Shire of Wagin

West Arthur Bushfire - Disaster Recovery Options for Damaged Roadside Vegetation

Version No.1

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Core Business Australia	**Document:**	West Arthur Bushfire – Disaster Recovery Options for Damaged Roadside Vegetation
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Postal Address PO Box 797 Busselton WA 6280 P: 1800 001 776 E: admin@corebusiness.net.au	**Synopsis:**	This document details options for managing roadside vegetation damaged as a result of the West Arthur Bushfire of January 27 2025

DISTRIBUTION SCHEDULE

Version No.	Date	Distribution	File Name
Version 1	17 February 2025	Issued to Shire of Wagin for Council consideration	1237 Wagin Disaster Recovery Options for Damaged Roadside Vegetation (Ver 1).docx
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Version 4			

Cover: Burnt Roadside Vegetation Warup South Road

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1.0 Introduction

On January 24 2025 a bushfire commenced on Lot 6 Arthur Road, within the Shire of West Arthur, approximately 117m south of Arthur Road near power lines. The fire burnt out approximately 6,726ha of farmland and road reserve, burning a path up to 4km wide over a distance of 23km. The fire burnt into the Shire of Wagin district and most of the fire was contained within the Shire of Wagin (Shire) district.

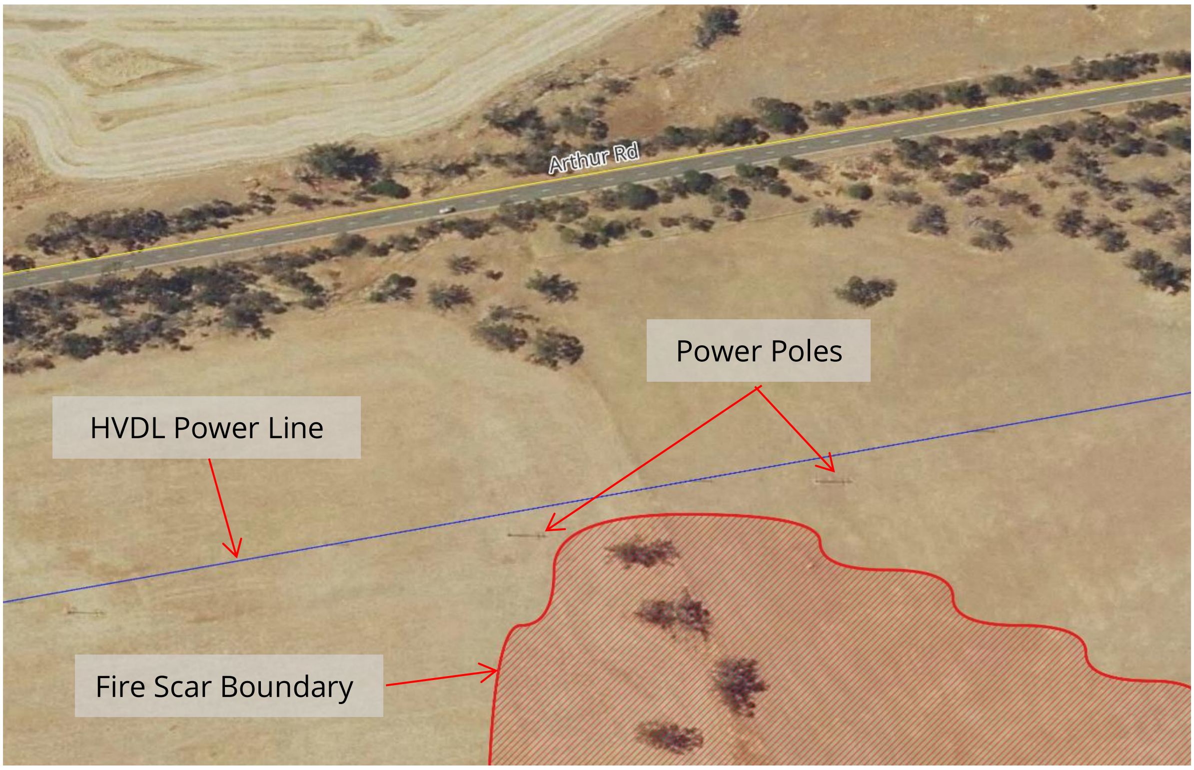

Figure 1: Approximate location where fire commences

The fire burnt through several road reserves which in some places were heavily vegetated with remanent native vegetation. A number of the burnt trees within the road reserve are very large and a danger to public safety due to a risk of falling on the road carriageway.

Several fence lines were burnt in the fire and needing to be replaced however there is concern from landowners that damaged trees along property boundaries might fall and damage repaired fences.

The fire was a Level 2 fire where control of the fire was taken over by the Department of Fire and Emergency Services (DFES). During and shortly after the fire, DFES arranged for several portions of vegetation to be pushed over in order to help halt the spread of the fire or to prevent assessed hazardous trees falling.

Several assessments of roadside vegetation were carried out by DFES Officers to identify hazardous trees and push them over. This occurred until control of the incident was handed back to the Shire. DFES Officers advised that there are still a number of potentially hazardous trees that will require ongoing assessment by the Shire and removal.

Many of the landowners impacted by the fire have expressed concern to elected members and Shire Officers about the remnant, damaged roadside vegetation and the potential for it to fall and potentially injure road users and / or damage repaired fence lines. There appears to be widespread support from impacted landowners for the Shire to totally remove burnt roadside vegetation from roadsides within the burn scar.

This report has been prepared for Council to consider the potential implications and costs of dealing with this issue, to provide options and to assist Elected Members with informed decision making.

2.0 Extent of Damage

As noted in the introduction the fire burnt out approximately 6,726ha of farmland and road reserve, burning a path up to 4km wide over a distance of 23km. Core Business Australia (CORE) obtained recent satellite imagery from the European Space Agency (ESA), Sentiel-2 satellite.

Sentinel-2 provides high-resolution images in the visible and infrared wavelengths, to monitor vegetation, soil and water cover, inland waterways and coastal areas and has spatial resolution: 10m, 20m, and 60m, depending on the wavelength. Revisit time to that same location on earth is 5 days so makes it ideal for land-cover maps, land-change detection maps, vegetation monitoring and monitoring of burnt areas. Figure 1: Approximate location where fire commencesFigure 1 shows the burn scar for the West Arthur bushfire as captured by Sential-2 on February 6 2025.

2.1 Road Reserve Area Impacted by Fire

GIS analysis was undertaken to identify the extent of road reserve damages by the fire. From this analysis it was identified that 61.69ha of road reserve was impacted by the fire as follows;

Road Name	Area
Warup Road South	3.02ha
Warup Road South	11.89ha
Baufort Road	7.78ha
Queerearrup Road	0.24ha
Queerearrup Road	0.04ha
Queerearrup Road	0.11ha
Queerearrup Road	0.09ha
Queerearrup Road	0.04ha
Queerearrup Road	9.83ha
Norring Dellyanine Road	12.06ha
Dellyeline Road North	8.32ha
Harris Road	8.27ha
Total	**61.69ha**

Table 1: Area of Road Reserves within the Fire Scar

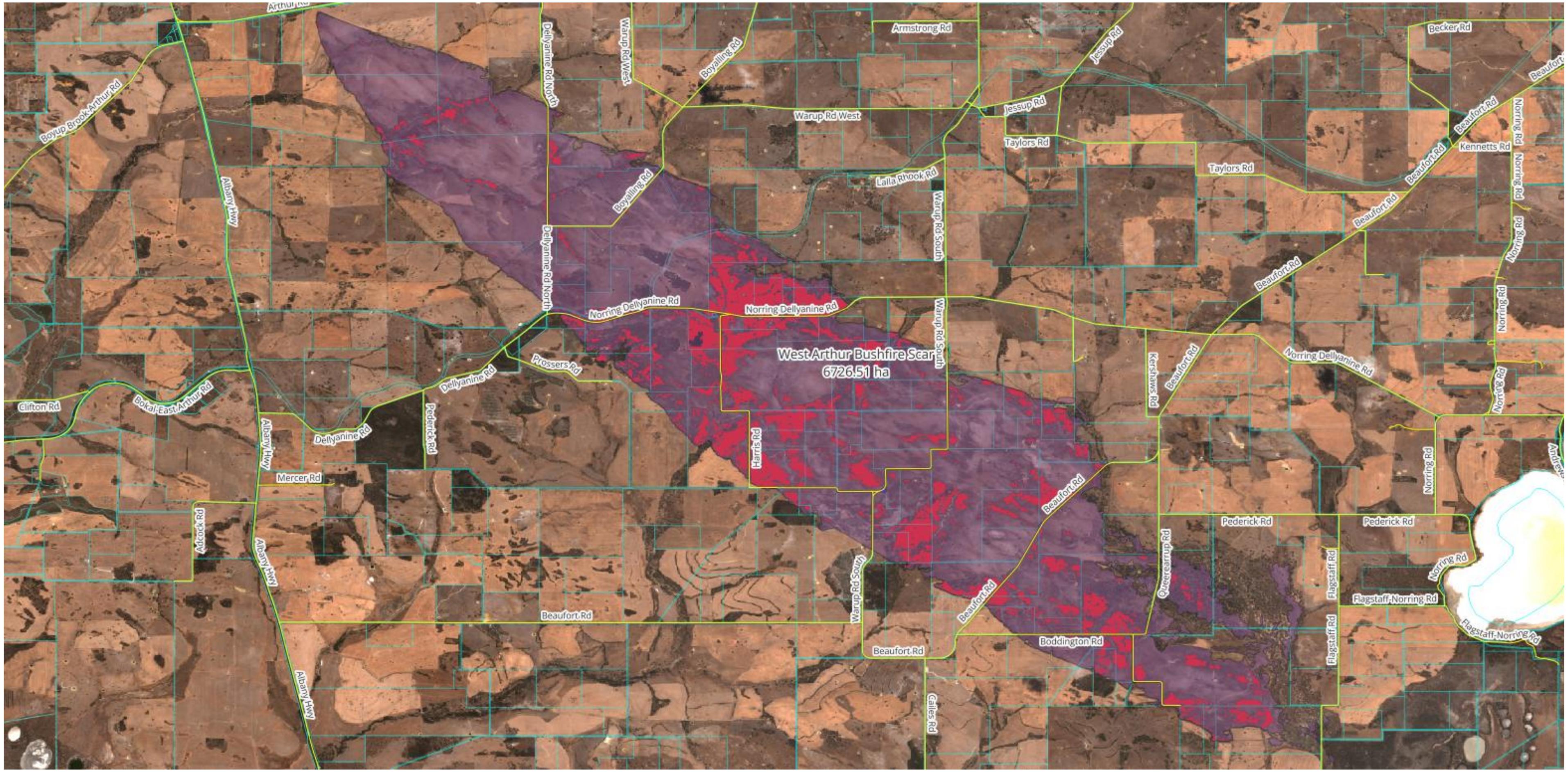

Figure 2: West Arthur Bushfire Scar Source ESA Sentinal-2 Satellite imagery 6/02/2025

Note that the GIS model has been set up to do more detailed analysis if required, dependent upon the options the Shire select. For example, a more detailed assessment of the hi res video to classify trees can be down with time permitting in order to refine the cost estimate and may be helpful when preparing a specification for engaging contractors in order to guide pricing.

2.2 Road Pavement Area Impacted by Fire

Roads were then overlaid the fire scar area and the length of road within the damaged road reserves and approximate area of the road pavement was calculated as follows;

Road Name	Road Length	Road Area
Dellyanine North Road	4.12km	2.47ha
Boyalling Road	2.52km	1.51ha
Norring Dellyanine Road	5.37km	3.22ha
Harris Road	2.15km	1.29ha
Warup Road South	4.71km	2.83ha
Harris Road	4.12km	2.47ha
Beaufort Road	3.71km	2.23ha
Queerearrup Road	0.12km	0.07ha
Queerearrup Road	0.02km	0.01ha
Queerearrup Road	0.04km	0.02ha
Queerearrup Road	0.06km	0.04ha
Queerearrup Road	0.02km	0.01ha
Queerearrup Road	2.78km	1.67ha
Boddington Road	2.04k	1.22ha
Total	**31.78km**	**19.07ha**

Table 2: Approximate Area of Road Pavements with the Fire Scar Area

Note that road width varies within the fire scar area and while there are some wide roads there are also some narrow roads therefore and average width of 6m was selected. Estimates contained within this report can be refined further if a more acuate measure of each road width were used.

2.3 Area of Remanent Roadside Vegetation Impacted by Fire

To calculate the area of remanent vegetation contained within the road reserve and impacted by fire, the area of road pavement was subtracted from the area of road reserve which resulted in an area of **42.62ha** of burnt roadside vegetation.

2.4 Quantity of Timber within the damaged Roadside Vegetation

From inspection it appears that approximately 1/3rd of the area of impacted vegetation is high density vegetation with large trees while another 1/3rd is medium density and the remaining third low density or no vegetation. CORE has undertaken a hi definition, geolocated video capture of the impacted roads however time has not allowed detailed assessment of the road sides to better classify vegetation density. Estimates contained within the report would benefit from a detailed assessment of vegetation density within the burn scar area.

According to the Department of Agriculture, Fisheries and Forests Snapshot of Australia's forest industry, Australian bushland varies in timber density from 100m³ to 300m³ per hectare. For this exercise, it has been assumed that high density vegetation yields along the Wagin roadside average 200m³/ha, medium density 100m³/ha and low density 50m³/ha.

On that basis, to clear all road-side vegetation within the burn scar area would require the removal and disposal of 4,973m³ of timber (~6,000 tonne of timber).

High Density	Medium Density	Low Density	Total
200m³/ha	100m³/ha	50m³/ha	
14.21ha	14.21ha	14.21ha	42.62ha
2,841m³/	1,421m³/	710m³/	4,973m³

Table 3: Estimate of Total Quantity of Timber within the damaged roadside vegetation

Say 5,000m³ of timber and vegetation matter to be disposed of.

3.0 Options for Clearing Burnt Roadside Vegetation

There are four options to clear burnt roadside vegetation as follows;

Option 1 – Clear all vegetation located with the road reserve area and within the burn scar area.

Option 2 – Clear identified hazardous vegetation located along the roadside and along fence lines.

Option 3 – Clear identified hazardous vegetation located along the roadside only

Option 4 – Do nothing

Within each option, there are a number of sub options.

3.1 Option 1 – Clear all Roadside Vegetation with the Burn Scar Area

While it is understood that this may be the preferred option for a number of adjoining land owners impacted by the fire, however there are a number of constraints associated with this option such as the need to comply with the Environmental Protection Act 1986 (EP Act) and the Aboriginal Heritage Act 1972. Both would require detailed assessment and approval prior to clearing. Whilst the EP Act includes some exemptions for roadside clearing, the only scenario that may qualify for roadside clearing in this instance would be on the basis of the clearing being a safety issue.

Under the EP Act, the onus is on the person doing the clearing to make the case it is being done for safety reasons. That could certainly be the case in relation to trees that are assessed as being hazardous to public safety but it is doubtful it could be argued in relation to all trees.

To obtain approval for a clearing permit to completely clear all verges within the burn scar would required the engagement of a specialist consultant to undertake a flora and fauna survey and report to support an application to the Department of Water and Environmental Regulation. The Shire would need to allow 4 to 6 weeks for the Flora and Fauna report and then 2 to 3 months for assessment, public advertising and approval (as a minimum). The application will need to be supported by land owner approval which in the case of a road reserve is the Department of Planning, Land and Heritage plus it may need to be supported by Aboriginal Heritage Impact Assessment and Native Title Holder approval.

Therefore, if Option 1 was Council's preferred option, in the first instance, at least Option 3 should be implemented followed by Option 1 following all approvals.

Assessment of a clearing permit application will likely be held in higher regard if Council's chosen disposal option is not to simply push cleared material onto private land and have land owners dispose of it by burning.

A better option would be to transport the cleared material to one or two strategic locations, contract a tub grinder and grind the material and then respread the ground material on the road verges from where it came.

Dependant upon the model of machine, tub grinders can process approximately 150m^3 to 300m^3 per hour. So to grind an estimated 5,000m^3 of timber and vegetation matter, would likely take between 16 and 33hrs (2 to 4 days). Wet hire of a tub grinder would be in the order of $6,000/day. Therefore, with mobilisation, relocation and demonisation the cost of a tub grinder would be in the order of $30 - $36,000.

Estimated cost of Option 1 is as follows;

Initial Hazard Reduction Clearing				
Item	**Rate**	**No**		**Cost/hr**
Traffic management	$ 150.00	1		$ 150.00
Wheeled excavator	$ 170.00	1		$ 170.00
Semi Rear Tipper	$ 175.00	2		$ 350.00
Labourer with Chainsaw	$ 75.00	2		$ 150.00
Labourer & Ute	$ 125.00	1		$ 125.00
			Cost per hour	$ 945.00
			Cost per 10hr day	$ 9,450.00
Production rate of 2km/day (one side of the road) i.e 2 x			31.78km	$ 300,321.00
Mobilisation and Demobilisation				$ 18,900.00
Total Estimated Cost of Initial Hazard Reduction Clearing				**$ 319,221.00**

Campaign Clearing of Remaining Vegetation				
Item	**Rate**	**No**		**Cost/hr**
Traffic management	$ 150.00	1		$ 150.00
Wheeled excavator	$ 170.00	1		$ 170.00
Semi Rear Tipper	$ 175.00	2		$ 350.00
Labourer & Ute	$ 125.00	1		$ 125.00
			Cost per hour	$ 795.00
			Cost per 10hr day	$ 7,950.00
Production rate of 1km/day (one side of the road) i.e 2 x			31.78km	$ 505,302.00
Mobilisation and Demobilisation				$ 15,900.00
Total Estimated Cost of Campaign Clearing of Remaining Vegetation				**$ 521,202.00**

Grinding and respreading of Cleared Material				
Tub Grinder				$ 36,000.00
Respread ground material				
Item	**Rate**	**No**		**Cost/hr**
Traffic management	$ 150.00	1		$ 150.00
Loader	$ 160.00	1		$ 160.00
Semi Side Tipper	$ 175.00	2		$ 350.00
Skid Steer Loader	$ 140.00	1		$ 140.00
Labourer & Ute	$ 125.00	1		$ 125.00
			Cost per hour	$ 925.00
			Cost per 10hr day	$ 9,250.00
Production rate of 2km/day (one side of the road) i.e 2 x			31.78km	$ 293,965.00
Mobilisation and Demobilisation				$ 18,500.00
Total Estimated Cost of Grinding and Respreading Material				**$ 348,465.00**

	Total Estimated Cost of Works	**$ 1,188,888.00**
	Specialist Sub Consultants (Flora & Fauna Report)	$ 30,000.00
	Supervision & Project Management @ 25%	$ 304,722.00
	Contingency @ 5%	$ 76,180.50
	Total Estimated Cost Option 1	**$ 1,599,790.50**

Note, there is no allowance for Aboriginal Heritage Surveys or Native Title Approvals. These will need to be confirmed.

3.2 Option 2 - Clear identified hazardous vegetation located along the roadside and along fence lines

As there is an exemption under the EP Act for roadside clearing for safety issues, selected clearing of identified hazardous trees along the roadside would likely be an exemption. This exemption may be able to be extended to trees along the fence line on the basis that landowners are often working on fences and hazardous trees are a danger to workers, working on fences. However the Shire is recommended to undertake a risk assessment in relation to each individual tree to be cleared. There is also exemption for clearing for fence lines however the fence lines are all in so it would be difficult to utilise this provision.

Hazard Reduction Clearing of Road & Fenceline				
Item	**Rate**	**No**		**Cost/hr**
Traffic management	$ 150.00	1		$ 150.00
Wheeled excavator	$ 170.00	1		$ 170.00
Semi Rear Tipper	$ 175.00	2		$ 350.00
Labourer with Chainsaw	$ 75.00	2		$ 150.00
Labourer & Ute	$ 125.00	1		$ 125.00
			Cost per hour	$ 945.00
			Cost per 10hr day	$ 9,450.00
Production rate of 1km/day (one side of the road) i.e 2 x			31.78km	$ 600,642.00
Mobilisation and Demobilisation				$ 18,900.00
Total Estimated Cost of Initial Hazard Reduction Clearing				**$ 619,542.00**
			Total Estimated Cost of Works	**$ 619,542.00**
			Supervision & Project Management @ 25%	$ 154,885.50
			Contingency @ 5%	$ 7,744.28
			Total Estimated Cost Option 1	**$ 782,171.78**

3.3 Option 3 – Clear identified hazardous vegetation located along the roadside only

Similar to Option 2 however only clearing identified hazardous trees along the roadside.

Option 3				
Hazard Reduction Clearing of Road & Fenceline				
Item	**Rate**	**No**		**Cost/hr**
Traffic management	$ 150.00	1		$ 150.00
Wheeled excavator	$ 170.00	1		$ 170.00
Semi Rear Tipper	$ 175.00	2		$ 350.00
Labourer with Chainsaw	$ 75.00	1		$ 75.00
Labourer & Ute	$ 125.00	1		$ 125.00
			Cost per hour	$ 870.00
			Cost per 10hr day	$ 8,700.00
Production rate of 2km/day (one side of the road) i.e 2 x			31.78km	$ 276,486.00
Mobilisation and Demobilisation				$ 17,400.00
Total Estimated Cost of Initial Hazard Reduction Clearing				**$ 293,886.00**
			Total Estimated Cost of Works	**$ 293,886.00**
			Supervision & Project Management @ 25%	$ 73,471.50
			Contingency @ 5%	$ 3,673.58
			Total Estimated Cost Option 1	**$ 371,031.08**

4.0 Option 4 – Do Nothing

While do nothing is always an option, in the longer term it would likely not be acceptable to the community both from a safety and amenity point of view. However, the Shire could work with individual landowners to address each area on a case by case basis.

Already it can be seen that some landowners have resources and are proactive and have already got in a cleaned up a lot, including the road verge while others have not done anything and may be waiting for the Shire to do something or simply don’t have the time, equipment or resources to tackle the job.

One of the risks with Options 1, 2, and 3 is that the Shire commits significant resources and by the time it’s implemented, the landowner has done the work themselves. Hence, whatever Option the Shire selects, it needs to work closely with each individual landowner and agree who is going to do what and document it. Options 2 & 3 rely on cleared material being stockpiled on private property and the landowner then disposing of the stockpiled material. Our understanding to date is that these agreements with landowners have been verbal. It is highly recommended that the Shire formalise these agreements in writing before proceeding.

5.0 Funding Options

One source of potential funding is DRFAWA. The purpose of DRFAWA is to assist local governments with the additional cost (over and above their own capacity) to repair / reconstruct essential public assets (EPA's) following a declared natural disaster.

The Australian Government defines EPA's as;

Transport	Roads Road infrastructure (including footpaths, bike lanes and pedestrian bridges) Bridges Tunnels Culverts
Public Infrastructure (Health, Education, Justice, Welfare)	Public hospitals Public schools Public housing Prisons/correctional facilities Police, fire and emergency services' stations Levees State/territory or local government offices Stormwater infrastructure

Roadside vegetation is not classified as an EPA and is ineligible for DRFAWA funding, however cleanup of identified hazardous roadside vegetation to protect the road (which is an EPA) is eligible however it need to be clearly documented that the tree is hazardous to the road, i.e. will fall on the road and not on the verge. Essentially, each tree to be removed and cost claimed against DRFAWA needs to be photographed and assessed as being hazardous to the road.

Also, DRFAWA is only for activated natural disasters and is not to be used as an alternative for insurance. There are media reports that fire may have resulted from a power line failure and when looking at the burn scar proximity to the power lines it appears (but not proven) that the source of the fire may have been the result of powerline failure in which case the fire being the result of a natural disaster may be questionable and hence the event may not be activated.

However, given that there does appear to be some indication that the source of the fire may have been a power line failure, the Shire may be better to pursue recovery funding through and insurance claim if it can be substantiated that the fire started from a powerline failure that was foreseeable and as a result of a lack of maintenance. However before heading down that path, it would be wise to seek specialist legal and insurance advice before committing funds.

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