road



4.2 South Side of Warialda Creek

The southern side of Warialda borders onto an extensive area of woodland. The understorey includes areas of low shrubs and grass. A network of unofficial vehicle tracks has been created along the southern edge of the town area which create fire breaks to a width of 10m or less. These tracks would reduce the risk of a ground fire causing damage to property but have minimal impact in the case of a bush fire which engulfs the woodland. Council occasionally grades these tracks.

The southeast sector of Warialda, east from Cross Street, includes larger Lots which are used for grazing of stock or gardening. The houses along the eastern edge of Cross Street have a clear zone at the rear of the houses and Cross Street itself to provide an APZ outside of the property boundary. The houses to the south of Queen Street between Cross and Market Street have some woodland connectivity in their backyards but remain mapped as having potential Flame Impact (BAL-40) in the event of a fire due to the connectivity to the large area of woodland to the south. It is recommended that a clear fire break be established using one of the east-west tracks in the bush to the south of these houses to form a connection between the most eastern house on Lot 4 in DP801691 (99 Queen St) and the southern end of Apollo Avenue. This would isolate the woodland area that extends into the back of these houses.

It is noted that the Flame Impact Zone associated with Warialda Creek extends onto the Warialda Road, between Cross and Market Streets along the northern edge of the Gwydir Highway. It is also noted that a Fuel depot is located within the Flame Impact Zone. The fuel depot is upslope of a potentially high fire fuel zone being Warialda Creek. At present the creek bank supports a range of unmanaged vegetation. The fuel depot would be regarded as a highly flammable essential service and therefore should be contained within a larger APZ zone. The land between the Depot and the Creek area is partly Council land (road reserve) and crown land (creek reserve). Council (and possibly the fuel depot owner) should jointly manage an APZ zone around the fuel depot.

The High School and associated buildings have a clear zone of 50m or more in addition to cleared tracks around the edge of the property within the adjoining reserve area. This is

considered acceptable as the clear zone generally exceeds the minimum for a woodland area. The clear zone/APZ for a woodland is 40m according to the RFS APZ calculator.

The Southern Reservoir is an important asset. At present, the property has a 10m APZ around the external fence, but shrub growth has become extensive within the property. The entrance road and access road around the concrete reservoir is maintained in a clear condition, however the property would be impacted by embers and therefore the surrounding shrubs as identified in the following photograph would burn and may damage external structures on the reservoir. It is therefore recommended that a 20m APZ is maintained around the reservoir.

Figure 10: Southern fence of Southern Reservoir showing shrub growth within the reservoir compound.



The residence at the southern end of Plunkett Street has been built within the woodland. The house itself has an APZ of 10m to 15m in width which is suitable for a woodland (grassy) region. The residents maintain an additional gravelled access along their southern boundary. The Bush Fire Preparation Map recommends that the southern edge of this house actively undertakes hazard reduction, but the house remains exposed to potential Flame Impact in a bush fire. The existing area of gravelled pavement is considered acceptable to reduce risk, but the residence would remain exposed to ember impact and potentially radiant heat. A recent fire was evident in this area.

Figure 11: Clear zone to south of southern residence in Plunkett Street.



Council's Southern Water Tower is accessed via Plunkett Street. The tower is located within a fenced area. The groundcover within the fenced area is maintained as a clear zone of approximately 15m or more to the east, south and west. The tower and associated infrastructure may be exposed to fire and possible ember issues along the northern side. Additional clearing and maintenance of ground cover is required to protect this asset.

A communication tower is located to the immediate south of the southern water tower. This communication tower has no APZ and is located within dense woodland. This structure remains part of the communications system for Warialda. In the event of a bush fire, the structure would be destroyed as access would be difficult and the tower is surrounded by similar woodland. This is a potential key asset that would be lost during a bushfire approaching the southern edge of Warialda and therefore any communications systems it provides would be lost.

Houses at the southern end of Holden Street adjoin the woodland area on an escarpment. The top of the escarpment is higher than the houses and there is a clear zone of more than 15m around the two houses at the end of the street. Due to the topography (downslope from woodland) the houses are considered as ember prone (BAL-19) and not at risk of Flame Impact.

Houses on the western side of Holden Street (south of Queen Street) back onto a strip of woodland. The houses are upslope of the woodland and therefore at higher risk in the event of a bush fire in this woodland. The strip of woodland is an average of 50m in width and therefore a minor risk. The houses have a 10m APZ along their western boundary in addition to the APZ of up to 40m or more from the western boundary of each property.

Figure 12: Clear zone along west boundary of Lot C/407998 looking south



Warialda Motel and the houses to the west are located in relatively open clear areas maintained with short grass by Council and others. In this condition, the fire risk is considered relatively low other than ember impacts. The grass cover should be kept in such a condition as the area adjoins an extensive woodland to the south and west.

Figure 13: APZ along boundary of Lot 167/751137 looking toward Motel



Warialda has a municipal water supply. The presence of hydrants did not seem to be clearly marked and highly visible to the general public. For example, a hydrant was located within long grass at the southeast end of Market Street. The hydrant had no visible marker. The location of this fire hydrant system is outside of the scope of this report but is noted as a matter for action in section 6 of this report.

4.3 Crown Land Around Warialda

Warialda town area is surrounded by Crown Land include Travelling Stock Routes and Crown Reserves.

In 2018, Council signed a new Licence agreement with the Crown to manage this land. A copy of the Crown Licence Plan is attached in appendix 4. Under Schedule 2 Terms and Conditions, Condition 4 states:

“Hazard Reduction – Fuel load must be maintained on licenced area as per approval Warialda Community Protection Plan (Gwydir BFMC)”.

Under this condition, Council has the legal right and responsibility to manage the fuel load within the Crown area under this agreement. A map showing the strategic areas identified with the Gwydir BFMC is also presented in Appendix 4. The areas shaded as “yellow” represent critical hazard reduction areas which need to be maintained with a low fuel load (grass, shrub layer) to reduce the potential for fires to enter the residential part of Warialda.

Crown land management differs between land held under the 2018 Crown Licence and TSR land managed by Local Land Services (LLS). Council has the authority to manage the land subject to the 2018 Crown Licence. TSR adjoining the town area is controlled by LLS. Permission is required from LLS to undertake any clearing work within TSR.

LLS services have the responsibility of managing the TSRs. At present, this is done by mainly grazing and weed management programs. LLS currently allow the clearing of a 6m wide APZ around the town limit. This is allowed to extend to a practical level of clear zone to enable access for clearing. Any additional clearing such as clearing of 10m or wider zone of forest or grassland is subject to approval from LLS Vegetation officers under the LLS Regulations. Contact must be made with LLS officers to discuss options for any additional clearing. The option of including an LLS officer on the Warialda Fire Break Committee should be investigated on the basis that the LLS is a significant landowner in the local area and manage some critical areas of vegetation adjoining the town boundary.

4.4 Electricity Supply Lines

Major power lines are present along the eastern, northern and western parts of the north side of Warialda. The smaller power lines are administered by Essential Energy. The major power lines are administered by TransGrid. Each supplier has scheduled vegetation maintenance programs.

Based on preliminary knowledge, Essential Energy has a 2-year cycle of vegetation management along power line corridors and TransGrid have a 3-year cycle of vegetation clearing. The clearing is generally limited to tree lopping and sucker management to maintain a 10m to 20m corridor on either side of the power line. The works do not necessarily include grass and shrub management unless these are impeding road access to the power lines.

5 Discussion

Warialda has some unique features in relation to bush fire events. These are highlighted by the Bush Fire Survival Map. There are four standards of threat included in the Survival Map. The town is surrounded by areas that have been mapped as “Flame Impact” prone. The majority of the town is mapped as prone to “Ember Impact”. The central zone of the town between the main street and west to Holden Street is classified as an area to “Be aware” of embers which could be considered as a BAL-Low area. This would provide a central area for an evacuation facility.

The remainder of the town extends to the edge of a large woodland and forest surrounding the town. Mapping predicts that Flame Impact would occur on all perimeter areas resulting in loss of houses and infrastructure.

Warialda Creek provides an avenue for fire into the central part of the town, including a potential to encroach the central Stephen Street bridge over the creek. In such circumstances, the town may be separated into two parts with limited access. On this basis, two options are available. Option 1 would be to ensure that the vegetation in the creek is managed and kept in a condition of low fuel hazard. Option 2 would be to provide **Neighbourhood Safe Places** on either side of the creek.

Option 1 is preferable, and it is noted that Council has a landscaping project that includes mowing along the creek area between Plunket Street pedestrian access and the Hope Street low bridge. Option 1 would protect the main bridge and therefore provide access for residences to a central evacuation point in the main street area and Captain Cook Park.

This investigation has identified a network of formal and informal fire breaks around the town area including an eastern Bypass and power line corridors to the north. These cleared zones would provide access to control fires as well as fire breaks to stop fires or reduce their encroachment on the town area. The majority of these fire breaks are located within “Forest areas” which have the highest risk of an intense fire and therefore require additional widths of APZ than the roads and tracks provide. The width of some of these fire breaks is limited to 5m or less when overhanging trees are accounted for.

(It should be noted that this investigation has been undertaken during a period of extensive drought and therefore groundcover was limited. The normal level of ground cover growth (grass, shrubs) could not be quantified in detail.)

Several areas of bushland within the town perimeter require some modification to improve asset protection zones. A review of historical aerial images indicates that some of this work has been done in the past 5-years or less. In particular, work around the hospital and aged care facility has now established an appropriate APZ. Other areas of Council managed land have been identified as requiring treatment.

It should be noted that the surrounding forest includes tall trees where the risk of a crown fire under extreme conditions may not be controllable until it reaches a clear zone or managed forest area of more than 150m in width. In such an event, the Bush Fire Survival Map should be utilised as a core management tool for decisions on evacuation and fire

control. In such an event, the identified Neighbourhood Safe Place would need to be identified and become operational within a short period for local and visitors to the town.

The Bush Fire Preparation Map that has been prepared for Warialda, presents important actions that need to be undertaken to minimise the risk of a bush fire entering the town area.

The issue of smoke and ash hazard during a bushfire should be highlighted. Smoke and ash will potentially fill the town area during a major event. This will result in poor visibility and have severe health implications. Poor visibility will limit the movement of traffic in the town and the visibility of sign posts directing people to evacuation points. The sizing and location of sign posts such as directions and locations to the Neighbourhood Safer Place and any Bushfire Last Resort Refuges needs to be considered for conditions of severe smoke hazard.

During a period of Smoke hazard, the option of providing masks needs to be considered. The minimum standard mask would be a P2 mask. This may assist in reducing health issues created by smoke, embers and ash. Local shops may carry a limited supply of such masks and therefore Council should aim to provide a supply of masks in the event of a fire.

Recent catastrophic fires have identified numerous issues with fire planning. Some of these issues are identified in the following table.

Table 1: Matters identified for consideration as a result of 2019-2020 catastrophic fire events in Australia

Issue	Comment
Electricity	There is a high probability that electricity lines would be damaged in the event of a significant fire. This would result in reduced water and essential services such as electricity for pumping of fuel at local service stations or maintaining basic essential services. Identification of alternative supplies to essential services should form part of the Bush Fire Management planning. This may include a requirement for local service stations and other facilities to have back-up generators in addition to Council providing a suitable generator for the Neighbourhood Safer Place. This would also be required to recharge electrical communication devices.
Phone services - communications	Mobile and landline phone systems will be essential during a bush fire event. Part of the system is currently exposed as it is located in woodland and has no APZ. It is therefore essential to identify requirements to maintain phone services as residents will rely upon phones for information (internet/emergency communication) during a fire event.
Water	Several days of water are stored in reservoirs at present. These are filled from bores. It would be essential to identify the security of the bores including power supply to the bores and the bore infrastructure.
Additional services for evacuees and others	In the event of a significant fire, an additional population may be trapped in Warialda. Services including water, food and short-

Issue	Comment
	term accommodation should be identified for a potential increase in the normal population for Warialda, including an influx of fire fighters and volunteers.
Radio – FM/AM services	The use of FM or AM radio transmissions to the local community has been identified as one of the final communication services if local telecommunication services are lost. It would therefore be essential to secure portable/battery powered radios/wirelesses as a means of communications and public advisory service.
Fuel for vehicles	In the event that electricity is not available, fuel storages will require back-up electricity to provide fuel for locals and visitors. This will include the Council depot, local fuel stations and other facilities (Roger Moore Fuels). Access to fuel for residents, visitors and fire fighting related equipment will be essential.

On the basis of this investigation, the issue of Council being able to manage the forest in a 150m wide zone around the town and key assets needs to be considered. Management in the form of hazard reduction, removal of excessive ground cover, shrub and sucker growth in addition to lopping and selective thinning of mature trees needs to be considered. If a 150m wide managed vegetation zone can be achieved, the potential for a forest fire to reduce to a smaller fire may be achieved as a result of significant reduction in vegetation density whilst retaining the native vegetation and biodiversity values within the 150m management zone. Management within this 150m zone would also retain the landscape characteristics around the town without having a complete clear zone of 50m to 60m adjoining residences and key assets, this losing the ambience of the timbered landscape that has been preserved as part of Warialda.

The plan presented in appendix 5 provides an outline of the recommend 150m managed vegetation zone. The difficulty with this zone is that it is mostly crown land in the form of TSR or part of the Crown Lease held by Council. Current legislation would severely limit the potential for Council to undertake management within this zone due to the statutory limits controlling the departments who manage this crown land. This includes the Local Land Services and Crown Lands. At present, Council has not exemptions to undertaken vegetation management within the crown land to achieve the required protection zone around Warialda.

Obtaining permission to manage this Zone is considered an **urgent** and key outcome if Council is to achieve a suitable buffer around Warialda to be able to protect the town during a significant fire. To date, conversations with Local Land Services and Crown Lands has indicated a significant degree of process and legislative difficulty in allowing Council to obtain permission to establish a 150m wide management zone around the town due to statutory limitations resulting from current legislation including the Biodiversity Conservation Act 2016, the Local Land Services Act 2013 and it is assumed the Crown Land Management Act 2016.

Without the necessary exemptions, these Acts and associated regulations prevent Council from achieving their Duty of Care to protect the township of Warialda from a forest fire event.

6 Recommendations and Actions

The following section provides recommendations for actions to occur to improve the readiness of Warialda during a fire event.

6.1 North Side

The following provides a list of items identified for action on the *northern side* of Warialda.

Table 2: Actions Required for Northern Warialda

Item for Action	Action Required
Eastern Bypass	Maintain a 20m clear zone including lopping of trees and clearing of ground cover.
Northern Power Line Corridor	Clear ground cover and sucker regrowth along edge of corridor to maximise effective fire break width of corridor. Responsibility of Essential Energy and TransGrid.
Northern fire breaks marked on Bush Fire Preparation Map	Maintain the Fire trails marked as Magenta and Yellow on the Bush Fire Preparation Map as critical for fire access and as fire breaks.
Northern electrical substation and critical assets	Create a clear zone of no grass in the form of a fire break road to further protect the substation on Warialda Road and improve the protection of the Council Depot. Liaise with Essential Energy to improve their APZ.
Residences with frontage to woodland areas	Provide residents with frontage (backyards) as identified in this report with information or directions to create appropriate APZs.
Hospital and Aged Care Facility	Ensure that the APZ to the east of the hospital and aged care facility is maintained as short grass to provide a minimum of 60m of clear zone to the adjoining woodland.
Fire Hydrants	Mark key fire hydrants with clear identification and protection structure (posts) and a 10m APZ zone to allow access for emergencies.
Clearing requirements – short term	Council to reviewing clearing of west end of J. A. McGregor Drive (west of Stephen Street) and make a clear zone connection to the north end of Kulaba Avenue.
Council depot	It is recommended that a fire break is formed around the outside of the eastern security fence to allow fire control access in this area.
Open grassland management	Clear and slash grassland between Electricity substation and 161 Warialda Road to formalise northern edge fire break.

6.2 South Side

The following provides a list of items identified for action on the *southern side* of Warialda.

Table 3: Actions Required for Southern Warialda

Item for Action	Action Required
Southern Reservoir	Create a 20m APZ around the southern reservoir by removing shrub growth within the compound and maintaining >10m APZ outside of the boundary fence.

Item for Action	Action Required
Southern Water tower	Create a 20m APZ around the southern water tower by controlling shrub growth within the compound and maintaining >10m APZ outside of the boundary fence.
Southern communication tower	Establish details of what communications it provides and whether an APZ can be established around the facility. (Land located within TSR – Contact LLS) Subject to approval, create a >10m APZ around the structure, including removal of trees within this zone to ensure communication from this facility are maintained during a bushfire. Liaison with Telstra required.
Southern fire breaks marked on Bush Fire Preparation Map	Maintain the Fire trails marked as Magenta and Yellow on the Bush Fire Preparation Map as critical for fire access and as fire breaks.
Fire Hydrants	Mark key fire hydrants with clear identification and protection structure (posts) and a 10m APZ zone to allow access for emergencies.
Clearing of existing tracks	It is recommended that a clear fire break be established along an east-west track to form a connection between the most eastern house on Lot 4 in DP801691 (99 Queen St) and the southern end of Apollo Avenue.

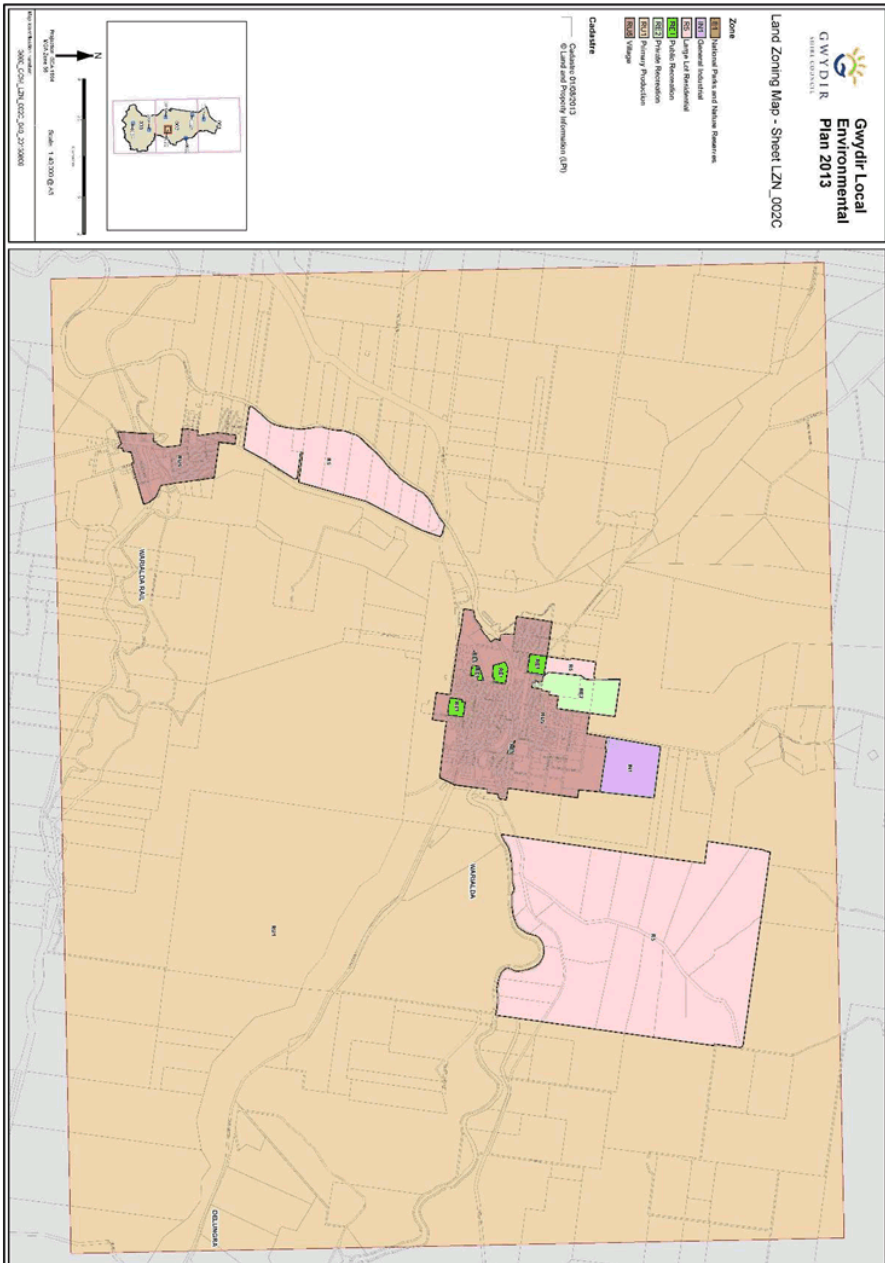
6.3 General Recommendations

The following presents recommendations for general actions to be instigated by Council and the community to improve fire safety and preparedness within the Warialda town area and immediate surrounds.

Item for Action	Action Required
150m Vegetation Management Zone around Warialda	Obtain approvals or exemptions to allow Council to manage the vegetation within a 150m zone around the edge of Warialda residences and key infrastructure from Crown Lands and the Local Land Services.
Evacuation centre equipment	Establish a suitable stockpile of equipment required for an evacuation centre including P2 dust masks, potable water, food, accommodation and communication equipment.
Evacuation signs	Establish sufficiently sized sign posts to direct residents and visitors to the Neighbourhood Safer Place. Signs to provide directions from north and south sides and be highly visible.
Annual inspections	Undertake annual inspections of residences and infrastructure around the edge of the urban and industrial fringe of Warialda to check on fuel loads that may exceed acceptable levels and therefore require management.

Item for Action	Action Required
General maintenance of vegetation within town area – Parks and Warialda Creek	Undertake a review of clearing and management of grass and tree growth within Warialda Creek between Philp Street to the east and the Neighbourhood Safer Place to the west (Captain Cook Park).
Fire Hydrants	Introduce an “Adopt a Fire Hydrant Policy” involving neighbours adjoining a fire hydrant along the edge of a critical fire hazard zone to clear and maintain the visibility of the fire hydrant. Maintain a 10m APZ around fire hydrants on the edge of the residential area.
Local Land Services	Maintain contact with Local Land Services who are responsible for maintaining stock reserves adjoining the town area. Purpose will be to liaise with LLS officers to control fuel loads on reserves by grazing, cold burns or clearing/slashing. The option of including an LLS officer on the Warialda Fire Break Committee should be investigated.
Warialda Fire Break Committee	The Warialda Fire Break Committee to be responsible for maintenance actions identified in this report, including proactive control measures to reduce fuel loads within the town and surrounding area by direct action or maintaining contact with the relevant authorities who are legally obliged to undertake appropriate fire management actions. The committee would also be responsible for operations of the Neighbourhood Safer Place until other authorities (NSW RFS) were required as a result of a fire.

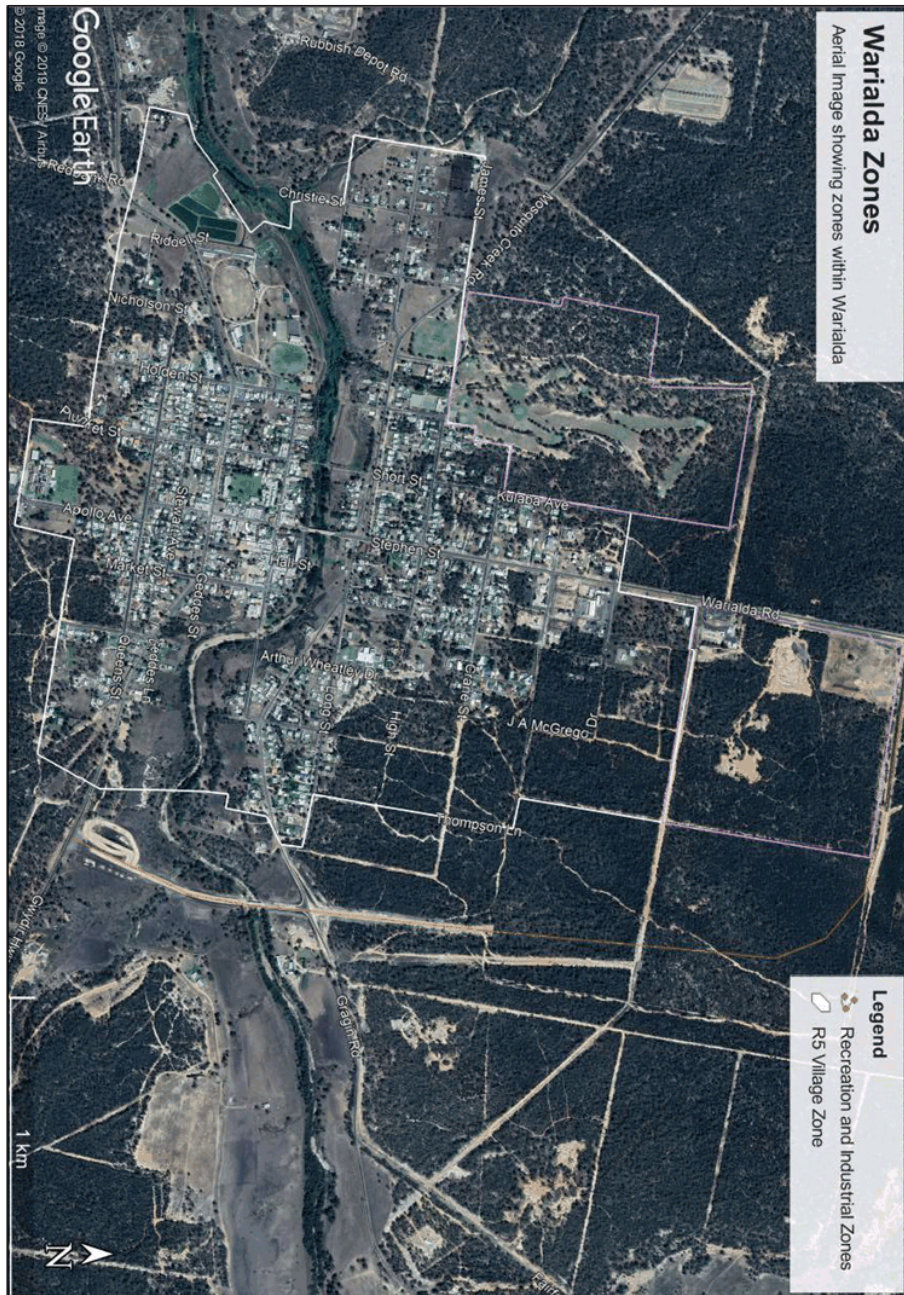
Appendix 1: Land Zoning Map for Warialda



Warialda Fire Break Investigation

Gwydir Shire Council

Figure 14: Aerial Image showing Land Zone Boundaries



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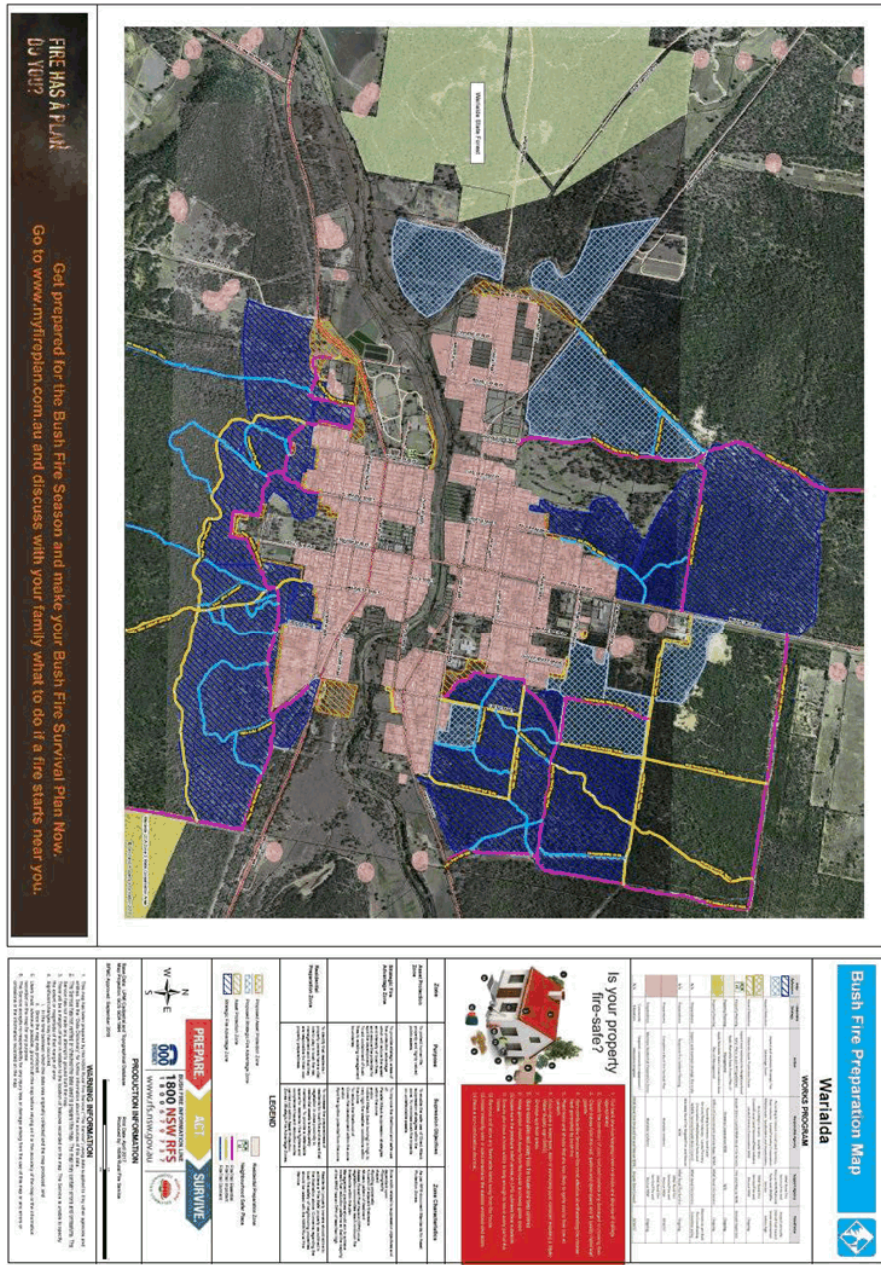
Figure 15: Aerial Image of Warialda with red dots showing fire hydrant locations



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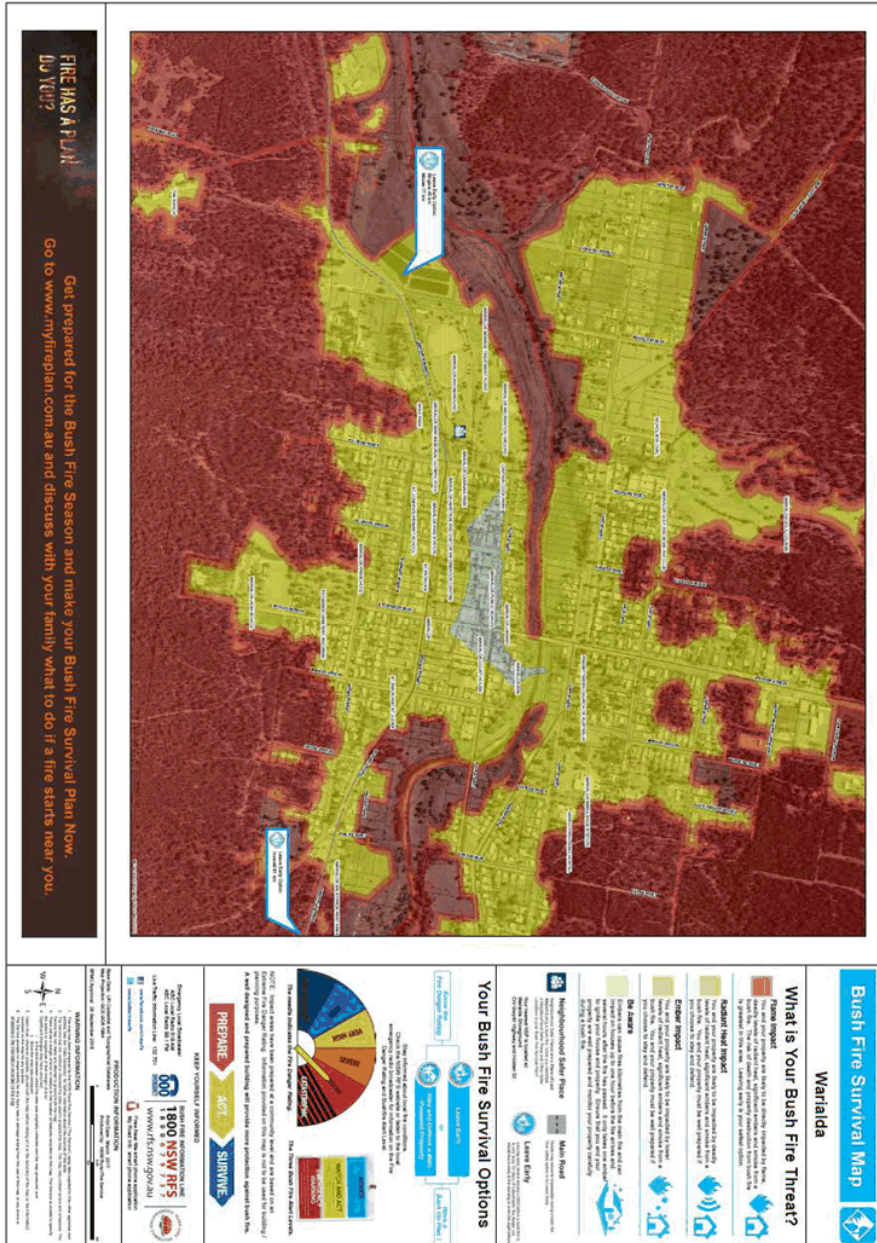
Appendix 2: Current Bush Fire Preparation Map for Warialda



FIRE HAS A PLAN. DO YOU?

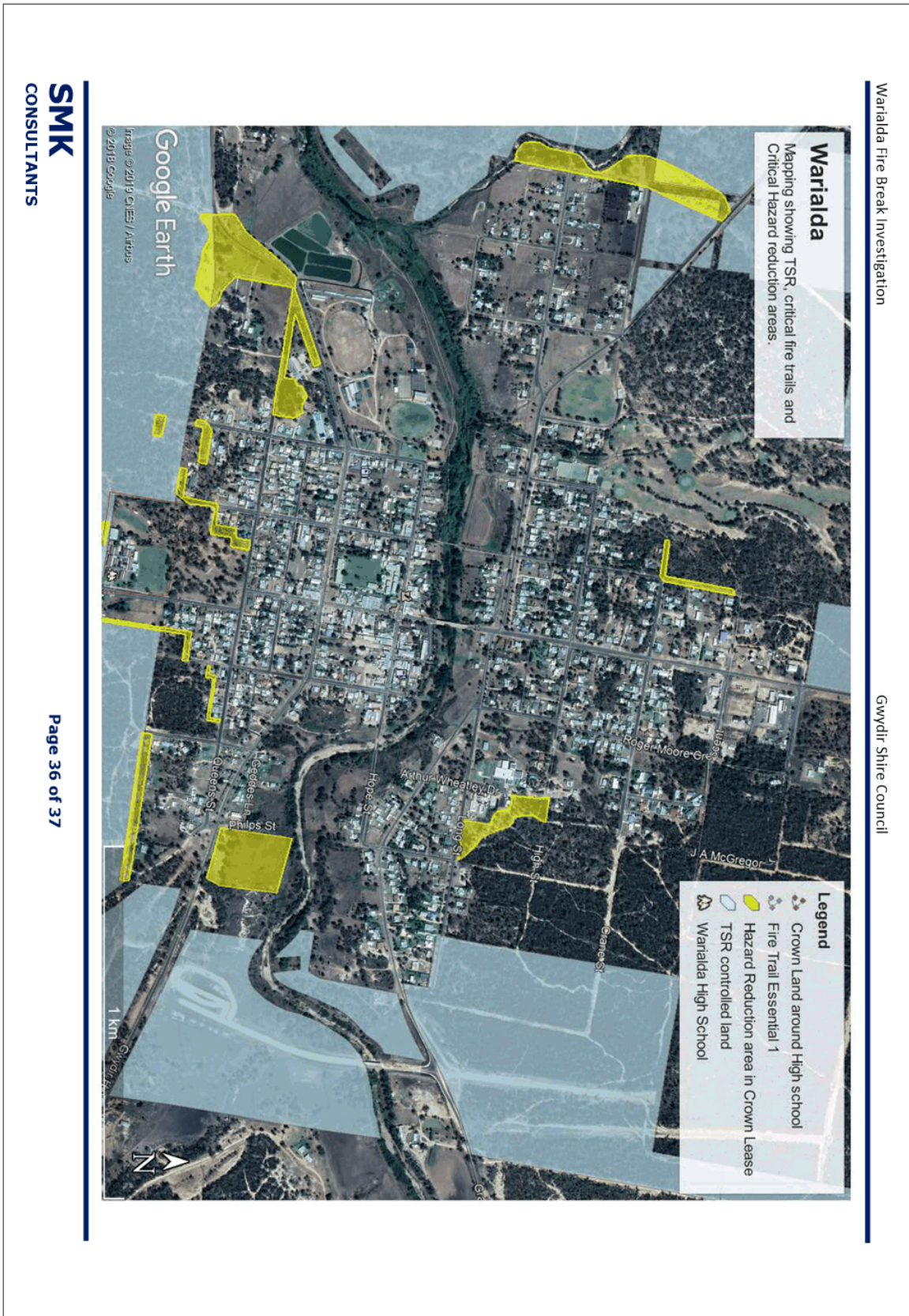
Get prepared for the Bush Fire Season and make your Bush Fire Survival Plan Now. Go to www.myfireplan.com.au and discuss with your family what to do if a fire starts near you.

Appendix 3: Warialda Bush Fire Survival Map



**FIRE HAS A PLAN
 DO YOU?**

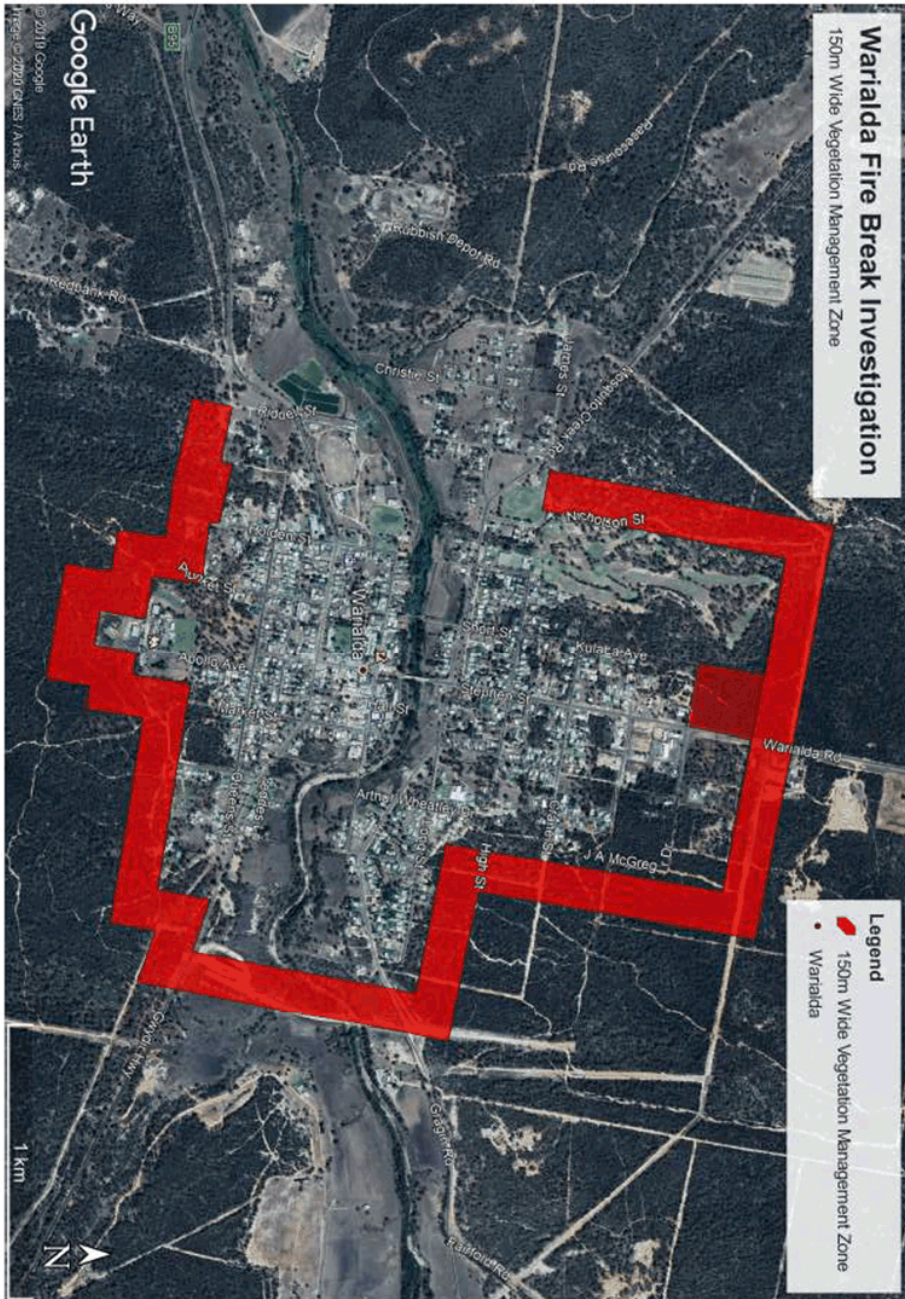
Get prepared for the Bush Fire Season and make your Bush Fire Survival Plan Now.
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Appendix 5: Plan showing 150m Vegetation Management Zone around Warialda



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