BAL Assessments

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Norton Rose Fulbright Australia
Level 15, RACV Tower,
485 Bourke Street, Melbourne
Att: Victoria Vilagosh
victoria.vilagosh@nortonrosefulbright.com;
jessica.kaczmarek@nortonrosefulbright.com;

15 August 2019

Dear Victoria

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

This report has been prepared as a bushfire risk assessment to guide the design stages for a planned subdivision and development of four existing lots in Waurn Ponds, City of Greater Geelong.

The lots covered by this assessment (the site) are:

- Lot 1 TP77822
- Lot 4 PS644553
- Lot 1 PS716122
- Lot 2 PS716122

I inspected the site on 11 August 2019

I believe that the subject properties can be developed in a way that successfully meets the policies as detailed in the Planning Policy Framework (PPF) clause 13.02. The bushfire risk to this site is low and is less than large parts of Victoria. With the required measures in place development is appropriate.

The proposed development will have a mix of lots for residential dwellings as well as a Park and a natural green area along the waterway running through the site. All the subject lots are currently zoned as Farming Zone and amendment C372 proposes to rezone the land to General Residential Zone..

Under the Planning Policy Framework clause 13.02, land within a designated Bushfire Prone Area (BPA); subject to a Bushfire Management Overlay (BMO); or "*proposed to be used or developed in a way that may create a bushfire hazard*" have to be able "*To strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.*" Furthermore the Operation of the Planning Policy Framework clause 71.02-3 states in part "*..... However in bushfire affected areas, planning authorities and responsible authorities must prioritise the protection of human life over all other policy considerations.*"

The subject property is in a designated Bushfire Prone Area. The subject property is not in a Bushfire Management Overlay Area. The subject property will not be subject to development that may create a bushfire hazard ie such as would a plantation.

Proposals at the "settlement" scale have to be able to achieve defendable space for a BAL-12.5 (viz. less than 12.5 kilowatts/square metre of radiant heat flux (RHF)) under AS3959 *Construction of Buildings in Bushfire-prone Areas* (Standards Australia, 2018) for all subsequently created building envelopes. In accordance with Planning Advisory Note 68 (March 2018) the application that is the subject of this review is of a "Settlement Planning" nature where BAL-12.5 is required to be achieved. This application can comply with all 13.02 settlement planning requirements.

The methodology used for this report was to assess the approximately 3km of the perimeter of the proposed development both by physical on the ground inspection, review of publically available aerial photos, maps and other information then assign, in accordance with AS3959-2018, to discrete sections, the relevant vegetation classification and topography under the classifiable vegetation for vegetation **off** the site but within the 100m assessment zone that applies under AS3959. I then have assigned to these sections the required defendable space, in accordance with AS3959, by which any dwelling building envelope must be setback from the perimeter of the development to achieve a BAL-12.5 construction rating and no more than the allowable radiant heat flux. This "*defendable space*" is in effect a **Building Exclusion Zone** and can be made up of perimeter roads, common areas such as maintained sports ground/playgrounds and building setbacks on individual lots as well as maintained buffer zones (if required). Defendable space is a fuel reduced zone with restrictions on surface & elevated fuels ie vegetation as well as canopy cover.

The site can substantially be broken down into two parts from a bushfire perspective:

i. Firstly we have the north and east aspects that are made up of developed and managed and maintained residential properties, along with an electricity suppliers' substation in the north-east corner. These areas are all Low Threat and no building setbacks are required.

ii Secondly I needed to investigate more thoroughly the south-east boundary along the rail line, the south-west boundary and the freeway road verge, the larger grassed pocket in the very south-west corner of the site and finally the west boundary and the freeway road verge

The south-east boundary bordering the rail line has an area of approximately 15m before the rail line, this area, at the time of inspection, contained very low grass such that it was Low Threat. It presumably had been slashed at some time however the frequency and reliability of this has not been established such that I must allow some caution here. Following the 20m rail corridor is an area of unmanaged grassland however I believe the rail line provides a sufficient fuel break (19m on flat ground for BAL-12.5), however if the grass on the property side of the rail line does become long it will be extremely susceptible to embers from a fire in the Grassland to the south.

The south-west boundary and the steep upslope of the freeway road verge appear to have been left unmanaged and by its nature I believe will remain in a relatively low threat condition. However here again long grass build up may be an issue.

The larger grassed pocket in the very south-west corner of the site; this is the most hazardous area of the site from a fire perspective yet I could not call it a bushfire threat. This pocket is in a small, relatively well defined area with the flat ground of less than 1ha, not counting the steep embankment where the grass is naturally short. This pocket is an area where the grass has the potential to become long.

Finally the west boundary and the freeway road verge; the road verge is not as steep an upslope as it is on the south boundary and it supports more grass however once again it is still a very narrow band. It contains between the embankment and the site a rudimentary access track and for part of its length a concrete walking track.

A fire in any of the areas described above will only cause localised flaming with flame impact on any directly adjacent buildings. There will also be ember impacts and some low level radiant heat impacts. However this will not have the same level of impact as direct flame contact from a bushfire front or a BAL-FZ exposure.

Considering the level and length of time of exposure from any minor fire along these boundaries I believe that these areas should not be classed as a "classifiable" vegetation hazard under AS3959

However to be conservative and as an additional layer of redundancy I recommend a 1.8m (minimum) high Colorbond fence be build hard against the ground ie no treated pine plinth or unnecessary gap, along all of the south and west boundaries.

Refer also to the CSIRO test results later in this report on the fire resistance of a Colorbond fence in a 30 minute test which showed reduced radiation levels to below 5 kW/m2 immediately behind the fencing system and a reduction in the radiant heat exposure on a structure nine meters from the fencing by at least a factor of two.

The reason the vegetation on the site was not taken into account is that this vegetation will likely be removed during development and I recommend be required to be managed in any event. Care must be taken if any vegetation pockets are left on the site that these do not become assessable classified vegetation under AS3959. This report is based on all the vegetation on the site being reduced to the enclosed vegetation management standard for Defendable Space.

As unmaintained Grassland is a classifiable vegetation hazard under AS3959 it is important if staged development of the project is planned that the grass on the underdeveloped section(s) of the site is managed to the defendable space standards set out in this report and this can be managed by a planning permit condition. If not any remaining vegetation could be a hazard to the early stages of development and prevent the principles of PPF 13.02 being obtained.

This report includes Bushfire Hazard Site Assessment and a Bushfire Hazard Landscape Assessment

The proposed Planning Permits contain standard CFA conditions to comply with the following fire fighting water supply and access requirements for new subdivisions and these are acceptable:

CFA Requirements for Water Supplies and Access for Subdivisions in Residential Zones

Requirements detailed in this document do not guarantee survival of the buildings or the occupants in a bushfire event for reasons including, as detailed in the foreword to AS 3959-2018 *Construction of Buildings in Bushfire-prone Areas*, the degree of (future) vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions. The occupants are strongly encouraged to develop and practice a bushfire survival plan and in accordance with CFA advice a policy of "leave early" is always recommended

Should you require further information or have any questions with regard to any of the enclosed information please contact John on 0417 885 747.

Yours Sincerely

John Burke

John Burke

BAL Assessments

Attachments: Planning and Property Information / Subdivision Master Plan / Colorbond Fencing / Site Maps / Bushfire Hazard Landscape Assessment / Bushfire Hazard Site Assessments / Defendable Space Vegetation Management requirements / Site Photos / Analysis of PPF 71.02-3 and 13.02

*For more information regarding our methodology please visit **www.BAL.net.au***
We work all over Victoria and specialize in:

*Simplified Procedure for determining the **BAL - Method 1***
Bushfire Prone Areas up to 20 degrees slope
*Detailed Method for determining the **BAL - Method 2** (Appendix B)*
(Method 2 is a complex methodology and can be used for steeper sites)
*Bushfire Management Overlay (**BMO**) – Site, Vegetation and Hazard assessments*
*Bushfire Risk Assessments under **PPF 13.02***
***Experts' reports** for VCAT, the Building Appeals Board and Panel Hearings*

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Planning and Property Information

Address: 35 HAMS ROAD WAURN PONDS 3216
Lot and Plan Number: Lot 1 TP77822
Standard Parcel Identifier (SPI): 1\TP77822
Local Government (Council): GREATER GEELONG **Council Property Number:** 228582
Directory Reference: Melway 464 H10

Address: 69-93 HAMS ROAD WAURN PONDS 3216
Lot and Plan Number: This property has 3 parcels. See table below.
Standard Parcel Identifier (SPI): See table below.
Local Government (Council): GREATER GEELONG **Council Property Number:** 219868
Directory Reference: Melway 464 G10

Parcel Details

Lot/Plan or Crown Description	SPI
Lot 4 PS644553	4\PS644553
Lot 1 PS716122	1\PS716122
Lot 2 PS716122	2\PS716122

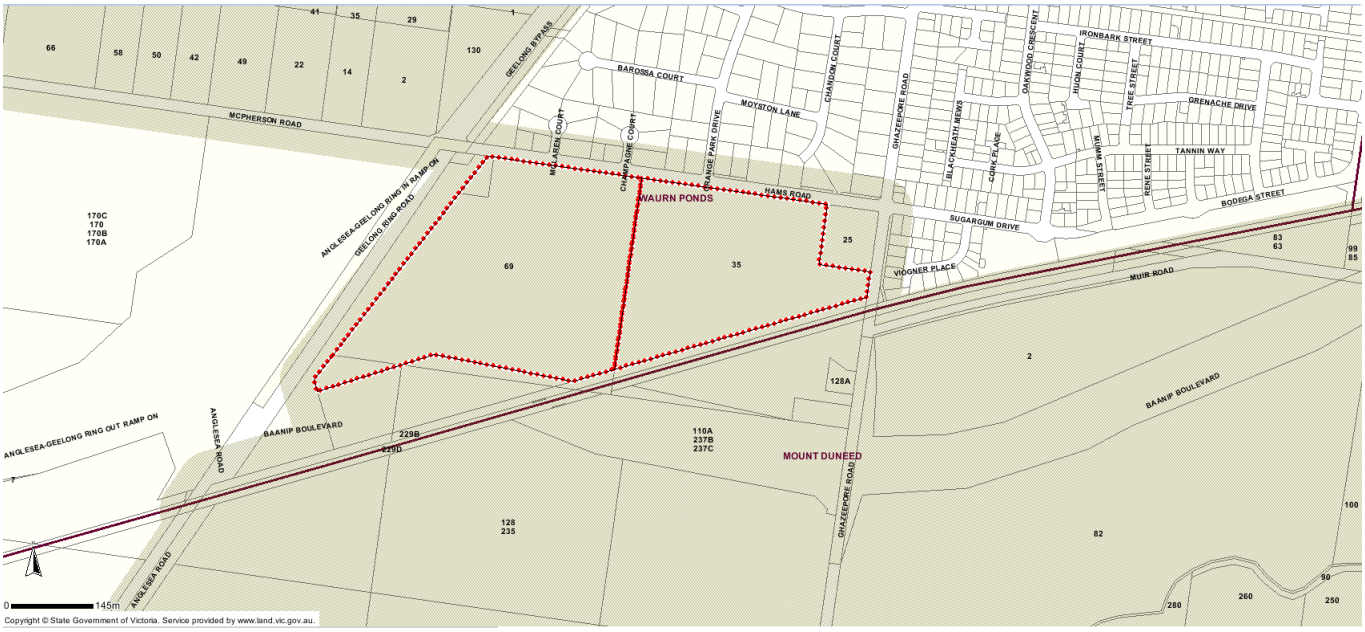
Planning Zone Summary

Planning Zone: FARMING ZONE (FZ)
SCHEDULE TO THE FARMING ZONE (FZ)

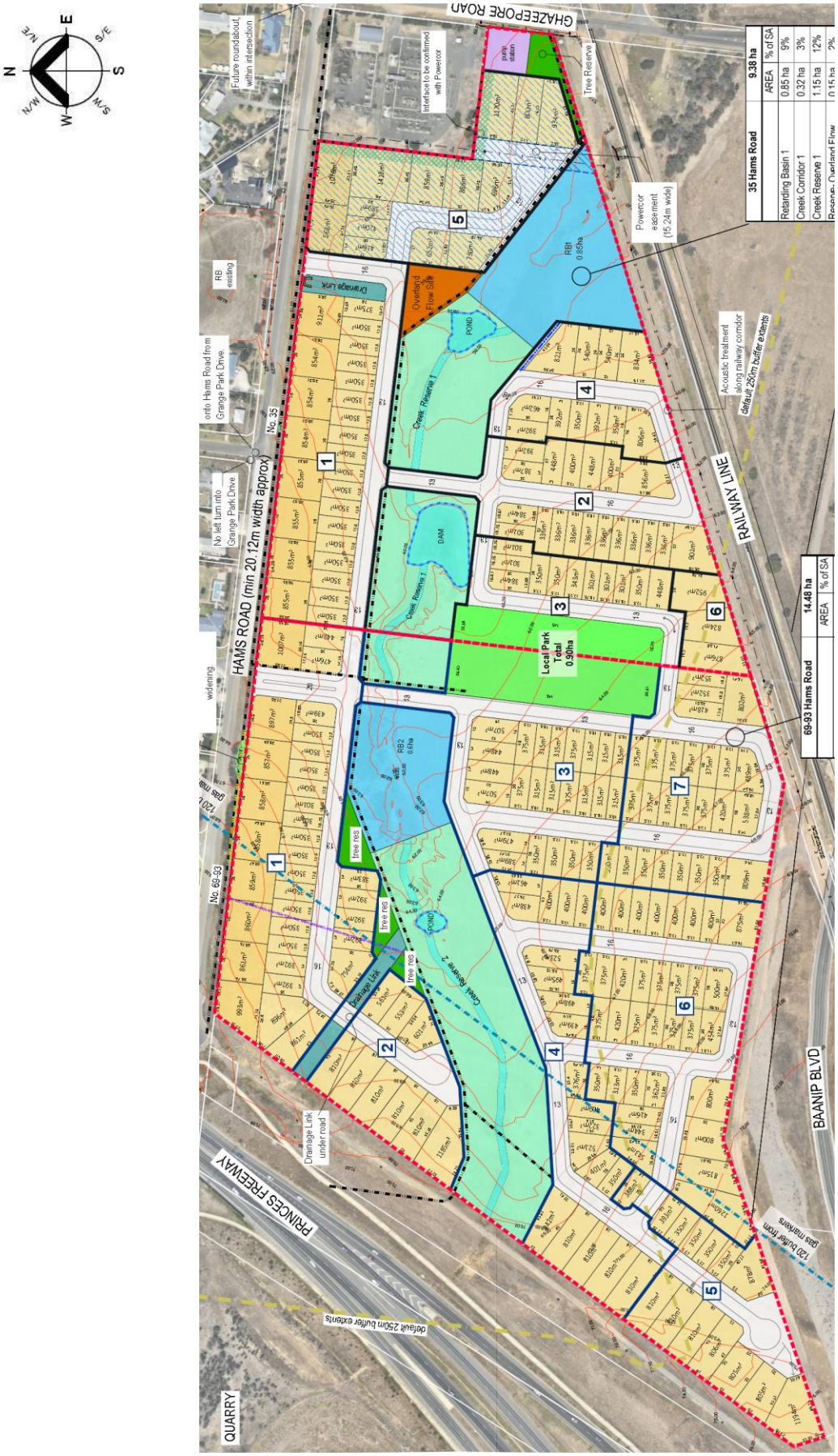
Planning Overlay: None

Areas of Aboriginal Cultural Heritage Sensitivity:
All or part of this property is an 'area of cultural heritage sensitivity'.

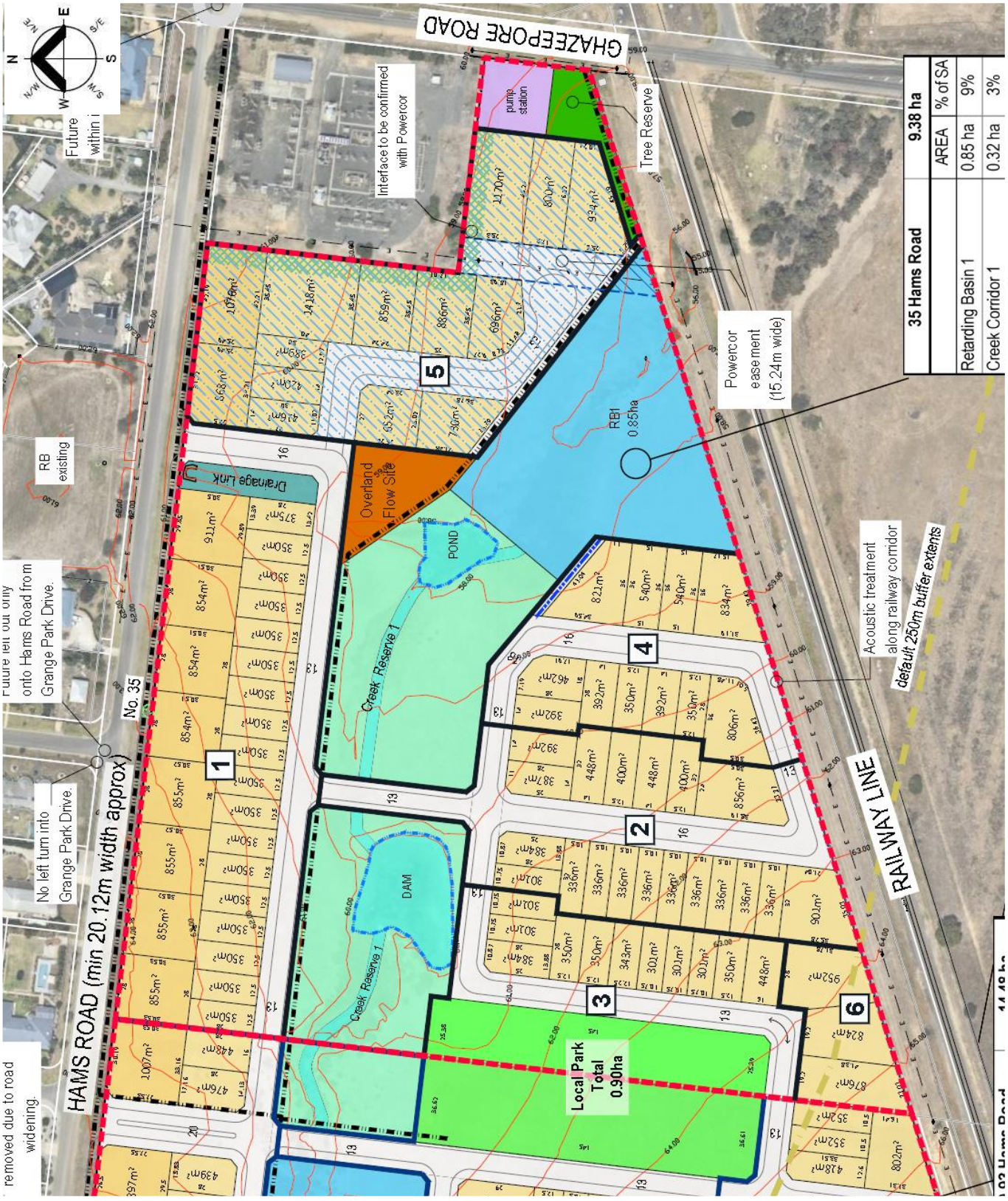
Designated Bushfire Prone Area (BPA)



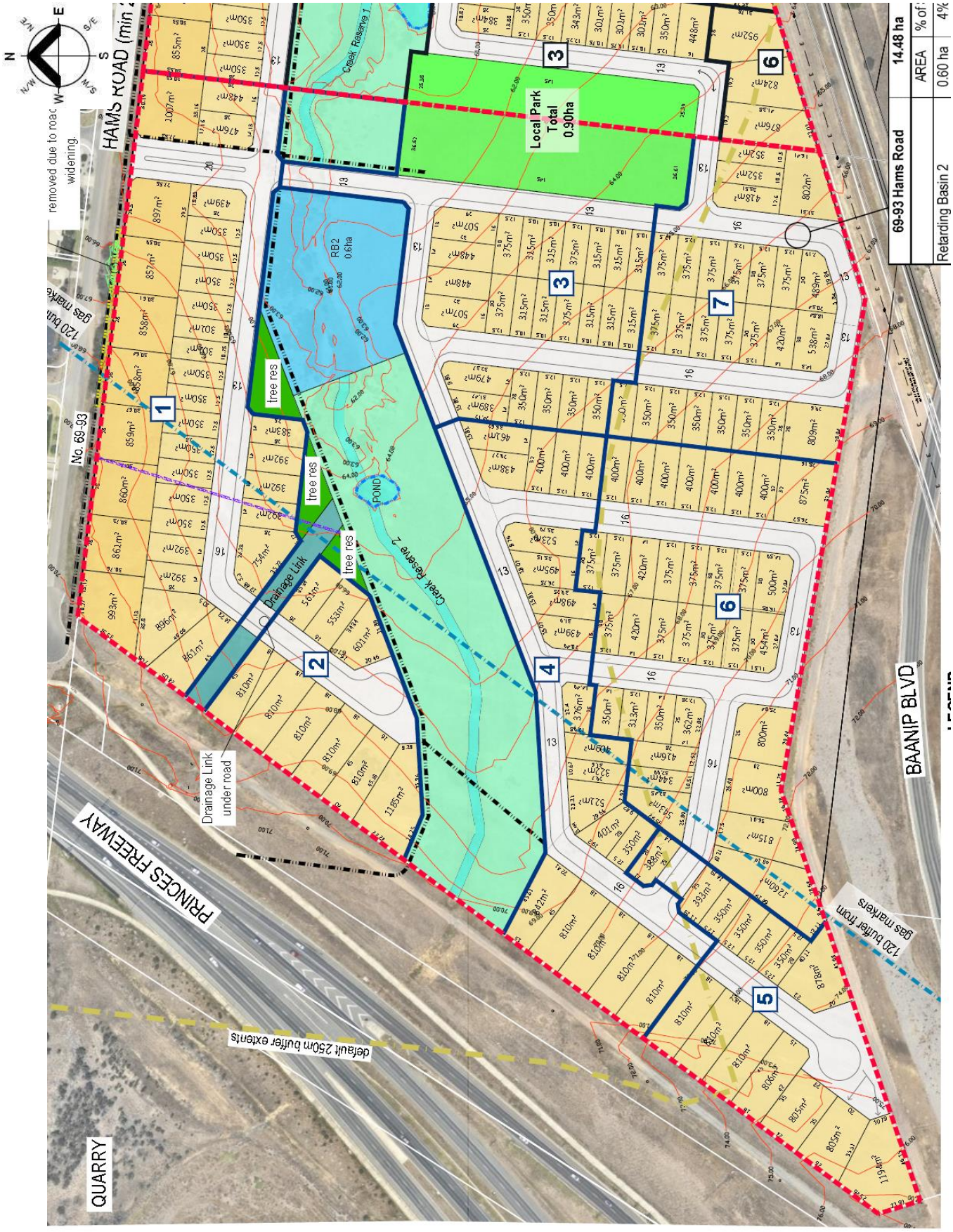
Overall Subdivision Master Plan



Subdivision Master Plan #35 Hams Rd



Subdivision Master Plan #69-93 Hams Rd



bushfire CRC

RESEARCH AND INVESTIGATION INTO THE PERFORMANCE OF RESIDENTIAL BOUNDARY FENCING IN BUSHFIRES

A recent testing project involving the Co-operative Research Centre for Bushfire (Bushfire CRC) and the CSIRO has revealed that different types of fencing can play an important part in defending homes against the threat of bushfire.

The research project was conducted in the NSW Rural Fire Service Experimental Testing Site at Mogo on the south coast of NSW, at what is believed to be the only bushfire simulator of this type in the world.

The research investigated the effects of typical Australian bushfire exposures on residential boundary fencing systems manufactured from prepainted and metallic coated sheet steel, treated softwood (pine) timber and hardwood timber.

The project received support and cooperation from BlueScope Steel.

THE RESEARCH

Anecdotal evidence already exists to suggest that steel fencing offers greater protection to residential housing against bushfire than alternative materials because of its non-combustibility.

The full results from this research will be used by the Bushfire CRC and the CSIRO to:

a) Influence how building codes and planning guides are developed, particularly around bushfire risk areas
b) Help provide advice to residents on the level of risk their individual property faces
c) Help develop education programmes for local communities

NSW RURAL FIRE SERVICE EXPERIMENTAL TESTING SITE AT MOGO.

RESULTS

1. STEEL FENCING

Of the different materials tested, prepainted and metallic coated sheet steel fencing (in this case made from COLORBOND® steel) performed best under all exposure conditions and in particular when faced with a 30-minute flame immersion test used to simulate potential effects of an adjacent house fire, which is common during bushfire events. (See table overleaf for further detail on exposure levels.)

2. TREATED PINE TIMBER FENCING

Treated pine timber fencing systems burnt to completion when subjected to the level one exposure (ember attack), and collapsed in sections during these exposures. This resulted in the breakage of window glass on the simulated house placed at the minimum allowable separation distance from a fence boundary in accordance with the Building Code of Australia.

3. HARDWOOD TIMBER FENCING

Hardwood timber fencing systems performed better than treated pine timber, supporting flame spread during the radiant heat and flame contact phases in exposure levels two and three. However, when faced with the 30-minute flame exposure test of level four, the hardwood timber fencing systems resulted in fence collapse within some minutes.

Bushfire CRC

Research for safer communities | www.bushfirecrc.com

THE TABLE BELOW OUTLINES THE LEVELS OF EXPOSURE THAT EACH FENCING PRODUCT WAS EXPOSED TO AND THE RESULTS OF THAT EXPOSURE.

LEVEL OF EXPOSURE	STEEL	HARDWOOD	TREATED SOFTWOOD (PINE)
1. LITTER IGNITED Leaf litter placed typically on fence rails and around fence posts and ignited to investigate and observe the influence of this ignition source - Ember Attack.	No structural failure of fencing system	No structural failure of fencing system	Burnt to completion in 1 to 2 hours during testing.
2. LITTER IGNITED + PRE-RADIATION Typical of an advancing bushfire occurring on a fire danger day of FDI* 40 but with sufficient clearing to avoid direct flame contact with the fence.	No structural failure of fencing system	Structural failure of fencing system in sections	Burnt to completion in 1 to 2 hours during testing.
4. SIMULATION OF STRUCTURAL FIRE Full continuous flame immersion for a period of 30 minutes. Designed to simulate a worst case structural fire where the fencing system may increase or decrease the risk of adjacent house ignition.	No structural failure of fencing system	Structural failure of fencing system in sections	Not tested - because exposure levels: 1. Litter ignited; 2. Litter ignited + Pre-radiation; and 3. Simulation of bushfire passage; Burnt down the fencing system to completion.
Note: Ember attack can occur before, during and after the Main Fire event. Hence this structural impact can create risk for the occupants in a number of different ways. * FDI - Fire Danger Index			

FURTHER INFORMATION

For more information on the testing, contact Richard Thornton at Bushfire CRC (03) 9412 9608 or visit www.bushfirecrc.com

The Bushfire CRC and its researchers involved in this project acknowledge the support of BlueScope Steel for this project and the valuable collaboration of the NSW Rural Fire Service which is a partner in the CRC.

This research was conducted as part of Project D1 Protecting People and Property, part of the Bushfire CRC's national research program.

THE DEVASTATING EFFECTS OF BUSHFIRES, CANBERRA 2003.

Research for safer communities | www.bushfirecrc.com

Background briefings on emerging issues for fire managers from AFAC and Bushfire CRC.

bushfire CRC afac

FIRE NOTE

ISSUE 70 NOVEMBER 2010

RESIDENTIAL BOUNDARY FENCES IN BUSHFIRES: HOW DO THEY PERFORM?

Testing of different types of fencing was conducted at the NSW Rural Fire Service Experimental Testing Site at Mogo on the south coast of NSW in 2005.

SUMMARY

The potential for residential fencing systems to act as a barrier against radiant heat, burning debris and flame impingement during bushfire is of the utmost importance to those whose homes rest in bushfire-prone regions. A 2005 testing project involving the Bushfire CRC and the CSIRO has revealed that different types of fencing can play an important part in defending homes against the threat of bushfire. Anecdotal evidence existed to suggest that steel fencing offerered greater protection to residential housing against bushfire than alternative materials because of its non-combustibility. The Bushfire CRC (with BlueScope Steel Limited and CSIRO Bushfire Research) set up a project to research and investigate the performance of residential boundary fencing systems through small and full-scale experiments looking at flame and ember propagation in fences, fences as barriers to radiant heat and flame, and toxic gas emissions from fencing systems. The full results of this research is being used by relevant agencies to influence how building codes and planning guides are developed, to provide advice to residents on the level of risk an individual property faces, and to help develop education programmes for local communities.

ABOUT THIS PROJECT

Project D1 Building and Occupant Protection was part of Bushfire CRC Program D: Protection of People and Property. Researchers involved in the project acknowledge the financial support of BlueScope Steel and collaboration with the NSW Rural Fire Service.

Author: Justin Leonard (right) is a Bushfire Research Project Leader with CSIRO Sustainable Ecosystems. For more information about this research contact Justin Leonard at justin.leonard@csiro.au

BACKGROUND

The findings from post-bushfire investigations show the importance of design and building materials for houses exposed to bushfires in Australia. CSIRO research has shown that the majority of houses, including fencing systems, destroyed in bushfires usually survived the passage of a fire front, but burnt down during the following few hours due to fire spreading from ignition caused by burning debris (Leonard 2003; Blanchi *et al.* 2004; Ahern *et al.* 2004; Chen & McAneney 2004).

A survey and studies after the 2003 bushfires in Canberra, for instance, showed very high levels of house loss deep into the urban environment (Leonard 2003). Similarly with the 2009 Victorian bushfires (McAneney 2010). Destroyed homes showed strong clustering. Most houses were ignited by ember attack and/or house-to-house ignition. In fact, the post-bushfire investigation in Canberra showed that in 50% of cases, the bushfire attack

FIRE NOTE

▲ Setting up timber fence for test burning.

mechanism was via embers, and in 35% it was via embers and some radiant heat from surrounding vegetation or other structures (Blanchi *et al.* 2004). Numerous studies have found that suppression activities by residents during and immediately after fires are important in saving homes – that human activity can significantly influence the survivability of structures.

In the case of the Canberra fires, residents who stayed in their homes to fight bushfires and spot fires before and after the passage of the fire front gave testimony to the specific protection offered by sheet steel boundary fencing systems to stay close to their homes to fight fires. With that in mind, it is proposed that fencing systems can offer protection to humans and homes during attack from bushfires and house-to-house ignition (similar to urban structural fires).

The Black Saturday Victorian bushfires of February 2009 have provided another opportunity to study the influences of fences on house survivability. The Bushfire CRC Task Force established immediately after Black Saturday has collected large volumes of relevant data that is pending analysis.

END USER STATEMENT

"This project has provided information that can be used in the development of planning and building codes, it offers practical, scientifically based information that fire agencies can provide to residents in bushfire prone areas to reduce their risk of bush fire attack."

– Lew Short, Group Manager Community Resilience NSW Rural Fire Service

BUSHFIRE CRC RESEARCH

The research aimed to observe, record, measure and compare the performance of commercial fencing systems made from pre-painted and metallic-coated sheet steel and timber (treated softwood and hardwood) when exposed to burning embers, radiant heat and flame attack. The objectives were to investigate:

- The performance of the most common commercial fencing systems made from pre-painted and metallic-coated sheet steel and timber (which are mostly used as residential boundary fencing in urban and urban rural interfaces).
- The potential for these fencing systems to act as protection for buildings against attack from radiant heat, burning debris and flame impingement during bushfires, and;
- Whether the behaviour of fencing systems contributes a risk to lives and homes.

The formal research testing involved:

- Small-scale flammability experiments, measuring the basic flammability of typical timber fencing materials (including the effect of ageing and weathering conditions).
- Toxic contaminant release experiments measuring gas and ash products from samples.
- Full-scale experiments (23 in total) on common timber and Colorbond steel fencing systems using a gas burner bushfire front simulator (including the effect on a simulated residential building and adjacent objects).

The research project was conducted in the NSW Rural Fire Service Experimental Testing Site at Mogo on the south coast of NSW in 2005.

▲ A steel fence after testing at the Mogo site.

RESEARCH OUTCOMES

SMALL-SCALE EXPERIMENTS

This investigation confirmed that Colorbond steel fencing panels do not ignite and contribute significant heat release during cone calorimeter exposure. Both pine and hardwood materials provide significant heat release under these exposures. The ranking of performance of these materials in descending order are: Colorbond steel (insignificant release), new hardwood, old hardwood, old pine and new pine.

Of particular interest was the effect moisture content had on the time to ignition for all these materials. In particular, the observation that a material exposed for six hours to 40 degreesC and 20% relative humidity had similar fire properties to the same material when conditioned at same temperature and relative humidity until moisture equilibrium was achieved. This highlights a significant point – that the fire behaviour of these specimens was influenced more by the surface moisture content rather than the average moisture content of the specimens, and hence the weather conditions on the day of fire impact will have a significant effect on the fire performance of timber elements.

TOXIC CONTAMINANT RELEASE

The major issue related to the combustion of Copper Chrome Arsenic (CCA)-treated pine is the release of significant levels of arsenic, as well as the high arsenic content in the timber ash (2.2% by weight). Arsenic can cause eye, throat and respiratory irritation, and is a confirmed human carcinogen. It is worth noting that the National Environmental Protection Measure provides health impact criteria for arsenic in soils in the range of 0.01-0.05%, and so the dispersion of CCA-treated pine ash could lead to site contamination, especially where large quantities of the material has been burnt. Analysis also showed that it could be harmful for a person to come into direct skin contact with the ash.

As for Colorbond steel, two human carcinogens (benzene and formaldehyde) were detected in the air toxicity experiments conducted on this material. While these gases were detected, the risks they present would depend on the levels of exposure to nearby occupants, which is unknown. In fact, evaluating the risks from these gases will depend on combustion conditions, the quantity of material burnt, the volume of combustion gases generated and its dispersion, and the degree to which site occupants are exposed to the gases.

LARGE-SCALE EXPERIMENTS

Colorbond steel

This had the best performance as it is a non-combustible material. It maintained structural integrity as a heat barrier under all experimental exposure conditions, and it did not spread flame laterally or contribute to fire intensity during exposure. The fencing reduced radiation levels within the fencing boundary to below 5 kW/m^2 immediately behind the fencing system during all radiation exposures, and reduced the radiant heat exposure on a structure nine metres from the fencing by at least a factor of two for the given fire size in the experiment.

Hardwood

Although combustible, closed paling hardwood fencing maintained a radiant heat barrier during radiation-only exposures, resulting in a reduction in heat received at the structure. In exposures where flame contact of the fencing occurred, flame emission from the fencing provided additional radiant heat exposure on the structure. Open paling hardwood fencing systems were partially effective in attenuating incident radiation

http://www.bushfirecrc.com/sites/default/files/managed/resource/_6baf_bluescope_fence_report_final.pdf

FURTHER READING

Ahern A., Aon Re Worldwide and Chladil M. (2004). *How Far do Bushfires Penetrate Urban Areas?* Tasmania Fire Service.

Blanchi, R., Leonard, J. and Maughan, D. (2004). *Towards New Information Tools for Understanding Bushfire Risk at the Urban Interface*. CSIRO Manufacturing & Infrastructure Technology, Bushfire Research, Bushfire CRC Research Project.

Chen, K. and McAneney, J. (2004). *Quantifying Bushfire Penetration Into Urban Areas in Australia*. Risk Frontiers–Natural Hazards Research Centre, Macquarie University, NSW, Australia, June.

Leonard, J. (2003). Bushfires in the ACT. Australian Institute of Building Surveyors 38th Annual State Conference.

McAneney, J and Chen, K. (2010) Bushfire Penetration Into Urban Areas in Australia: A Spatial Analysis, Bushfire CRC report for the 2009 Victorian Bushfires Royal Commission.

▲ Researcher Justin Leonard examines a fence after burning test at the NSW Rural Fire Service Hot Fire Training Facility.

when flames did not contact the fencing systems, however they provided little barrier during direct flame contact. Neither fencing configuration supported lateral flame spread to the extent that would expose the structure to direct flame contact. Under structural fire exposure conditions, the fencing quickly burnt away leaving no barrier to the impinging flames.

Treated pine

This had the worst performance, as its integrity under leaf litter attack resulted in ignition and extensive flame spread with the potential for loss of the adjacent structure. Its performance as a heat barrier was good until ignition of the fencing occurred, after which point additional heat impact was received by all elements behind the fencing. Significant risk of house loss occurred during all experimental exposures, either through thermal exposure or mechanical impact as the fencing collapsed onto the structure. Under structural fire exposure conditions, the fencing quickly burnt away leaving no barrier to the impinging flames and radiant heat.

FUTURE DIRECTIONS

The cone calorimeter experimental method used for toxic release does not assess the fire hazard of the materials – or products made from them – under actual fire conditions. The results, when used alone, should only be used for research and development, quality assurance or similar industrial needs. More extensive toxic release experiments could be conducted to simulate fencing exposure to bushfire for a quantitative risk assessment of: the toxic gases released during combustion of each fencing material; the impact of air emissions of arsenic; the exposure of site occupants to arsenic from the ash from CCA-treated pine, and; the contamination of building sites from arsenic.

Detailed analysis is needed of the fencing data collected by the Bushfire CRC Task Force after Black Saturday.

Fire Note is published jointly by the Bushfire Cooperative Research Centre (Bushfire CRC) and the Australasian Fire and Emergency Service Authorities Council (AFAC). This Fire Note is prepared from available research at the time of publication to encourage discussion and debate. The contents of the Fire Note do not necessarily represent the views, policies, practices or positions of any of the individual agencies or organisations who are stakeholders of the Bushfire CRC.

Bushfire Cooperative Research Centre
Level 5/340 Albert Street
East Melbourne VIC 3002
Telephone: 03 9412 9600
www.bushfirecrc.com

Bushfire CRC is a national research centre in the Cooperative Research Centre (CRC) program, formed in partnership with fire and land management agencies in 2003 to undertake end-user focused research.
Bushfire CRC Limited ABN: 71 103 943 755

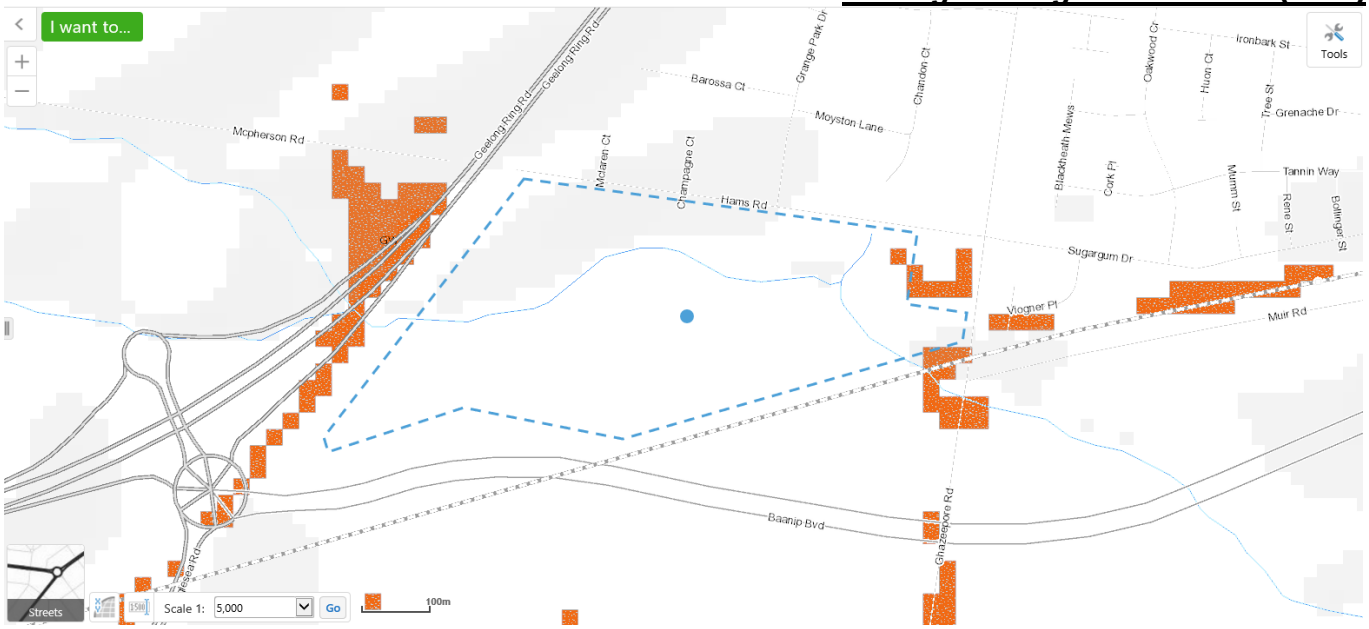
Australasian Fire and Emergency Service Authorities Council
Level 5/340 Albert Street
East Melbourne VIC 3002
Telephone: 03 9418 2388
www.afac.com.au

AFAC is the peak representative body for fire, emergency services and land management agencies in the Australasia region. It was established in 1993 and has 26 full and 10 affiliate members.

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Site Maps

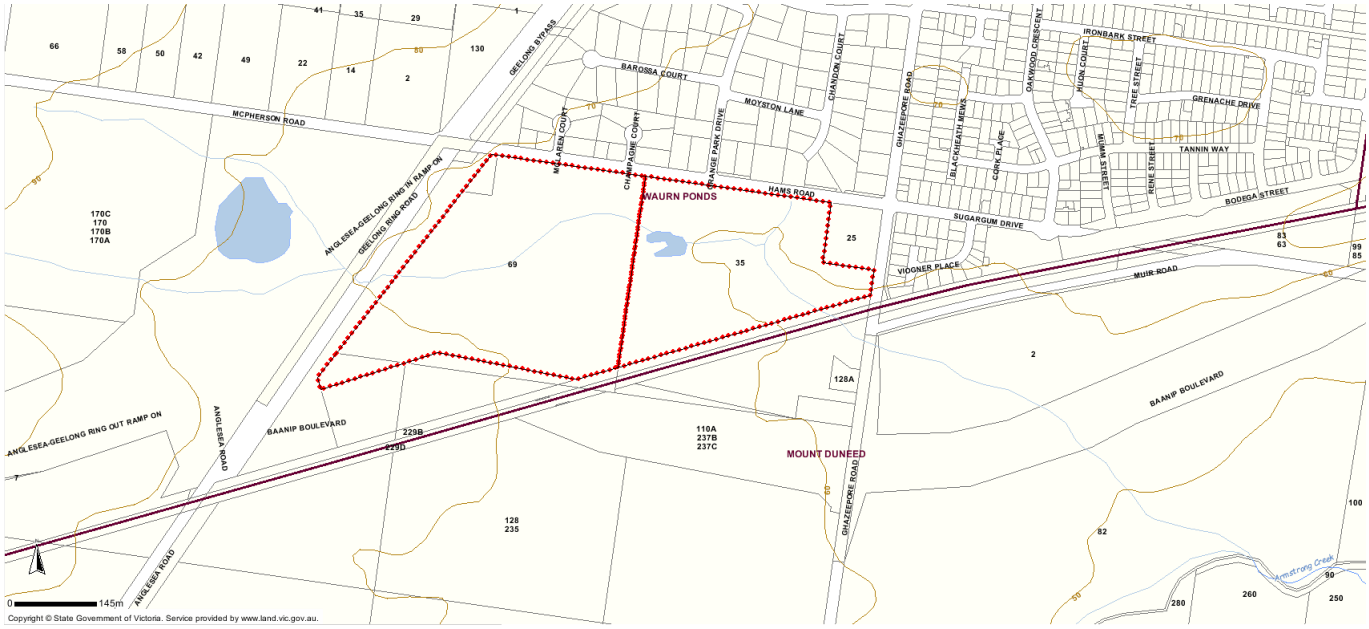
Ecological Vegetation Class (EVC)



GW = EVC 175, Grassy Woodland (Benchmarks for this EVC: Trees to 10m, 15% canopy cover)

Note: farmland pasture Grasslands does not have an EVC

Contour Map

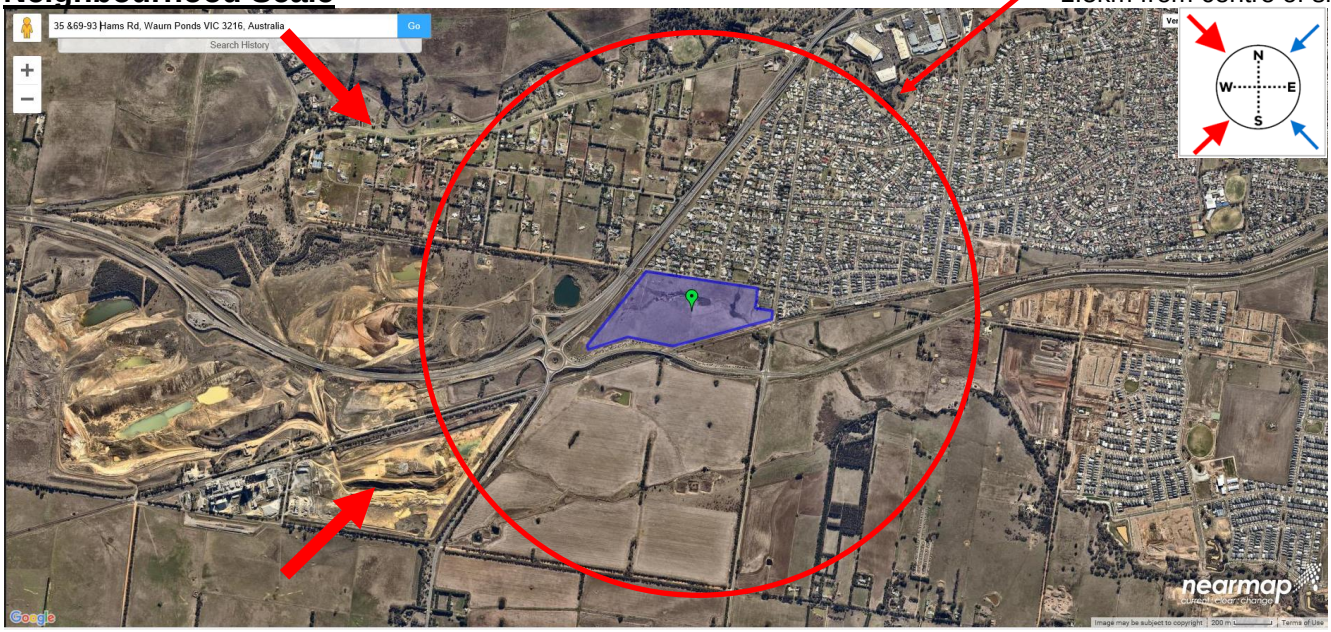


Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Bushfire Hazard Landscape Assessment

Neighbourhood Scale

1.5km from centre of site



Landscape Scale

6km from centre of site

It is considered that the fire risk from the wider landscape is no greater than that assumed by AS3959 and therefore adequately dealt with by the AS3959 defendable space tables and building construction controls and/or Radiant Heat modelling

The main fire weather comes from the North-West followed by the South-West (*Long, M (2006) A climatology of extreme fire weather days in Victoria*). The existing settlement/Quarry in these directions provide significant shielding enough to ameliorate any landscape fire and any risk can be credibly dealt with by the AS3959 defendable space and building construction controls.

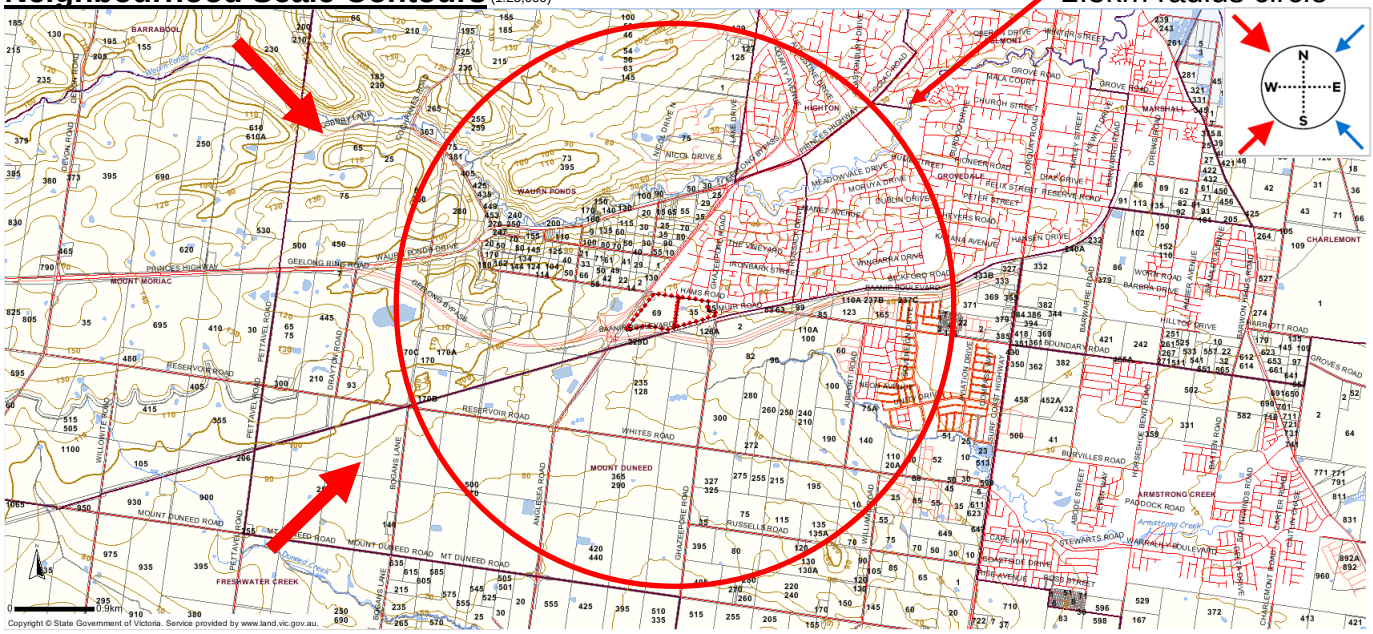
In accordance with the DELWP Technical Guide *(Planning Permit Applications Bushfire Management Overlay, September 2017)* I believe this site is situated in a “Broader Landscape Type 1” area. The landscape risk to this site is low and is less than large parts of Victoria. With the required measures in place development is appropriate.

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

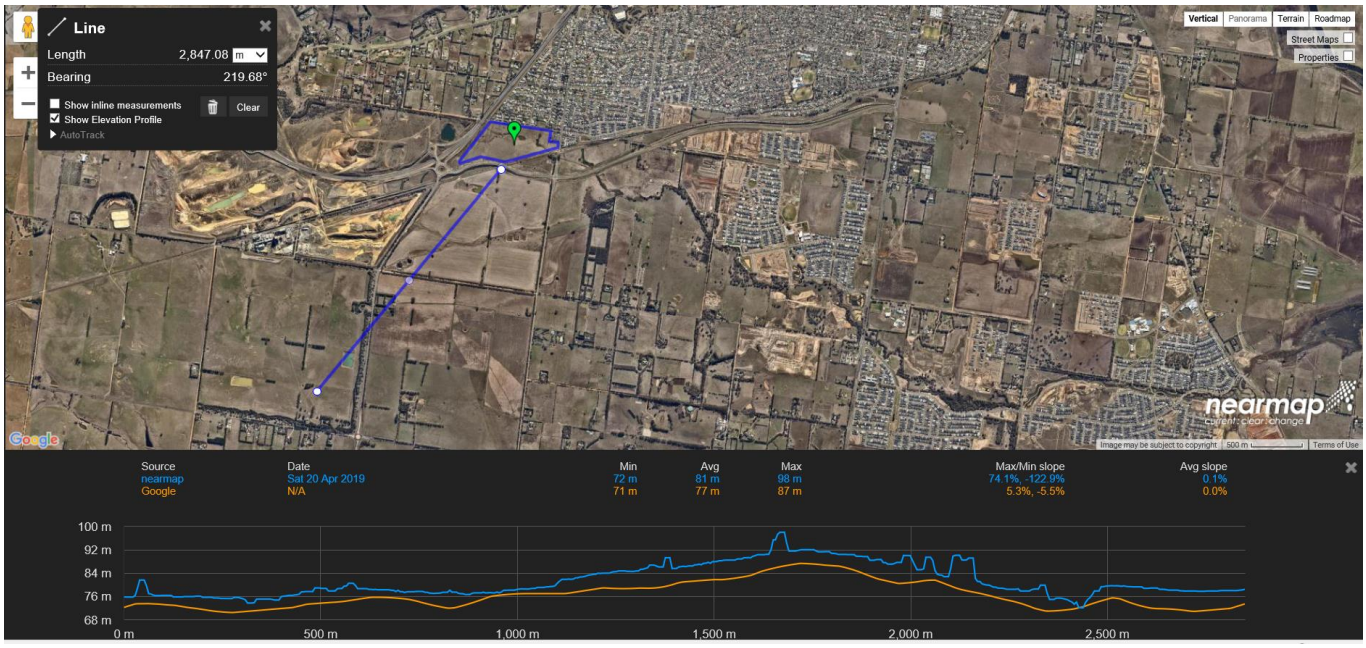
Bushfire Hazard Landscape Assessment

Neighbourhood Scale Contours (1:25,000)

2.5km radius circle



Elevation Profile – South-West

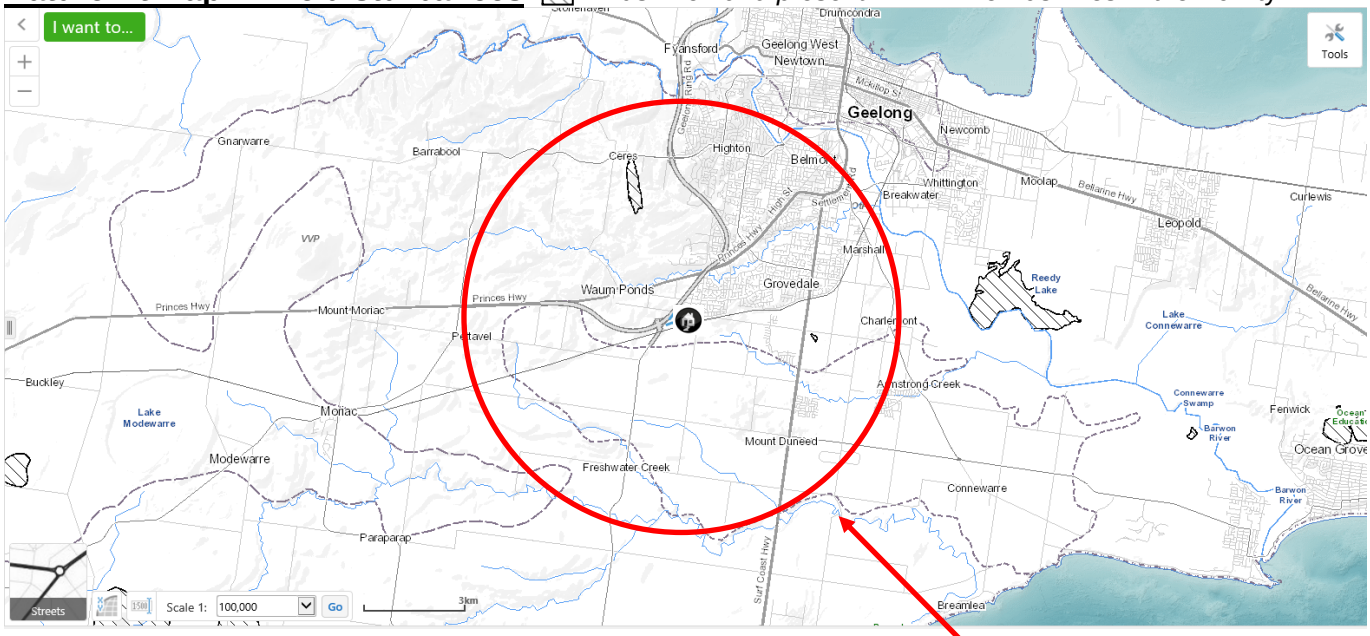


Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Bushfire Hazard Landscape Assessment

NatureKit Map – Fire disturbances

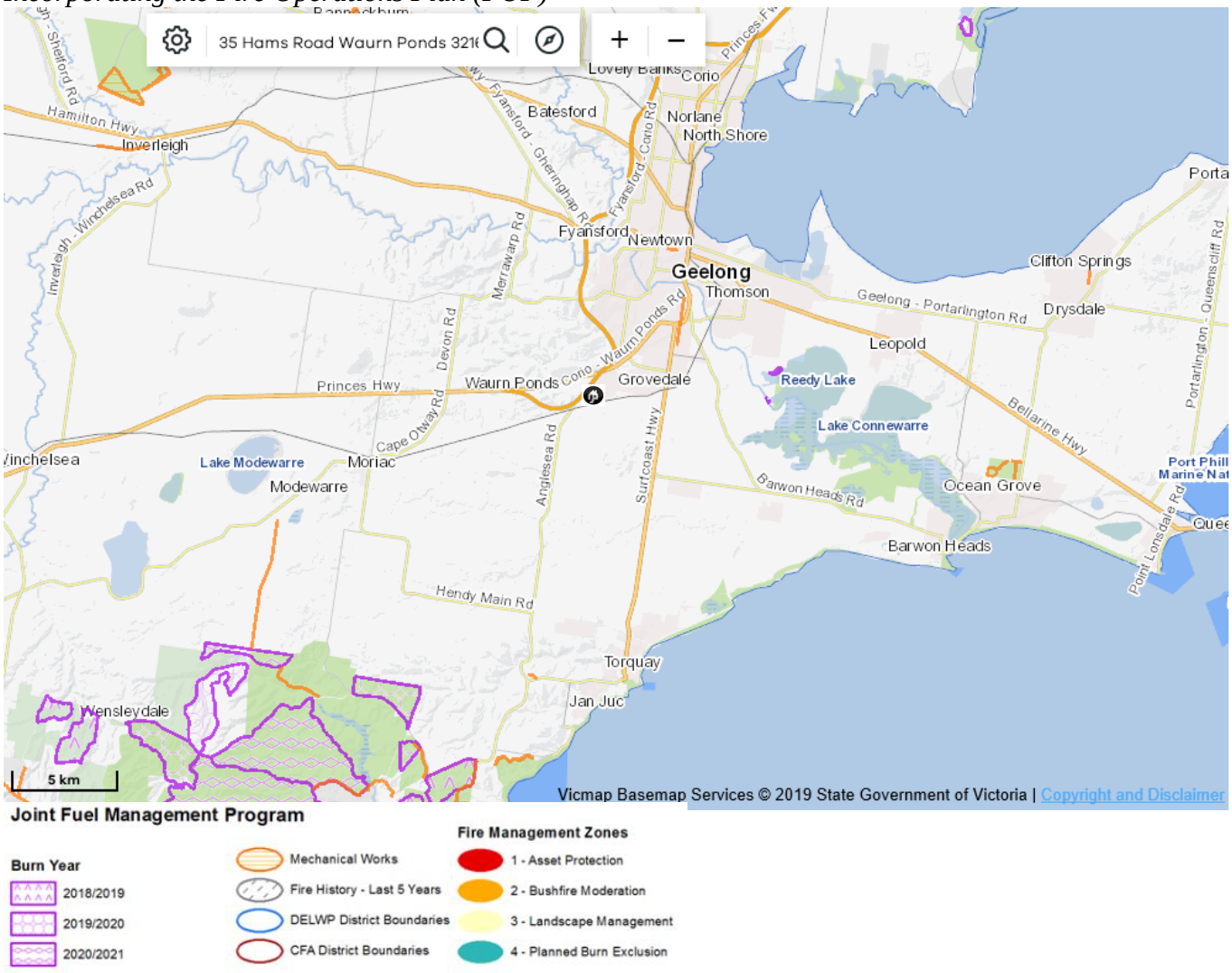
= *Bushfire 1970-present* No Bushfires in the vicinity



5km radius

DELWP Joint Fuel Management Program (JFMP)

Incorporating the Fire Operations Plan (FOP)



Bushfire Hazard Landscape Assessment

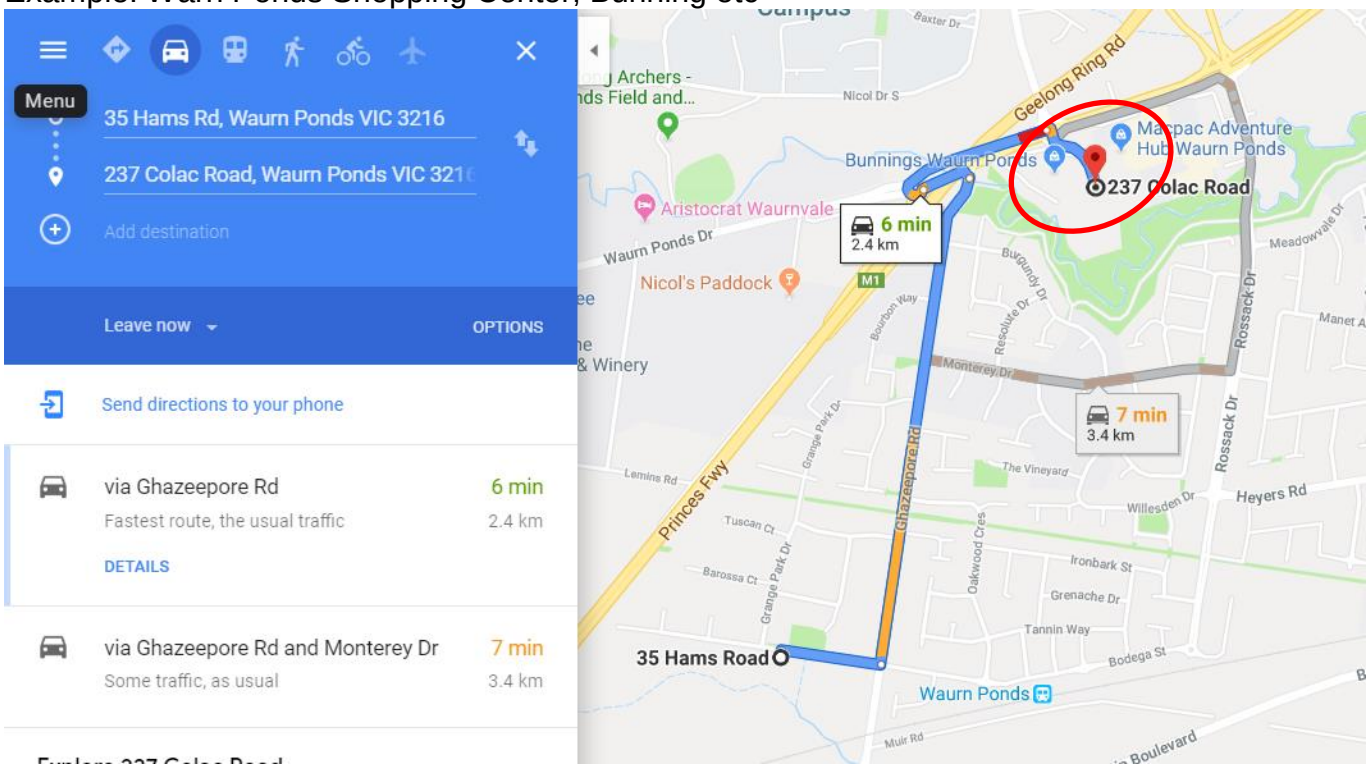
Shelter In Place

No designated NSP-BPLR is available in the area. A 'Neighbourhood Safer Place' also known as a 'Bushfire Place of Last Resort' (NSP-BPLR) is a place of last resort when all other bushfire plans have failed.

Once developed the subject site should be suitable for shelter in place. However safe egress is available to suitable BAL-Low shelter in place areas within the adjacent built up residential areas of Waurn Ponds.

A BAL-Low area is basically an area where there is no "classifiable" bushfire hazard vegetation in accordance with AS3959 within 100m under AS3959 and 150m under the Bushfire Management Overlay.

Example: Warn Ponds Shopping Center, Bunning etc



Bushfire Hazard Site Assessment

Defendable Space

Defendable space is a fuel reduced zone with restrictions on surface & elevated fuels ie vegetation as well as canopy cover.

Below is the vegetation management standard for this fuel reduced zone.

Defendable Space

Defendable space to a distance of to the property boundary around the proposed building(s) is provided and is managed in accordance with the following requirements:

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

Also take into account the following from AS3959-2018 *Construction of Buildings in Bushfire-prone Areas* (Standards Australia, 2018),

NOTE: Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm).

References:

CFA Recommendations for Defendable Space
https://www.cfa.vic.gov.au/documents/20143/69511/BMO-Individual-conditions-defendable_space-Oct-2017.pdf

and

Victorian Planning Provisions clause 53.02 Table 6
http://planning-schemes.delwp.vic.gov.au/schemes/vpps/53_02.pdf

Site Photographs

≈ North of proposed works

≈ North of proposed works

≈ East of proposed works

Site Photographs

≈ East of proposed works

≈ South-East of South boundary of proposed works

≈ South-East of South boundary of proposed works

Site Photographs

≈ South-East of South boundary of proposed works

≈ South-West of South boundary of proposed works

≈ South-West of South boundary of proposed works

Site Photographs

≈ South-West of South boundary of proposed works

≈ South-West of South boundary of proposed works

≈ South-West corner of proposed works

Site Photographs

≈ South-West corner of proposed works

≈ South-West corner of proposed works

≈ South-West corner of proposed works

Site Photographs

Overlooking the site from
≈ West of proposed works

Overlooking the site from
≈ West of proposed works

≈ West Boundary of proposed works

Site Photographs

≈ West Boundary of proposed works

≈ West Boundary of proposed works

≈ West Boundary of proposed works

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Analysis of PPF 13.02

Operation of the Planning Policy Framework (PPF) clause 71.02-3 and in more detail in PPF clause 13.02 of the Victorian Planning provisions requires that planning authorities and responsible authorities must prioritise the protection of human life over all other policy considerations

The following table demonstrates how the requirements have been achieved and complied with:

REQUIREMENTS	*COMPLIANCE*
71.02-3 Integrated decision making	
..... However in bushfire affected areas, planning authorities and responsible authorities must prioritise the protection of human life over all other policy considerations	*As demonstrated by the compliance with all applicable measures, principally defendable space and the BAL building construction controls, it can be shown that this development will reduce the Bushfire risk to an acceptable level.*
13.02-1S Bushfire planning	
Policy Application	
This policy must be applied to all planning and decision making under the Planning and Environment Act 1987 relating to land that is: • Within a designated bushfire prone area; • Subject to a Bushfire Management Overlay; or • Proposed to be used or developed in a way that may create a bushfire hazard	*The site is within a designated Bushfire Prone Area (BPA)* *The site is not subject to a Bushfire Management Overlay (BMO) either totally or partially* *With the site developed this will reduce the grassfire hazard in the area*
Objective	
To strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.	*As demonstrated by the compliance with all applicable measures, principally the BAL building construction controls, it can be shown that this development will reduce the Bushfire risk to an acceptable level.*
Strategies	
Protection of human life	
Give priority to the protection of human life by: • Prioritising the protection of human life over all other policy considerations. • Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire. • Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision-making at all stages of the planning process.	*As demonstrated by the compliance with all applicable measures, principally the BAL building construction controls, it can be shown that this development will reduce the Bushfire risk to an acceptable level.* *The site is assessed as being safe for access and egress to BAL-Low areas, refer to the Bushfire Hazard Landscape Assessment enclosed herewith.* *Through the ongoing maintenance of the appropriate defendable space and building construction controls in accordance with AS3959 the subject site should be suitable for shelter in place.* *However in accordance with CFA advice a policy of "leave early" is always recommended.* *Through the application of the appropriate defendable space and building construction controls in accordance with AS3959 the bushfire risk will be reduced to an acceptable level*

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Analysis of PPF 13.02

Bushfire hazard identification and assessment	
Identify bushfire hazard and undertake appropriate risk assessment by:	
• Applying the best available science to identify vegetation, topographic and climatic conditions that create a bushfire hazard.	*The application of AS3959, aided by the CFA publication Vegetation-Classes-Victorian-Bushfire-Management-Overlay, onsite assessments and measurements, available vegetation and contour mapping and the application of a severe fire weather index, known as a Fire Danger Index (FDI), of 100 in accordance with AS3959 adequately satisfies this requirement.*
• Considering the best available information about bushfire hazard including the map of designated bushfire prone areas prepared under the Building Act 1993 or regulations made under that Act.	*The site is in a designated Bushfire Prone Area (BPA) which requires the application of AS3959 and this has been undertaken as described elsewhere in the Bushfire Risk Assessment, in particular in the Bushfire Hazard Site Assessment enclosed herewith.*
• Applying the Bushfire Management Overlay to areas where the extent of vegetation can create an extreme bushfire hazard.	*The site is not subject to a Bushfire Management Overlay (BMO) either totally or in part and is not subject to the threat of extreme fire behaviour that would warrant the site being included in the future.*
• Considering and assessing the bushfire hazard on the basis of:	*A Bushfire Hazard Landscape Assessment has been undertaken, and enclosed herewith, in accordance with the DELWP Technical Guide.*
▪ Landscape conditions - meaning conditions in the landscape within 20 kilometres and potentially up to 75 kilometres of a site;	*Landscape conditions have been assessed in the Bushfire Hazard Landscape Assessment enclosed herewith.*
▪ Local conditions - meaning conditions in the area within approximately 1 kilometre of a site;	*Local conditions have been assessed in the Bushfire Hazard Site Assessment enclosed herewith and in the Bushfire Hazard Landscape Assessment enclosed herewith*
▪ Neighbourhood conditions - meaning conditions in the area within 400 metres of a site; and,	*Neighbourhood conditions have been assessed in the Bushfire Hazard Landscape Assessment enclosed herewith.*
▪ The site for the development.	*The site has been assessed in the Bushfire Risk Assessment*
• Consulting with emergency management agencies and the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.	*In informal discussions about a range of issues CFA advise that, if required, this discussion is to take place between council and the CFA after a consultants' report has been received.*
• Ensuring that strategic planning documents, planning scheme amendments, planning permit applications and development plan approvals properly assess bushfire risk and include appropriate bushfire protection measures.	*The bushfire risk to this site has been assessed and appropriate bushfire protection measures and building controls are outline in the Bushfire Risk Assessment, in particular in the Bushfire Hazard Site Assessment enclosed herewith, and with the required measures, in particular the application of defendable space, in place development is appropriate.*
• Not approving development where a landowner or proponent has not satisfactorily demonstrated that the relevant policies have been addressed, performance measures satisfied or bushfire protection measures can be adequately implemented.	*As demonstrated by the compliance with all applicable measures it can be shown that this development has reduced the Bushfire risk to an acceptable level. The bushfire risk to this site has been assessed and appropriate bushfire protection measures and building controls are outline elsewhere in the Bushfire Risk Assessment, in particular in the Bushfire Hazard Site Assessment, and with the required measures in place development is appropriate.*

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Analysis of PPF 13.02

Settlement planning	
Plan to strengthen the resilience of settlements and communities and prioritise protection of human life by:	
• Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959-2009* Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009*). .*{superseded by 2018 edition}	*A Bushfire Hazard Site Assessment in accordance with AS3959 has been undertaken, and enclosed herewith, for this application and the resulting building areas of the site can achieve a radiant heat flux of less than 12.5 kilowatts/square metre (viz. BAL-12.5).*
• Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS 3959-2009* Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009*) where human life can be better protected from the effects of bushfire. .*{superseded by 2018 edition}	*A BAL-Low area is basically an area where there is no "classifiable" bushfire hazard vegetation, in accordance with AS3959, within 100m under AS3959.* *Suitable BAL-Low shelter in place areas will be available on this site, however, in accordance with CFA advice, an action plan of leave early is recommended.* *Safe egress is available to suitable BAL-Low shelter in place areas within the adjacent built up residential areas.*
• Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.	*With the site developed this will reduce the grassfire hazard in the area*
• Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reducing bushfire risk overall.	*With the site developed this will reduce the grassfire hazard in the area*
• Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.	*A Bushfire Hazard Landscape Assessment, in accordance with the DELWP Technical Guide, has been undertaken, and enclosed herewith, and with the required measures in place development is appropriate and will reduce the bushfire hazard in the area.*
• Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.	*With the required measures in place development on this site is appropriate.*
• Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under *AS 3959-2009* Construction of Buildings in Bushfire-prone Areas* (Standards Australia, 2009*). .*{superseded by 2018 edition}	*A Bushfire Hazard Site Assessment in accordance with AS3959 has been undertaken, and enclosed herewith, for this application and the resulting building areas of the site can achieve a BAL-12.5 rating.*

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Analysis of PPF 13.02

Areas of biodiversity conservation value	
Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are important areas of biodiversity.	*The development can successfully implement the required bushfire protection measures however the biodiversity impacts are outside the scope of this Bushfire analysis and is to be dealt with by others if required. Although it does not take any specific expertise to see that the subject site is currently a grassed paddock.*
Use and development control in a Bushfire Prone Area	
In a bushfire prone area designated in accordance with regulations made under the Building Act 1993, bushfire risk should be considered when assessing planning applications for the following uses and development: • Subdivisions of more than 10 lots. • Accommodation. • Child care centre. • Education centre. • Emergency services facility. • Hospital. • Indoor recreation facility. • Major sports and recreation facility. • Place of assembly. • Any application for development that will result in people congregating in large numbers.	*As demonstrated by the compliance with all applicable measures it can be shown that this development will reduce the Bushfire risk to an acceptable level.* *The proposal is to rezone the land for subdivision of more than 10 lots.*
When assessing a planning permit application for the above uses and development: • Consider the risk of bushfire to people, property and community infrastructure. • Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk. • Ensure new development can implement bushfire protection measures without unacceptable biodiversity impacts.	*This application can comply with these requirements:* *As demonstrated by the compliance with all applicable measures it can be shown that this development will reduce the Bushfire risk to an acceptable level.* *The application of the identified defendable space and building construction controls in accordance with AS3959 has addressed the identified bushfire risk* *The development can successfully implement the required bushfire protection measures however the biodiversity impacts are outside the scope of this Bushfire analysis and is to be dealt with by others if required. Although it does not take any specific expertise to see that the subject site is currently a grassed paddock.*
Policy guidelines	
Consider as relevant: • Any applicable approved state, regional and municipal fire prevention plan.	*No plans of relevance to this site have been identified.*

Bushfire Risk Assessment: Hams Rd 35 & 69-93, Waurn Ponds

Analysis of PPF 13.02

Policy documents	
Consider as relevant: • Any applicable approved state, regional and municipal fire prevention plan.	*No plans of relevance to this site have been identified.*
• AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009). .*{superseded by 2018 edition}	*A Bushfire Hazard Site Assessment has been conducted in accordance with AS3959 and are enclosed herewith*
• Building in bushfire-prone areas - CSIRO & Standards Australia (SAA HB36- 1993, 1993).	*This handbook is somewhat outdated since the subsequent publication of the new edition of AS3959 in 2009 and 2018 however to the extent it is relevant this application complies*
• Any bushfire prone area map prepared under the Building Act 1993 or regulations made under that Act.	*The site is in a designated Bushfire Prone Area which requires the application of AS3959 and that has been undertaken as described elsewhere in the Bushfire Risk Assessment.*

AS3959 Note:

PPF13.02 references the 2009 edition of AS3959. The 2018 edition of this standard has now been published. The new National Construction Code (NCC) came into force on 1 May 2019 and that has adopted the 2018 edition of AS3959.

However we note that for the purposes of this Bushfire Risk Assessment there are no practical differences in the assessment methods between the two editions.