2009 Victorian Bushfires Royal Commission

FINAL REPORT

SUMMARY

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2009 Victorian Bushfires
Royal Commission

Professor David de Kretser AC
Governor of Victoria
Government House
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Your Excellency

In accordance with the Letters Patent dated 16 February 2009, we have the honour of presenting to you the final report of the 2009 Victorian Bushfires Royal Commission.

It consists of four volumes and a summary:

- Volume I, *The Fires and the Fire-related Deaths*, describes the progress of the fires that burned in Victoria in January and February 2009 and summarises the results of the Commission's inquiries into the 173 associated deaths.
- Volume II, *Fire Preparation, Response and Recovery*, presents the Commission's conclusions and recommendations in connection with fire preparation, response and recovery.
- Volume III, *Establishment and Operation of the Commission*, describes how the Commission went about its work.
- Volume IV, *The Statements of Lay Witnesses*, presents the statements and associated materials of the 100 lay witnesses who shared with the Commission their experiences of the fires. As this volume contains some video footage, it is only available in an electronic version.

It has been a privilege to undertake this work. We hope that our findings and recommendations will help to ensure that we do not see a repetition of the tragedy of 7 February 2009.

Dated this 31st day of July 2010.

The Honourable Bernard Teague AO
Chairperson

Ronald McLeod AM
Commissioner

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PREFACE

The bushfires of Black Saturday, 7 February 2009, caused the death of 173 people. Black Saturday wrote itself into Victoria's history with record-breaking weather conditions and bushfires of a scale and ferocity that tested human endurance. The lives of many Victorians were changed forever, and many showed they are capable of deeds of great courage and compassion. Although some communities were physically destroyed, their members also displayed ingenuity, strength and resolve in the face of this calamity. There was also widespread devastation of considerable areas of the scenic forests and woodlands that form part of Victoria's natural heritage.

Eighteen months later, the landscape is healing, flora and fauna are returning, and individuals and communities are getting on with rebuilding their homes and lives. We acknowledge the losses—of family, friends, fellow citizens, homes, gardens, animals, and the many other things that people hold dear. We have seen the pain people have endured and continue to bear, and we know it will be a long road to full recovery for many. Bushfire is an intrinsic part of Victoria's landscape, and if time dims our memory we risk repeating the mistakes of the past. We need to learn from the experiences of Black Saturday and improve the way we prepare for and respond to bushfires.

The 2009 Victorian Bushfires Royal Commission was an important part of ensuring that those lessons are clearly defined and learnt. The Commission conducted an extensive investigation into the causes of, the preparation for, the response to and the impact of the fires that burned throughout Victoria in late January and February 2009. As Commissioners, we concentrated on gaining an understanding of precisely what took place and how the risks of such a tragedy recurring might be reduced.

In our deliberations we ensured that the voices of affected community members were heard. Our priority was to listen to people directly affected by the fires. We also ensured that the Commission's processes were firmly based in the community through open hearings (including in regional towns), web streaming so that people could listen to the hearings over the internet, public submissions, the participation of lay witnesses, the creation of the Black Saturday Gallery, and the participation of family and friends in hearings about people who died as a result of the fires. This access will continue: the Commission's website will remain active, and all the Commission's documentation will be available at the Public Records Office of Victoria.

This report is an important part of securing the memory of the fires. The first volume describes the origins and course of the 15 fires that wrought the greatest harm on 7 February and the response to them. It also tells the stories of the 173 people who died. Volume II looks at what lessons can be learnt from these experiences—how we can reduce the risk and impacts of fire and minimise fire-related loss of life in future. Volume III reports on the Commission's administration and processes. Volume IV reproduces the statements of the 100 lay witnesses who gave personal accounts of their experiences in the fires in late January and February and in their aftermath. The stories told by these people grounded our work. They continually reminded all at the Commission that bushfires deeply affect people and communities and that their needs and safety must be at the forefront of government policy.

The recommendations we make give priority to protecting human life, and they are designed to reflect the shared responsibility that governments, fire agencies, communities and individuals have for minimising the prospect of a tragedy of this scale ever happening again.

We offer this report to the Governor and the people of Victoria.

The Hon. Bernard Teague AO
Chairperson

Ronald McLeod AM
Commissioner

Susan Pascoe AM
Commissioner

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Image 1 The Redesdale fire

Source: Courtesy of Alex Ip.

SUMMARY OF THE REPORT

CONDITIONS ON 7 FEBRUARY 2009

Victoria endured one of its most severe and prolonged heatwaves during the final week of January 2009. The temperature in Melbourne was above 43°C for three consecutive days for the first time since records had been kept. Saturday 7 February was forecast to reach temperatures in the low 40s, accompanied by strong winds. In the lead-up to the day the Premier of Victoria, the Hon. John Brumby MP, described the state as 'tinder dry'. The Country Fire Authority and the Department of Sustainability and Environment, the State's primary bushfire agencies, warned that forests and grasslands were the driest they had been since the Ash Wednesday fires in 1983.

The conditions forecast for 7 February were realised, as were people's worst fears when fires broke out across the state. Temperatures were nearing 40°C by 11.00 am in many parts of the state and later climbed to the mid-40s. Numerous areas endured record-breaking maximums—including Melbourne, which reached 46.4°C. Strong winds in the morning grew to storm force as the day progressed, and a wind change moved across the state during the afternoon, greatly intensifying the fires. The Commission was informed that the CFA and DSE attended or patrolled 316 grass, scrub or forest fires on that day. Of these, the Commission examined in detail 15 fires that caused (or had the potential to cause) the greatest damage.

The most serious consequence of the fires was the death of 173 people. Left behind are families, friends and communities still trying to come to terms with their loss. Accompanying this loss of life is the fires' impact on property and the infrastructure that supports communities, as well as the substantial environmental impact, which will take years to fully reveal itself—let alone be ameliorated. It is extremely difficult to quantify the cost of a disaster like this, but the Commission estimates it to be more than $4 billion.

This was one of Australia's worst natural disasters. It will be many years before its effects dim. Governments, fire and emergency services agencies and all individuals can learn valuable lessons from those days, so that we might reduce the risk of such destruction occurring again. It would be a mistake to treat Black Saturday as a 'one-off' event. With populations at the rural–urban interface growing and the impact of climate change, the risks associated with bushfire are likely to increase.

THE ROYAL COMMISSION

In the days immediately following 7 February the State responded to the consequences of this disaster. A relief effort to deal with immediate needs was the first priority. But it was also clear that the community needed to understand this tragedy and how to minimise the risk of a similar tragedy occurring in the future. On 9 February 2009 the Premier announced the State's intention to establish a royal commission. One week later the Hon. Bernard Teague AO, Susan Pascoe AM and Ronald McLeod AM were appointed as the Royal Commissioners.

The Commission's task was substantial. The Governor of Victoria, Professor David de Kretser AC, issued the letters patent, setting out the Commission's terms of reference, on 16 February 2009 (see page 38). The Commission began its work that day, giving early priority to community engagement: between 18 March and 8 April it held 26 community consultations in fire-affected areas, seeking to learn about the experiences and concerns of individuals affected by the fires. A directions hearing was held on 20 April 2009, and the hearing of evidence began on 11 May 2009 and concluded on 27 May 2010. During that time the Commission held 155 days of hearings—including eight days of regional hearings and 23 days examining the 173 fire-related deaths.

To conduct this inquiry properly the Commission needed to ground its work in an understanding of the reality of bushfire and its effects on people's lives. This imperative permeated the Commission's work, from the initial community consultations to the public submissions, the 100 lay witnesses who gave personal accounts of their experiences, and the involvement and support given to the families who attended the hearings into the fire-related deaths. The Commission felt that its work could, and should, contribute to individual and community healing, as well as accommodate the strong public interest in the inquiry. This commitment to people went beyond the requirement to ensure natural justice for represented parties and those potentially affected by the Commission's findings and recommendations: as much as possible, the people who were most directly affected by the fires were given a voice and their stories and views were heard.

The Commission views protection of human life and the safety of communities as the highest priority for bushfire policy and directed its efforts accordingly. This priority guided the Commission in its analysis, the collection of evidence, its reports and the formulation of its recommendations. The recommendations further reflect the Commission's recognition that individuals, fire agencies and Commonwealth, State and local governments share responsibility for preparing for fire and improving people's safety. While placing the preservation of human life at the heart of its deliberations, the Commission also sought to ensure that due consideration was given to Victoria's environmental sustainability.

The Commission was asked to inquire into and report on the causes and circumstances of the fires that burned in January–February 2009, the preparation and planning before the fires, all aspects of the response to the fires, measures taken in relation to utilities, and any other matters it considered appropriate. The letters patent directed the Commission to make such recommendations as it thought fit on preparation and planning for further fire threats and risks, land-use planning and management, fireproofing of structures, emergency response, communication, training, infrastructure and overall resourcing.

THE FIRES

The fires in January–February 2009—and in particular on 7 February—have deeply scarred the Victorian people and the landscape. The Commission therefore begins its report with a discussion of the 15 most damaging, or potentially damaging, fires that burned on 7 February, including those in which people died. Many of these fires were significant because of their size and impact; some of the smaller ones, however, provide insight into the differing circumstances and demands of the day. The Commission examined the following fires (shown here in the order in which they ignited):

- Delburn
- Bunyip
- Kilmore East
- Horsham
- Coleraine
- Pomborneit–Weerite
- Churchill
- Murrindindi
- Redesdale
- Narre Warren: Harkaway
- Narre Warren: Lynbrook—Coral Drive
- Narre Warren: Lynbrook—Golf Club Road
- Upper Ferntree Gully
- Bendigo
- Beechworth–Mudgegonga.

These fires were not the only ones that occurred during the 2008–09 bushfire season: DSE and CFA staff and volunteers fought hundreds of fires. The fire season was long and demanding, placing considerable pressure on firefighters even before the worst fires began in early February. Figure 1 shows the extent of the fires of January–February 2009.

Figure 1 The January–February 2009 bushfires

Victoria has a long, sometimes devastating, history of fire. The conditions on 7 February gave rise to particularly destructive bushfires. These very intense fires share some features that set them apart from less intense fires. Very dry fuels and strong surface winds resulted in erratic fire behaviour and the development of strong convective activity capable of lifting firebrands such as burning bark high in the convection column. Strong upper air winds transported burning bark downwind for many kilometres, resulting in long-distance fire spotting.

Spotting was an important factor in the spread of some fires. Firebrands carried by the strong winds spread from one ridge top to the next in areas of broken terrain. They were carried across sparse eaten-out pasture or areas where grass was less than fully cured and might otherwise have arrested the fires' spread.

Although they varied in their size and impacts, the most severe of the 7 February fires the Commission examined shared a number of features:

- Rapid fire spread followed ignition, which responding crews could not contain.
- Fires crowned in forested areas, which made them impossible for ground crews to control.
- Powerful convection columns were generated above the fires.
- Extensive forward spotting occurred as a result of the fuel type, the weather conditions and the topography.
- Late in the day a wind change altered the direction of fire spread and extended the firefront.

RECOGNITION OF THE FIREFIGHTERS

The Commission acknowledges all those who placed their lives at risk to fight the fires that burned in Victoria in January–February 2009, and particularly on and after 7 February. Its gratitude extends to career firefighters from all the government agencies involved, volunteers, private units, industry brigades, police, and ambulance and other emergency services workers, as well as firefighters who came from interstate and overseas to help. Were it not for their efforts the damage and loss would have been even greater.

The Commission particularly recognises the contribution of volunteers and their families. The strength of the CFA volunteer base was evident on 7 February; this includes its surge capacity, the local knowledge of its members and its rapid response. The Commission heard of volunteers preparing for the day, warning local residents and assisting with the confronting task of locating and identifying the dead. Countless more volunteers took up support roles.

Although not well known, private units play an important role in firefighting in many parts of Victoria. They are usually operated by farmers or landowners, and their equipment usually consists of a small multi-purpose farm utility with a portable tank and pump mounted on the rear. Operators might be members of the CFA but this is not always the case.

The operators of forest plantations above a certain size are required to have industry fire brigades. These brigades need only protect the plantation assets, but the plantation operator can, and often does, permit the brigade to operate outside its designated area.

The Commission acknowledges the firefighting support provided by industry brigades and private units and encourages continued cooperation between public and private operators. It is a practical and valuable expression of shared responsibility that strengthens the state's overall firefighting capacity.

THE FIRE-RELATED DEATHS

The greatest tragedy of Black Saturday, and one of the primary reasons why this Royal Commission was established, was that 173 people died as a result of the fires. This far exceeded the loss of life from any previous bushfires—including Ash Wednesday, in February 1983, when 75 people died in Victoria and South Australia.

Five fires claimed people's lives. The greatest loss resulted from the Kilmore East fire (119 people); it was followed by Murrindindi (40), Churchill (11), Beechworth-Mudgegonga (2) and Bendigo (1). The great majority of these people died on 7 February; four died in the following days or weeks as a result of the injuries they sustained on 7 February, and one person, an interstate firefighter, died as a result of injuries sustained after 7 February.

The Commission heard many accounts from people who survived the 2009 bushfires, but it was only by examining the circumstances of the deaths that it could complete its investigation of these fires. In particular, the examination of the circumstances of the deaths helped the Commission expand its knowledge of the way people understand and respond to bushfire. These inquiries also cast light on its consideration of matters such as planning and building regulation, the need for a broad range of safety options, and what makes a home defendable against bushfire.

RESPONDING TO BUSHFIRE

The response to the fires on 7 February was characterised by many people trying their best in extraordinarily difficult circumstances. There were many examples of people who met the challenge admirably. Nevertheless, some poor decisions were made by people in positions of responsibility and by individuals seeking to protect their own safety. The Commission is conscious of the pressure and difficulties people faced on the day, but it would be negligent if it overlooked the shortcomings: we need to learn the lessons so that problems can be avoided in the future. The Commission therefore examined the policies, systems and structures needed to ensure that government, fire and emergency services agencies and individuals make informed, effective decisions about their response to bushfires in a way that protects life and minimises loss.

VICTORIA'S BUSHFIRE SAFETY POLICY

As the fires of January–February 2009 burned fire agencies and individuals made crucial decisions in the context of an overarching policy for community safety in bushfires. That policy had become known colloquially as 'stay or go' but is more accurately described by its full title, 'Prepare, Stay and Defend or Leave Early'.

As a result of its inquiries the Commission concludes that the central tenets of the stay or go policy remain sound. The 7 February fires did, however, severely test the policy and exposed weaknesses in the way it was applied. Leaving early is still the safest option. Staying to defend a well-prepared, defendable home is also a sound choice in less severe fires, but there needs to be greater emphasis on important qualifications.

The policy is now in transition. Since 7 February the State has improved the policy and the community education campaign that accompanies it, including in response to the Commission's interim recommendations. The Commission considers that, although the changes the State has made to date advance the policy, further change is needed.

The stay or go policy failed to allow for the variations in fire severity that can result from differing topography, fuel loads and weather conditions. In particular, it did not adequately account for the ferocious fires experienced on Black Saturday. A bushfire safety policy must be capable of dealing with the fact that every fire is different and must differentiate potential firestorms from most bushfires. The most fierce fires call for a different approach to community safety, for different advice, support and responses from fire agencies. On such days, if the initial attack fails to contain a fire, the operational focus and mindset of fire agencies should move to providing information and attending to community safety rather than fire suppression.

The stay or go policy tended to assume that individuals had a fire plan and knew what to do when warned of a bushfire threat. But many people did not have a well-thought-out plan and were left to make their own decisions without the benefit of assistance from the authorities. In addition, warnings—when they were given—were too narrow: they were directed at getting people to enact their fire plans, rather than giving more specific directions or advice. The Commission heard that many people wait and see what happens before leaving in response to one or more of a range of 'triggers', such as a fire being in their area, the situation becoming dangerous, or being personally told to leave. For these people the lack of alternatives—the provision of shelters and refuges or evacuation—became critical as a fallback option. Any policy must encourage people to adopt the lowest risk option available to them, which is to leave well before a bushfire arrives in the area. The Commission acknowledges, however, the reality that people will continue to wait and see, and a comprehensive bushfire policy must accommodate this by providing for more options and different advice.

The State has accepted that the policy options of leaving early or staying to defend do not fully cover the need for contingency plans, but it still appears reluctant to implement alternatives, arguing that the availability of a suite of options could discourage some people from leaving early. The Commission is concerned that the State's reluctance is reflected in the slow progress with community refuges and bushfire shelters. It simply does not face the reality that the earlier binary policy approach did not help many people who, for various reasons, did not find either option acceptable in their circumstances.

Advice about bushfires must also be provided to the community in a way that engages them. The population exposed to fire on the urban fringes is growing and the demographics are changing. It is essential that there be a continued focus on providing frank and meaningful advice about the risks and what is required to adequately prepare for and survive a bushfire. Local planning and emergency management processes are also crucial to the formulation of this advice. The fact that not all houses are defendable in all circumstances was recognised before 7 February. In the Commission's view this message needs to be conveyed more forcefully. An important observation from the circumstances of many of the fire-related deaths is that defendability is affected by the surrounding environment—not just the land and vegetation immediately adjacent to a house. Being close to a heavily forested area can increase the ferocity of an approaching fire and the likelihood of heavy ember attack, making it harder to defend a house. Defending a house also requires at least two able-bodied, fit and determined adults who are physically and mentally prepared to work long and hard in arduous and dangerous conditions. The rigours of mounting a defence in the face of fires such as those on Black Saturday caught many by surprise. The Commission finds it particularly worrying that nearly half of the people who died were classed as 'vulnerable' because they were aged less than 12 years or more than 70 years or because they were suffering from an acute or chronic illness or disability.

Community education must continue to stress that staying in fire-prone areas on days when conditions are as severe as those on Black Saturday involves grave risk to one's life.

The policy approach also needs to recognise the important underlying principle of shared responsibility. A fundamental aspect of the Commission's recommendations is that everyone—the State, municipal councils, individuals, household members and the broader community—must accept greater responsibility for bushfire safety in the future and that many of these responsibilities are shared.

The Commission uses the expression 'shared responsibility' to mean increased responsibility for all. It recommends that State agencies and municipal councils adopt increased or improved protective, emergency management and advisory roles. In turn, communities, individuals and households need to take greater responsibility for their own safety and to act on advice and other cues given to them before and on the day of a bushfire.

'Shared responsibility' does not mean 'equal responsibility'. The Commission considers that in some areas the State should assume greater responsibilities than others; for example, the State and its fire authorities are likely to be more able than individuals to identify the known risks about bushfire. It is also necessary for the State, municipal councils and families to recognise the specific needs of vulnerable people, who might need early warning, assistance or separate consideration particularly on code red days.

The future policy

The Commission understands the attraction of an uncomplicated policy framework that presents two clear options—stay or go—but such an approach is simplistic. Realistic advice is unavoidably more complex and requires subtlety. As a consequence, although the Commission suggests retaining the effective elements of the existing policy it also recommends augmenting and improving the policy in a number of areas:

- covering the full range of fires—with particular recognition of the heightened risk associated with the most ferocious fires on the worst of days
- strengthening warnings and improving their timeliness and dissemination
- providing more practical and realistic options such as community refuges, bushfire shelters and evacuation—including assisted evacuation of vulnerable people
- improving the quality and availability of advice on fire behaviour and house defendability and clearly conveying the message that among the risks of staying to defend are death and serious injury.

To be effective these changes need to be part of a well-designed long-term community education program that captures people's attention, makes allowance for local needs and circumstances, and is regularly evaluated and improved. Municipal councils should take a more active role in planning for bushfire, including planning for evacuation and shelter options in their municipalities.

Among the elements of the policy that should be retained are the following:

- the principle of shared responsibility—that there are legitimate and important roles for both individuals and the State
- encouragement to leave early as the safest option
- staying and defending still being a sound choice in less severe conditions and fires, providing certain precautions are taken
- emphasis on preparation, whether staying to defend or leaving early
- sound advice for individuals, households and communities—including a mix of specific and general advice delivered through various modes and media.

It will not be easy to maintain the focus on bushfire safety over time. Community memory of ferocious fires can fade because of the relative infrequency of such events. In these circumstances there is a risk of individual and collective underestimation of the risk—and possibly complacency. Individuals must remain vigilant, and the State should use community education and public awareness to break the cycle of complacency. Teaching bushfire history and safety in schools is important for maintaining community memory and awareness.

Image 2 The Bendigo fire

Source: Courtesy of *The Bendigo Advertiser.*

Finally, individual planning and action for bushfire safety can often involve hard decisions. For example, firefighting equipment and infrastructure are expensive, and some people in bushfire-prone areas who want to defend their homes might not have the financial means to prepare their home fully. Dilemmas such as this should be discussed in education programs under the revised bushfire safety policy.

The revised policy needs to challenge people to think about what they would do if bushfire threatened on a work day, during school holidays or when they had other plans (such as a party). They also need to ask themselves whether they are physically and mentally strong enough to cope with the demands of a sustained firefight, what would they do if their plans fail, and how would they protect their pets and livestock or would they leave them. People need to face the fact that bushfires do not necessarily arrive at convenient times. Their planning needs to reflect this reality.

EMERGENCY AND INCIDENT MANAGEMENT

The State's emergency management framework provides for planning, preparation and coordination in the management of crises and natural disasters. On Black Saturday new state-level operational arrangements were being trialled by the CFA and DSE. This was the first fire season (2008–09) that the agencies had been co-located and operating from the integrated Emergency Coordination Centre in Melbourne. The purpose of the iECC was to achieve effective strategic planning and coordination, better information sharing and faster decision making. People who worked at the iECC overwhelmingly considered that the outcome of the fires would have been far worse had the agencies not been co-located.

The Commission agrees with this conclusion but further concludes that the state-level emergency management arrangements still faltered because of confusion about responsibilities and accountabilities and some important deficiencies of leadership. True integration was not achieved: the CFA and DSE followed operating procedures that were not fully consistent, used separate technology systems, and in many cases performed duplicate functions. The State has acknowledged some of these problems, and since 2009 systems at the iECC (now the State Control Centre) have been upgraded and the centre's layout changed. The Commission endorses these improvements and supports the continued use of the State Control Centre for integrated emergency management.

The experience of 7 February also highlighted several areas in which high-level state arrangements need reform. On Black Saturday the roles of the most senior personnel were not clear, and there was no single agency or individual in charge of the emergency. The Commission notes changes made as part of the new coordination, command and control arrangements but considers that more should be done. It recommends that the roles be clarified, including through organisational change.

Even when the right policies and systems are in operation, strong and effective leadership is essential. On 7 February the leaders ultimately responsible for the operational response to the emergency were the Chief Officer of the CFA, Mr Russell Rees, the Chief Fire Officer of DSE, Mr Ewan Waller, and the Chief Commissioner of Police, Ms Christine Nixon. Although many of the functions associated with each individual's role might have been delegated to subordinates, these people were still ultimately accountable. The Commission concludes that some elements of the leadership provided on 7 February were wanting. Mr Rees and Mr Waller ought to have done more in relation to warnings (this was dealt with in the Commission's first interim report), supporting incident management teams and statewide planning. The Commission considers that Ms Nixon's approach to emergency coordination was inadequate. Ms Nixon herself acknowledged that leaving the integrated Emergency Coordination Centre and going home at about 6.00 pm on 7 February was an error of judgment. The Commission shares this view.

Although the Commission concludes that the Minister for Police and Emergency Services acted properly before and during the bushfires it considers that he should have raised the option of declaring a state of disaster with the Premier. The circumstances clearly met the criteria for such consideration. Even if practical cross-agency and community cooperation was already in evidence and no additional coercive powers were needed, such a declaration would have recognised the gravity of the situation and might have sharpened emergency agencies' focus on community safety and warnings. In the Commission's view, if circumstances potentially satisfy the criteria for declaring a state of disaster, the option of making such a declaration should be discussed with the Premier.

The Commission not only looked at state-level management but also at the management of individual incidents. Overall, AIIMS (the Australasian Inter-service Incident Management System) was well understood and accepted by fire agencies. The Commission supports its continued use with some minor modifications to increase the profile of the Information Unit and recognition of the importance of local knowledge within level 3 incident management teams.

At the local level, the performance of individual incident management teams varied on 7 February, and the experience of the day demonstrated how important effective preparation is to good performance. It was invariably those IMTs that were well prepared, staffed by people with the appropriate training and experience, and well practised that managed difficult fires well. The Commission commends these groups for their planning and preparation. Problems that arose where this did not occur led the Commission to make recommendations about improving preparation, training and staffing, information flows and agency integration, so that more IMTs have the capability, competence and support needed to perform well in future fires.

In the lead-up to 7 February the State, including fire agencies, recognised that the day had the potential to be catastrophic and began planning and notifying the community and personnel accordingly. Pre-designated incident control centres were advised to be ready for a 'hot start'. In practice, however, the state of readiness of the ICCs and the level 3 incident management teams that staffed them varied. Again, the State has improved its procedures since 7 February, increasing the number of personnel required for a full level 3 IMT and establishing standards for pre-positioning teams. The Commission is concerned, however, that the revised standards do not go far enough, and it proposes that in all areas where a code red fire day is forecast a full IMT be in place from 10.00 am. Additionally, fire agencies should prescribe and audit a minimum number of joint training exercises for level 3 IMTs.

On 7 February not all the IMTs managing level 3 incidents were staffed by people with level 3 training, and facilities in the incident control centres from which IMTs operated were in some cases deficient. The Commission recommended in its first interim report that pre-designated level 3 ICCs be properly staffed and equipped. In response, the State allocated $28 million to upgrade level 3 ICCs and divisional command points, the upgrade being scheduled for completion by 30 June 2010.

Further, the Commission's examination of shortages of level 3 Incident Controllers revealed major differences between the DSE system of accreditation (formal assessment of a candidate against known criteria) and the CFA system of endorsement (nomination or approval of a person to perform a particular role). Since both agencies provide members to joint IMTs, it is highly desirable that there be a uniform standard and selection process, to ensure that each Incident Controller, regardless of agency, has similar experience and competence. The Commission considers that DSE's accreditation process is rigorous and thorough and is suitable for use by both DSE and the CFA. The CFA's process is more subjective and less transparent. The Commission proposes that a uniform, objective and transparent accreditation process for level 3 Incident Controllers and a system of performance review be adopted and that a traineeship scheme be used to progress people from level 2 to level 3 positions.

Those IMTs that were poorly prepared or did not have access to fully qualified staff also often had the greatest difficulty managing information flows, which are crucial to the issuing of public warnings and informing firefighters of changing conditions and potential danger. In the light of the evidence, it is plain to the Commission that effective training is essential. The training needs to provide information on the services available at the State Control Centre—such as specialists trained in weather forecasting, fire behaviour analysis and predictive mapping—and to stress the importance of preparing timely written incident action plans (based on a standard template) within four hours of reported ignition of a fire.

In addition, skilled officers need to be supported by robust, consistent and coordinated information and systems for tracking fire vehicles and mapping fires. When the State's approach to fighting ferocious fires is so highly dependent on cross-agency coordination it is unacceptable that effective coordination of information systems has not been achieved.

Finally, roadblocks play an important part in maintaining public safety during a bushfire and after a bushfire can protect health and safety or facilitate fire investigations. On and after Black Saturday more than 4,500 roadblocks were established to regulate traffic on roads leading into and around fire-affected areas. The evidence revealed a number of systemic problems with the way the roadblocks operated, among them inflexibility, poor communication and denying access to firefighters. Since Black Saturday new guidelines have been released that improve the operation of full and partial roadblocks, allow an Incident Controller to delegate responsibility for the establishment and operation of roadblocks with the support of Victoria Police, and formalise a system of wristbands to identify people who can pass through a roadblock. Guidance is also provided on how police should exercise discretion at a roadblock. The Commission welcomes the new emphasis Victoria Police gives to compassion and commonsense in the exercise of discretion.

FIREGROUND RESPONSE

Successful response to a fire relies on an effective blend of personnel, resources and processes. On 7 February many operational systems worked well, particularly considering the weather conditions. For example, the Commission heard few complaints about firefighting equipment, which has been a priority for CFA investment in recent years. Many crews were on standby ready for initial attack, and some successfully controlled fires that were potentially very damaging.

The best opportunity to bring a bushfire under control is at or near the point of ignition, when the fire is small. The role of first attack is to contain the fire swiftly and minimise the risk to life and property. This is particularly important on days of extreme fire danger, when initial attack might be the only opportunity for containing a fire. Aircraft are an integral part of initial attack and, together with ground crews, provide continuing support during an extended fire. Depending on where they are stationed and their dispatch protocols, aircraft can often get to a fire and start the initial attack before ground crews arrive.

Image 3 Fires near Kinglake

Source: Courtesy of *The Herald & Weekly Times*.

During January–February 2009 aircraft played an important role in the responses to fires. On 7 February, however, their use and effectiveness were limited by the weather, which in many cases made flying unsafe. There were other impediments, too. For instance, the process for dispatching an aircraft requires a request for the aircraft to pass through three layers of authority before it is cleared by the State Air Desk. The system is cumbersome and in some cases delayed the air response. Alternative methods for rapid dispatch are used elsewhere in Australia and overseas, but Victorian agencies appear reluctant to consider the option of a faster response system. The Commission proposes that state policy be changed so that all personnel required to fly aircraft and support air attack are on standby on code red days and that aircraft are automatically dispatched to high-risk fires in designated areas.

The Commonwealth owns and controls aircraft that could be used for firefighting. Before the 2009–10 fire season it held an operational briefing, outlining its resources and capabilities to the states and territories. The Commission considers, however, that cooperation between the State and the Commonwealth would be strengthened by an agreement that allows Commonwealth aerial resources to be automatically incorporated in the State's preparedness planning and, where available, used on days of high fire risk.

More broadly, effective access to and use of technology is important to effective detection and management of fires and tracking of resources on the ground. As noted, various problems became evident with information technology at incident control centres, including because the CFA and DSE used different systems and incident management team staff sometimes had difficulty gaining access to both systems. This inhibited the use and transfer of information such as warnings, maps and situation reports. The Commission notes that the CFA and DSE are investing in systems aimed at rectifying many of these shortcomings, including through the extensive upgrade of level 3 incident control centres.

Resource tracking is often a manual and time-consuming process. It is essential Incident Controllers know the location of vehicles, personnel, equipment and aircraft so that fire management can be planned and directed and critical information, such as red flag warnings, can reach those on the fireground when they need it. The Commission identified two areas of concern. First, the CFA and DSE use different systems and the CFA system, by the CFA's own admission, has not kept up with emerging technology. Second, on 7 February there were widespread problems with radios and phones and crews not filling in the required paperwork, which made it difficult to track firefighters and vehicles. The Commission makes specific suggestions for improving information and tracking systems and proposes that standardising these systems be a priority.

Communications systems on 7 February were also hindered by poor coverage, lack of interoperability between emergency services agencies, and insufficient investment in new technologies. For example, the transmission speed of the paging system had been reduced in order to expand reception coverage, and this caused serious delays in other than the most urgent messaging. There were also communication difficulties between metropolitan and regional police because of incompatible radio systems. Further, radio 'black spots' meant that reception was poor or non-existent in some areas, and there was channel congestion and insufficient channel availability. These problems were exacerbated when fire damaged or destroyed radio and telecommunications infrastructure.

The State has begun work to resolve these problems, notably through the new Emergency Services Communications Strategic Framework, which has six priorities: seamless statewide communication, call taking and dispatch, consistent statewide quality of service, improved data services, location-based services, and community communication. Until the statewide communications system envisaged by the new framework becomes a reality, the CFA should continue to improve its existing communications system, including by resolving coverage deficiencies. There should also be further research into smoke interference with communications systems and equipment, and this problem should be recognised in CFA and DSE training for communications planners.

Firefighter safety

The CFA's and DSE's management of firefighter safety deserves commendation. The number of fires that needed to be tackled simultaneously, and their intensity, created enormous challenges and risks for firefighters on Black Saturday. At times conditions were chaotic on the fireground, communications were difficult, and supervisors and crew leaders were required to manage in extreme conditions. The fact that there were no firefighter deaths during firefighting activities on 7 February speaks volumes for the emphasis the CFA and DSE had given to training and safety awareness.

Improving firefighter safety is a focus for the CFA and DSE, especially since the Linton inquiry into the death of five firefighters in 1998. In the days before 7 February there was a strong emphasis on firefighter safety, including giving crews safety briefings. A number of crews praised the equipment and safety measures available to them during the burnovers on Black Saturday.

Despite this, the Commission heard that there is further scope to improve firefighter safety. Although no-one died during firefighting activities, regrettably two firefighters did die in February 2009. One firefighter died on 7 February when he left his crew to help a relative, and an interstate firefighter died on 17 February after being struck by a falling tree. There were also numerous occasions on which firefighters were in extreme danger and some were injured.

Firefighters caught in burnovers often lacked the accurate and timely information they needed to avoid risk. Inadequate briefings, communication and communication equipment, maps and weather information were common concerns. The Commission also identified several deficiencies in safety investigations and proposes that the CFA and DSE amend their procedures for investigating safety incidents and 'near misses'. Fire agencies should also focus on ensuring that they have thorough processes for identifying and approving particularly dangerous activities such as back-burns. The Commission recommends that this be supported by training for all personnel, to ensure there is a clear understanding of the responsibility of the Incident Controller in approving such activities.

The Commission is also disappointed at the low priority given to the appointment of safety advisers, despite such advisers being mandatory for level 3 incidents under the CFA and DSE joint standard operating procedures. These personnel ensure that safety is a priority and advise, guide and support the incident management team in identifying and dealing with safety concerns. On 7 February there were about 200 trained DSE and CFA safety advisers but only two were appointed to incident management teams.

Given the failure to appoint safety advisers and the dangerous situations that caught a number of firefighters unaware on 7 February, the Commission reaffirms that an officer responsible for safety must be appointed to all level 3 incidents. In addition, safety advisers should be renamed safety officers—consistent with recommendations from the Linton inquiry and consistent with the title given to other key personnel in an incident management team.

REDUCING THE NUMBER OF FIRES

It is axiomatic that the most effective way of reducing bushfire damage and protecting human life is to prevent fires from starting. It is obviously impossible to eliminate bushfires, but it is possible to reduce the risk and incidence of fires started as a result of human activity. Nine of the 15 fires the Commission examined were started as a direct or indirect result of human activity; five were associated with the failure of electricity assets, and the causes of four were thought to be suspicious.

Broader data suggest that about one-third of bushfires in Victoria might be lit by people acting with mischievous or criminal intent. Although the proportion of fires that are caused by electricity infrastructure is low—possibly about 1.5 per cent of all ignitions in normal circumstances—on days of extreme fire danger the percentage of fires linked to electrical assets rises dramatically. Thus, electricity-caused fires are most likely to occur when the risk of a fire getting out of control and having deadly consequences is greatest.

Victoria's electricity assets are ageing, and the age of the assets contributed to three of the electricity-caused fires on 7 February 2009—the Kilmore East, Coleraine and Horsham fires. Distribution businesses' capacity to respond to an ageing network is, however, constrained by the electricity industry's economic regulatory regime. The regime favours the status quo and makes it difficult to bring about substantial reform. As components of the distribution network age and approach the end of their engineering life, there will probably be an increase in the number of fires resulting from asset failures unless urgent preventive steps are taken.

The Commission considers that now is the time to start replacing the ageing electricity infrastructure and to make major changes to its operation and management. The seriousness of the risk and the need to protect human life are imperatives Victorians cannot ignore. The number of fire starts involving electricity assets remains unacceptably high—at more than 200 a year. Although it is not possible to eliminate the risk posed by electricity assets, the State and the distribution businesses should take the opportunity to invest in improved infrastructure and substantially remove one of the primary causes of catastrophic fires in Victoria during the past 40 years.

In view of the size of Victoria's electricity distribution network, any replacement program will take years to complete even if it begins immediately. It is therefore necessary to consider interim measures for reducing the bushfire risk associated with the current network and the Commission suggests ways by which this could be done.

The Commission considers that Energy Safe Victoria needs to take a more proactive role as the electricity industry safety regulator. In the past it has taken a largely passive role, focusing on confirming distribution businesses' bushfire mitigation plans and line clearance plans. It has not assessed in detail whether safety objectives contained in the *Electricity Safety Act 1998* are actually being achieved. The Electricity Safety Management Scheme regime has undergone important changes recently. It is now compulsory for the distribution businesses to participate in the regime and specify how they will meet their obligations under the Electricity Safety Act. Energy Safe Victoria should now also have access to more of the data needed to assess the circumstances of fires caused by failed distribution infrastructure and 'near misses', so that it can identify trends and take these into account in the development of bushfire prevention strategies.

Overall, the Commission is strongly of the view that Energy Safe Victoria's regulatory powers and resources need to be strengthened, including the organisation's ability to apply sanctions for non-performance. It proposes that Energy Safe Victoria have a clear mandate to prevent and mitigate electricity-caused bushfires and powers to fulfil that mandate.

The other major bushfire cause linked to human activity relates to fires that people deliberately or accidently light. Deliberate fire-setters constitute only a small proportion of the population, yet their actions can cause enormous damage to individuals, communities and the environment. The evidence before the Commission suggests that there is a good deal of preventive activity under way at the local, state and national levels. There remains, however, considerable scope to improve the evidence base on deliberate fire-setting and so improve policy and program development; the extent and causes of this behaviour are not well understood.

The Commission notes that traditionally Victoria Police's approach to arson has focused on criminal investigation and emergency management, rather than crime prevention. This appears to be changing. Victoria Police has acknowledged that it is necessary to better understand arsonists and their behaviour and motivations in order to improve prevention and control. It advised the Commission that since 7 February 2009 it has greatly increased the attention it pays to arson prevention. Specifically, it has introduced a statewide arson prevention and detection strategy and a statewide Operations Response Unit, which will, among other things, increase visible police patrols in high-risk locations during periods of extreme bushfire risk.

The Commission welcomes the focus on research and evaluation of current and proposed strategies. It urges Victoria Police to continue to pursue a coordinated statewide approach to arson prevention and to evaluate this approach after the first fire season in which it operates, to determine whether sufficient support is being given to local initiatives.

The Commission also welcomes the national focus on arson prevention by the Ministerial Council for Police and Emergency Management. It encourages the Commonwealth, state and territory governments to ensure that the National Work Plan to Reduce Bushfire Arson has a suitable focus on evaluating current and proposed programs to encourage the development and sharing of best-practice approaches and gives priority to producing a nationally agreed framework for data collection.

REDUCING THE DAMAGE CAUSED BY FIRE

Fire is an integral part of the Australian environment, and the states in the south-east are most prone to bushfires. The risks associated with bushfires are also potentially increasing as a result of population growth in the rural–urban interface and the probable effects of climate change. The result is that, although it might be possible to reduce the number of severe fires and to be better prepared for fire, bushfire will never be eliminated from the Australian landscape.

Recognising that it is not possible to stop all fires, the Commission considered ways of reducing the loss of life and damage caused when fire does occur by reducing exposure to fire, helping to make homes more defendable, reducing the intensity and spread of fire, and helping people recover from the impact of fire.

PLANNING AND BUILDING

In all, 2,133 houses were destroyed as a result of the January–February 2009 bushfires in Victoria. The Commission heard many accounts of people who tried to defend a well-prepared house and failed. Many of the 173 people who died as a result of the fires had been trying to defend their home, a number of which had been prepared in accordance with CFA advice. These results demonstrate that where people live, the standard of the buildings in which they live, how those standards are maintained and, therefore, planning and building controls are crucial factors affecting safety in a bushfire.

The protection of human life should always be the overriding objective. Although it is not possible to guarantee that any building will survive a bushfire, particularly a ferocious one, the Commission considers that there are some areas where the bushfire risk is so high that development should be restricted.

Image 4 Looking to Melbourne from the Kinglake Ranges

Source: David Geraghty, courtesy of *The Herald & Weekly Times*.

The approach the Commission proposes acknowledges the complexity of the planning system and seeks to strengthen consideration of bushfire throughout the planning process by giving greater recognition to bushfire risk without imposing unacceptable biodiversity costs. This is the most effective way of maintaining the capacity to assess each development on its merits, while ensuring that such assessment attaches sufficient weight to the risk and impacts of bushfire. The Commission therefore proposes that the Victoria Planning Provisions relating to bushfire and the CFA guidelines for assessing permit applications in areas of high bushfire risk be amended in order to give priority to protecting human life and to ensure that development does not occur in areas in which either the bushfire risk or the environmental cost of making people safe is too high. The effectiveness of these controls should be reviewed at a later stage to determine whether the objective of substantially limiting the construction of homes in areas of high bushfire risk has been achieved. If not, more prescriptive controls should be introduced.

In addition, the Commission makes detailed proposals about the planning regime in order to improve information and understanding of bushfire through better mapping of both bushfire risk and Victoria's biodiversity. It also recommends that bushfire risk be accounted for in the application of controls on clearing native vegetation and that the construction of houses be restricted on high-risk blocks that are too small to enable a defendable space to be created and maintained.

In relation to building standards, the Commission concludes that construction standards for bushfire-prone areas do not adequately cover all the important components of bushfire risk. It recommends improving standards and clarifying objectives to redress these deficiencies. The high risk to any home that is built in the Flame Zone and is therefore likely to be subject to direct contact with flames must also be recognised. Deemed-to-satisfy construction standards are not appropriate for such dwellings. Because of the risk, each building must be designed specifically to respond to the conditions on the site.

Further, building regulations do not adequately cover the construction of non-residential buildings used by vulnerable groups—for example, schools, hospitals, child care centres and aged care facilities—in bushfire-prone areas. The building regulations need to contain specific standards for the construction of such buildings.

Applying land-use planning and building controls to minimise or reduce bushfire risk presents challenges. In particular, the planning and building systems operate prospectively and have little capacity to deal with past decisions and existing settlements or buildings in bushfire-prone areas, so they cannot account for people who are already living in areas of extremely high risk. The Commission therefore proposes that action be taken to help people move away from those areas where other bushfire risk-mitigation measures are not viable. In particular, the State should develop and implement a voluntary retreat and resettlement strategy—including non-compulsory land acquisition—for existing developments in areas at unacceptably high bushfire risk.

Even when bushfire safety is embedded in planning and building decisions it can be difficult to ensure that the standards that applied at the time of subdivision or construction are maintained. There is a need for mechanisms designed to ensure that bushfire safety continues to be a priority for building owners. The Commission puts forward a range of proposals aimed at facilitating continued maintenance of standards—including amending the *Sale of Land Act 1962* to require that vendor statements include information that will help potential buyers understand the bushfire risk of a property before they finalise the purchase.

LAND AND FUEL MANAGEMENT

Prescribed burning is one of the main tools for fire management on public land. It cannot prevent bushfire, but it decreases fuel loads and so reduces the spread and intensity of bushfires. By reducing the spread and intensity of bushfires, it also helps protect flora and fauna. Ironically, maintaining pristine forests untouched by fuel reduction can predispose those forests to greater destruction in the event of a bushfire.

About 7.7 million hectares of public land in Victoria is managed by DSE. This area includes national parks, state forests and reserves, of which a large portion is forested and prone to bushfire. DSE burns only 1.7 per cent (or 130,000 hectares) of this public land each year. This is well below the amount experts and previous inquiries have suggested is needed to reduce bushfire and environmental risks in the long term.

The Commission recognises that prescribed burning is risky, resource intensive, available only in limited time frames, and can temporarily have adverse effects on local communities (for example, reduced air quality). Nonetheless, it considers that the amount of prescribed burning occurring in Victoria is inadequate. It is concerned that the State has maintained a minimalist approach to prescribed burning despite recent official or independent reports and inquiries, all of which have recommended increasing the prescribed-burning program. The State has allowed the forests to continue accumulating excessive fuel loads, adding to the likelihood of more intense bushfires and thereby placing firefighters and communities at greater risk.

The Commission proposes that the State make a commitment to fund a long-term program of prescribed burning, with an annual rolling target of a minimum of 5 per cent of public land each year, and that the State be held accountable for meeting this target. DSE should modify its Code of Practice for Fire Management on Public Land so that it is clear that protecting human life is given highest priority, and should report annually on prescribed-burning outcomes.

To ensure continuing environmental protection, the State needs to improve its understanding of the effects of different fire regimes on flora and fauna. The Commission proposes that DSE expand its data collection on the effects of prescribed burning and bushfire on biodiversity. Maintenance and extension of data collection on Victoria's flora and fauna assets has not been a high priority. It needs to be improved so that more informed and scientifically-based decision making can accompany the development of prescribed-burning regimes that meet conservation objectives as well as accommodating bushfire safety considerations.

Managing clearing along roadsides is a particular challenge for municipal councils. The councils are responsible for bushfire prevention and mitigation and biodiversity management along local and some arterial roads; VicRoads has similar responsibilities for rural freeways and arterial roads. In some cases these roadsides contain the only remnant native vegetation in an area and offer important wildlife corridors and shelter. Consequently, differing objectives for road safety, biodiversity protection and bushfire prevention can be difficult to reconcile.

In the case of bushfires, roads and roadsides can be important fuel breaks, so road managers need to reduce the fuel levels in preparation for the fire season. Roads are also essential for people seeking to escape fires and for emergency services seeking access to fires. Since the 2009 fires land and road managers and the CFA have identified high-risk roads and are carrying out fuel-reduction work to reduce the future risks of bushfire.

The Commission is aware of the unresolved tensions between mitigation of bushfire risk and environmental conservation in the approach to roadside clearing and the legislative complexities to do with road safety, biodiversity and bushfire risk mitigation that affect roadside management. These concerns would be reduced if the State's planning provisions were amended to facilitate a broad range of roadside works to reduce bushfire risk, if municipal councils received better guidance to help them resolve competing environmental and bushfire management objectives, and if VicRoads implemented a systematic statewide assessment of bushfire risk for all roads.

RELIEF AND RECOVERY

The destruction wrought by the bushfires of January–February 2009 resulted in one of the largest recovery efforts seen in Australia. The Commission's observations on the early relief and recovery efforts are based on accounts of people's individual experiences and information it examined. Recovery for people, communities, local economies and the environment is difficult and requires a long-term approach. This process is being facilitated by the Victorian Bushfire Reconstruction and Recovery Authority, established on 10 February 2009.

In view of the scale of the disaster, the Commission considers that overall the initial relief and recovery efforts were well managed. Municipal council relief centres were generally activated quickly. They provided assembly points and places of refuge for people displaced by the fires and helped to lay a foundation for the progressive build-up of relief and recovery services. The Commission heard many expressions of gratitude from people affected by the bushfires for the care and attention they received at relief centres. The State and Commonwealth Governments' relief initiatives were generally prompt and well coordinated. The Minister for Police and Emergency Services coordinated recovery efforts at the State Cabinet level, as would be expected.

People from local communities, and then the wider community, responded generously to the obvious need for support to be provided to people rendered homeless and dislocated by the fires. Food, clothing and bedding flooded in to relief centres, and a great debt of gratitude is owed for this generosity.

But the chaos caused by a disaster of this scale inevitably meant that unanticipated situations arose and some plans failed. The Commission recognises that relief and recovery processes are complex and are made more so when the emergency is rapidly escalating and occurring at multiple locations. Continuing fires, inaccessible roads and loss of power and telecommunications hindered relief efforts and interfered with communication and mobility. This stress on the system brought into focus some community concerns about initial relief and recovery processes:

- The registration process in relief centres was frustrating to many as recovery agencies separately collected personal information from bushfire-affected people, adding to their trauma and slowing the agencies' ability to respond. It took some time for coordinated collection of information to become effective.
- Medical services were not always available locally, and initially there appeared to be poor coordination of some first aid services.
- Post-fire welfare checks were not well coordinated, especially for small, isolated communities and individuals who remained on their properties.
- Roadblocks were a source of frustration and difficulty for local residents, Victoria Police, the Department of Primary Industries, CFA volunteers and others coordinating relief efforts.

Image 5 Marysville gathers to remember Black Saturday

Source: Courtesy of *The Age*.

- Non-insurance and under-insurance have impeded the rebuilding process.
- Fencing bordering public land remains a problem because of the requirement that private landowners bear the full cost of restoring damaged fencing between their property and public land.
- The coordination of animal relief after the fires was fragmented.

The State has since initiated changes to improve many of these processes.

The Commission considers it too early to comment in detail on the medium- to long-term recovery and reconstruction effort, but it encourages the review and evaluation of initiatives to support learning from experience.

BUILDING ON CURRENT KNOWLEDGE

Although there is much to learn from the experiences of Black Saturday, the Commission urges all involved in developing and implementing bushfire policy to look to the long term. Governments need to create an environment in which individuals, communities and fire agencies build on current knowledge in the light of future information and experience. To make people living in bushfire-prone areas safer, Victoria needs flexible policy that takes advantage of new technology and changes management practices to capitalise on potential improvements. Adaptive thinking and processes are best supported by good organisational structures, rigorous research, and continuous policy evaluation and improvement.

ORGANISATIONAL STRUCTURE

In the Commission's view, a disaster of the scale of 7 February will always put pressure on organisational processes and structures. In this case it highlighted serious deficiencies in top-level leadership as a result of divided responsibilities, and the operational response was hindered by differences between agencies' systems, processes and procedures. Individually, the problems identified might be resolved by changing working arrangements between the CFA and DSE, and work is already under way towards this. But, when considered collectively, the problems illustrate systemic failings that led the Commission to contemplate organisational change. The Commission does not consider that the shortcomings identified in connection with Black Saturday can be overcome simply by doing more of the same, even if it is done better.

Many of the concerns identified related to operational matters such as control, interoperability and interagency standards, leading the Commission to conclude that a focus on improving operational capability is required. In considering the role of organisational change in responding to these concerns the Commission sought a wide range of views from within Victoria, from interstate and overseas, and from the policy, operational and academic perspectives. A diversity of views was presented. There was no consensus about the best approach to organisational arrangements for Victoria's fire services agencies. Nor was a compelling model put forward.

In weighing the various opinions, the Commission was not convinced by the State's view that structural change is not needed and that the focus should be on refinement of existing arrangements. For many of the operational problems the Commission identified, previous attempts to improve coordination have failed. Typically, progress has been slow or incomplete or has not achieved the level of interoperability required. Neither is the Commission persuaded that radical reform, such as moving to a single fire service, is necessary or desirable at this time. There might be an intuitive attraction to merging agencies, but there is a risk that the merger itself becomes the primary focus of effort, which could easily distract attention and focus from the operational improvements the Commission considers to be the priority.

Further, if it were not done carefully, subsuming all elements into one agency could undermine the strengths of each agency. For instance, DSE's specialist expertise in forest firefighting—which is crucial given the fire risk that characterises Victoria's forests—must be maintained and strengthened. Additionally, there were no compelling criticisms of the governance structures of the fire agencies, and the Commission therefore proposes that the existing governance arrangements remain unchanged.

The absolute priority is to improve operational performance. In support of this, the Commission recommends modest and targeted organisational reform as a catalyst for change. This would involve improvements to common operational policy and standards, stronger coordination and unambiguous command and control, greater interoperability, and a strengthened capacity to provide an integrated response.

In keeping with these priorities, the Commission sees the immediate appointment of a full-time Fire Commissioner as a necessary first step. The Fire Commissioner would be an independent statutory appointment and the senior professional fire officer in Victoria. The position would not entail governance or management responsibility for the three fire agencies (the CFA, DSE and the Metropolitan Fire and Emergency Services Board). The Chief Officers of the agencies would, however, be directed by the Fire Commissioner on operational matters in preparation for and on extreme and code red days and for level 3 fires. The Fire Commissioner would be responsible for the following:

- developing and building operational capacity to prepare for the highest risk days
- the control of level 3 fires—standing delegations for level 3 fires would rest with the Chief Officers of the CFA, DSE and the MFB, who would also retain operational control over level 1 and 2 fires
- leading a program of reform to expand operational capability, interoperability and the resilience of Victoria's fire services. This would be set out in a three-year action plan endorsed by the Minister and would involve working closely with the Chief Officers, who would lead operational change in their respective organisations
- advising the Government on the metropolitan fire district boundary
- representing Victoria on operational matters in national committees.

The Commission also looked at the funding of fire services. Fire services in Victoria are currently funded through a mix of contributions from insurance companies, the State and municipal councils. Insurance companies recoup the cost of their statutory contribution to the CFA and the MFB by imposing a Fire Services Levy on insurance premiums for building and contents insurance.

The current model's claimed benefit is that the insurance premium is a good way of linking the charge for fire services to the fire risk of individual properties. Evidence suggests, however, that this link is at best tenuous. Fundamentally, the Commission considers that the current funding model lacks transparency and is inequitable since people who are not insured or are under-insured do not make a fair contribution to the funding of fire services.

The Commission takes the view that the lack of equity and transparency in the current arrangements constitutes a good reason for moving to another system. Several other Australian states and territories already require all property owners to contribute to fire services via a levy on property, as opposed to insurance, and the Commission proposes that Victoria also move to replace the Fire Services Levy with a property-based levy.

RESEARCH AND EVALUATION

Governments need to invest more in bushfire research to enable Australia to rebuild the capacity it once had as a leader in this field. The Bushfire Cooperative Research Centre (initiated by Australian and New Zealand fire and land management agencies, their research partners and the Commonwealth Government) contributes to this effort. Overall, the Bushfire CRC has made gains in re-establishing a community of researchers and has consolidated the research agenda, but it does not meet all research needs. To a large extent its research program is determined by its stakeholders (which has resulted in a focus on applied research) and its funding cycle and thus its research projects have been relatively short term. Commonwealth Government funding for the Bushfire CRC is due to expire in 2013.

A permanent national centre for bushfire research is needed with reasonable surety of long-term funding. In developing the model for such a body, governments should consider incorporating the following features:

- pure and applied research as well as long-term research projects
- strong governance arrangements—including research independence
- the location of the research centre, preferably in Victoria
- a balanced focus that includes physical, biological and social research
- links with teaching and promotion of graduate scholarships
- cross-institutional and jurisdictional collaboration
- international collaboration and sharing of knowledge
- the research priorities highlighted in evidence before the Commission.

The Commission's work revealed a number of research gaps and priorities. Some were raised by expert witnesses; others became apparent when the Commission was conducting its analysis. These gaps are a good starting point for considering short- and long-term priorities for bushfire research in Australia. They include the following areas:

- the effects of prescribed burning and bushfire on biodiversity and on reducing bushfire risk
- the establishment of databases to map Victoria's flora and fauna, to register Victoria's fire risk and to identify its bushfire-prone areas
- the extent of deliberately lit bushfires and the causes of fire-setting behaviour
- the long-term effect of trauma resulting from the experience of bushfire
- the effects of fire activity and smoke on radio communications
- the extent of road deaths in bushfires, including use of cars as shelters in bushfires
- house defendability in extreme conditions
- the circumstances of the thousands who survived the Black Saturday bushfires by leaving early or late or by defending their homes or sheltering
- the shelter options—including factors affecting the safety of different places of shelter and particularly motor vehicles in the open, dams, pools, creeks and water tanks.

In addition to this, the Commission invites the Commonwealth to take the initiative on two matters outside the proposed research framework. The first is to consider the development of nationally acceptable bushfire terminology. It became apparent during the Commission's hearings that a number of bushfire-related terms are cumbersome, have obscure meanings or are potentially confusing to the general public. The second matter arises from there being no agreed methodology for estimating the cost of bushfires. The Commission experienced difficulty performing its analysis because of the lack of data and the absence of an agreed methodology for estimating various costs. This is a deficiency in the nationally available bushfire information and an area in which further collaborative work is warranted.

Finally, if fire agencies are to lift their capability and performance and improve the response capacity of individuals and communities, they need to become true evidence-based learning organisations. The Commission proposes that the fire agencies adopt and fund a culture of reflective practice that routinely pursues current research, searches for best practice, and habitually evaluates policies, programs and procedures with a view to improving internal practice and that of the communities they serve. Policy—especially in an area such as bushfire safety—needs to be reviewed and evaluated periodically, with the results of such review and evaluation being used in the development of policy and program improvements.

IMPLEMENTATION

In response to the unprecedented events of Black Saturday, the State, the Commonwealth and local governments made changes to their policies and practices. The governments and agencies initiated some of these changes of their own volition; other changes were implemented in response to the recommendations in the Commission's interim reports.

Since the Commission's interim reports were issued the State has invested a considerable amount in infrastructure, technological improvements and wide-ranging amendments to policies and procedures. For example, it endorsed a 10-year Emergency Services Communications Strategy Framework to improve emergency services communications and developed the One Source One Message tool to enable all Incident Controllers to send bushfire warnings simultaneously to a range of outlets, including the CFA and DSE websites, Victorian Bushfire Information Line operators and media broadcasters. Although the State has shown a strong commitment to implementing the Commission's recommendations, the Implementation Monitor nevertheless noted some concern about the recommendations relating to the fire danger rating, 'neighbourhood safer places', and the preparedness of some incident control centres. The Implementation Monitor also noted slow progress in the local government sector.

The Commonwealth has also made progress implementing initiatives and the Commission's interim recommendations. Among the important developments are provision of funding to the states and territories for the procurement of the national telephone-based warning system, incorporating fire danger indexes in district and township forecasts issued by the Bureau of Meteorology, and moving speedily to initiate the development of standards for bunkers in bushfire-prone areas.

As this final report makes further recommendations, the implementation effort will be ongoing. The Commission notes that the recommendations of previous inquiries have not always been implemented. For example, recommendations recognising the importance of prescribed burning in managing bushfire risk have not led to suitable prescribed-burning targets for Victoria. The Commission therefore considers that there is a need for a process whereby governments and the community have access to transparent, independently verified information on the response to the Commission's recommendations.

The State should nominate an independent implementation monitor or the Victorian Auditor-General to provide to the people of Victoria a report within two years on implementation of the Commission's recommendations. The report should detail the progress made towards implementing each recommendation in the final report and the interim reports. Recommendations from the interim reports that have not been fully implemented (such as those concerning refuges) should be given specific focus. Other recommendations that should receive particular attention are those that governments have previously shown reluctance to implement (such as increased fuel-reduction targets) and major recommendations that will require substantial implementation effort (such as replacing ageing electricity distribution infrastructure).

Where appropriate, the annual reports of government and fire agencies should detail the outcomes and effectiveness of the response to the recommendations. If there is no discernible change, more extensive reform might be needed.

Implementation of the Commission's recommendations calls for effort on the part of all levels of government. This might prove particularly challenging for municipal councils. The Commission envisages that councils would take a much greater role in local planning and preparation for bushfire and in implementing existing planning and building laws within a framework that takes better account of bushfire risk, while continuing with their existing role in bushfire relief and recovery.

The Commission makes some suggestions that would also help to clarify processes for municipal councils in areas such as clearing roadside vegetation, but it is also sensitive to the imbalance in the financial capacity of various municipal councils and the difficulty they have obtaining technical expertise in relation to bushfire. In a perverse way, those councils that have the most pressing need to apply substantial resources and effort to make their communities more bushfire safe are in many cases those that are the least well resourced. The State should examine whether local government requires greater support, including funding, to ensure that individual councils have the capacity to implement the agreed changes.

THE COMMISSION'S REPORTS

The Commission produced two interim reports and a final report. The interim reports form part of the work and deliberations of the Commission and, along with the final report, should be regarded as one body of work.

This final report is the culmination of the Commission's work. It describes and analyses the bushfires of January–February 2009 and makes recommendations about changes needed to reduce the risk, and the consequences, of similar disasters in the future. It also describes how the Commission went about its task. The final report consists of four volumes:

- Volume I—The Fires and the Fire-related Deaths
- Volume II—Fire Preparation, Response and Recovery (Parts One and Two)
- Volume III—Establishment and Operation of the Commission
- Volume IV—The Statements of Lay Witnesses.

The conclusions from Volumes I and II are outlined in this summary.

Volume III describes the work of the Commission, the conduct of its inquiry, and its administration for the Victorian historical and public record. It will be useful for others who in future are faced with the task of establishing and running a royal commission.

In reflecting on lessons learnt from this Royal Commission, the Commission notes that, unlike other state jurisdictions or the Commonwealth, Victoria does not have specific legislation that deals with the role, conduct and powers of a commission of inquiry. This lack of a legislative basis caused uncertainty, which the Commission considers undesirable. Arising from this, the Commission proposes that the State consider legislation for the conduct of inquiries—in particular, the conduct of royal commissions.

Volume IV is an electronic volume that collates the statements of the 100 lay witnesses who shared their experience of the fires during the Commission's hearings. The lay witnesses were an important part of the Commission's work, giving an 'on the ground' perspective to the experiences and real-life examples of how fire policies and emergency procedures affect individuals and communities. This offers an important way of preserving personal memories of the fires. It provides insights into people's preparation for bushfire and how they reacted to the conditions of Black Saturday and serves as a powerful reminder of the impacts of the fires on individuals, families and communities.

Volume IV appears in electronic form only because, as well as containing written statements, it contains photographs, video footage, other documentary material provided as part of the evidence, maps, and satellite photographs taken before and after the fires to help illustrate the impact the fires had on different parts of the state. The quantity and nature of the material mean a printed version is impractical.

The State is responsible for making copies of the Commission's report available to the public and will be doing so through Information Victoria. The report is available in hard copy and electronically. The electronic version is available on DVD and via the internet; it contains hyperlinks that enable the reader to also read the evidence referred to in the report. For the next 12 months the electronic version of the report and other information about the Commission will be retained on the Commission's website, www.royalcommission.vic.gov.au. After that it will be available through the website of the Victorian Department of Premier and Cabinet.

RECOMMENDATIONS

In preparing its recommendations the Commission chose not to constrain the State with undue prescription: it wanted to obviate the risk of narrowing policy makers' vision. To complement the recommendations, the Commission expresses views and draws conclusions in the text of the report, proposing the type of action the State (and others) should take to deal with matters that warrant further attention. The Commission trusts that those responding to the report will attach substantially the same weight to these proposals as they accord the primary recommendations.

When the term 'State' is used in the recommendations it is not intended to be read narrowly. It applies not just to the elected government and the organisations that form part of the Victorian public service. Depending on the circumstances, it can also encompass public entities that make up the broader public sector, such as the Country Fire Authority, and the 'special bodies' defined in the *Public Administration Act 2004,* such as Victoria Police.

VICTORIA'S BUSHFIRE SAFETY POLICY

RECOMMENDATION 1

The State revise its bushfire safety policy. While adopting the national Prepare. Act. Survive. framework in Victoria, the policy should do the following:

- enhance the role of warnings—including providing for timely and informative advice about the predicted passage of a fire and the actions to be taken by people in areas potentially in its path
- emphasise that all fires are different in ways that require an awareness of fire conditions, local circumstances and personal capacity
- recognise that the heightened risk on the worst days demands a different response
- retain those elements of the existing bushfire policy that have proved effective
- strengthen the range of options available in the face of fire, including community refuges, bushfire shelters and evacuation
- ensure that local solutions are tailored and known to communities through local bushfire planning
- improve advice on the nature of fire and house defendability, taking account of broader landscape risks.

RECOMMENDATION 2

The State revise the approach to community bushfire safety education in order to:

- ensure that its publications and educational materials reflect the revised bushfire safety policy
- equip all fire agency personnel with the information needed to effectively communicate the policy to the public as required
- ensure that in content and delivery the program is flexible enough to engage individuals, households and communities and to accommodate their needs and circumstances
- regularly evaluate the effectiveness of community education programs and amend them as necessary.

RECOMMENDATION 3

The State establish mechanisms for helping municipal councils to undertake local planning that tailors bushfire safety options to the needs of individual communities. In doing this planning, councils should:

- urgently develop for communities at risk of bushfire local plans that contain contingency options such as evacuation and shelter
- document in municipal emergency management plans and other relevant plans facilities where vulnerable people are likely to be situated—for example, aged care facilities, hospitals, schools and child care centres
- compile and maintain a list of vulnerable residents who need tailored advice of a recommendation to evacuate and provide this list to local police and anyone else with pre-arranged responsibility for helping vulnerable residents evacuate.

RECOMMENDATION 4

The State introduce a comprehensive approach to shelter options that includes the following:

- developing standards for community refuges as a matter of priority and replacing the 2005 Fire Refuges in Victoria: Policy and Practice
- designating community refuges—particularly in areas of very high risk—where other bushfire safety options are limited
- working with municipal councils to ensure that appropriate criteria are used for bushfire shelters, so that people are not discouraged from using a bushfire shelter if there is no better option available
- acknowledging personal shelters around their homes as a fallback option for individuals.

RECOMMENDATION 5

The State introduce a comprehensive approach to evacuation, so that this option is planned, considered and implemented when it is likely to offer a higher level of protection than other contingency options. The approach should:

- encourage individuals—especially vulnerable people—to relocate early
- include consideration of plans for assisted evacuation of vulnerable people
- recommend ‘emergency evacuation’.

RECOMMENDATION 6

Victoria lead an initiative of the Ministerial Council for Education, Early Childhood Development and Youth Affairs to ensure that the national curriculum incorporates the history of bushfire in Australia and that existing curriculum areas such as geography, science and environmental studies include elements of bushfire education.

RECOMMENDATION 7

The Commonwealth lead an initiative through the Ministerial Council for Police and Emergency Management, facilitated by Emergency Management Australia, to develop a national bushfire awareness campaign.

EMERGENCY AND INCIDENT MANAGEMENT

RECOMMENDATION 8

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures to require the following:

- that at locations that attract preparedness levels A or B there be a full incident management team under the leadership of an accredited level 3 Incident Controller in position by 10.00 am on days of code red fire danger and a core incident management team (eight personnel) under the leadership of an accredited level 3 Incident Controller in position by 10.00 am on days of extreme fire danger
- that a full level 3 IMT be led by a level 3 Incident Controller unless the State Controller determines otherwise.

RECOMMENDATION 9

The Country Fire Authority and the Department of Sustainability and Environment prescribe and audit the minimum number and nature of level 3 joint training exercises in which incident management team staff (including volunteers) are required to participate.

RECOMMENDATION 10

The State clarify whether, during major fires, Victoria Police should discharge its coordination functions from the State Emergency Response Coordination Centre or from the State Control Centre.

RECOMMENDATION 11

The State consider amending the *Emergency Management Act 1986* and the *Emergency Management Manual Victoria* in order to achieve the following:

- remove the title of Coordinator in Chief of Emergency Management from the Minister for Police and Emergency Services
- clarify the function and powers of the Minister
- designate the Chief Commissioner of Police as Coordinator in Chief of Emergency Management, who would have primary responsibility for keeping the Minister informed during an emergency.

RECOMMENDATION 12

The State consider either amending the *Emergency Management Act 1986* or adopting a standing practice to require the Minister for Police and Emergency Services or the Chief Commissioner of Police to consult the Premier about the possibility of declaring a state of disaster for all of or any part of Victoria whenever the Minister or the Chief Commissioner of Police becomes aware of circumstances that make it a reasonable possibility that the criteria for making such a declaration will be satisfied.

RECOMMENDATION 13

The State consider amending the *Emergency Management Act 1986* to introduce a graded scale of emergency declarations short of a state of disaster.

RECOMMENDATION 14

The Victorian fire agencies amend the AIIMS framework before the 2010–11 fire season in order to do the following:

- designate the Information Unit as a separate section reporting directly to the Incident Controller and require that the Information Unit contain a dedicated Public Information Officer whenever a full incident management team is required
- specify a set of functions in relation to which the Deputy Incident Controller for a level 3 incident will have oversight, which may be adjustable for a particular incident by agreement between the Incident Controller and the Deputy Incident Controller
- ensure that an individual with local knowledge is incorporated in an incident management team.

RECOMMENDATION 15

The Country Fire Authority and the Department of Sustainability and Environment:

- amend their procedures to require that an incident action plan summary be completed within the first four hours of an incident being reported and be provided to the State Control Centre and, where established, to the relevant Area of Operations Control Centre
- adopt DSE's incident action plan summary as the template to be used by all incident management teams and ensure that the template is included in the online IMT Tool Box
- provide regular training to IMT staff, highlighting the importance of information and reinforcing the support available from specialists within the State Control Centre.

RECOMMENDATION 16

The Country Fire Authority and the Department of Sustainability and Environment improve mapping support in the following ways:

- DSE providing mapping data free of charge to emergency response agencies
- greatly increasing the CFA's 'write' access to FireMap for incident management team staff
- establishing a joint DSE–CFA training program to ensure that mapping officers in level 2 and 3 incident management teams are fully trained in using FireMap, including in producing fire prediction maps
- requiring before the 2010–11 fire season that FireMap be used for joint incidents.

RECOMMENDATION 17

The Country Fire Authority and the Department of Sustainability and Environment establish before the 2010–11 fire season:

- a uniform, objective and transparent process based on the current DSE approach for the accreditation of level 3 Incident Controllers
- a performance review system for level 3 Incident Controllers
- a traineeship program for progression from level 2 to level 3 incident management team positions.

RECOMMENDATION 18

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures to require that a suitably experienced, qualified and competent person be appointed as Incident Controller, regardless of the control agency for the fire.

RECOMMENDATION 19

The Country Fire Authority provide to all CFA volunteers an identification card or similar to facilitate their passage through roadblocks established in accordance with the 2009 Guidelines for the Operation of Traffic Management Points during Wildfires.

FIREGROUND RESPONSE

RECOMMENDATION 20

The Country Fire Authority and the Department of Sustainability and Environment amend their policies on aerial preparedness and standby arrangements, their dispatch protocols and the management of aircraft in order to do the following:

- require that at locations that attract the risk assessment or preparedness level A on code red days all personnel needed for air operations must be on standby by 10.00 am
- establish a system that enables the dispatch of aircraft to fires in high-risk areas without requiring a request from an Incident Controller or the State Duty Officer.

RECOMMENDATION 21

The State, in conjunction with Emergency Management Australia and the Department of Defence, develop an agreement that allows Commonwealth aerial resources that are suitable for firefighting and support activities to be incorporated in preparedness plans and used on days of high fire risk.

RECOMMENDATION 22

The Country Fire Authority and the Department of Sustainability and Environment standardise their operating systems and information and communications technologies with the aim of achieving greater efficiency and interoperability between agencies.

RECOMMENDATION 23

The Country Fire Authority review and improve its communications strategy as a matter of priority and develop a program for identifying and responding to black spots in radio coverage.

RECOMMENDATION 24

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures for investigating safety incidents and 'near-misses' to ensure that all dangerous incidents, including back-burns, are fully investigated and that all relevant people are consulted and informed of the results.

RECOMMENDATION 25

The Country Fire Authority and the Department of Sustainability and Environment require without exception that all relevant staff be trained in the need for Incident Controller approval to be obtained before a back-burn is lit.

RECOMMENDATION 26

The Country Fire Authority and the Department of Sustainability and Environment adopt the title 'safety officer' (as opposed to 'safety adviser') and require without exception that a safety officer be appointed to every level 3 incident management team.

ELECTRICITY-CAUSED FIRE

RECOMMENDATION 27

The State amend the Regulations under Victoria's *Electricity Safety Act 1998* and otherwise take such steps as may be required to give effect to the following:

- the progressive replacement of all SWER (single-wire earth return) power lines in Victoria with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk. The replacement program should be completed in the areas of highest bushfire risk within 10 years and should continue in areas of lower bushfire risk as the lines reach the end of their engineering lives
- the progressive replacement of all 22-kilovolt distribution feeders with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk as the feeders reach the end of their engineering lives. Priority should be given to distribution feeders in the areas of highest bushfire risk.

RECOMMENDATION 28

The State (through Energy Safe Victoria) require distribution businesses to change their asset inspection standards and procedures to require that all SWER lines and all 22-kilovolt feeders in areas of high bushfire risk are inspected at least every three years.

RECOMMENDATION 29

The State (through Energy Safe Victoria) require distribution businesses to review and modify their current practices, standards and procedures for the training and auditing of asset inspectors to ensure that registered training organisations provide adequate theoretical and practical training for asset inspectors.

RECOMMENDATION 30

The State amend the regulatory framework for electricity safety to require that distribution businesses adopt, as part of their management plans, measures to reduce the risks posed by hazard trees—that is, trees that are outside the clearance zone but that could come into contact with an electric power line having regard to foreseeable local conditions.

RECOMMENDATION 31

Municipal councils include in their municipal fire prevention plans for areas of high bushfire risk provision for the identification of hazard trees and for notifying the responsible entities with a view to having the situation redressed.

RECOMMENDATION 32

The State (through Energy Safe Victoria) require distribution businesses to do the following:

- disable the reclose function on the automatic circuit reclosers on all SWER lines for the six weeks of greatest risk in every fire season
- adjust the reclose function on the automatic circuit reclosers on all 22-kilovolt feeders on all total fire ban days to permit only one reclose attempt before lockout.

RECOMMENDATION 33

The State (through Energy Safe Victoria) require distribution businesses to do the following:

- fit spreaders to any lines with a history of clashing or the potential to do so
- fit or retrofit all spans that are more than 300 metres long with vibration dampers as soon as is reasonably practicable.

RECOMMENDATION 34

The State amend the regulatory framework for electricity safety to strengthen Energy Safe Victoria's mandate in relation to the prevention and mitigation of electricity-caused bushfires and to require it to fulfil that mandate.

DELIBERATELY LIT FIRES

RECOMMENDATION 35

Victoria Police continue to pursue a coordinated statewide approach to arson prevention and regularly review its approach to ensure that it contains the following elements:

- high-level commitment from senior police
- a research program aimed at refining arson prevention and detection strategies
- centralised coordination that includes comprehensive training, periodic evaluation of arson prevention strategies and programs, and promotion of best-practice prevention approaches
- a requirement that all fire-prone police service areas have arson prevention plans and programs, according to their level of risk.

RECOMMENDATION 36

The Commonwealth, states and territories continue to pursue the National Action Plan to Reduce Bushfire Arson in Australia, giving priority to producing a nationally consistent framework for data collection and evaluating current and proposed programs in order to identify and share best-practice approaches.

PLANNING AND BUILDING

RECOMMENDATION 37

The State identify a central point of responsibility for and expertise in mapping bushfire risk to:

- review urgently the mapping criteria at present used by the Country Fire Authority to map the Wildfire Management Overlay, to ensure that the mapping used to determine building and planning controls is based on the best available science and takes account of all relevant aspects of bushfire risk
- map and designate Bushfire-prone Areas for the purposes of planning and building controls, in consultation with municipal councils and fire agencies
- finalise the alignment of site-assessment methods for planning and building purposes, taking into account bushfire risk to human safety as well as to property.

RECOMMENDATION 38

The State implement a regional settlement policy that:

- takes account of the management of bushfire risk, including that associated with small, undeveloped rural lots
- includes a process for responding to bushfire risk at the planning stage for new urban developments in regional cities, the process being similar to that used for new developments in Melbourne's Urban Growth Zone.

RECOMMENDATION 39

The State amend the Victoria Planning Provisions relating to bushfire to ensure that the provisions give priority to the protection of human life, adopt a clear objective of substantially restricting development in the areas of highest bushfire risk—giving due consideration to biodiversity conservation—and provide clear guidance for decision makers. The amendments should take account of the conclusions reached by the Commission and do the following:

- outline the State's objectives for managing bushfire risk through land-use planning in an amended state planning policy for bushfire, as set out in clause 15.07 of the Victoria Planning Provisions
- allow municipal councils to include a minimum lot size for use of land for a dwelling, both with and without a permit, in a schedule to each of the Rural Living Zone, Green Wedge Zone, Green Wedge A Zone, Rural Conservation Zone, Farming Zone and Rural Activity Zone
- amend clause 44.06 of the Victoria Planning Provisions to provide a comprehensive Bushfire-prone Overlay provision.

RECOMMENDATION 40

The Country Fire Authority amend its guidelines for assessing permit applications for dwellings, non-dwellings and subdivisions in the Bushfire-prone Overlay in order to accommodate the amendments to the Wildfire Management Overlay that are implemented as a result of recommendation 39 and make the guidelines available to municipal councils and the public. The revised guidelines should do the following:

- substantially restrict new developments and subdivisions in those areas of highest risk in the Bushfire-prone Overlay
- set out the CFA's guidelines for assessing permit applications for dwellings, non-dwellings and subdivisions—including the minimum defendable space requirements for different risk levels
- clarify that the CFA will approve new developments and subdivisions only if the recommended bushfire protection measures—including the minimum defendable space—can be created and maintained on a continuing basis
- emphasise the need for enduring permit conditions—in particular, conditions for the creation and maintenance of minimum defendable space to be maintained for the life of the development.

RECOMMENDATION 41

The State:

- amend the Victoria Planning Provisions to require that, when assessing a permit to remove native vegetation around an existing dwelling, the responsible authority and the Department of Sustainability and Environment, as referral authority, take into account fire hazard and give weight to fire protection purposes
- develop guidelines for determining the maximum level of native vegetation removal for bushfire risk mitigation, beyond which level the application would be rejected.

RECOMMENDATION 42

The Department of Sustainability and Environment develop and administer a collective offset solution for individual landholders who are permitted to remove native vegetation for the purpose of fire protection.

RECOMMENDATION 43

The Department of Sustainability and Environment conduct biodiversity mapping identifying flora, fauna and any threatened species throughout Victoria and make the results publicly available. The format used should be compatible with that used for Bushfire-prone Area mapping.

RECOMMENDATION 44

The Country Fire Authority produce for community guidance material on fire-resistant landscape and garden design, including a list of fire-resistant species.

RECOMMENDATION 45

The State press municipal councils—in particular, Murrindindi Shire Council—to urgently adopt a bushfire policy in their Local Planning Policy Framework and incorporate bushfire risk management in their planning policies and strategies for rebuilding communities such as Marysville, Kinglake and others affected by the January–February 2009 fires.

RECOMMENDATION 46

The State develop and implement a retreat and resettlement strategy for existing developments in areas of unacceptably high bushfire risk, including a scheme for non-compulsory acquisition by the State of land in these areas.

RECOMMENDATION 47

Standards Australia do the following:

- amend the objective of AS 3959-2009, Construction of Buildings in Bushfire-prone Areas, to ensure that it incorporates reducing the risk of ignition from ember attack
- review, and amend as appropriate, the testing methods prescribed in its standards for Tests on Elements of Construction for Buildings Exposed to Simulated Bushfire Attack (AS 1530.8.1 and AS 1530.8.2) to ensure that, so far as is possible, the methods provide a reliable predictor of the performance of construction elements under bushfire conditions.

RECOMMENDATION 48

The Australian Building Codes Board do the following:

- amend the performance requirements in the Building Code of Australia to ensure that they incorporate reducing the risk of ignition from ember attack
- work with Standards Australia to effect expeditious continuing review and development of AS 3959, Construction of Buildings in Bushfire-prone Areas, and other bushfire-related standards referred to in the Building Code of Australia
- negotiate with Standards Australia and SAI Global Ltd an arrangement for free online access to AS 3959-2009, Construction of Buildings in Bushfire-prone Areas, the other Australian standards referred to in AS 3959-2009, and any other bushfire-related Australian standards referred to in the Building Code of Australia
- amend the Building Code of Australia to remove deemed-to-satisfy provisions for the construction of buildings in BAL-FZ (the Flame Zone)
- include in the Building Code of Australia bushfire construction provisions for non-residential buildings that will be occupied by people who are particularly vulnerable to bushfire attack, such as schools, child care centres, hospitals and aged care facilities.

RECOMMENDATION 49

The State modify its adoption of the Building Code of Australia for the following purposes:

- to remove deemed-to-satisfy provisions for the construction of buildings in BAL-FZ (the Flame Zone)
- to apply bushfire construction provisions to non-residential buildings that will be occupied by people who are particularly vulnerable to bushfire attack, such as schools, child care centres, hospitals and aged care facilities
- other than in exceptional circumstances, to apply a minimum AS 3959-2009 construction level of BAL-12.5 to all new buildings and extensions in bushfire-prone areas.

RECOMMENDATION 50

Standards Australia move expeditiously to develop a standard for bushfire sprinklers and sprayers.

RECOMMENDATION 51

The Victorian Building Commission, in conjunction with the Country Fire Authority, develop, publish and provide to the community and industry information about ways in which existing buildings in bushfire-prone areas can be modified to incorporate bushfire safety measures.

RECOMMENDATION 52

The State develop and implement, in consultation with local government, a mechanism for sign-off by municipal councils of any permit conditions imposed under the Bushfire-prone Overlay and the regular assessment of landowners' compliance with conditions.

RECOMMENDATION 53

The State amend s. 32 of the *Sale of Land Act 1962* to require that a vendor's statement include whether the land is in a designated Bushfire-prone Area, a statement about the standard (if any) to which the dwelling was constructed, the bushfire attack level assessment at the time of construction (where relevant) and a current bushfire attack level assessment of the site of the dwelling.

RECOMMENDATION 54

The State amend the *Country Fire Authority Act 1958* to enable the Chief Officer to delegate the power to issue fire prevention notices.

RECOMMENDATION 55

The State initiate the development of education and training options to improve understanding of bushfire risk management in the building and planning regimes by:

- providing regular training and guidance material to planning and building practitioners
- helping a suitable tertiary institution design and implement a course on bushfire planning and design in Victoria.

LAND AND FUEL MANAGEMENT

RECOMMENDATION 56

The State fund and commit to implementing a long-term program of prescribed burning based on an annual rolling target of 5 per cent minimum of public land.

RECOMMENDATION 57

The Department of Sustainability and Environment report annually on prescribed burning outcomes in a manner that meets public accountability objectives, including publishing details of targets, area burnt, funds expended on the program, and impacts on biodiversity.

RECOMMENDATION 58

The Department of Sustainability and Environment significantly upgrade its program of long-term data collection to monitor and model the effects of its prescribed burning programs and of bushfires on biodiversity in Victoria.

RECOMMENDATION 59

The Department of Sustainability and Environment amend the Code of Practice for Fire Management on Public Land in order to achieve the following:

- provide a clear statement of objectives, expressed as measurable outcomes
- include an explicit risk-analysis model for more objective and transparent resolution of competing objectives, where human life is the highest priority
- specify the characteristics of fire management zones—including burn size, percentage area burnt within the prescribed burn, and residual fuel loading
- adopt the use of the term ‘bushfire’ rather than ‘wildfire’.

RECOMMENDATION 60

The State amend the exemptions in clause 52.17-6 of the Victoria Planning Provisions to ensure that the provisions allow for a broad range of roadside works capable of reducing fire risk and provide specifically for a new exemption where the purpose of the works is to reduce bushfire risk.

RECOMMENDATION 61

The State and Commonwealth provide for municipal councils adequate guidance on resolving the competing tensions arising from the legislation affecting roadside clearing and, where necessary, amend environment protection legislation to facilitate annual bushfire-prevention activities by the appropriate agencies.

RECOMMENDATION 62

VicRoads implement a systematic statewide program of bushfire risk assessment for all roads for which it is responsible, to ensure conformity with the obligations in s. 43 of the *Country Fire Authority Act 1958* and with the objectives expressed in the VicRoads 1985 Code of Practice.

ORGANISATIONAL STRUCTURE

RECOMMENDATION 63

The State enact legislation designed to achieve two specific ends:

- appoint a Fire Commissioner as an independent statutory officer responsible to the Minister for Police and Emergency Services and as the senior operational firefighter in Victoria
- make the Chief Fire Officer of the Department of Sustainability and Environment a statutory appointment.

The Fire Commissioner should have responsibility for the following:

- promoting and directing reform aimed at increasing the operational capability, interoperability and resilience of Victoria's fire services
- developing and building operational capacity to prepare for the days of highest bushfire risk and exercising control over level 3 fires as the permanent State Controller
- providing to government periodic advice on the metropolitan fire district boundary on the basis of triggers, frequency and criteria approved by government
- representing Victorian interests on operational matters in national committees.

RECOMMENDATION 64

The State replace the Fire Services Levy with a property-based levy and introduce concessions for low-income earners.

RESEARCH AND EVALUATION

RECOMMENDATION 65

The Commonwealth establish a national centre for bushfire research in collaboration with other Australian jurisdictions to support pure, applied and long-term research in the physical, biological and social sciences relevant to bushfires and to promote continuing research and scholarship in related disciplines.

MONITORING IMPLEMENTATION

RECOMMENDATION 66

The State appoint an independent monitor or the Victorian Auditor-General to assess progress with implementing the Commission's recommendations and report to the Parliament and the people of Victoria by 31 July 2012.

REFLECTIONS

RECOMMENDATION 67

The State consider the development of legislation for the conduct of inquiries in Victoria—in particular, the conduct of royal commissions.

THE COMMISSION'S TERMS OF REFERENCE

Following are the Commission's terms of reference, as issued on 16 February 2009.

ELIZABETH THE SECOND BY THE GRACE OF GOD
QUEEN OF AUSTRALIA AND HER OTHER REALMS AND TERRITORIES,
QUEEN, HEAD OF THE COMMONWEALTH

To The Honourable Bernard George Teague AO
Ronald Neville McLeod AM
Susan Mary Pascoe AM

GREETINGS:

WHEREAS:

A. On Saturday 7 February 2009, the State of Victoria experienced the most devastating bushfires in its history, resulting in a catastrophic loss of life and public and private property.

B. The State of Victoria is recognised as a region subject to a very high fire risk and has previously experienced extensive bushfires, most notably in 1939, 1944, 1969, 1977, 1983, 2003, 2005 and 2006.

C. A range of inquiries conducted after those bushfires has led to the development of a coordinated State-wide approach to planning for, and responding to, bushfires and an extensive network of career and volunteer emergency services personnel.

D. The weather conditions on 7 February were unprecedented in terms of high temperatures, low humidity and wind speeds, following years of drought. The conditions on that day also followed a heatwave and bushfires, including in Gippsland, in late January 2009.

E. Over 4,000 fire service volunteers and career staff immediately responded to combat more than 300 fires across Victoria on 7 February and over 10,000 personnel were subsequently involved in the largest coordinated emergency response and community recovery operation in the State's history.

F. The State acknowledges and commends the significant dedication and efforts of staff and volunteers in responding to this emergency in extremely difficult conditions.

G. Notwithstanding the scale of these efforts, there was an unprecedented loss of life, extreme property damage, and major community trauma and displacement.

H. The Governor of the State of Victoria, in the Commonwealth of Australia, by and with the advice of the Executive Council, has therefore deemed it to be expedient that a Commission should issue to you in the terms set out below.

I. It is anticipated that in conducting Our Commission you will take into account the important role and functions of the Coroner, Victoria Police, the Director of Public Prosecutions and the Victorian Bushfire Reconstruction and Recovery Authority, and that you will consult with each of those persons or bodies to the extent that you consider appropriate in order to avoid the inquiries of Our Commission from interfering unnecessarily with the functions of those persons or bodies.

NOW THEREFORE the Governor of the State of Victoria, in the Commonwealth of Australia, by and with the advice of the Executive Council and acting pursuant to section 88B of the **Constitution Act 1975**, appoints and constitutes you

The Honourable Bernard George Teague AO
Ronald Neville McLeod AM
Susan Mary Pascoe AM

to be Our Commissioners

AND HEREBY APPOINTS The Honourable Bernard George Teague AO to be Chairperson of the Royal Commission.

FOR THE PURPOSE of inquiring into and reporting on the following matters:

1. The causes and circumstances of the bushfires which burned in various parts of Victoria in late January and in February 2009 ("2009 Bushfires").

2. The preparation and planning by governments, emergency services, other entities, the community and households for bushfires in Victoria, including current laws, policies, practices, resources and strategies for the prevention,

identification, evaluation, management and communication of bushfire threats and risks.

3. All aspects of the response to the 2009 Bushfires, particularly measures taken to control the spread of the fires and measures taken to protect life and private and public property, including but not limited to:

   (a) immediate management, response and recovery;
   (b) resourcing, overall coordination and deployment; and
   (c) equipment and communication systems.

4. The measures taken to prevent or minimise disruption to the supply of essential services such as power and water during the 2009 Bushfires.

5. Any other matters that you deem appropriate in relation to the 2009 Bushfires.

AND WE direct you to make such recommendations arising out of your inquiry as you consider appropriate, including recommendations for governments, emergency services, other entities and the community on:

6. The preparation and planning for future bushfire threats and risks, particularly the prevention of loss of life.

7. Land use planning and management, including urban and regional planning.

8. The fireproofing of housing and other buildings, including the materials used in construction.

9. The emergency response to bushfires.

10. Public communication and community advice systems and strategies.

11. Training, infrastructure, and overall resourcing needs.

AND WE do by these presents give and grant you full power and authority to call before you such person or persons as you shall judge likely to afford you any information upon the subject of this Our Commission, and to inquire of and concerning the premises by all other lawful ways and means whatsoever.

AND WE declare the powers of the Commission at the discretion of the Chairperson may, at any time, be exercised by one or more Commissioners.

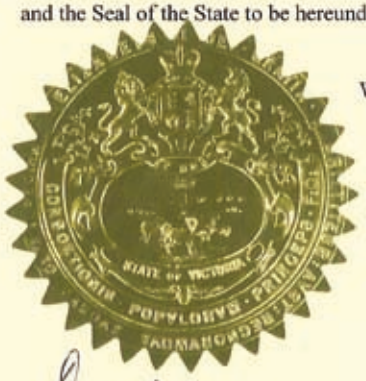
AND WE will and command that this Our Commission shall continue in full force and virtue and that you shall and may from time to time and at every place or places proceed in the execution thereof, and of every matter and thing therein contained although the same be not continued from time to time by adjournment.

AND WE direct you to conduct your inquiry as expeditiously as possible and to furnish US with:

(i) an interim report focusing on immediate actions that can be taken prior to the 2009-2010 fire season, by 17 August 2009; and

(ii) a final report by 31 July 2010 or such later date as WE may be pleased to fix.

IN TESTIMONY WHEREOF WE have caused these Our Letters to be made Patent and the Seal of the State to be hereunder affixed.



WITNESS His Excellency Professor David de Kretser, Companion of the Order of Australia, Governor of Victoria and its dependencies in the Commonwealth of Australia at Melbourne this 16th day of February Two thousand and nine in the fifty-eighth year of Our reign.

By His Excellency's Command

Premier of Victoria

Entered on the record by me in the Register of Patents Book No 44 Page No 111 on the 16th day of February 2009.

Secretary, Department of Premier and Cabinet

THE PEOPLE WHO DIED

The Commission focused on improving Victoria's bushfire safety, so that the lessons learnt from the tragedy of Black Saturday will make the state a safer place. It offers this report and its recommendations to the Government and people of Victoria in memory of those who lost their lives.

ARTHURS CREEK

Josef Matheis
Glenys Matheis

BENDIGO

Mick Kane

CAMBARVILLE

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2009 Victorian Bushfires Royal Commission

FIRE PREPARATION, RESPONSE AND RECOVERY

FINAL REPORT VOLUME II
PART ONE

THE HON. BERNARD TEAGUE AO – CHAIRPERSON

RONALD MCLEOD AM – COMMISSIONER

SUSAN PASCOE AM – COMMISSIONER

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A NOTE FOR READERS

The Commission is conscious of the wide interest in its report—not only in Victoria but elsewhere in Australia and internationally. Its readership will be broad and readers' interests will vary. Some chapters will be of keen interest to many, including people affected by the late January and February 2009 bushfires. Other chapters are directed at a more technical readership and might be of interest to academics or practitioners. Governments and their agencies will probably examine the entire report in detail, seeking to understand its implications for policy, operational practices and service delivery.

In view of this broad audience, the Commission tried to make its report as accessible as possible, without undue technicalities, and thus more easily read by the general public. Each chapter is designed to stand alone to help readers who might have more discrete interests. Such an approach inevitably results in some repetition. Each chapter's introductory remarks provide brief background information, describe the chapter's purpose, and summarise the essential position the Commission is advocating.

The report is available in hard-copy and digital form. The digital version contains links to the evidence for those interested in seeing additional detail about the material discussed (the transcript and exhibits) and submissions. The report was written with electronic production in mind, and this influenced decisions about matters such as the presentation of endnotes.

Following are some of the terms used in the report in the interests of consistency and simplicity:

- bunkers—when referring to personal bushfire shelters
- community refuges—rather than designated refuges
- bushfire shelters—rather than neighbourhood safer places, except where the current policy framework is being discussed
- roadblocks—rather than traffic management points
- code red days—rather than Code Red/Catastrophic days
- stay or go—to refer to Victoria's bushfire safety policy
- vulnerable people—incorporating groups such as young people, older people, the ill and the infirm.

Technical terms are, however, used if a direct reference is made to existing government policy or in a direct quote, to ensure that the meaning is conveyed accurately. Further, some of the terms used in this report differ from those used in the Commission's interim report. The decision to use different terminology is based on new evidence and a desire to simplify and clarify the language used.

The Commission recognises that a number of different terms are used to describe bushfires—for example, wildfire and megafire, as used in the United States. To ensure consistency and minimise confusion, this report uses the term 'bushfire' in all instances other than when referring to the name of a policy or report. The Commission also tends to use the words 'ferocious' and 'severe' to describe the type of fire that occurred on 7 February.

For simplicity, the Commission also uses the term 'wind change' generically when referring to the complex interaction between changes in the wind's direction and fire behaviour. Chapter 1 in Volume I discusses the impact of wind on fire behaviour and the nature of the wind change on Black Saturday.

Overall, the Commission did not reach a firm view about the appropriateness of using any of these terms beyond its final report, but it does note a preference for plain language. In Chapter 11 in Volume II the Commission expresses support for further work being done in order to identify the best words to use in public communications about bushfire.

Three other conventions applied in this report warrant mention. First, for consistency with fire agencies' use in bushfire warnings and other measurements of time, the 24-hour clock is used in the discussion of the fires in Part One of Volume I. Throughout the rest of the report the 12-hour clock is used to refer to time. Second, although metric measures are generally used in the report, imperial measures are used if they reflect more commonly understood terminology—for example, a quarter-acre block.

Third, readers should bear in mind that the Commission draws a distinction between 'State' and 'state'. The State refers generically to the mechanisms of the Victorian Government, including the departments and agencies that were collectively represented as parties before the Commission. In contrast, the state is used in reference to Victoria as a place or geographic entity.

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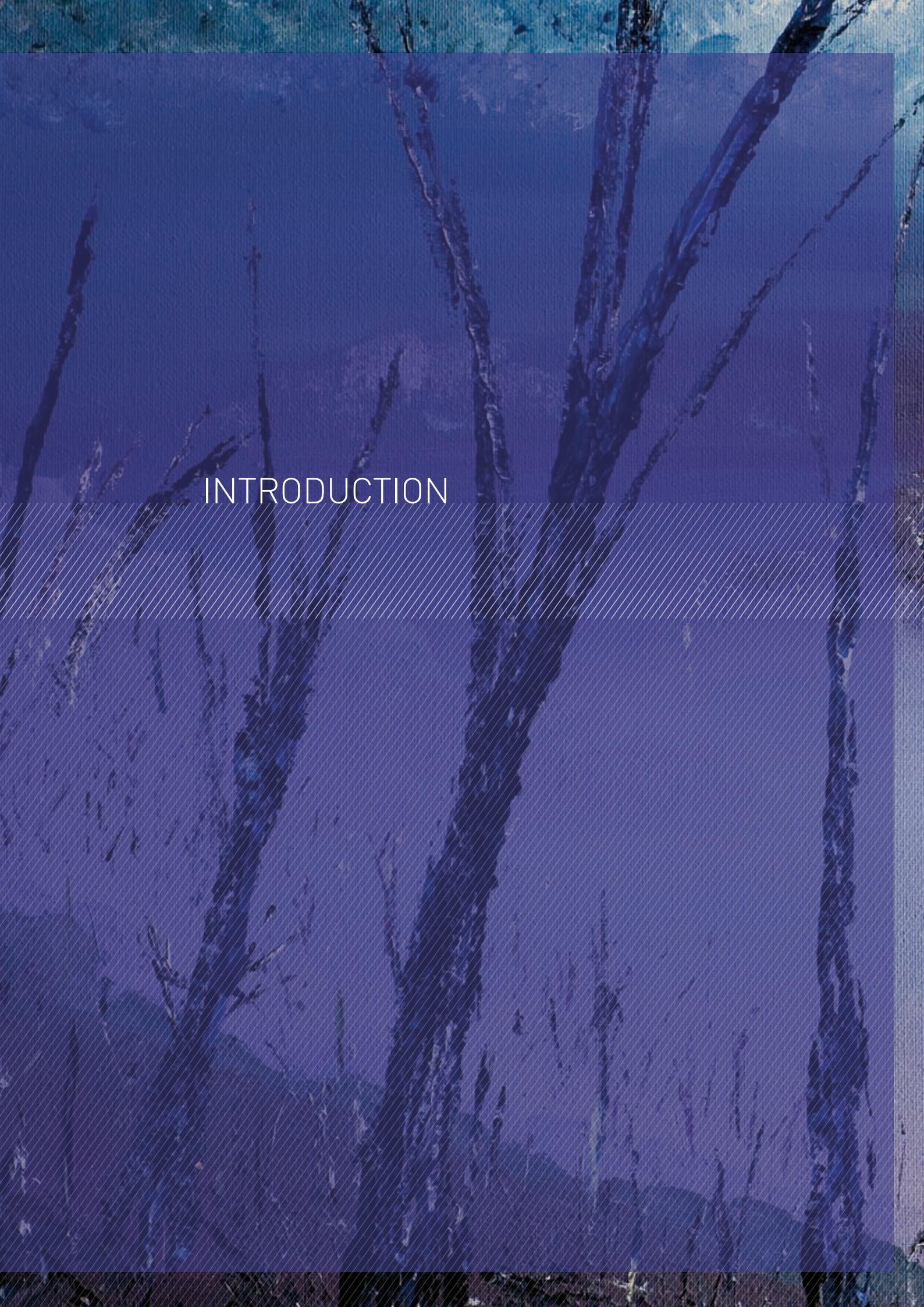
PART TWO



INTRODUCTION

INTRODUCTION

It is imperative that the Victorian community learn from the experience of 7 February 2009. Government regulation, policies and procedures need to change so they better recognise the risk of death from ferocious bushfires and work to substantially mitigate that risk. Individuals and communities need to better understand bushfire and be more active in preparing for and responding to fire. It is only through a joint effort between government and citizens—an effort giving priority to saving lives—that the risk of repeating Black Saturday can be reduced.

Volume II of the Commission's final report builds on the material in Volume I, which describes the progress of the fires and the circumstances of the deaths of the 173 people who died as a result of the 7 February fires. Volume II develops the main themes that were identified, analyses the lessons learnt, and makes recommendations on what can be done to reduce the risk and impact of future fires. It also considers policy, regulatory and organisational matters related to bushfire safety.

THE IMPLICATIONS FOR POLICY REFORM

Although the fires of January–February 2009 were catastrophic, they were not the first fires to gravely affect the State of Victoria. The outcome of these fires, however—especially the loss of life—surpassed that of past fires. Nevertheless, it would be a mistake to treat these fires as unprecedented or a 'one-off' event unlikely to be repeated and thus ignore the lessons to be learnt.

Fires are part of the Australian environment, and the states in the south-east of the continent are most at risk. It is possible, too, that the risks associated with bushfires are increasing as a result of population changes at the rural–urban interface and the probable impacts of climate change.[1]

THE RURAL–URBAN INTERFACE

The rural–urban interface is where the suburbs meet the bush—'where human habitation sits alongside areas of vegetation'—and is an area particularly at risk of bushfires caused by humans, including fires that are deliberately lit.[2]

The six fastest growing municipalities in Melbourne—Wyndham, Melton, Hume, Whittlesea, Cardinia and the City of Casey—are all at the rural–urban interface, and between 2006 and 2026 their population is projected to increase by 200,000.[3] Population growth in areas close to bushland increases the risk of fires starting and makes the potential consequences of fire more severe.[4]

Substantial population growth is also expected in many other parts of Victoria, among them regional centres, coastal areas, rural areas around Melbourne, alpine areas and along the Murray River.[5]

Although the population is projected to increase in these areas, communities' capacity to respond to bushfires will not necessarily increase at the same rate.[6] There are two main reasons for this:

- People who move from Melbourne to rural and regional areas typically have little or no bushfire awareness.
- Population change is expected to lead to an increased proportion of older Victorians—that is, Victorians aged 60 years and older—living in rural areas.

Both these demographic factors could affect the 'levels of direct participation by individual community members in volunteer fire brigades, and … the personal resources available to individuals and households to prepare for and protect themselves against bushfire'.[7]

CLIMATE CHANGE

To augment its understanding of climate change and the potential impacts on bushfire prevalence in Australia, the Commission invited Mr Kevin Hennessy to give evidence before it. Mr Hennessy has been a Principal Research Scientist with CSIRO since 1987 and has expertise in the development of Australian climate change projections. In 2007, as a member of the UN Intergovernmental Panel on Climate Change, he was among the recipients of the

Nobel Peace Prize.[8] The evidence Mr Hennessy presented to the Commission was based on peer-reviewed literature and was not contested by the parties in the hearings.[9] The Commission therefore used this evidence as the basis for its conclusions, which are also consistent with the views of the State of Victoria and of Australia's leading climate science agencies.

The Victorian Government has acknowledged that climate change is one of the 'greatest challenges facing Victoria, Australia and the global community', and the Premier, the Hon. John Brumby MP, has stated that his Government is 'committed to meeting the climate change challenge and committed to driving down greenhouse gas emissions'.[10] In November 2009 the Premier asked the Victorian Parliament to accept 'the overwhelming scientific consensus that human activity is causing global warming' and urged 'effective action to reduce greenhouse gas emissions and mitigate the effects of climate change'.[11] The Government's position is supported by both the Bureau of Meteorology and CSIRO, which recognise that climate change is likely to magnify the factors associated with bushfire risk.[12]

Bushfire risk and bushfires' severity are greater with higher temperatures, higher wind speeds, lower humidity and extended periods of drought. Meteorological data show that Australia's average annual temperatures have increased by 0.9°C since 1910, most of this increase occurring since 1950. In south-east Australia rainfall has decreased.[13]

Since 1973 droughts have become more intense as a consequence of the warmer average temperatures and decreased rainfall.[14] An analysis of Forest Fire Danger Index data for a range of sites in Victoria from 1974 to 2003 shows an upward trend in the rating associated with an increase in the number of days of very high and extreme fire danger.[15]

Climate change is also likely to increase the risk of heatwaves, hot days and dry conditions in Victoria, contributing to increased fire risk with time.[16] In a report prepared for the Commission, Mr Hennessy stated:

> Climate scientists have looked very closely at natural external forcing factors that have affected climate over the 20th century. Through these studies, they have been able to determine that none of these natural processes can explain the sustained rise in global temperature that has been observed. Rather, changes due to natural forcing have been superimposed on a background warming trend, and it is very likely that most of the observed global warming since the mid 20th century is due to anthropogenic increases in greenhouse gases.[17]

In its formal hearings the Commission took limited evidence on the subject of climate change because it was persuaded by Mr Hennessy's conclusions, which, as noted, are consistent with the opinions of the Bureau of Meteorology and CSIRO, Australia's leading climate science agencies. The Commission is aware of debate in the scientific community about the causes of climate change, but it did not see value in entering this debate when the Bureau of Meteorology and CSIRO, as well as Victoria and the Commonwealth, have concluded—as have the Commissioners themselves—that climate change is affecting the Australian environment and its weather patterns.

STRUCTURE OF THIS VOLUME

State, Commonwealth and local government policy and regulation and their response to bushfire, the activities of emergency services, and the actions of individuals and communities are the subject of this volume, which also presents the Commission's recommendations in relation to those areas.

The Commission recommends a major review of the policy framework for supporting members of the Victorian community in maintaining a safe lifestyle despite the occasional occurrence of serious bushfires. It examined the systems and structures needed to ensure that government, emergency services agencies and individuals make informed, effective decisions in connection with bushfires in such a way as to minimise loss of life and other damage. These matters are discussed in Chapter 1, 'Victoria's bushfire safety policy', Chapter 2, 'Emergency and incident management', and Chapter 3, 'Fireground response'.

The risk of fires starting should be reduced wherever possible. The evidence on the 15 fires the Commission examined makes it clear that most of these fires started as a direct or indirect result of human activity. The failure of electricity assets and fires that are suspected of being either deliberately or accidentally lit were the most common causes. The Commission discusses and makes recommendations in relation to how the incidence of such fires might be reduced in Chapter 4, 'Electricity-caused fires', and Chapter 5, 'Deliberately lit fires'.

The Commission also looked at ways of limiting the loss of human life caused by bushfires and reducing exposure to and the intensity of fires when they do break out. Recommendations in this regard are presented in Chapter 6, 'Planning and building', and Chapter 7, 'Land and fuel management'.

Chapter 8, 'Relief and recovery', discusses helping people recover from the impacts of fires. The Commission is mindful that recovery is a long process and, because this process has a long way to go in the case of the January–February 2009 fires, it is too soon to evaluate the entire recovery program. The Commission focused instead on the response immediately after the fires and how government might later assess and improve its long-term recovery strategies.

The Commission also recognised the need to look at priorities in the long term, with a view to creating an environment in which individuals, communities and fire agencies all give more emphasis to community safety, using the experience of and lessons learnt from the Black Saturday fires. These matters are discussed in Chapter 9, 'Shared responsibility', Chapter 10, 'Organisational structure', and Chapter 11, 'Research and evaluation'.

Finally, the Commission acknowledges that all governments, and particularly the State of Victoria, have made a considerable number of changes to bushfire policies and approaches since 7 February. The State's decision to have its response to the recommendations made in the Commission's interim report independently reviewed by Mr Neil Comrie, former Chief Commissioner of Victoria Police, is commended.

From now, though, there will no longer be a royal commission to automatically keep a focus on implementing reform. In the light of the experience of past bushfire inquiries—when many recommendations have been only partially implemented or not implemented at all and moves for reform have lost their momentum with the passage of time—in Chapter 12, 'Monitoring and implementation', the Commission outlines a framework for ensuring that government agencies' progress in implementing the Commission's recommendations is reported on, independently and transparently, to government and the community.

While dealing with a complex and varied range of topics in this volume, the Commission strove to ensure consistency and coherence throughout the analysis and recommendations. As noted in the introduction to the Commission's entire report (see Volume I), the recommendations are framed broadly and their rationale is detailed in the surrounding text. Readers wanting to probe further into evidence that was presented to the Commission and the views of parties who appeared before it are encouraged to read the transcript of hearings, the submissions of counsel assisting and the responses from the parties. This material will be available on the Commission's website for 12 months and after that will be available through the website of the Department of Premier and Cabinet.

The recommendations and suggestions the Commission makes in Volume II are formulated against the background of the types of fires that ravaged Victoria on 7 February. Those fires were as ferocious as any that had previously beset the state. As a consequence, the Commission was particularly focused on identifying the changes that are needed to better prepare the State for dealing with similar circumstances when they next occur.

Not all the recommendations have equal relevance to the preparation for and response to bushfires of lesser intensity. The Commission expects that the State and its agencies will sensibly reflect the thrust of what is proposed in a way that graduates the implementation of change so as to maximise its relevance to different bushfire circumstances.

The Commission considers that adoption of its recommendations will strengthen the fire agencies' capacity to deal with a wider range of bushfire possibilities than were envisaged by the previous operational arrangements and practices. If this does occur the overall capabilities of the agencies will expand and community protection will improve.

1 Exhibit 708 – Hansen Report (EXP.021.001.0001) [4.1]–[4.2], [5.1]–[5.2]

2 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0022

3 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [31], Attachment 3 (WIT.3003.002.0076) at 0079

4 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0022

5 Exhibit 931 – Statement of Armytage, Attachment 3 (WIT.3003.002.0076) at 0079

6 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [32]

7 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [32]; Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0022

8 Exhibit 222 – Curriculum Vitae – Kevin Hennessy (EXP.006.001.0038) at 0038

9 Hennessy T6776:18–T6776:22. The hearings and the role of the parties is discussed in Volume III

10 Victoria, *Parliamentary Debates*, Legislative Assembly, 25 November 2009, 4140 (Mr John Brumby)

11 Victoria, *Parliamentary Debates,* Legislative Assembly, 25 November 2009, 4140 (Mr John Brumby)

12 Exhibit 145 – Climate Change Impacts on Fire-Weather in South-East Australia (TEN.055.001.0001)

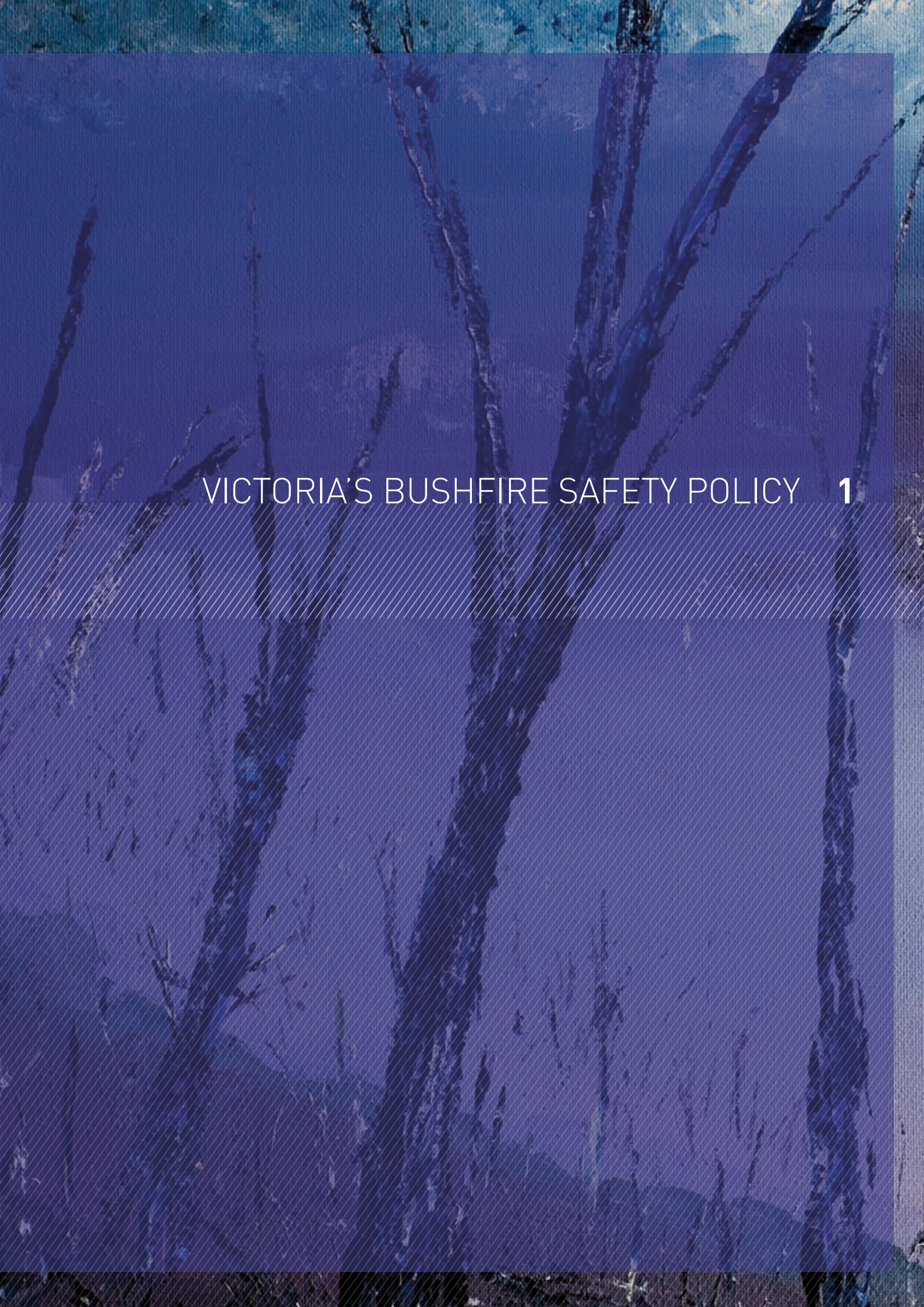
13 Exhibit 222 – Climate Change and the 2009 Bushfires (EXP.006.001.0001) at 0018–0019

14 Exhibit 222 – Climate Change and the 2009 Bushfires (EXP.006.001.0001) at 0020

15 Exhibit 145 – Climate Change Impacts on Fire-Weather in South-East Australia (TEN.055.001.0001) at 0005, 0024, 0028–0029

16 Exhibit 222 – Climate Change and the 2009 Bushfires (EXP.006.001.0001) at 0025, 0028

17 Exhibit 222 – Climate Change and the 2009 Bushfires (EXP.006.001.0001) at 0015



VICTORIA'S BUSHFIRE SAFETY POLICY 1

1 VICTORIA'S BUSHFIRE SAFETY POLICY

During the bushfires of January and February 2009 individuals and fire agencies made crucial decisions that affected many lives. These decisions were made in the context of a broad policy relating to bushfire safety, known colloquially as 'stay or go' but more accurately described as 'prepare, stay and defend or leave early'. The Commission investigated how the stay or go policy performed under the extreme conditions of Black Saturday. Although its investigation brought to light shortcomings in the policy as it applied on that day, it also revealed elements of the policy that continue to be relevant.

Each bushfire is unique in its point of ignition, speed and impact, and there is great variation in how individuals and communities plan for and respond to bushfires. The Commission considers that a more comprehensive policy is required—one that better accommodates the diversity of bushfires and human responses. This chapter looks at the changes necessary for fire agencies, communities and individuals.

The human and environmental impact of fire is influenced by the way fire agencies and individuals respond and how a particular fire burns. On 7 February 2009 factors such as fuel loads, weaknesses in the responses of fire agencies and individuals, extreme weather conditions, and an environment predisposed (as a result of drought) to a catastrophic event combined to produce one of Australia's worst natural disasters. Fierce fires such as those experienced on Black Saturday inevitably tested the stay or go policy, exposing its deficiencies—particularly in relation to severe weather, which is when the most serious fires can occur.

The Commission's view is that the main tenets of the stay or go policy remain sound. Leaving early, before there are fires, is the safest option; staying to defend a well-prepared, defendable home is a sound choice in less severe fires for those who are mentally and physically able. Modifications to the policy are, however, warranted in the light of the experience of Black Saturday. The following shortcomings became evident and are discussed in this chapter.

First, the policy did not adequately account for differences between fires and the fact that fires can have widely diverging characteristics depending on topography and other factors. In the worst circumstances a combination of high fuel loads and drought can on the worst days lead to the most ferocious fires. There is no convenient adjective or brief expression for these days. They are days when ferocious fires are expected and eventuate, when the fire agencies cannot put out the fires and should focus on putting out information to warn people to evacuate and shelter, and when individuals should upgrade their preparation and willingness to heed advice to evacuate. They are the days when too many people die—Black Friday in 1939, Ash Wednesday in 1983, Black Saturday in 2009 and a few other dreadful days when multiple bushfire deaths occurred.

Second, the focus of the warnings issued was far too narrow. They were directed to (a minority of) people with well-thought-out fire plans and did not take account of the knowledge that many people 'wait and see' and leave the area only when they receive a clear indication 'trigger' that they are in danger. In addition, the State provided no advice about alternatives to leaving early or staying and defending. Alternatives are always necessary, and these were deficient. Important options such as shelters, refuges and evacuation had been effectively sidelined. The generalised nature of the policy represented a binary approach to community safety—stay or go.

Third, the approach and the accompanying educational materials and advice were deficient in important areas. Inadequate information was provided about fire behaviour, the difficulty of making a property defendable, and the risks inherent in defending a house. Frank and direct advice is needed in a number of areas:

- Many houses are close to or even surrounded by heavily forested land with high fuel loads that seriously compromise defendability.
- Among the risks of staying to defend are death and serious injury.
- Normally, two able-bodied people are needed to defend a home. Both must be physically and mentally strong and be prepared for a long, arduous task. Vulnerable people, including children, should not be present.
- Firefighting equipment such as pumps, generators and hoses needs to be fire resistant to withstand a bushfire. Failure of any of this equipment can have lethal consequences.
- Many houses in bushfire-prone areas are not built to withstand bushfire. Even modern building standards are designed merely to increase a building's chance of survival during the passage of a firefront and do not make houses completely ember proof.

The Country Fire Authority has improved its education material since 7 February 2009, but further changes are necessary. Fire agencies should attach the same value to community education and warnings as they do to fire-suppression operations. People also need better support when trying to make informed decisions. Further, they should accept personal responsibility for seeking information, planning and acting.

The Commission understands the attraction of a policy framework that is uncomplicated and presents just a few clear options, but to adopt such an approach is to oversimplify. Realistic advice that is unambiguous about the risks and will protect people's safety is unavoidably complex. In this chapter the Commission therefore makes seven recommendations with a view to improving Victoria's bushfire safety policy. The following effective elements of the existing policy should be retained:

- the principle of shared responsibility—that there are legitimate and crucial roles for individuals and the State
- leaving early is the safest option
- advice to stay and defend in the case of less severe fires, providing those who do stay are physically and mentally able, understand the risks involved, and take specific precautions
- an emphasis on preparation, regardless of the preferred bushfire safety plan
- providing a mix of specific and general advice to individuals and communities—including media campaigns, community education, community engagement and community fireguard groups.

The policy should, however, be extended beyond these elements to do the following:

- cover the full range of fire types—with particular recognition of the heightened risk that accompanies the most ferocious fires on the worst days
- give added weight to the role of warnings and improve their timeliness, content and methods of dissemination
- provide more practical and realistic options that are tailored to local needs—for example, community refuges, bushfire shelters, emergency evacuation, and assisted evacuation of vulnerable people
- improve the quality and availability of advice on fire behaviour and house defendability.

To be effective, these changes will need to be part of a well-designed, long-term community education program that engages people, takes account of local needs and circumstances, and is regularly evaluated and improved. Local governments should be more active in planning for bushfire, including evacuation and shelter options. School education is also a central element.

Finally, the policy needs to make it clear that bushfires—including ferocious fires—are inevitable. A change of attitude, on the part of individuals and fire agency personnel, is necessary in relation to severe bushfires, so that higher priority is given to warning communities, rather than fire suppression, in order to avoid a recurrence of the tragedy that befell Victoria on Black Saturday.

1.1 STAYING OR GOING

Although an unplanned fire of any size is a potentially challenging and frightening thing, it only becomes a hazard to human life when it interacts with people. When any fire threatens lives, homes, communities and livelihoods, it has the potential to become a disaster. Recognising this, fire authorities advise communities on how they can protect themselves and mitigate the effects of fire.

When anyone is threatened by bushfire they have two basic choices—to stay where they are or to leave. These might seem simple options, but in fact numerous factors come into play. People who choose to stay might do so for any of a number of reasons:

- They want to defend their home or protect their farm or property.
- They want to protect their livestock and pets.

- They decide it is safer to stay.
- They are not fully aware of the risk.
- They plan to leave but then circumstances change.
- They expect to be told if it is unsafe to stay but do not receive such a warning or do not recognise the risk when warned by neighbours, friends or family.
- They plan to go when it gets dangerous but leave it too late.
- They are unable to go because of a lack of transportation, because routes are blocked or because smoke obscures visibility to the point that driving is too dangerous.
- They are unaware of a suitable or available route out.

On the other hand, people who choose to leave might do so for a variety of reasons:

- They feel it is the safest option for them, their children or other vulnerable household members.
- They have planned to stay but decide on the day that staying is too dangerous.
- They receive a trigger that causes them to act—for example, seeing or smelling smoke.
- They are advised to leave by the authorities or by friends or family.
- They have a specific destination in mind or are advised or aware that a suitable route is available.
- They can readily take their pets with them.

The fundamental decision about staying or going influences many other elements of fire management and community behaviour and is central to how people respond to bushfire.

1.2 THE POLICY AT 7 FEBRUARY

The stay or go policy was based on the principle that people need to plan ahead to stay and defend or to leave early and prepare themselves and their property accordingly. The stay and defend option rested on the assumption that, with proper preparation and active defence, most homes could be successfully defended from bushfire. This was qualified by recognition that in limited cases some buildings cannot be defended against high-intensity bushfires. The leave early option was based on the idea that people must leave before the fire threatens and travel becomes hazardous; it cautioned, 'Leaving your home late once you can see flames burning nearby is a deadly option'.[1]

The policy that applied in Victoria on 7 February reflected a national approach implemented by all Australian fire agencies.[2] In 2005 the Australasian Fire and Emergency Service Authorities Council released a paper outlining its position on bushfires and community safety. The key elements of AFAC's position were as follows:

- Bushfires are a common and normal occurrence.
- Bushfires can cause death and injury to people and animals and damage property, the natural environment and other community assets.
- Losses can be reduced; not all will be saved.
- Managing risk and reducing loss is a shared responsibility between government, householders and land managers.
- Firefighting resources cannot always protect every property.
- People need to prepare, then stay and defend their property or leave early.
- People who cannot cope with bushfire should relocate well before the fire impacts their location.
- Last-minute evacuations are dangerous.
- Mass evacuation is not the favoured option.
- The decision whether to order evacuation should be made by the lead fire combat authority.

- Road access must be carefully managed during fire events.
- It is essential for people in threatened communities to have ready access to accurate information to help with decision making.
- Fire emergency plans should be developed for all areas that are at risk of bushfire.
- Land-use planning should be part of efforts to strengthen the community's ability to cope with bushfire.
- Fire agencies should support community recovery.[3]

AFAC's position was generally reflected in the State's 2008 *Living with Fire: Victoria's Bushfire Strategy.* The Commission notes that this strategy was endorsed by the State and the CFA played an important role in disseminating it to residents in bushfire-prone areas.[4]

Fundamental to the stay or go policy was the idea that people should decide for themselves in advance of a bushfire whether they will stay to actively defend a well-prepared home or leave early to avoid any confrontation with the fire. People were advised to make the choice in the light of individual circumstances, without being directed by fire agencies, and to detail their intentions in a 'fire plan' to be activated on days of high bushfire risk.[5] The policy did not tell people they risked death and serious injury if they stayed to defend.[6]

The policy directed people who decided to leave early to identify their own triggers for leaving, their destination and the route they would take to get there. Suggested triggers were 'when you hear about a fire burning in your district … long before the fire impacts on your immediate area' or the declaration of a total fire ban or high fire danger day.[7]

The policy did not provide advice about what people should do if for some reasons it became impossible to adhere to their decision to leave early or to stay and defend or if they changed their mind. AFAC's 2005 *Position Paper on Bushfires and Community Safety* recognised that contingency plans would be required (where, for example, 'a building catches fire and [the fire] cannot be extinguished').[8] In practice, however, neither the State nor its agencies provided advice about contingency options.

1.2.1 THE EMPIRICAL BASIS FOR THE STAY OR GO POLICY

The stay or go policy was based on the results of extensive research into previous bushfires—how buildings ignited and were destroyed, the significance of the actions of occupants in building survivability, and the circumstances in which people died. The stay and defend option drew on two main conclusions from that research:

- Most houses are damaged or destroyed by embers, rather than by direct flame contact or radiant heat.[9]
- The presence of people able to put out spot fires greatly increases the likelihood of a building surviving.[10]

In summary, the Commission's interim report noted that the empirical basis for the policy was research that found the following:

- If houses were attended, house losses were much reduced, although there were important exceptions to this:[11]
  - The spread of fire when a house ignites depends on both the suppression activity of its occupants and how the house is ignited. Occupants are unlikely to survive bushfires if their houses are destroyed very quickly. Fires originating in roofs might be expected to compromise occupants' safety.[12]
  - Although 'by far the greater proportion of houses offer relatively safe havens during the passage of a fire' (compared with last-minute evacuation), residents of houses surrounded by exceptionally high concentrations of fuel, 'might sometimes be wise to evacuate temporarily to safe places nearby'.[13]
  - Although there is probably a better chance of saving a house by staying with it during a bushfire (than by leaving it), the house must be a 'safe one' and there must be adequate public warning.[14]
- Severe weather conditions play an important part in increasing the potential for house loss.[15]
- The greatest proportion of civilian deaths in bushfires occurred during attempts at late evacuation.[16]
- A significant proportion of deaths occurred while people were outside defending properties.[17]
- A minority of deaths occurred inside homes and, of those, most occurred while the victims were considered to have been 'passively sheltering' or engaged in what were described as 'meagre and unsuccessful attempts to defend'.[18]

The foundation of the policy was credible research that analysed available data on the way buildings had burnt and the circumstances in which people had died in previous fires. As detailed in Section 1.4, some of the assumptions of the research were called into question by the events of 7 February. The unprecedented amount of information available for analysis offers the State and fire agencies opportunities to investigate and evaluate their policies.

1.2.2 COMMUNITY EDUCATION

To a considerable degree, Victorian fire authorities have seen the 'stay or go' policy as largely non-operational, delivered by 'community facilitators'. Operational firefighters generally did not advise the public on what they should do or when they should go. Additionally, because community members were responsible for making their own decisions, effective community education was fundamental to the policy's success.[19]

The Country Fire Authority's approach to community education has emerged over a number of years. A research paper it prepared in 1999 highlighted areas in which change would improve the organisation's ability and capacity to increase community safety in relation to bushfire, including the need to:

- move beyond incident suppression to focus on the human dimension of emergency management
- move away from a 'prescriptive paradigm' that assumed that disseminating information to the community would result in the desired behavioural change towards a 'participative paradigm' that recognised that emergency services would not always be able to protect the community during emergencies and therefore sought to empower individuals to take greater responsibility for their own safety
- recognise the complexity of individual decision-making processes and tailor education and programs to accommodate this and facilitate heightened community preparedness
- recognise that not everyone will be well prepared and that during an incident agencies need to take account of those people whose safety is likely to be threatened because they are less prepared
- recognise the multiple dimensions of preparedness—that is, namely awareness, understanding, planning, physical preparation and psychological readiness.[20]

The Commission considers that, although some of the elements were reflected in CFA community education, some of the messages that have a particular relevance to the 7 February fires do not appear to have been embraced.

The CFA, the Department of Sustainability and Environment and the Metropolitan Fire and Emergency Services Board 2004–2007 *FireReady* campaign crystallised the move towards the 'participative paradigm' and aimed to do three main things:

- increase community awareness—including among those living on the urban fringe—of the inevitability of fire, the need to take action to mitigate fire risk and the actions residents can take to mitigate risk on their properties
- increase understanding of the role of fuel-reduction burning in mitigating bushfire risk
- promote, among residents of and tourists visiting areas of high bushfire risk areas, awareness of available sources of information before the onset of and during bushfire.[21]

Central elements of the community education program were:

- community information forums and meetings
- community fireguard groups
- street corner meetings
- media and public relations campaigns
- online information.[22]

This approach was further reinforced in Victoria's Living with Fire bushfire strategy. One of the six 'key strategic directions' identified in the strategy is 'building community capacity to live with fire'.[23] In the strategy the State Government, the CFA, DSE, the MFB and the Department of Human Services acknowledge that 'the public has a right to be involved in the decisions that affect their lives. Equally, the community needs to be supported to accept responsibility and be encouraged to become active participants in decision-making'.[24]

The strategy notes that Victoria will augment its current programs (such as FireReady and Community Fireguard) as well as introduce new initiatives to increase individual and household capacity to 'live with fire'. The strategy emphasises the importance of participatory community involvement as an essential tool in building community strength and recognises the importance of social structures that support communities before, during and after bushfires.[25]

The Commission's interim report noted that before 7 February 2009 the State Government devoted unprecedented effort and resources to informing the community about the fire risks Victoria faced. But that campaign did not, on its own, translate 'levels of awareness and preparedness' into universally successful risk minimisation on Black Saturday.[26] Indeed, the Commission appreciates that no campaign will have universal success: all campaigns are dependent on the quality of the information, the modes of dissemination, and the willingness and capacity of people to hear, understand and act on the information. The Commission does, however, consider that there is room for improvement in the State's approach to community education, as detailed in Sections 1.8.2 and 1.8.3.

The Commission's interim report also noted that the CFA has taken a multi-faceted approach to educating the community, recognising that the more important aspects of household and community preparedness accrue only in the long-term and necessitate sophisticated interaction between the community and fire agencies. The Commission commended the CFA's Community Fireguard program, noting, though, that there was scope for further development, particularly in how the program is applied to the peri-urban fringe.[27] Reviews of the program carried out since 7 February are discussed in Section 1.5.

1.3 LESSONS BEFORE 7 FEBRUARY

Before 7 February there was in the fire agencies some awareness of weaknesses in the stay or go policy. In a 2004 review of the policy Professor John Handmer, Innovation Professor in Risk and Sustainability at RMIT University, and others identified shortcomings with both the empirical basis of the policy and its implementation:

- the need to distinguish between survival strategies for 'normal' bushfire events and 'mega' events because 'the prepare, stay and defend option may be challenged by extreme bushfire events'
- the need to define when it is not safe to stay
- the need to define how early is early enough to leave
- the role of warnings in implementing the policy
- lack of community understanding of the stay or go message
- physical, social and economic barriers to adopting the options offered by the policy
- differences between rural communities and urban interface communities
- 'macro' social trends and their impact on the stay or go policy—in particular, people's growing expectation that authorities would protect them from risk.[28]

Subsequently, in 2008, research conducted by the CFA and the Bushfire Cooperative Research Centre (including Professor Handmer) again identified weaknesses in the policy:

- People living in fire-prone areas had often not developed comprehensive bushfire survival plans.
- People who planned to stay were often not well prepared and did not have back-up plans.
- Even if people had knowledge of how to act, many lacked the capacity to implement the options described in the policy.
- Some people were not mentally and physically prepared to stay and defend their properties, and many underestimated the ferocity of the fires.
- The 'leave early' message was not well understood.
- During bushfires many were likely to 'wait and see', waiting for advice from authorities or evidence of fire in their immediate area, then leaving if the situation became dangerous. Triggers for leaving were often advice from authorities or the presence of smoke or flames in the immediate area.
- Many people who planned to stay and defend were consciously or unconsciously keeping last-minute evacuation as an option.[29]

The Commission was not told of changes made to the advice the State provided to communities as a result of this research. In particular, the finding of the 2004 review that survival strategies need to distinguish between 'normal' and 'mega' bushfire events is directly relevant to the situation facing the state before 7 February 2009, yet does not appear to have been reflected in preparations for that day. This seems to be a serious failing of community safety advice. Without doubt, these valuable research findings were confirmed by the events of Black Saturday and need to be reflected in future policy advice that pertains to all bushfires, but particularly in relation to the most serious.

1.4 LESSONS FROM 7 FEBRUARY

The experiences of people who died as a result of the fires of 7 February 2009, as well as those of the people who survived, offer an extraordinary opportunity to evaluate the influence community safety policies and messages have on individuals' decisions in the face of disasters and highlight the diverse factors that influence people's decision making.

In order to evaluate the effectiveness of the overall bushfire safety policy in operation on 7 February, it is necessary to look at the full range of experiences from the fires. There were people whose plan was to stay and defend, people whose plan was to leave early, and many people who made last-minute decisions because they were waiting to see what eventuated on the day.

Although in some cases these decisions proved fatal, many people did survive. The areas affected by the two most devastating fires, Kilmore East and Murrindindi, were home to about 14,000 residents in about 6,000 homes: 159 people died in the Kilmore East and Murrindindi fires and 1,780 homes were destroyed.[30] The large number of deaths that occurred as a consequence of all the fires on 7 February led the Commission to investigate why those deaths occurred. It was unable to fully investigate the circumstances of the thousands who survived—who had left the area, successfully defended their homes or successfully sheltered from the fire.[31] Evidence before the Commission, however, provides insights into these people's experiences:

- the evidence of a range of witnesses, including lay witnesses who described how they survived the fires
- the accounts of relatives, neighbours and friends and other information about those who died received in the course of the Commission's hearings into each of the 173 deaths that resulted from the fires
- a Bushfire Cooperative Research Centre mail survey of 1,350 households affected by the Kilmore East, Murrindindi, Churchill, Beechworth–Mudgegonga, Bendigo, Bunyip and Horsham fires[32]
- a Bushfire CRC research report *Use of Informal Places of Shelter and Last Resort on 7 February 2009* based on the observations and experiences of people who survived the fires in Kinglake, Kinglake West, Marysville and Callignee[33]

- a 2010 Office of the Emergency Services Commissioner report, *Where Are They Going? People Movement During Bushfires,* based on telephone interviews conducted with 616 households in townships at high bushfire risk[34]
- a review by Professor Handmer of the civilian fatalities that resulted from the 7 February bushfires[35]
- a review by Dr Joshua Whittaker, Research Fellow, Centre for Risk and Community Safety, School of Mathematical an Geospatial Sciences, RMIT University, and Professor Handmer of important bushfire research findings since 7 February.[36]

Box 1.1 Findings of recent research

Dr Whittaker's and Professor Handmer's 2010 *Review of Key Bushfire Research Findings* examined a number of research reports that were prepared in the aftermath of Black Saturday—for example, reports by the Office of the Emergency Services Commissioner, the Bushfire CRC, the CFA and the Department of Justice. The reports contained the following common findings:

- There was a high level of awareness of bushfire risk in high-risk areas.
- Over two-thirds of all households have fire plans.
- Three-quarters of households want to be better prepared.
- There appears to be a gender distinction in individuals' intentions. Women are more likely than men to intend to leave as opposed to staying and defending.
- Many people intend to wait for official advice or direct danger before taking action.
- Understanding and good intentions do not necessarily equate to, and are not good predictors of, appropriate action.

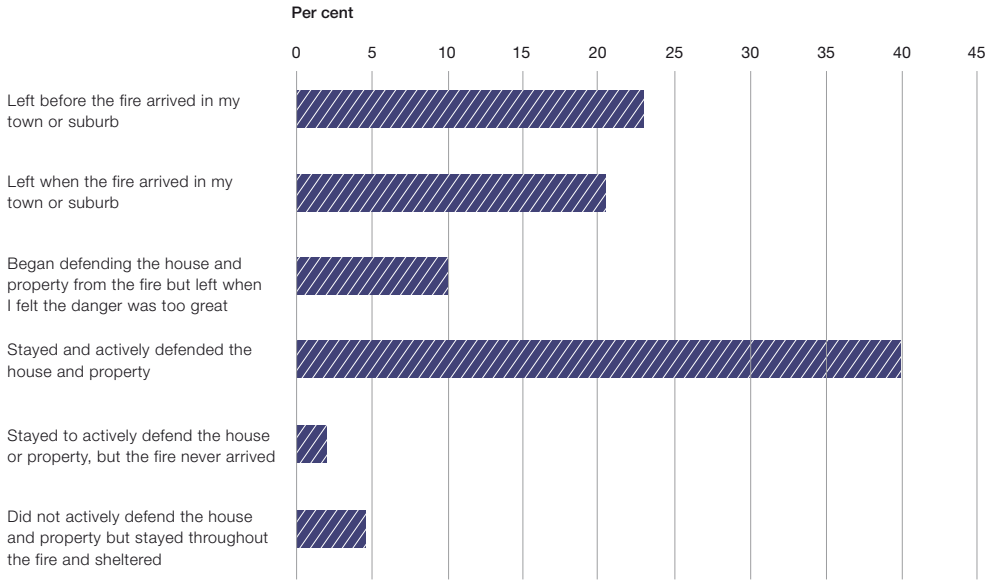
Intended responses to threatening bushfires varied because of differences in the samples and the timing of the research, as well as how questions were asked and the data were coded. For example, some surveys asked questions only of those in areas of high bushfire risk, while some asked questions only of those in areas affected by the 7 February fires.[37]

Throughout this chapter the Commission relies on the Bushfire CRC household survey results: this was the most comprehensive survey available of people's actions on 7 February. Where appropriate, the Commission supplemented this information with information from the Office of the Emergency Services Commissioner's report, which dealt with the intentions of individuals who resided in 52 townships at high bushfire risk.

1.4.1 WHAT PEOPLE DID

Data from the Bushfire CRC household survey show that just over half the respondents stayed with their properties when the fire hit and either actively defended their property or used it as a shelter. The remainder left either before or when the fire arrived in their town or suburb.[38]

Figure 1.1 Bushfire CRC household survey: what did you do during the bushfire?



Source: Analysis of the figures set out in Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey.[39]

The majority of survey respondents claimed to have had a firm plan for what to do if a fire occurred before 7 February. The CRC's qualitative analysis, however, found considerable variation in the quality of people's plans and that a high level of last-minute preparation occurred on the day.[40]

Evidence before the Commission shows that, although a high proportion of people do not intend to stay and defend, they also do not necessarily intend to leave early; many wait for official advice or evidence of direct danger before taking a course of action. Actual estimates of the proportion of people intending to wait vary as a result of differences in the aims, methods of data collection, samples, timing and methods of analysis. Most surveys, however, suggest that more than half of respondents do not have a clear prior intention to either stay and defend or leave early.[41]

It is important to note that intentions are not good predictors of actions. Dr Whittaker and Professor Handmer's *Review of Key Bushfire Research Findings* noted that research into behaviour during the 7 February fires found that a significantly higher proportion of respondents stayed to defend than suggested by research into intended responses.[42] It is possible that some of these people were waiting for sufficiently compelling triggers to decide what to do. During this time, they might have made superficial preparations, but it is unlikely that their intent was ever to stay and defend. Perhaps as a result of the speed of the fire or because they did not receive a suitable trigger, they ended up staying. Some survived; others did not. The importance of persuasive triggers needs to be emphasised.

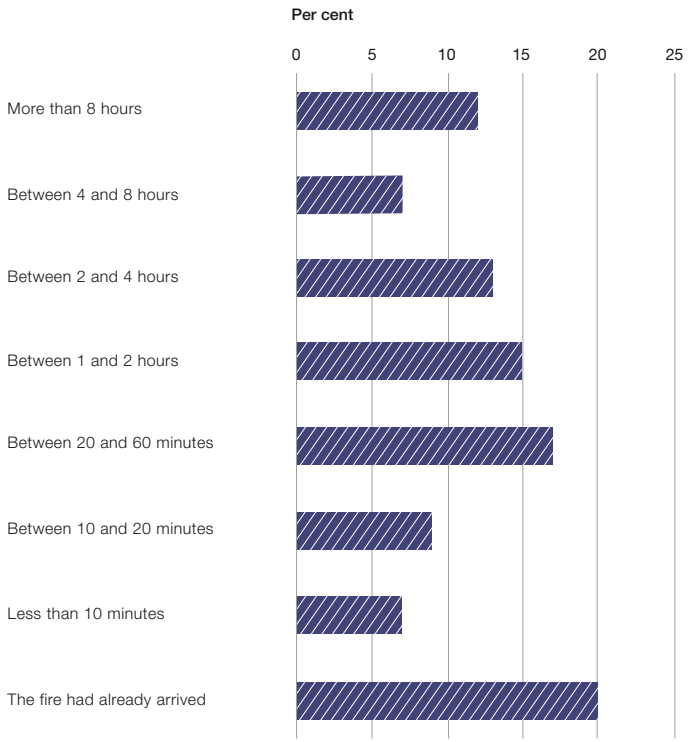
1.4.2 THE PEOPLE WHO LEFT

At 7 February the State's advice on leaving early explained that this meant leaving home 'before a fire threatens and road travel becomes hazardous'.[43] Possible triggers noted in the *Living in the Bush: bushfire survival plan workbook* are the declaration of a total fire ban or 'when you hear about a fire burning in your district'.[44] It is apparent, however, from individuals' responses to the Bushfire CRC household survey that people's understanding of leaving early was considerably different from that of the State. The survey results show that generally individuals considered 'leaving

early' to mean leaving more than two hours before the fire arrived.[45] Mr Russell Glenn, who owned a weekender in Marysville, told the Commission, 'We were aware of the "stay or go" policy and aware that people who wished to evacuate should "leave early". I did not know, and still do not know, exactly what "leave early" means'.[46]

Despite this, the evidence before the Commission suggests that a large proportion of people did not make the decision to leave until the fire was in their area. Of the people who responded to the Bushfire CRC household survey and had left their homes and properties up to an hour before or when the fire arrived in their town or suburb on 7 February, almost half had left when the fire arrived in their area.[47] The Commission considers that, although these people survived, their safety would have been better secured if they evacuated earlier in the day.

Figure 1.2 Bushfire CRC household survey: how long before the fire arrived in your town or suburb did you leave?



Source: Analysis of the figures set out in Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey.[48]

People who left early

The Bushfire CRC household survey indicated that of those who left, about 32 per cent departed more than two hours before the fires arrived; in some cases even before it started.[49] As Figure 1.2 shows, about 12 per cent left more than eight hours before the fire arrived, which was probably before the fire started. A further 7 per cent left within four and eight hours of the fire arriving, and 13 per cent left between two and four hours before the fire arrived. Many residents who planned to leave early had children, which influenced their decision.[50] For example, the Commission heard that Ms Jesse Odgers, a sole parent with two school-aged children, took her children out of school on Friday 6 February and left Kinglake to go to a property on the coast.[51]

People who left late

Just over half (53 per cent) of the respondents left less than an hour before the fire arrived. Of those who stayed with their properties but left at some stage during the fire, more than three-quarters left when the fire was within 500 metres of their property.[52] The majority of people leaving did not intend to travel far. Most of them indicated an intention to travel

to a destination in their local area—half to a destination within 10 minutes away and one-third to a location less than 5 minutes away. Dr Whittaker and Professor Handmer commented, 'The implication of this may be that, since they do not intend to travel far, they do not need to leave early'.[53]

The Commission heard from a range of sources evidence that provided greater context in relation to the risks involved in making a choice between leaving late or staying. There are many accounts of residents who left their homes very late having to drive through smoke and sometimes flames to reach safety.[54] Mr Chris Petreis, who had a property in Humevale, told the Commission about his and his friend's experience of fleeing 'at the last minute when [they] felt that staying was no longer a safe alternative':

> I still thought the fire was miles away when the whole place around us just suddenly exploded into flames like someone had thrown petrol on it and lit a match. I don't believe that any fire front actually reached us at that time and I never saw one—I think the eucalyptus trees simply exploded into flames in the intense heat … I could see that the very large pine trees lining the driveway were on fire and I had to drive through a canopy of flames just to get out to Coombs Road. The trees along Coombs Road were also well alight.[55]

Of those who left late, some successfully left areas where nearly all who stayed died. For example, a number of people left Pine Ridge Road in Kinglake West on the afternoon of 7 February in the hours before the fire reached the area. The Commission heard evidence from or about people, all of whom reached safety, who left between 3.50 and 6.00 pm, when the fire hit Pine Ridge Road. Ten people who remained died in the Kinglake West section of the road.[56] In retrospect, it is apparent that leaving Pine Ridge Road on the afternoon of 7 February was safer than staying—even when the fire had reached the street and houses were alight, despite the risks this entailed.

The Commission also heard evidence about the evacuation of about 200 people from Marysville as the fire approached the town. When the wind change drove the fire into Marysville at about 6.45 pm, police directed residents who had gathered at Gallipoli Park oval to drive in convoy to Alexandra. Although the evacuation was risky because the Buxton–Marysville Road could have become blocked, each of the three police officers who gave evidence about the evacuation judged that in this instance evacuation was safer than remaining on the oval. As it turned out, the convoy reached Alexandra safely.[57] This is discussed in Chapter 10 in Volume I.

These examples might be the exception rather than the rule. It is clear that considerable numbers of people survived by leaving their homes shortly before the fires arrived. A small number, however, died while they were fleeing. It is not known how many attempted a late evacuation, failed, sought shelter at home and subsequently died. The Commission agrees with the fire agencies that late evacuation can be deadly. Until Black Saturday most civilian deaths in bushfires in Australia had occurred during late evacuation.[58] On 7 February there were again a number of people who died when trying to flee. The Commission heard about four family members who left in four separate cars: only two reached safety.[59] A father and son also left their property in separate cars after trying to defend their home: they both died on the road while the house remained standing.[60] In other accounts there were people whose decision was made so late that the only option left was to try to outrun the fire. Twenty-four people died fleeing in vehicles or on foot. Some who were fleeing on foot had originally tried to flee in their vehicle and when this failed they left their vehicle to try to escape on foot.[61]

Image 1.1

Source: Courtesy of the *Herald & Weekly Times*.

Triggers and warnings

Among the respondents to the Bushfire CRC's household survey who planned to leave early in the event of a bushfire, the triggers for leaving varied greatly. Some people heeded the extreme weather warnings delivered in the days leading up to 7 February and left before the day; others made their decision on the basis of police doorknocks, community meetings and the deteriorating weather conditions on the day.[62] Although the majority of survey respondents (72 per cent) expected to receive an official warning, 63 per cent of all survey respondents did not receive one. Many respondents (63 per cent) reported that they received information and warnings from a family member, friend or neighbour.[63]

The evidence before the Commission relating to the people who died is consistent with the findings of the Bushfire CRC's household survey. The Commission's hearings into the fire-related deaths revealed that the majority of people who died had received information or warnings, most often from family, friends and neighbours. Some relied on monitoring websites and media broadcasts for official information, which in some cases proved inaccurate or came too late. In almost all cases those who died did not necessarily equate the warning they received with a trigger to leave.[64] Ms Donna Beattie said:

> The last thing I said to John was 'Please, please leave'. John said, 'We'll be right mate'. I drove away believing that John was not going to leave. I think John may have fobbed me off to avoid a confrontation with me. This is the last time I saw them alive.[65]

Research conducted by the Office of the Emergency Services Commissioner showed that many people relied on tangible signs of a fire threat as a trigger for leaving. This included advice from emergency services, a feeling that they or their family were in danger, or seeing smoke or flames. Witnesses who appeared before the Commission confirmed this.[66] Many noted that awareness of a total fire ban day was not a sufficient indication to leave. Mr Ken Rogers of St Andrews noted, 'There are many, many total fire ban days without fires, so it is not a sufficient indication that we should either do anything special or leave'.[67] This shows the importance of educating the public about appropriate triggers for evacuation.

1.4.3 THE PEOPLE WHO STAYED

The 56 per cent of respondents to the Bushfire CRC household survey who stayed with their property when the fire arrived either actively defended their property or used it as a shelter. Nearly all engaged in some form of active defence of their house. Only 7 per cent used the house solely as a means of sheltering from the fire. One-fifth (20 per cent) of those who stayed subsequently fled when they felt the danger had become too great.[68]

The evidence the Commission heard about the people who survived and those who died offers insights into why people choose to stay and defend, the financial cost of being well prepared, the risks of staying, and the factors that influence the success or failure of property defence.

Eighty-three per cent of survey respondents who stayed with their properties on 7 February said they stayed to protect their house, property and/or livestock. About 10 per cent stayed because they felt it was too late to leave. A number of lay witnesses told the Commission about their decision to stay to protect their property, which often involved defending a home. The welfare of livestock and pets was another deciding factor for many who stayed.[69]

This was consistent with the accounts the Commission heard about the intentions of those who died. A number of these people had stayed to protect homes. There were also a small number of cases in which people died after refusing to leave without their pets and animals or delaying their departure for too long because of concern for their animals. Their evidence demonstrates that the strong ties people have with their homes and their animals have a big impact on their decision making. Some people took the State's advice that leaving late was dangerous and stayed because they thought it was too late to leave.[70]

The evidence supports the observation of Associate Professor Thomas Cova from the Department of Geography at the University of Utah—that staying to defend involves an implicit trade-off between protecting life and protecting property since a household that stays in the hope of saving their property forgoes the opportunity to leave early to ensure the protection of their lives.[71] For many, this decision can be a difficult one and not just a matter of deciding between monetary loss and their lives. Rather, their decision was whether to take a risk to save their property and try to conserve the memories and emotional security embodied in their home or to leave and save their lives, knowing that an undefended house in the path of a bushfire is likely to be destroyed. Mr Roger Cook told the Commission:

> When [my son] saw my reluctance to leave, he sympathised and said he understood that I had built the house and that because it wasn't insured we'd lose everything if the place burned down, but we had to go. It was probably quite true that the fact that I'd built the house was affecting my judgment. I knew that staying wasn't the safest thing to do but I just felt so much about the house.[72]

In some cases, however, people who died thought that, by staying to defend their house, they were taking effective action in terms of their own safety.[73] The events of 7 February proved them wrong. The need to emphasise the risks of staying was a central theme in the Commission's interim report and is considered in further detail in Section 1.9.3 and in Chapter 9.

Defendability

The decision to stay and defend rests on an assumption that a house is defendable and that there are sufficient resources with which to successfully defend it. A number of factors affect the defendability of a house: construction, siting, proximity to and type of vegetation, access to water and power, and the geography of the surrounding area. This is complicated by the nature of the fire and the physical and mental capacity of those involved in the defence.

Many who made careful preparations and remained to defend on 7 February were not able to save their homes, and in some cases their lives.[74]

The nature of defendability is variable and dependent on circumstance. The location of some houses, either in or close to heavily forested areas or at the top of ridge lines or slopes, might render them undefendable in almost all fire situations other than the most benign and slow moving fires. Other homes are rendered undefendable because there is no alternative water or power supply or the firefighting equipment is not robust enough to withstand the intense conditions.[75] A number of witnesses told the Commission how they lost access to their water supply when the power supply failed and, without generator back-up, they had no power for their electric pumps. The generally reliable water supply for the townships of Marysville and Buxton failed on the evening of 7 February because the demand for water exceeded the capacity of the pipes to deliver it.[76]

Professor Handmer noted that about a third of fatalities were associated with homes with questionable defendability.[77] On the basis of the hearings and evidence, the Commission considers this estimate conservative. Many of the houses were perilously close to bushland that contained high fuel loads and was very dry because of drought; this exposed them to heavy ember attack and direct flame contact. Others were surrounded by dense forest or at the top of steep slopes and ridges, where fire behaviour is accelerated by the topography. The high fuel loads close to houses had a direct influence on the momentum and ferocity of the fire, and this meant that much of the CFA's advice about preparation around the home became of lesser consequence as a result of the broader landscape in which these houses were built. This more widespread consideration needs to be factored into future measures of, and information about, house survivability and has direct relevance to discussion on defendability in Section 1.8.3. In the Commission's view, properties in these types of places are undefendable, even if the properties themselves are relatively clear of vegetation and well maintained.

With ferocious fires such as those on 7 February there is no guarantee that good preparation and defendability will result in successful defence. The Commission heard many times of hoses and fittings melting in the heat. It also heard of a small number of cases where the petrol in petrol-powered pumps evaporated.[78] There is evidence that strong winds preceding and/or accompanying the firefront caused roof and other structural damage to houses, exposing the houses to ember and direct flame attack and effectively rendering them undefendable.[79]

Defending a house against a fire calls for physical and mental fortitude often for a long time. Lay witness Dr John Ferguson, who successfully defended his home at Buxton with the assistance of his wife and neighbours, spoke of the physical demands of fighting the fire: 'I couldn't believe we had been going for five or six hours, it seemed like a much shorter time … I probably drank something like 5 litres during the time of the fire … it is very hard work. We were absolutely exhausted. You need to be reasonably physically fit …'[80]

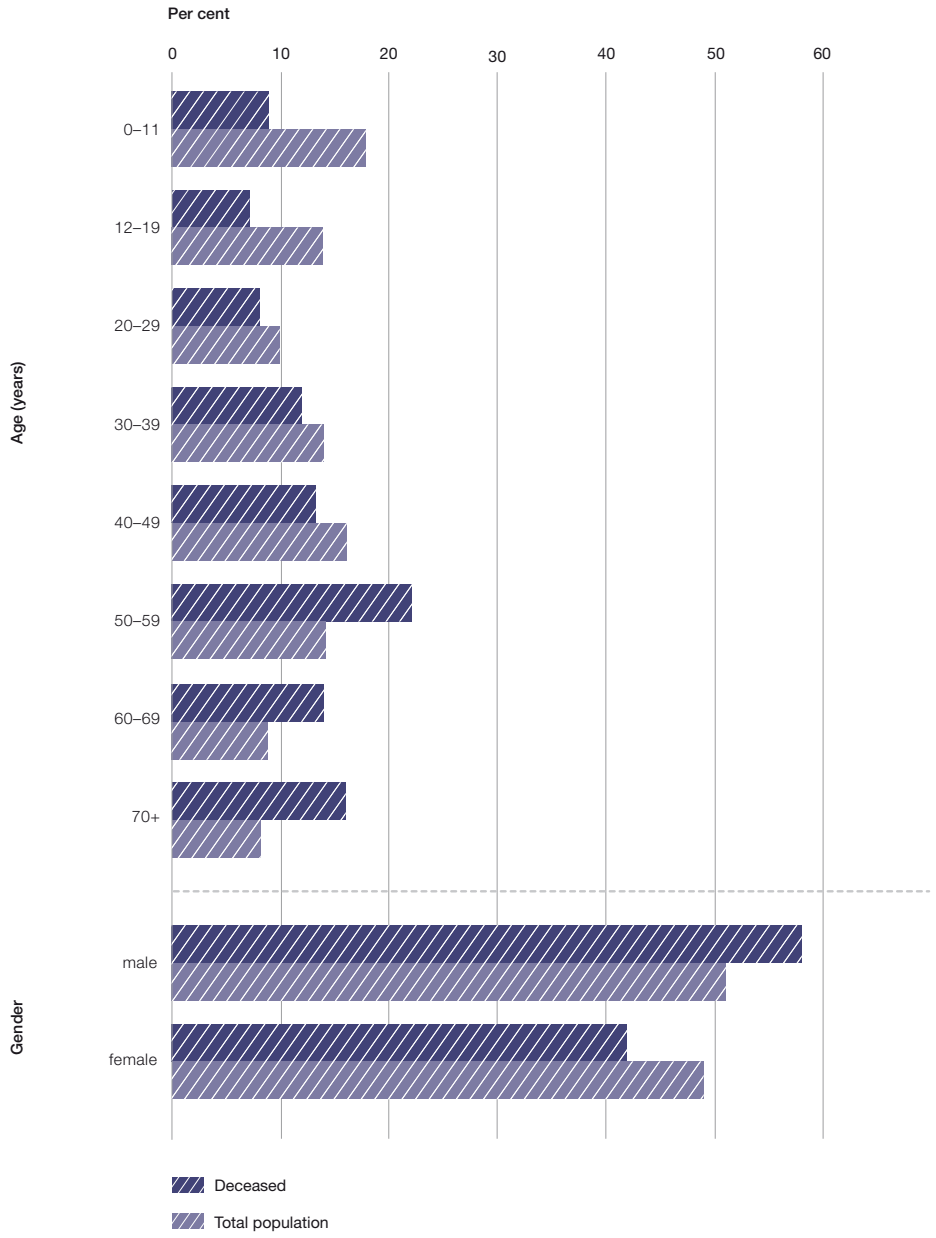
Many witnesses spoke of the firefront lasting much longer than the 10 to 20 minutes they had expected.[81] Ms Pat Easterbrook's experience of the Beechworth–Mudgegonga firefront was typical:

> The 'firefront' never really seemed to pass. The fire just raged and roared around the house for those whole two hours. The ute, the barbecue, the tool shed, the hay shed, the tractor—everything was just burning. The trees were burning and the wind just kept roaring through.[82]

According to the Bushfire CRC survey, more than half the respondents whose homes had been damaged or destroyed on 7 February believed that luck or chance had played a role.[83] Section 1.8.3 discusses the need for individuals to understand defendability—and the need for the State to provide frank and expert advice on defendability.

The Commission also notes, even if a house is built to the relevant building standard, this standard is not designed to ensure survivability without active defence. Experience bears this out: a large number of houses that were unoccupied during the passage of the fires on 7 February did not survive. Additionally, the Commission found that houses that are not actively defended are an inadequate shelter and, unless the occupants intend to actively defend the house, they should not be there.

Figure 1.3 Demographics of a representative fire-affected local census area and demographics of those who died: a comparison



Source: Analysis of the figures set out in Exhibit 894 – Review of Fatalities in the February 7, 2009 Bushfires.[84]

The analysis shows that the people who died were disproportionately older compared with the community profile. In addition, men were disproportionately more likely to die. The Commission considers that the State should have regard to these statistics and specifically target these groups' education about the risks of staying to defend.

1.4.4 VULNERABLE PEOPLE

The Commission heard evidence about people who were particularly vulnerable in the face of the Black Saturday fires. The evidence suggests that the concept of vulnerability and vulnerability's impact on a person's risk, needs, decision making and actions is complex. This is discussed further in Section 1.8.7.

The Commission was told about two organised evacuations of vulnerable people on 7 February, both in response to fire threat. The Bunyip Hillview aged care facility and Neerim Hospital were evacuated at the instigation of staff members, who, on becoming aware of the possible threat of the Bunyip fire, notified the Department of Human Services and contacted the Municipal Emergency Response Coordinator, who in turn contacted the Incident Controller. When the trigger point for evacuation of Hillview (agreed by the Incident Controller and the MERC) occurred, the MERC advised the facilities' CEO to begin the evacuation and arranged for Victoria State Emergency Service volunteers, a bus and ambulance transport for those who required it. The hospital evacuation proved difficult because it was coordinated by an incident control centre that was not responsible for the fire and the transport was inadequate.[85] These evacuations are discussed in Chapter 4 of Volume I.

Victoria State Emergency Service at Marysville evacuated older people and others who needed assistance in consultation with local police and with some assistance from Murrindindi Shire Council.[86] In 2006 and 2007 VICSES had put together a list of people who might need assistance with evacuating.[87] Murrindindi Shire Council also kept a list of vulnerable residents, including the elderly, people with disabilities and people from non–English speaking backgrounds, who might need special consideration, although this list was not used on 7 February.[88] These evacuations are discussed in Chapter 10 of Volume I.

The Commission also heard evidence of vulnerable people on 7 February who remained in the fire area and died. A significant number—more than 40 per cent—of the people who died were considered by Professor Handmer to be potentially vulnerable to bushfire because of age, ill-health or a combination of both. Of the 172 civilians who died, 16 per cent were aged 70 or over and 9 per cent were children under 12. Twenty-four per cent of the 172 civilians had chronic health conditions, and 5 per cent had acute disabilities that probably affected their mobility, judgment or stamina.[89]

Figure 1.3 shows the demographics of the areas affected by the Kilmore East and Murrindindi fires with the demographics of those who died in those fires.

1.4.5 BUSHFIRE AWARENESS AND KNOWLEDGE

Bushfire awareness and knowledge are crucial if people are to be able to make informed decisions about protecting themselves and their belongings. This is relevant for the entire community. Of the 173 people who died, six were tourists caught on unfamiliar roads and three were house-sitting.[90] Population growth and changing demographics in rural–urban interface areas mean that many people who are now living in areas that are highly fire prone do not have the benefit of generational knowledge of local fire history and historical fire events.

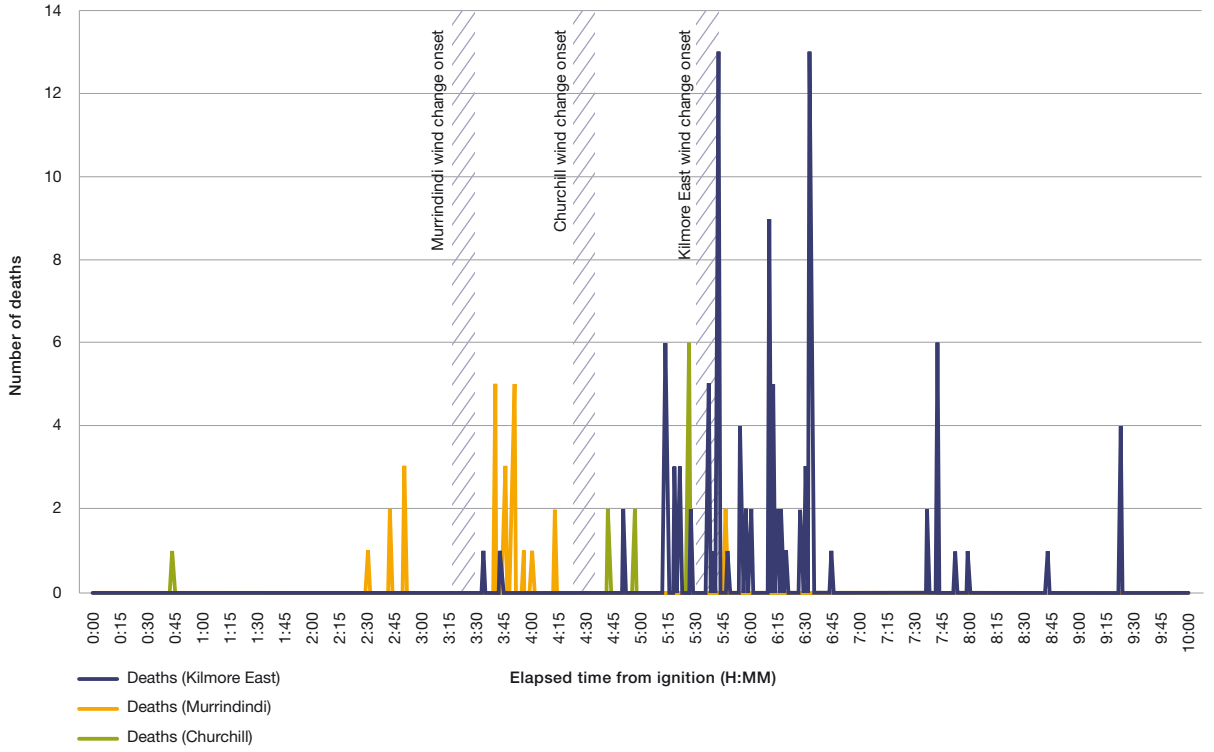
The potentially lethal impact of a late wind change—a feature of Australia's bushfire history—does not appear to be understood by many members of the public. The evidence before the Commission highlighted that on Black Saturday many people were caught by surprise. This lack of awareness was clearly illustrated by the comments by Mr Glenn Rogers of Callignee. Just before dinner on 7 February Mr Rogers received a phone call from his brother, who told him a strong wind change was expected and it would turn the wind in Glenn's direction. Neither Mr Rogers nor his father-in-law Rodney understood the implications of this:

> Rodney and I didn't understand fire behaviour. We expected that the front of the fire would turn like a snake. What I mean by this is that if the fire was going one way and the front was 500 metres wide, it would turn and the front would still be 500 metres wide. I've since learnt that the whole flank of the fire becomes the new front. I had no idea that was how fire worked or that the front would be heading directly for us when the wind changed. Rodney and I both thought it would horseshoe around us.[91]

The Commission also analysed the time between fire ignition and death. It found that 35 per cent of the deaths in the fire zone occurred before the wind change. Among this 35 per cent, the average time between fire ignition to the estimated time of death was just under five hours. In striking contrast, the average time between the wind change and the estimated time of death for those who died after the change was 32 minutes. For Marysville the figure was even less—an average of about 18 minutes.[92]

Figure 1.4 shows some of the results of this analysis, looking at the three deadliest fires of 7 February. The dotted vertical line represents the time after ignition of the three individual fires when the wind change first affected the three firegrounds. A noticeable 'spike' in deaths occurs at or immediately following this point for each of the three fires.

Figure 1.4 Elapsed time from fire ignition to death



Source: Commission analysis from evidence of the fire-related deaths.

The relatively long period from reported fire ignition to death is important. The 7 February fires demonstrated a considerable amount of time can elapse between when a fire is first reported and when it affects communities. The proximity of the fire's ignition point to populated areas is a central factor, and an understanding of the significance of this can give fire authorities—and people in the potential path of a fire—an opportunity to respond in differing ways. Traditionally, fire authorities have used this time to focus on suppression. The events of 7 February show, however, that on days when fire suppression is likely to be ineffective fire authorities can use this period for analysis and the development and distribution of warnings, giving residents better information with which to make decisions. Contrary to the State's previous advice, there might be an opportunity for people in the potential path of the fire to evacuate to a safer place if timely warnings are given. The options are described later in this chapter. The Commission notes, however, that although these options are important, the later the choice is exercised the greater the risk of death or injury.

The Commission also records a note of caution. Although there was a relatively lengthy period between ignition and many of the deaths that occurred during these fires, this will not always be the case. The Narre Warren and Upper Ferntree Gully fires were suppressed and as a result did not spread into the Dandenong Ranges (see Chapter 12 in Volume I). Had this not occurred, many houses would have very rapidly faced the full impact of a ferocious fire travelling uphill. As emphasised throughout this report, all fires differ in their ferocity and their location vis-a-vis population centres. On 7 February there was an extended period between ignition and deaths for some fires; for others there was less time.

1.4.6 PREPARATION AND PLANNING

Preparation is an essential part of a fire plan, whether staying to defend or leaving.[93] People who stayed to defend their properties on 7 February or used their house as a shelter from the fire made a range of preparations. One theme that emerged from the evidence of lay witnesses concerns the effort and expense that goes into having a well-prepared home. Fire preparations covered areas such as building design, access to water and power, protective clothing, vegetation management, defendable space around the home, and protective devices such as free-standing and permanently fixed sprays and sprinklers, as well as the development of an overall fire plan.[94]

A good fire plan helped many people defend their homes on 7 February, although it was not a guarantee of success.[95] A fire plan prepared and rehearsed over a number of years appears to have greatly bolstered people's confidence in their ability to safely defend their home. Witnesses told the Commission how they had spent years making alterations to their property and ensuring that every fire season all aspects of their fire plan were viable and 'ready to go'. For the most part, people developed these plans after attending CFA community meetings and participating in CFA fireguard groups, where the importance of preparation during the bushfire season had been stressed.[96] The evidence before the Commission showed, however, that some people were overly confident about their level of preparedness, a factor that in some cases had dire consequences. In addition to having confidence in their fire plans, many lay witnesses who successfully defended their property spent the days up to and including 7 February seeking out information about the weather, fire alerts and advice. This information was obtained a number of ways—774 ABC radio and ABC local radio stations, the CFA, the Bureau of Meteorology and DSE websites, and watching the sky for changes to the weather.[97] On 7 February preparations for defending properties started early and continued throughout the day. All this activity culminated in the active defence of property—carried out according to what often were well-structured and closely followed fire plans—which extended over a number of hours, often into the early hours of 8 February. On the basis of their experiences on 7 February, many of these residents said they would stay and defend if their homes were threatened by another fire. Almost all, however, would amend their fire plans to ensure an even higher level of preparedness.[98] The Commission also heard from witnesses whose experience of 7 February led them to concluded they would not stay and defend in the future.[99]

Although being well prepared was noted as a central factor in the successful defence of properties, other evidence showed that preparedness it is no guarantee of success. Evidence from the hearings into the fire-related deaths revealed that many people who died did act in accordance with their fire plan and were well equipped, with adequate water, power and suitable firefighting equipment.[100] In one account, when the inhabitants had planned to stay and defend, the evidence suggested that wind damage to the roof exposed the house to ember and flame attack. Despite having substantial firefighting equipment, the inhabitants were forced to shelter in the house. By this time, though, the house could no longer provide shelter while the firefront passed, and the couple were unable to leave the building before they were overcome.[101] A Bushfire CRC survey of houses affected by the Kilmore East, Murrindindi, Churchill, Bunyip, Bendigo, Beechworth–Mudgegonga, Horsham and Narre Warren fires found that wind was an important factor in house damage: 13 per cent of houses damaged were damaged by both fire and wind.[102]

This evidence underpins the Commission's view that, although staying to defend remains a valid option in limited circumstances (having regard to the intensity of the fire, the defendability of a home, the adequacy of firefighting equipment and the mental and physical fitness of the people involved), it should be attempted only by people who understand and accept the risks—including the risk of death. Householders who fail to prepare in advance of a fire expose themselves to serious risk as they are forced to make last-minute decisions that might ultimately prove fatal. Inadequate planning might result in a late evacuation hampered by smoke and poor visibility, ember and flame attack, or having the escape route blocked by a fallen tree. It could leave no choice but to shelter where there is inadequate protection.[103]

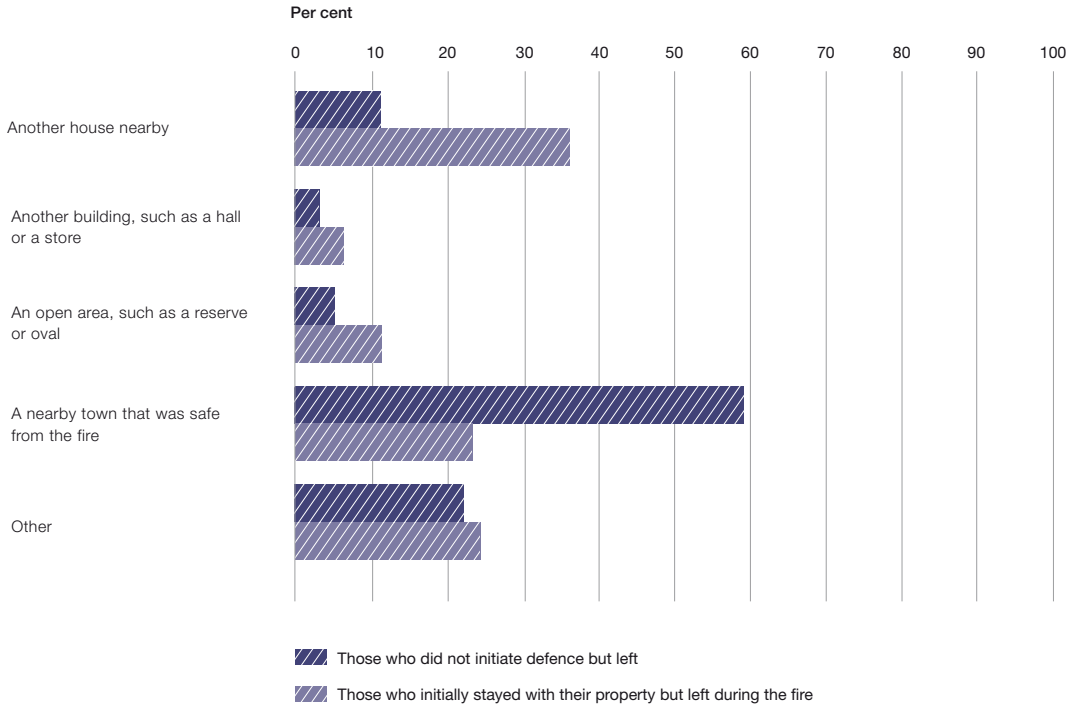
1.4.7 PLACES OF SHELTER

The people who left their homes sheltered in a variety of locations—other houses or buildings, bunkers, reserves and ovals, pubs, in-ground swimming pools, cars, dams, and so on. Some people reported that these were pre-planned alternatives and that they helped people survive.[104] The Commission also heard examples of people dying in very similar locations, which serves to highlight that these locations do not guarantee safety, despite apparently offering

better protection than the situations from which the people had fled. Others fled conditions that threatened their lives but died before being able to find a safer haven.

Figure 1.5, derived from the results of the Bushfire CRC household survey, shows that people who left well before the fire were able to travel further than those who stayed with their properties then left at some stage during the fire. More than twice as many respondents who left before or when the fire arrived went to a nearby town that was safe from fire. In contrast, those who left at some stage during the fire were twice as likely to go to a house nearby or shelter in an open area or another building.[105]

Figure 1.5 Bushfire CRC household survey: when you left, where did you go?



Source: Analysis of the figures set out in Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey.[106]

Box 1.2 Shelter

Many people sought shelter in the centre of Kinglake township, inside their cars and inside the CFA shed. Others sheltered inside the CFA sheds in Kinglake West and Marysville. Some people sheltered in Kinglake Central Primary School until it burned down; people also found shelter in open spaces such as Gallipoli Park oval in Marysville, Kinglake West oval, Kinglake Memorial Reserve oval and Callignee oval. Some sheltered in ploughed paddocks.[107] Mrs Vicki Ruhr abandoned her burning house with her family. She recalled:

> The smoke was very thick and pungent, but the fires provided enough light to see where we were going. We all marched in single-file hurriedly down into the middle of the back paddock, which contained our olive grove, and covered our mouths and noses with the wet towelling. We lay face-down on the ground in the olive grove after helping each other place the towels and dressing gown over the top of us.[108]

None of these places of shelter were designated fire refuges. The Bushfire CRC report on informal places of shelter concluded, in relation to Kinglake and Kinglake West, that many people simply 'ended up' there because they did not know of any likely safer alternative.[109]

Some witnesses sheltered in a bunker on their property. Others described seeking shelter behind a structure that provided a barrier between them and the radiant heat of their burning home.[110] Others found shelter in a body of water:

- Mr Daryl Hull immersed himself in the lake next to Gallipoli Park oval for up to an hour during the worst of the fire.[111]
- Mr Peter Brown and his family took shelter under wet blankets in their in-ground swimming pool, both as the firefront hit and then as they watched their St Andrews home burn down.[112]
- Others took shelter in concrete water tanks and dams.[113]

Not all were successful in their shelter attempts. In Kinglake West a family of five, including three young children, left their burning house to seek shelter in a nearby dam. Three succumbed to the fire and did not reach the dam. The father and his young daughter did, but they were seriously burnt and the child later died.[114] In another instance, in Strathewen, a young man appears to have fled a burning house in which four people died. He, too, died, being found 300 metres from the house, close to a dam.[115] The Commission also heard of seven people who died in bunkers or bunker-like structures.[116]

Firefighters are taught survival drills, including how to identify places that offer a high chance of survival, among them dams, creeks and wet gullies. DSE firefighters are trained to recognise these 'natural refuges' in a forest fire. This training was put to good use by Mr Michael Lauder and his crew from the Toolangi DSE office, who kept themselves and 19 campers, including nine children, safe in the Murrindindi River after they had been cut off by the Murrindindi fire.[117] Such experiences show that there could be benefits in transferring some of the messages incorporated in firefighter training to the broader public.

A number of witnesses protected themselves inside their cars—either near their burning homes or after driving to a place where they felt safer. The car provided both immediate protection from radiant heat and a means to move to a safer place. Some witnesses spoke of using their car's air-conditioning while sheltering inside the car.[118] Mr Ken Rogers, who lived in St Andrews, told the Commission about his experience, and that of his wife, Annie, and their son, Danny, of sheltering in a car as the fires destroyed their house:

> We decided together that the safest thing to do was to move our car to a clear area and shelter inside it. Accordingly, I dashed back inside and collected my car keys and my wallet. I then moved my car away from the house and to a clear and flat part of our driveway. We then sat inside the car and watched our house burn down. When the house fire was at its height, Annie turned to me and said 'I think the chops will be done by now'.[119]

The Commission notes however, the imperfect protection offered by a vehicle and the fact that in cases such as this a vehicle was used in order to move away from burning fuels rather than being a preferred choice as a place of shelter. Nevertheless, Professor Handmer noted that the evidence of people generally surviving in conventional cars was in contrast to that associated with past fires.[120] This area warrants further research (see Chapter 11).

As discussed in Section 1.8.6, the Commission considers that a revised bushfire safety policy should provide information about places in which to shelter and support for individuals in identifying such places.

1.4.8 THE PSYCHOLOGICAL IMPACT

The psychological impact of bushfire cannot be underestimated. Exposure to such an event is traumatic and can have long-term adverse psychological consequences, especially for children. Professor Alexander McFarlane of the University of Adelaide, a psychiatrist who has conducted longitudinal studies of the effects of the Ash Wednesday fires on children, found that the trauma and hardship caused by the Ash Wednesday bushfires was a significant cause of psychological disorders in children. He also noted that the many strains on families and communities in the aftermath of a fire can have a 'snowballing effect' that compounds the initial trauma of the fire.[121]

Of course, it is not only children who suffer psychologically after the trauma of a bushfire: the impact on adults is often profound.[122] The Commission heard from lay witnesses of the complex and varied emotional and psychological reactions children and adults have experienced since the 7 February fires.[123] Mrs Vicki Ruhr told the Commission:

> I am blessed with a strong disposition and have been holding up mostly. I have my 'blue' days but am yet to have my own 'breakdown'. I know it's coming and I know it will be hard, but I also know it is inevitable and a normal part of the recovery process. For now, I experience a wide range of human emotion on a daily basis. I am exhausted, I feel despair and dismay every day and I have immense trouble thinking about the future. I've noticed myself become impatient and intolerant, and this is something very foreign to me and I don't like it. I'm sick and tired of dealing with bureaucracy, paperwork and processes. I hear my friend, Suzanne Hyde, who perished in the fires. I hear her voice and I hear her screams—often. I worry about my husband and my children. I miss my community, my home, my garden and my farm animals.[124]

This can, in turn, further affect children's psychological wellbeing. Professor McFarlane noted that it is not only a child's exposure to a bushfire that can have adverse long-term psychological consequences, but also parents' exposure and its impact on the parents' psychological health.[125] The longer term psychological effects of these fires remain to be seen. The recovery section of the report, Chapter 8 of this volume, provides further information about trauma and long-term impacts.

The Commission calls on individuals to consider very carefully the potential impact on their mental health of staying to defend as part of their bushfire safety planning.

1.5 CHANGES SINCE 7 FEBRUARY

1.5.1 THE STAY OR GO POLICY

The Commission's interim report considered implementation of the stay or go policy as it was on 7 February and recommended changes. In summary, the recommendations focused on the following:

- reinforcing the need to prepare
- clearly conveying the message that the safest option is always to leave early
- providing to householders information on defendability—including that not all homes are defendable in all circumstances
- clearly explaining the risks associated with staying to defend—including the risk of death
- discouraging children and vulnerable people from staying and defending
- emphasising the need for contingency plans
- providing advice directed at the needs of communities on the urban–rural interface.[126]

The State, including the CFA, has made a number of important advances in response to the Commission's recommendations, although these have not been fully tested because the 2009–10 bushfire season was relatively benign. The State conducted an extensive community education campaign for the 2009–10 bushfire season, incorporating the revised messages recommended by the Commission. The initiative involved a media campaign, distribution of education materials to individuals in high-risk areas, and community meetings. Materials were developed for specific audiences, including children, non-English speakers, tourism operators and tourists. Information covering subjects such as what to do with pets was also produced.

Specific advice on the defendability of individual properties was also offered to households. The CFA has developed a household bushfire self-assessment tool to help residents determine whether their properties are defendable. The tool is available online and in hard copy and is supported by a telephone helpline and trained officers who can visit private properties to provide specific advice about defendability. The Commission welcomes this development, although it notes the concern of the Victorian Bushfires Royal Commission Implementation Monitor, Mr Neil Comrie APM AO, that the CFA should promote these services more widely.[127]

To support the campaign, education materials were revised to reflect the changes to the messages, and facilitators and educators were trained in conveying the information. Additionally, there was an internal CFA campaign aimed at educating CFA members about changes to community advice.[128]

Municipal councils also contributed to education efforts:

- Colac Otway Shire Council worked with community groups to develop a community fire plan.
- Glenelg Shire Council distributed newsletters about FireReady preparation and personal safety.
- Horsham Rural City Council held a Living with Fire expo in partnership with the CFA and other agencies.
- Moira Shire Council implemented a campaign to inform tourists, emphasising FireReady principles and encouraging tourists to register their location.
- Queenscliffe Borough Council facilitated the creation of personal emergency plans for vulnerable people.[129]

The Commission was advised that the 2009–10 campaign is part of a long-term initiative designed to encourage behavioural change and community engagement.[130] The Department of Justice commissioned expert research to assess the effectiveness of the summer fire campaign. The researchers found that the campaign built awareness and understanding about bushfire safety and led some people to take preparatory action. They also found, however, that complacency was still evident.[131]

Work on implementing the Commission's recommendations continues. The State is currently updating its fire education program for schools and intends to roll out the revised program in early 2011.[132] It is also evaluating existing tools to ensure that they continue to meet current needs (and will meet future needs) and has already conducted two reviews of its Community Fireguard program, which highlight options for improving the program and some important policy matters. As discussed in Section 1.8.2, the Commission considers that the Community Fireguard program should continue to be a central plank of the CFA's community education program in the future.

Box 1.3 Review of CFA's Community Fireguard program

The CFA Community Fireguard program, launched in 1993, is a community development program that aims to help residents develop local bushfire survival strategies that correlate with their lifestyle, values and the local environment. The objective is to 'reduce the loss of life and property by developing self-reliant communities who have made a commitment to managing their own fire safety'.[133]

CFA facilitators deliver the program and provide information and support to residents so that they can establish Fireguard groups and develop survival plans. The program is delivered over four or five meetings that provide information on fire behaviour, personal safety, house survival, fire protection equipment and include a street walk around the group's local area.[134]

Two reviews of the Community Fireguard program conducted since Black Saturday found that being a member of a Community Fireguard group helped members actively manage their experience of the bushfires. They also found that Community Fireguard participants' houses were more likely to survive a bushfire, even if the house was undefended.[135] The reviews did, however, identify some limitations and problems with the program:

- Some participants did not fully understand the concept of leaving early or thought it was impractical in some circumstances—for example, leaving on total fire ban days because of the number of such days declared in the bushfire season.[136]
- Although the program encouraged participants to prepare contingency plans to accommodate possible changes in circumstances, very few people prepared for enough scenarios, suggesting that this level of complexity is not well understood. Many participants trying to clear vegetation and carry out general fire management on their property in accordance with Community Fireguard training encountered difficulties with local councils.[137]
- The Community Fireguard program was not always implemented as intended and the training needed greater reach, understanding and implementation.
- There was scope for greater involvement of all three levels of government to link the training messages with the practicalities of implementation—particularly in relation to warning systems and fuel reduction.[138]

Among the suggested improvements to the program were the following:

- ensuring that a consistent standard of training is provided across the State
- more regular meetings
- developing a quality assurance process for individual and household fire plans
- incorporating problem-solving components in the training
- promoting 'plan for all possibilities' as opposed to stay or go
- increasing community awareness of the program
- making completion of training a condition of Community Fireguard group membership
- developing CFA guidelines and advice about equipment standards.[139]

The reviews concluded that the costs and benefits of expanding the program to involve more communities and develop more active membership should be further examined.[140]

1.5.2 INFORMATION AND WARNINGS

In addition to its interim report recommendations about the stay or go policy, the Commission made recommendations relating to the role of information and warnings. These focused on the following:

- ensuring that warnings are founded on the principle of maximising the potential to save lives
- improving the content, format and method of disseminating warnings—including identifying greater opportunities for the use of sirens, the Standard Emergency Warning Signal and telephones
- improving fire severity scale that denotes the risk posed by dangerous and extremely dangerous bushfires
- expanding the capacity of existing information sources such as websites
- clarifying fire agencies' responsibility to issue warnings
- clarifying the ability of appropriately qualified personnel to issue warnings where the Incident Controller is not available.[141]

All agencies have introduced commendable changes to improve the content and dissemination of information and warnings. The new national framework for advice and warnings to the community, established by the Australasian Fire and Emergency Service Authorities Council in late 2009, was a major achievement.[142] A national review of the AFAC policy for community safety during bushfires was under way on 7 February, when this subject was brought into sharp focus.[143] The new framework and the nationally agreed community education message 'Prepare. Act. Survive.' is based on the following principles:

- Fires affect people and communities.
- The framework therefore places public safety as its primary consideration.
- A fire can threaten suddenly and without warning.
- People living in high-risk areas need to be prepared to take protective action at any time.[144]

Figure 1.6 Prepare. Act. Survive. bushfire survival kit

Source: Courtesy of the Country Fire Authority.

The *Prepare. Act. Survive.* bushfire survival kit distributed by the CFA during the 2009–10 bushfire season, contains material on:

- understanding the environment—the impact of weather, vegetation and road access
- assessing whether a home has adequate defendable space
- preparing a home—how fires impinge on houses, managing vegetation, and house maintenance and improvements
- leaving early—who should leave early (for example, children, the elderly, other vulnerable groups), when they should leave (including what triggers to use), where they should go, how they should get there, what they should take and what back-up plans they should make
- defending—personal capacity, property preparation, recommended equipment and resources, the role of house structure and building design, personal safety, contingency plans, activating plans and managing animals.[145]

The kit emphasises the following:

- Bushfires can kill.
- Careful planning and preparation are vital.
- Those who plan to stay and actively defend should be physically fit and able and mentally prepared.
- Even well-prepared homes can be destroyed by bushfire.[146]

Among other important achievements by the State, the Commonwealth Government and fire agencies to improve information and warnings are the following:

- clarifying fire agencies' responsibility for issuing warnings, with greater emphasis on the obligation to warn the community[147]
- elevating the Information Unit within the AIIMS structure and augmenting its role by creating the position of Public Information Officer[148]
- developing new protocols for issuing warnings, to enable the Incident Controller and other personnel to issue warnings in the event of imminent danger, and adopting new technology for the creation and dissemination of warnings[149]
- developing and implementing a single 'One Source One Message' portal for CFA and DSE to upload bushfire warnings and information to the CFA and DSE websites, the Victorian Bushfire Information Line, and relevant radio and television broadcasters[150]
- implementing the National Emergency Warnings System, which can distribute voice and text warnings and messages via landline and mobile phone[151]
- negotiating new memoranda of understanding to broadcast emergency information (similar to that already in operation with the ABC) with commercial radio and television stations[152]
- improving the content of warnings, including adoption of the Common Alerting Protocol[153]
- developing guidelines for the use and authorisation of the Standard Emergency Warning Signal, plus using the signal on three occasions during the 2009–10 bushfire season[154]
- developing new guidelines for using fire sirens as a community warning method[155]
- developing a new nationally agreed fire danger rating scale that includes the new category of 'code red', which applies to days where the fire danger index is predicted to be above 100[156]
- incorporating fire danger ratings in Bureau of Meteorology forecasts and warnings[157]
- commissioning expert research into the development of a new fire severity scale[158]
- upgrading the Victorian Bushfire Information Line with extra trained staff, extra office space and telephone lines, improved IT infrastructure, faster access to warning information and access to more overflow staff on 'spike' days
- amending the *Country Fire Authority Act 1958* to clarify the Chief Officer's responsibility for issuing warnings.[159]

Many of these changes reflect a shift in the responsibility of fire agencies, increasing the need for timely advice and triggers to the public. The changes expand the responsibilities of the Incident Controller, particularly during more severe fires, to oversee the safety of local communities, as much as manage the response to the fire.

Figure 1.7 New fire danger rating scale

FIRE DANGER RATING	Recommended Action
CODE RED (CATASTROPHIC)	**If you live in a bushfire prone area the safest option is to leave the night before, or early in the morning.**
EXTREME	The safest option is to leave early in the day if you live in a bushfire prone area and your Bushfire Survival Plan is to leave. Only stay if your home is well prepared, well constructed and you can actively defend it.
SEVERE	The safest option is to leave early in the day if you live in a bushfire prone area and your Bushfire Survival Plan is to leave. Only stay if your home is well prepared and you can actively defend it.
VERY HIGH	If you live in a bushfire prone area and your Bushfire Survival Plan is to leave, the safest option is to leave at the beginning of the day.
HIGH	Check you Bushfire Survival Plan.
LOW-MODERATE	Check you Bushfire Survival Plan.

Source: Courtesy of the Country Fire Authority.

Each of these developments is welcomed. The Commission notes, however, that, although a significant number of changes have been initiated, many of the new features have not yet been fully tested or embedded in practice. In addition, because there were few major incidents in the 2009–10 bushfire season, the Commission is unable to comment conclusively on the success of these changes. The State will need to continue to review and assess their suitability.

The Commission considers that the language of warnings could be further improved. (This is discussed in Section 1.9.1) As outlined in the note to readers, the Commission did not reach a firm view on terminology, but it notes that plain language is preferable and encourages further work in this area (see also Chapter 11). One recommendation relating to warnings has not yet been implemented. The Commission recommended that a second phase of the National Emergency Warnings System project be undertaken to investigate whether it is technically possible to send warnings to mobile telephones according to their location. The State has received information from the telecommunications industry, but it is not yet clear whether the second phase of the project is technically possible. The Commonwealth has, however, committed funding to identify a technical solution.[160]

Nevertheless, the Commission considers that there remains room for improvement in relation to the content of warnings, particularly in the templates that have been developed for use by the Chief Fire Officer, Incident Controllers and their delegates. The Bushfires Royal Commission Interim Report Implementation Monitor noted that aspects of these templates are potentially confusing.[161]

The Commission is particularly concerned about the lack of action on sirens. The Implementation Monitor considered that the guidelines for sirens are onerous and difficult to meet, and the Commission agrees.[162] No communities have applied to obtain or use a siren. Emergency Services Commissioner Mr Bruce Esplin said moves were under way in three locations.[163] Although this is encouraging, there should be fewer barriers to action. Greater action is required, particularly in high-risk areas such as the Dandenong Ranges and the Otway Ranges.

1.5.3 EMERGENCY CALLS

In its interim report the Commission also recommended improvements to the systems for emergency calls. This included improving the information flow between government agencies and 000 to facilitate better emergency telephone services and surge capacity on days of high bushfire risk.[164]

The Commission notes that a new procedure has been implemented for the efficient provision of warnings from the CFA to other relevant government agencies and 000. The State has also introduced a number of initiatives to ensure that the Emergency Services Telecommunications Authority has greater capacity to deal with emergency calls during bushfires—including improving IT infrastructure, adding office space and arranging additional surge capacity.[165] The Commission welcomes these developments.

1.5.4 EVACUATION AND REFUGE

The Commission also made recommendations on the role of evacuation and refuge, focusing on the following:

- enabling trained CFA personnel to recommend to people that they leave early, that recommendation being based on a risk assessment of their household and property
- creating a greater role for local government in facilitating evacuation
- replacing the existing fire refuges policy
- developing criteria for the identification and operation of 'neighbourhood safer places'
- identifying community refuges and neighbourhood safer places, recording their locations and advertising their availability to the community
- developing appropriate signs for neighbourhood safer places
- allocating resources to defend neighbourhood safer places while they are being used during a bushfire
- reviewing the adequacy of existing bushfire protection measures for children's services facilities
- evaluating trials of the Victorian Fire Risk Register.[166]

The State has incorporated evacuation as an option in its new warning templates. This is discussed in Section 1.8.6.

The Commission's interim report also recommended that the State 'amend the State Emergency Response Plan so that the word relocation is used in preference to the word evacuation (except in cases where evacuation is clearly more appropriate)'. The intent of this recommendation was to remove possible confusion from the compulsory or mandatory connotations of the word 'evacuation'.[167] The SERP was duly amended and now defines 'relocation' as a voluntary decision made by residents, in advance of the possible impact of the emergency, which is based on the advice and recommendation of the control agency but is made in most cases without the assistance of emergency agencies. 'Evacuation' is defined as a planned strategy, usually involving direct assistance from emergency agencies and when the risk of impact from an emergency is highly likely. Although the terms are defined separately, they are used interchangeably elsewhere the SERP; this is potentially confusing.[168] The Commission considers that the definitions used in the SERP are appropriate but the use of the terms interchangeably is not. Its vision for the role of evacuation and relocation, including the terminology, is described in Section 1.8.7.

In its interim report the Commission made recommendations about 'neighbourhood safer places' and adopted the State's terminology it was mindful of the level of safety people might ascribe to such places.[169] The State has since amended the relevant legislation, developed guidelines for the assessment of potential neighbourhood safer places and established neighbourhood safer places in at least 29 of Victoria's 52 nominated high-risk towns; many other

potential sites have been assessed. Established neighbourhood safer places have also been incorporated in local planning and listed on council websites.[170] The Commission is, however, concerned about the progress of the State and councils in identifying and promoting neighbourhood safer places (see Section 1.8.6) and about the current terminology (see Section 1.8.6 and Chapter 11).

The State has not yet replaced the existing Fire Refuges Policy, and the Commission is disappointed at the lack of progress that has been made (see Section 1.8.6). In its interim report the Commission found that the lack of refuges left people's needs unmet if they found themselves in danger when their plans failed, they were overwhelmed by circumstances, they changed their minds, they were away from home or they had no plan. The Commission was not convinced by the argument of the Municipal Association of Victoria and the CFA that the mere provision of refuges might encourage people to leave late, thus placing them at risk.[171] It recommended that the State replace the 2005 Fire Refuges Policy following its review by the Office of Emergency Services Commissioner. The State accepted the Commission's recommendation and initially advised that the review could be completed within months. More recent advice suggests that, although the review is under way, it has not progressed beyond the stage of a discussion paper released on 25 June 2010. This is partly because of concern about dealing with the question of refuges in isolation from the stay or go policy and other 'risk and refuge' matters and partly because of the complexity of the review. The Commission was also advised that the State does not intend to finalise its policy until a new standard for the construction or retrofitting of fire refuges is developed.[172]

The State accepted that the old policy did not take account of the need for contingency plans for people who could not or did not implement the choices presented by the policy but appears to retain a level of resistance in implementing these options.[173] Mr Esplin, argued:

> The difficulty with a 'suite of options' being part of a behaviour change program is that it might encourage individuals who would otherwise choose the less risky 'leave early' option to feel unrealistically more secure that there are 'other options' available to them. Whilst bushfire planning necessarily requires a level of contingency planning, it is a real concern that the 'contingency plan' will become 'Plan A', leaving the individual at far higher risk of death or injury by fire.[174]

The Commission is concerned that the State's reservation about a 'suite of options' is reflected in the slow progress on community refuges and bushfire shelters and that the State simply does not face up to the reality that the policy approach in place on 7 February did not adequately reflect human behaviour and was therefore irrelevant to many people. In future a range of bushfire safety options should be available to try to help people who, for a variety of personal reasons and situations, do not find either the option to leave early or the option to stay and defend to be acceptable in their circumstances.

Since February 2009 the State has done a good deal of work to ensure that aged care facilities, hospitals, schools and children's services have emergency management plans, including detailed and comprehensive evacuation plans.[175] For example, the Department of Health and the Department of Human Services have a policy framework for planning and preparing for and responding to bushfires. It incorporates the potential for assisted evacuation (before a code red day) and evacuation (emergency response when a fire is imminent). Among other things, the departments can direct the transfer and early cessation of some services. In many cases the policy requires planning to be activated three days before a code red day to enable adequate planning, preparation and implementation.[176]

There are some similarities between Victoria and California in relation to the threats posed by bushfire. As part of its deliberations, the Commission explored the approach to evacuation in California.

Box 1.4 Evacuation in California

The Commission heard evidence from Mr Tim Streblow, Deputy Chief of the Sonoma–Lake Napa Unit of CAL FIRE (the California Department of Forestry and Fire Protection), about evacuation policies in California, where evacuation is the primary protective action taken when a community is threatened by fire. The Incident Commander and the Operations Section Chief make the decision to evacuate and local law enforcement officers enforce it. People subject to an evacuation order are notified through the media, telephone warning systems, social networking and door-to-door advice from law enforcement officers. This approach is supported by a community education program that encourages people to leave early in response to an evacuation order and encourages them to plan and prepare for an evacuation. The California Penal Code contains general powers for law enforcement officers to order evacuations in the event of a disaster. Mr Streblow told the Commission, however, that the preferred legal basis for making evacuation orders is the Emergency Services Act, which relies on a local governing body proclaiming a state of local emergency.

In California evacuation orders can be voluntary or mandatory. In either case an evacuation is ordered only after a fire is burning. The Commission heard evidence that 'in some cases, areas may be under a voluntary evacuation order for days to weeks and on occasion areas will be under mandatory evacuation for days to weeks'.

The Commission also heard about civilian deaths in 'wildfires' in California during late evacuation but notes that the limitations to the available data and research in this area make it difficult to draw strong conclusions about the connection between these deaths and the timing and management of ordered evacuations. It is not possible for the Commission to make a direct comparison between the United States and Australia because of potential differences in factors such as topography and population spread, the number of fire starts, weather conditions, forest types, rates of fire spread and fire spotting behaviour, and cultural differences. There are, however, similarities. Incident command teams in California face challenges in effecting safe evacuations that are likely to be encountered in south-eastern Australia, including fast-moving fires, isolated communities with poor road access, lack of time, power and communications failures, evacuation routes affected by traffic congestion or by fire, early wind changes, and confusion among law enforcement officers and the public.[177]

The Commission considers that there are elements of the Californian approach to evacuation that the State of Victoria should consider, and adapt to local conditions as appropriate, when reassessing its own approach to evacuation:

- There is a strong focus on local evacuation planning. Most Californian communities with a history of wildfire have prepared a community evacuation plan, which makes evacuation a great deal easier because people know in advance what to expect, how to prepare, where they might be directed to go and how to get there.[178]
- The Californian approach caters for communities for which evacuation might not be a safe option—for example, isolated communities with one road in and out through heavily wooded country. Contingency options such as 'shelter in place' are developed.[179]

School closures and preparation for bushfires

In its interim report the Commission made a number of recommendations related to schools. These involved completion of reviews of identified refuges in schools in areas of bushfire risk, developing priorities for any necessary rectification work, and reviewing bushfire protection measures in children's services facilities. The Department of Education and Early Childhood Development has completed its review of school refuges, assessed 36 refuges and identified two further acceptable refuges. Although not all rectification works are complete, the Commission is satisfied that such works have been assigned priority as recommended and are progressing.[180]

Since 7 February the department has also implemented major policy changes and projects to ensure that all Victorian schools and children's services are well prepared for bushfires. The department's regional directors now decide whether to close government schools and licensed children's services after consulting with the CFA and emergency services on total fire ban days and days of extreme risk. A number of schools have been closed on total fire ban days since 7 February. Other projects include developing and distributing a bushfire self-assessment tool for children's services and for government, Catholic and independent schools, and providing a bushfires resources kit to schools.[181] These are positive developments.

National park closures

Closing national parks or state forests on days of high bushfire risk can be an important way of reducing the risk of accidental and deliberately lit fires, as well as the risk to both members of the public and park and forests employees from fires that do start.

On 7 February national parks were closed but there was no policy governing closure of state forests, although DSE issued a media release warning the public to be mindful of the extreme fire danger.[182] DSE has since developed a new policy on closure of national parks and state forests; it is based on the new national fire danger rating system introduced after 7 February.[183] Parks Victoria has identified national parks exposed to high bushfire risk and developed a bushfire risk register to determine which sites will be closed on code red, extreme and severe fire danger days. In general, state forests, and national parks in bushfire-prone areas, will be closed on code red days. On extreme and severe fire danger days most national parks will remain open, but some will be closed and the services provided modified, depending on the risk. Assessment of whether or not parks will close on extreme or severe fire days is based on predominant vegetation type, overall fuel hazard assessment and proximity to townships and schools in high-risk areas of Victoria.[184]

Closure of national parks and state forests is effected through a variety of means—for example, physically using gates at access points. But restricting physical access to the majority of areas and enforcing the declared closures is not always possible. To help ensure voluntary compliance with park closures, DSE and Parks Victoria are focusing on providing warnings and information to the community to foster an understanding of the level of fire risk when visiting national parks and state forests.[185] The Commission commends this approach.

1.6 TOWARDS A BETTER BUSHFIRE SAFETY POLICY

As is evident, at present Victoria has a bushfire safety policy in transition. Although a number of initiatives and changes have been implemented since Black Saturday and the publication of the Commission's interim report, there is a need for further work—and ultimately a change of mindset, which could take some years. A coherent framework is also necessary, and in this section the Commission sets out the primary components of an improved Victorian bushfire safety policy.

The Commission understands the attraction of a policy framework that is uncomplicated and capable of being presented in a way that gives clear advice to the community, without ambiguity or uncertainty. In the Commission's view, however, giving sound and realistic advice on how people can best protect their personal safety is unavoidably complex and has become more so as a result of the experience of Black Saturday.

The revised bushfire safety policy reflects the Commission's analysis of the strengths and weaknesses of stay or go, the central tenets of which are sound. To leave early remains the safest option, and to stay and defend should also continue to be a key part of the policy, although there should be greater emphasis on important qualifications. The main limitations of the stay or go policy are described at the beginning of this chapter; for convenience, they are summarised in the following paragraphs.

1.6.1 EVERY FIRE IS DIFFERENT

Stay or go failed to provide for the variations in fire severity that can result from differing topography, fuel loads and weather conditions.[186] In particular, it did not adequately take into account the potential for ferocious fires such as those experienced on Black Saturday. What is needed is a policy capable of dealing with the fact that every fire is different. There should be recognition that potential firestorms should be differentiated from most bushfires. The former call for a different approach from a community safety point of view and different advice and support from fire authorities. On such days the operational focus and the thoughts of fire agencies should be directed at providing information to help the community stay safe, as opposed to fire suppression.

1.6.2 HUMAN BEHAVIOUR VARIES

The stay or go policy tended to assume that individuals had a fire plan and knew what to do when warned about a bushfire threat. But many people did not have a well-thought-out plan and were left to make their own decisions without the benefit of assistance from the authorities.[187] In addition, warnings were too narrow: they were directed at getting people to put their fire plans into action, rather than giving more specific directions or advice. The Commission heard that many people wait to see what eventuates before leaving in response to a range of prompts, such as a fire being in their area, the situation becoming dangerous or being told to leave. For these people the lack of alternatives—the provision of shelters and refuges or evacuation—can become critical because they have no fallback option.[188]

Although the Commission considers that any policy must encourage people to adopt the lowest risk option available to them—which is to leave well before a bushfire arrives in their area—the reality is people will continue to wait and see, and a comprehensive policy must respond to this by allowing for more options and better warnings.

1.6.3 ADVICE AND LOCAL PLANNING ARE CRUCIAL

Advice about bushfires must be provided to the community in an effective way. The population exposed to fire is growing and is diverse. A continued focus on providing frank and meaningful advice on the risks and what is required to adequately prepare for and survive a bushfire is essential. Local planning and emergency management processes are also essential if this advice is to have a sound basis. The fact that not all houses are defendable under all circumstances was recognised before 7 February, but the Commission considers that this information needs to be conveyed more forcefully. It is necessary to stress that staying—given the forecast conditions for a day as severe as Black Saturday—would involve grave risk to one's life.

1.7 THE REVISED POLICY FRAMEWORK

The Commission sees the need for a number of important changes to be made in order to make the State's bushfire safety policy more comprehensive and to accommodate the lessons of 7 February. To improve communities' and households' ability to live with the threat of fire in Victoria, the changes focus on personal survival and the knowledge, capability and commitment required by the State, municipalities and individuals. The changes the Commission recommends do not diminish the role of effective land management (including fuel reduction) or the need for improved building and planning measures. These and other actions are essential to a truly strategic approach to fire management and are dealt with in subsequent chapters of this volume.

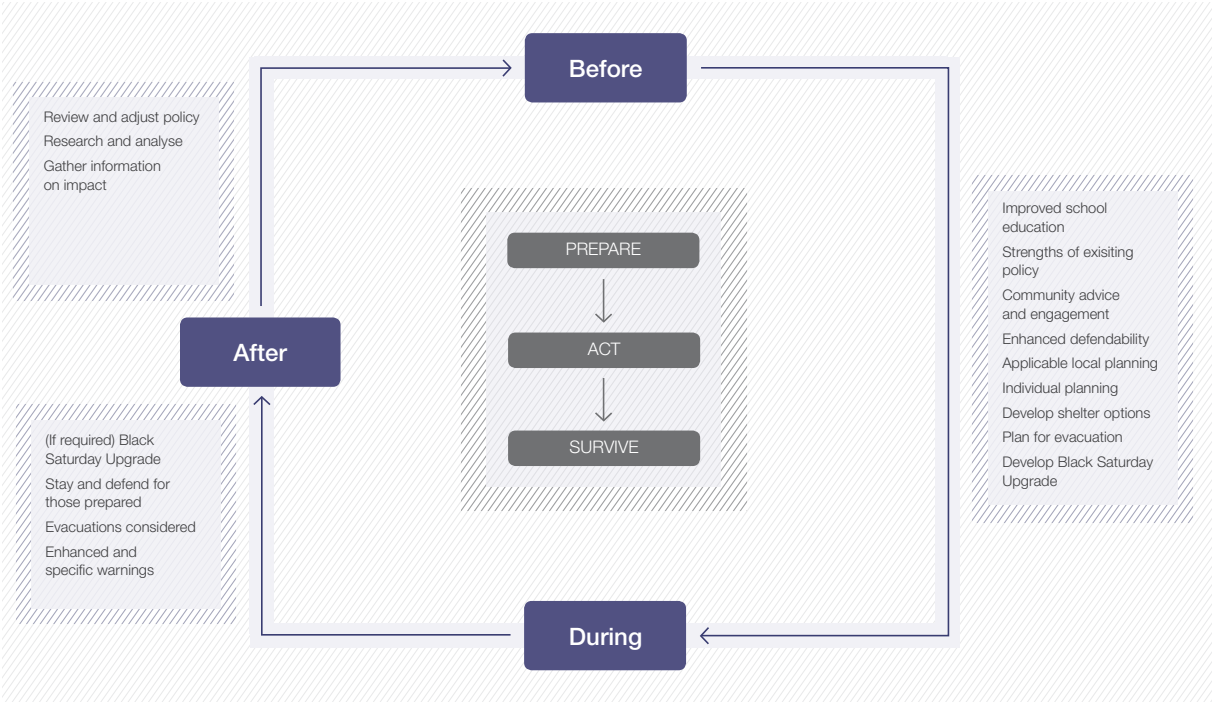
The Commission's recommended bushfire safety policy has three sections, describing the actions required before, during and after a bushfire. These three distinct phases are crucial to bushfire survival and are characteristic of any fire of any severity in any place. They align with Prepare. Act. Survive.—the national approach adopted in late 2009 by the Australasian Fire and Emergency Service Authorities Council.[189] The policy the Commission recommends is designed to ensure that Prepare. Act. Survive. is implemented effectively in Victoria. The following actions are proposed under each phase:

- before a bushfire
  - building on the strengths of the existing policy—leaving early
  - strengthened continuing community advice and engagement
  - a more holistic understanding of defendability
  - greater focus on local planning for bushfire safety
  - identification and development of shelter options—including community refuges and shelters
  - planning for evacuations
  - development of a Black Saturday Upgrade for operational planning

- during a bushfire
  - issuing warnings that are timely and more specific
  - a clearer role for Incident Controllers and individuals when considering evacuations
  - supporting the stay and defend option for those who are well-prepared, on all but the most dangerous days
  - on days where ferocious fires break out, the existing Prepare. Act. Survive. framework being supplemented by an operational upgrade that focuses more strongly on recommending evacuation from areas likely to be in the path of a bushfire
- after a bushfire
  - gather information about the impact
  - monitor and review
  - review and adjust the policy.

The figure below shows the proposed approach.

Figure 1.8 Framework for Victoria's bushfire safety policy



1.8 BEFORE A BUSHFIRE

Most actions need to occur, or be planned, before a bushfire starts. Fewer actions need to be taken during or after a bushfire. The Commission recognises that its approach calls for long-term changes in thinking and behaviour, such as changing the community's understanding of bushfire and of agencies' planning and response. As a result, the revised policy might take more than five years to implement, even with a strong commitment by all stakeholders. If efforts are adopted nationally and the Commonwealth supports the states and territories, faster and more successful program implementation might be achieved. The Commission strongly supports Commonwealth participation in this process.

1.8.1 BUILDING ON THE STRENGTHS OF THE EXISTING POLICY: LEAVING EARLY

Encouragement to leave early is a fundamental strength of the policy in place on 7 February. The Commission heard evidence that, although some people did leave early on 7 February, there remains confusion about the best time to leave, and many people report that they do not intend to leave early, even on code red days.[190] The Commission considers that leaving bushfire-prone areas early on days of high bushfire risk, especially on days predicted to be code red, is the safest response to the threat of bushfire. It also concurs with the State that it is crucial to encourage people to adopt this lowest risk behaviour.[191]

As part of its bushfire safety strategy, the State should ensure that the message to leave early is well understood, particularly by the following groups:

- people living in bushfire-prone areas
- people living in areas where late evacuation will probably be very dangerous—for example, in heavily vegetated areas with limited road access and egress
- people responsible for vulnerable people, who might face difficulties leaving later and are likely to be at greatest risk if caught in a fire.

A further message for consideration in a revised bushfire safety policy is that areas in larger towns could offer greater protection than smaller townships or settlements, and these need to be identified and promoted as potential places for evacuation or relocation.

1.8.2 CONTINUING COMMUNITY ADVICE AND ENGAGEMENT

In the past two decades Victorian fire services have raised the priority of community education about the risks posed by bushfires and how people might act to mitigate those risks.[192] Successful community education should aim to influence people who might be at risk of bushfire and encourage their participation as well as an appropriate safety response. The information needs to promote changes in behaviour that increase the chances of survival for people in bushfire-prone areas.

Victoria has a diverse population. People have various reasons for choosing to reside where they do and have different perceptions of bushfire risk. This affects their reaction to safety warnings.[193] Similarly, the threat posed by a bushfire is unpredictable, a fact clearly demonstrated on Black Saturday. Tailoring messages in such a way as to accommodate these factors is therefore important: what might be suitable for one community, or even a section of a community, may not be suitable for another. The CFA already disseminates information in an integrated and multi-faceted way, ensuring that a range of delivery modes and media are used to maximise community engagement with the information.[194]

The Commission also supports expanding the CFA's Community Fireguard program to involve a greater number of communities and develop more active membership. Reviews of the program suggest that greater community capacity would be beneficial in mitigating the risks from bushfires.

Current international research also provides direction about how community education could be continuously improved. The 2010 Human Dimensions of Wildfire Conference in the United States showcased research into ways to engage with diverse communities and help those communities to become bushfire aware. For example, a well-educated, financially comfortable community living in a semi-rural setting and having members who are mostly compliant with rules and regulations will require an engagement strategy that differs from that appropriate for an isolated or fringe-dwelling community with limited financial resources and members who may distrust authority and government.[195]

Although much progress with community education has been made, the Commission considers more could be done. This would require even greater resources to be directed at community engagement and, ideally, the development of a nationally consistent approach. This idea of a consistent approach has merit: much of Australia is bushfire-prone and increasingly people are living in rural or semi-rural areas as well as regularly moving between jurisdictions.[196] The reach, profile and recognition of campaigns such as *Life. Be in it* and *Slip Slop Slap* illustrate the impact national awareness campaigns can have. The success of the cyclone warning messages in northern Australia, across Western Australia, Northern Territory and Queensland, is an example of a national approach to a natural hazard. The same is required for bushfire across southern Australia.

Improved engagement with communities at risk of bushfire also needs to be explored. Although appropriate information is essential, its provision will not necessarily change behaviour or ensure safety. Individuals are more likely to become involved when they consider information useful and relevant to their circumstances. The inference the Commission drew from the evidence is that many people in bushfire-affected communities might not have fully embraced the stay or go message because they did not recognise the danger of facing a ferocious bushfire.

Community education strategies must also reflect how people actually behave.[197] Faced with a bushfire threat, some people will leave early, others will be intent on staying to defend their home, and many will decide whether and when to leave on the basis of triggers that might be specific to their individual circumstances and location. Timely and accurate warnings can provide such triggers, but the content and delivery must be carefully developed to elicit the right response.

The Commission considers that volunteers have unrivalled access and credibility in local communities and are therefore in a very good position to meet and communicate with local residents. In this context, the revised policy will require a whole-of-workforce approach: all firefighters will become communicators of the message and will need to have a sound knowledge of the bushfire safety policy and be able to discuss it with members of the community. This will allow firefighters to better harness local resources and will result in communities and individuals becoming less dependent on the State, more 'fire adapted', and more responsible for their own safety.[198]

This expanded education role could place strain on CFA volunteers, who expressed concern about already being stretched when trying to meet community demands. A revised mix of paid and volunteer positions might help to resolve this.[199] Ultimately, a number of specialists are probably required to run education programs, but all firefighters might be asked questions from time to time and need to be able to respond to those questions properly.

1.8.3 CRUCIAL KNOWLEDGE

It is vital that people have an accurate understanding of several topics if they are to make better informed decisions when preparing for and facing bushfire.

Fire behaviour

The main determinants of fire behaviour are summarised in Chapter 1 of Volume I. The impacts of wind and a wind change are particularly important. Wind affects the shape, direction, rate of spread and behaviour of a fire. A south-westerly wind change can turn the flank of a long, narrow, cigar-shaped fire pushed by northerly winds into a firefront several kilometres wide.[200] If this information had been more widely and better understood on 7 February, it would have helped people recognise the danger associated with the wind change.

A more holistic understanding of defendability

In its interim report the Commission identified one of the main gaps in information and advice to be the lack of access to technical expertise to help people to determine the level of defendability of their house. Fire agencies need to be explicit in their advice about defending a home, spelling out in plain language that defending a house against a bushfire is a serious undertaking accompanied by grave risks, including the risk of death. The Commission is concerned that people who do choose to stay and defend their home must be under no illusion that even the most carefully prepared of houses can be destroyed by fire; that even people who are extremely well prepared can die fighting fires at home; and that the best laid plans are vulnerable to failure. The Commission recommended in its

interim report that the CFA advise people about the defendability of their homes and that advice on staying to defend should specifically contain the warning that being in a bushfire can be a terrifying, life-threatening experience that can cause serious, long-term psychological damage. This is particularly the case for ferocious and fast-moving fires.

Following adoption of these recommendations, the CFA now advises people about the defendability of their homes through community education materials, the Household Bushfire Self-Assessment Tool and direct advice (see Chapter 6). The Commission welcomes this important development. It notes that the most recent CFA advice to householders, *Prepare. Act. Survive. Your Bushfire Survival Kit* has incorporated the following:

- the risks of staying to defend—including the risk of death
- that defending is not an option for children, the elderly or those with vulnerabilities
- that not all houses are defendable
- that many houses that are defendable in moderate fire conditions will be undefendable in extreme conditions
- that preparation involves more than creating a defendable space around the home and having an adequate water supply. For example, equipment such as pumps, hoses and fittings must be specifically designed to endure extreme fire conditions.[201]

The Commission considers that there are still some weaknesses in the guidance the CFA provides in relation to house defendability. First, advice given about improving building defendability must make it clear that current building standards are only designed to provide for individuals protection from the firefront for only about 15–20 minutes. It should also be made clear that the standards assume a house will be actively defended. The Commission heard from a number of witnesses who experienced firefronts that lasted over an hour.[202]

Second, the CFA's current focus on defendability appears to be largely confined to the immediate surrounds of a house. Analysis conducted by the Commission showed that a considerable proportion of those who died in or around dwellings or who died fleeing from their properties were in areas that were closely adjoining or in some cases completely surrounded by heavy forest. Others were on the crests of hills or on upper slopes surrounded by large concentrations of forest and in similar positions the Commission considers would have been undefendable on 7 February, even if the properties themselves were relatively clear and well maintained.[203] Defendability is affected by the surrounding environment, such as proximity to a heavily forested area. These broader factors affect the ferocity of the approaching fire and whether the house could be subject to very heavy ember attack.

Properties close to heavily forested areas are more prone to ember attack than those in open farmland. The momentum and ferocity of a fire travelling through heavy forest will be different from and greater than a fire burning in grazed paddocks. Assessments of defendability should therefore consider the nature of the nearby undergrowth and fuel load. On the basis of the evidence before the Commission, broader landscape influences are not adequately identified, considered or explained by the CFA when it is assessing the defendability of properties.

A Bushfire CRC study of bushfire penetration into urban areas in a selection of fires in south-eastern Australia since 1967 (including Marysville and Kinglake) concluded that, by avoiding building structures within 100 metres of bushland boundaries, 'the majority of building damage would be avoided'. This has implications not just for limiting property damage (see Chapter 6) but also for the safety of people who choose to stay and defend.[204]

Professor Roz Hansen, an urban planner, provided advice to the Commission about how far away houses and the urban edge should be from adjacent bushland. The 2007 CFA kit, *Building in a Wildfire Management Overlay,* focuses on vegetation and fuel within 100 metres of the proposed house; the New South Wales Rural Fire Service advises this should be 140 metres. Professor Hansen went on to say:

> Land in more isolated locations, or on allotments on the edge or fringe of township boundaries, or adjacent to but outside these boundaries, may require a wider assessment of existing vegetation cover beyond distances of 100–140 metres. This is especially relevant to land which is close to large tracts of forest and bushland where fuel loads can be high and the severity and extent of an approaching bushfire can be potentially catastrophic.[205]

The Commission's hearings into the fire-related deaths revealed that a large number of people died in homes the Commission considered were undefendable on 7 February. This question needs more serious analysis, and objective measures and tools to help determine minimum set-back distances from heavy fuel concentrations when assessing a house's defendability need to be developed. Further research into this is required as a matter of urgency (see Chapter 11).

Third, the Commission notes that the guidance the CFA provides does not include the defendability of farm, commercial and industrial premises since these require separate expert advice. Information provided about houses under Victoria's new bushfire safety policy is unlikely to apply to more complex structures and should not be relied on for offices, warehouses, factories or farm sheds. Larger premises will require specific advice, and this should be specifically sought from fire agencies or commercial providers of advice.

Finally, evidence before the Commission suggested that demand for individual site visits had been minimal, possibly reflecting the CFA's reluctance to date to provide such advice. The CFA needs to more actively promote the option of individual assessments of defendability.[206] Interim Report Implementation Monitor Mr Neil Comrie also identified this as an area for improvement.

Changes to the CFA Act following recommendations in the Commission's interim report empower the CFA to provide advice on defendability and give CFA officers immunity from legal liability for doing so, but they do not mandate giving defendability advice as part of the Chief Officer's core responsibilities.[207] As a consequence, the CFA might continue to be reluctant to provide such advice. The Commission believes that good advice about defendability is as essential as issuing warnings on the day of the fire. The State should strengthen arrangements to ensure that the CFA provides an appropriate level of advice to individuals on the defendability of their properties. The State should evaluate the arrangements within two years and consider amending the CFA Act to require the Chief Officer to provide defendability advice if the evaluation shows that the arrangements are not sufficient.

Bushfire safety options

Contingency planning is very important: when a fire plan fails and things go wrong, people need alternatives. The Commission's recommendations broaden the range of contingency measures available to communities. Community education is required so individuals understand the options that are available, make informed choices about the relative safety of the alternatives, and know what assistance will be provided during a fire to help them make a decision. For example, education on evacuation might cover the processes for evacuation, the availability of shelters and the information provided in warnings.

1.8.4 LOCAL PLANNING FOR BUSHFIRE SAFETY

The Commission envisages that local councils, with adequate resources and support from the Victorian Government and fire agencies, would play a central role in local bushfire planning. Emergency Services Commissioner Mr Esplin accepted the need for and importance of local planning in Victoria's bushfire safety policy, specifically in relation to community alert sirens, shelters and evacuation.[208] The Commission heard from a number of witnesses, such as Associate Professor Cova, who emphasised the benefits of developing plans at the local level.[209] Mr Streblow of CAL FIRE provided an Incident Controller's point of view. He explained that having a community evacuation plan makes it much easier to evacuate an area threatened by fire.[210] He also stated:

> We do as much as we can prior to an event, prior to the fire. So through an educational process we will explain to people why we do this. An example is the Paradise plan. That plan gets out to the public. They understand it. They know why we are doing it. They know what the components are. So education is probably the greatest component that we use to get compliance.[211]

A local planning approach would overcome one of the primary shortcomings identified in relation to 7 February: the stay or go policy did not accommodate diverse local circumstances.

Individual and household fire plans have long been a feature of the CFA's approach, and this should continue. Local planning can help individuals by highlighting community circumstances and ensuring these are recognised in individual plans. Consistent with the Commission's view on shared responsibility (see Chapter 9) all parties in bushfire-prone areas—the State, councils, communities and individuals—should work to develop comprehensive plans that identify and respond to local risks. Such plans would provide a range of safety options that meet the needs of the local community, consider how vulnerable people would be catered for, and clearly describe the alternatives available to the local community.

Existing local planning processes

The Commission has identified three existing processes that could be used to improve bushfire safety planning:

- municipal emergency management planning
- municipal fire prevention planning and its successor, integrated municipal fire management planning
- township protection planning.

Under the *Emergency Management Act 1986* all councils must prepare and maintain a municipal emergency management plan. These plans must be prepared in accordance with guidelines published in the *Emergency Management Manual Victoria.* Emergency management plans are developed on the advice of municipal emergency management planning committees and must identify the resources available in the municipality that can be used for emergency prevention, response and recovery and specify how those resources are to be used.[212]

Councils are also required to prepare a municipal fire prevention plan.[213] Under the CFA Act the CFA may appoint a municipal fire prevention committee in country Victoria. These committees make recommendations to council about the preparation and content of a fire prevention plan. This plan identifies the municipality's fire risks, determines the appropriate responses to or treatment of those risks, and specifies who is responsible for implementing each response or treatment.[214]

Township protection plans were originally developed by the CFA as operational response plans to prepare for firefighting operations and identify local access routes and vulnerabilities such as schools, nursing homes and hospitals.[215] The purpose of the plans was revised in the wake of the 2009 bushfires to include more detailed consideration of the actions community members could take when fire threatens their town.[216] The Commission was advised that 66 township protection plans had been developed, including one for each of the 52 high-risk towns identified by the State Government. These plans have three parts, covering community information, township planning factors (focused on initial operational response) and fire prevention works. The community information is produced in the form of a map detailing important locations and facilities, such as neighbourhood safer places, and where to obtain emergency information. The plans were produced quickly after Black Saturday and those provided to the Commission varied greatly in their quality. Some contained details about local information sources and clearly showed the location of neighbourhood safer places, but others appeared of limited benefit to local residents, lacking clear guidance on the location of safer places.[217] At present there is no formal connection between township protection plans and emergency management plans and fire prevention plans. Township protection planning is a CFA initiative that has taken place outside local emergency management and fire prevention planning processes. Given the relevance of some of the content of township protection plans, particularly fire prevention works, the Commission considers there is scope for better aligning these plans with other local plans in the future.

The Commission is of the view that the existing emergency management, fire prevention and township protection plans do not facilitate the level of planning necessary to mitigate the risks of bushfire at the local level. The Commission would prefer a single bushfire management plan, although it acknowledges that the CFA should carry out separate operational response planning. Fire prevention works, one of the three elements of township protection plans, should form part of the single local plan.

Figure 1.9 Integrated Municipal Fire Management Plan Framework

A need for greater integration

Fortunately, work is under way to better integrate emergency management plans and fire protection plans through the development of an integrated municipal fire management plan framework. The concept of integrated fire management plans emerged in a 2002 CFA review of municipal fire prevention arrangements. The review identified areas for improvement, including revision of the municipal fire prevention planning guidelines, better integration of planning processes between all agencies and levels of government, and review of the unwieldy fire prevention plan structure.[218] A plan documenting the new framework was developed in 2004. Its objectives included reforming fire prevention planning to encompass a risk-based approach to the planning and management of fires and assimilating the proposed framework into the emergency management planning process for Victoria.[219]

The framework was approved in February 2007 and is to be supported by State, regional and municipal committees established by the Minister for Police and Emergency Services.[220] Over time, existing fire prevention committees in country areas of Victoria will be replaced by fire management planning committees, which will be responsible for integrated planning at the municipal and local level and developing municipal fire management plans. They will report, as a sub-committee, to the municipal emergency management planning committee, under guidelines in the *Emergency Management Manual Victoria.*[221]

A closer connection between municipal fire management planning and municipal emergency management planning, as proposed under the framework, is much needed and is welcomed by the Commission, even though this framework does not currently, but should, include consideration of elements of township protection plans. Fire management planning committees will produce municipal fire management plans, according to ministerial guidelines also published in the *Emergency Management Manual Victoria.* Fire management plans will be sub-plans to the existing municipal emergency management plan, ensuring that fire prevention, response and recovery are linked, consistent and holistic. The plan must consider the social, economic and built and natural environment aspects of fire and guide participants in fire management planning activities. It will also cover ecological and cultural use of fire.[222] The Commission heard positive feedback about the advent of integrated fire management planning at the municipal level.[223]

State and regional fire management planning committees have been formed. Only 10 councils have established fire management planning committees, however, and by March 2010 only two had disbanded their prevention committees, which are to be replaced. A draft state strategy has been approved and published; it shows the framework being implemented between 2010 and 2012.[224] The Commission notes that the progress of implementing the framework has been frustratingly slow and urges the State to give priority to the roll-out of the integrated fire management plan framework.

One of the main outcomes of the framework is the development of the Victorian Fire Risk Register, a tool used to map bushfire risk and considered in the Commission's interim report. At least 22 councils have mapped their bushfire risk using the register, and mapping is in train in several others.[225] The Commission heard that the register provides a consistent and uniform way of identifying and documenting fire risk across Victoria. Mr Kevin Kittel, the municipal fire prevention officer for Corangamite Shire, told the Commission that the ability to see the identification and treatment of risks in map form had tremendous advantages over having to read very long documents.[226]

A need for better guidance

The guidelines for municipal emergency management planning in the *Emergency Management Manual Victoria* provide very little advice to councils on what emergency response arrangements are required.[227] This leads to inconsistency and could also mean that the arrangements are inadequate. For example, the Murrindindi municipal emergency management plan had been assessed as complying with the guidelines of the Emergency Management Act but it did not include plans to prevent or respond to bushfire or to evacuate Marysville or any other township in the shire.[228] The Commission considers this unacceptable. The State should review the guidance it provides to councils, to help them develop and implement more focused and useful local emergency planning, particularly in relation to bushfires.

Mr Kittel expressed concern about the level of guidance provided when preparing municipal fire management plans. The CFA provided a broad template on which to base the plans. The template did not include the mandatory information required or fully developed aims and objectives. As Mr Kittel pointed out, this could result in very different fire management plans being developed across the state, which is at odds with the objectives of an integrated framework.[229] The framework states that ministerial guidelines for municipal fire management planning would be published in the *Emergency Management Manual Victoria.* Although this has not occurred, the State advised the Commission that work is under way and that, once the Commission's final report is delivered, it will give urgent attention to finalising the guidelines.[230] The Commission urges the State to publish, without delay, guidelines for the development of municipal fire management plans. The guidelines should be clear and concise and should contain a list of the bushfire risks to be identified in each municipality and the treatments that may be applied to each of those risks. They should also require use of the Victorian Fire Risk Register to identify, document and treat fire risk.

Enhancing the role of local planning

Victoria's bushfire safety policy must be described in state policy documents, given force through state legislation, communicated in the training of emergency personnel, and accounted for in statewide resourcing decisions. Success is dependent, however, on local application and implementation. Local governments, in consultation with the CFA and other agencies, need to assess which bushfire safety options are available in their local area in advance of a fire, and include alternatives in their emergency management planning.

Local planning for each community should cover the following:

- evacuation—assisted evacuation for vulnerable people who require support and emergency evacuation in the face of a bushfire threat
- shelter options—community refuges and bushfire shelters.

Detailed plans should include possible evacuation routes, who would take action to effect an evacuation, and triggers for that action. Activities could also include building shelters and modifying local areas to make them safer. Additionally, local plans would be the primary source of information on bushfire safety options for people living or

visiting the area and should be prepared with this in mind. Information and advice about contingency options must stress that people's individual and household fire plans should draw on those local plans to identify the options available in their community.

In the highest risk areas the Commission considers practical exercises such as simulated evacuations should be conducted. Professor Dutch Leonard of Harvard University and Professor Paul 't Hart of the School of Politics and International Relations at the Australian National University stress the importance of training and practice.[231] Conducting local trials or drills could involve responding to a recommendation to evacuate or a siren. Planning and trials should envisage different types of fires, including firestorms. Plans should also explicitly consider how safety options will be implemented on the most dangerous days and how the community response on those days should differ because of the heightened risk.

Integrated planning by municipal fire management planning committees is the Commission's preferred approach, and it urges the State to continue the roll-out of the integrated fire management plan framework in line with its current timetable, if not sooner. It notes with regret, however, that this is not under way in most municipalities and is not expected to be completed before 2012. As a consequence, interim measures are required. This could include 'fast-tracking' the development of municipal fire management plans in areas of highest bushfire risk, integrating information already completed in township protection plans, and distributing this widely across local communities. Whatever the approach, councils, the CFA, and other local agencies should be involved in determining shelter and evacuation options, and a primary outcome should be developing and distributing information about the options in a form that is able to be understood by residents.

1.8.5 INDIVIDUAL PLANNING AND PREPARATION

Individuals played a key role in implementation of the stay or go policy, and this should continue under the revised policy, although with additional support from the State and local councils. Household preparedness in advance of a fire is crucial and must be encouraged and assisted through advice and education to give people the best chance of survival. 'Preparedness' should be distinguished from an approach that assumes that households will implement a predetermined fire plan come what may. The Commission envisages that residents of fire-prone communities would take personal responsibility for living in a high-risk area, seek the knowledge and skills to allow them to prepare their home for bushfire, evacuate early and safely when it is recommended and, if trapped, make use of learned skills to survive the fire.

Individual plans should draw on an area's local plan, applying local options to the household's circumstances and needs. The CFA should provide updated guidance about the main components of a household fire plan, including contingency options and the need to obtain and understand warnings. Contingency options should include alternatives for situations where people find themselves trapped in a house, motor vehicle or out in the open.

Planning for animals

Section 1.4.2 notes the importance of the attachment between individuals and their pets and livestock and how that attachment can influence an individual's actions when threatened by fire. This attachment needs to be recognised, and there is a need for practical information about how individuals can include their animals in their evacuation or prepare themselves for leaving their animals behind. As with humans, early evacuation of animals is the safest course, but this might not be easy for people with numerous or large animals. Dr Sarah McCaffrey, Research Forester and Social Scientist with the US Department of Agriculture's Forest Service told the Commission her research showed that animals were a barrier to people's willingness to evacuate: 'They know they can't get their animals out in time so they're going to just figure out how to manage internally. I have actually met a number of people who would like to evacuate but recognise they can't get their animals out and so are going to stay'.[232]

The difficulties associated with planning for animals were highlighted by a number of lay witnesses, among them Dr Renee Paulet, who lived in Callignee on 7 February. She told the Commission:

> If we were to leave, I wouldn't leave before there was a fire because I wouldn't leave without the horses and anywhere I moved them to, a fire could start there. So, I would be waiting until I heard that a fire had started, whether it be on the ABC or on the internet, and then I could make a decision as to where would be the safe place for us and our animals to go.[233]

Farmers occupying broad-acre holdings have traditionally relied on clearing their land to provide a place of refuge for their animals, and the Commission heard evidence of this occurring during the 2009 fires. In other cases animals were moved to safer locations: well-resourced farmers generally have the equipment and knowledge to do this relatively quickly. For hobbyists and people with pets, though, removal requires careful prior planning; and the intended means of removal also needs to be realistic and be able to be implemented quickly and in a way that does not endanger the carer.[234]

1.8.6 IDENTIFICATION AND DEVELOPMENT OF SHELTER OPTIONS

In its interim report, the Commission expressed support for a new approach to shelter and proposed the following options:

> **Designated community fire refuges**, identified, constructed or refurbished by the State (following the review of the 2005 Fire Refuges Policy) and maintained by councils
>
> **Neighbourhood safer places**, identified by the State in consultation with councils, and maintained by councils. It is noted that the State's proposal suggests that the CFA would assess and manage neighbourhood safer places
>
> **Privately identified safer places**, being arrangements made by individuals should their plan to stay and defend fail, or should they find themselves otherwise exposed. These arrangements could include options like their own inground swimming pool, or a neighbour's ploughed paddock.[235]

Having considered further evidence on these three options, the Commission reiterates its view that more options are required. It proposes that further attention be given to making a range of shelter options available, depending on the location, level of bushfire risk and needs of each community. The Commission considers, however, that the terminology currently used could be simplified and has adopted the following terms to describe the three options just outlined above: community refuge, bushfire shelter and personal shelter. The Commission adopted the term 'community refuge' to acknowledge the role this facility might play in an 'all-hazards' approach to emergency management, although the current emphasis is on bushfires.

The Commission focused on what needs to be done to increase the availability of government-sanctioned shelter options—that is, community refuges and bushfire shelters—as opposed to personal shelters since these will vary greatly depending on individual circumstances. Following a recommendation in the Commission's second interim report, a national standard for the construction of private bushfire shelters, or bunkers, has been developed and adopted in Victoria. The Commission notes that this could provide another valuable personal shelter option.

The Commission is mindful that there will be situations where people find themselves trapped in their house, in a motor vehicle or out in the open during a bushfire. The State should advise people about how to make themselves as safe as possible in these circumstances. This should include providing advice about when and how to use informal shelter options (for example, a water body such as a dam or pool) and large cleared spaces (for example, an oval or paddock) particularly if they are in a motor vehicle. Section 1.8.4 outlines how the options should be incorporated in local planning.

Community refuges

The history of fire refuges in Victoria and their status as at 7 February 2009 were canvassed in detail in the Commission's interim report. Councils are responsible for providing fire refuges, in accordance with the State's 2005 policy, Fire Refuges in Victoria: Policy and Practice. The policy states that refuges will be provided only in rare and exceptional circumstances, and must comply with published standards and guidelines.[236] By 7 February 2009 fire refuges had all but disappeared from Victoria's bushfire-prone areas: there were only nine designated community fire refuges in two municipalities. At present the Woods Point mine is Victoria's only community refuge (see Chapter 8 of the Commission's interim report).[237]

The Commission's interim report recommended that the State replace the 2005 refuges policy with a new policy. It also highlighted a number of challenges, particularly for local councils, that would need to be considered in

developing a new policy. These included identifying communities and areas where refuges might be appropriate; determining suitable locations; standards for design, construction, siting, operation and performance; capacity; assigning responsibility for establishment and maintenance; funding; and legal liability.[238] Councils' concern about legal liability and the possibility of litigation was one of the perceived stumbling blocks, and the Commission indicated that the State should consider immunity or indemnity in its revision of the refuges policy. The Commission also recommended that the CFA give priority to providing crews to defend refuges and neighbourhood safer places and considered that people present should have available to them the equipment necessary to actively defend these locations.[239]

The State's recent discussion paper on the refuges policy identified a number of options for dealing with the question of liability, among them providing an immunity, the State indemnifying councils for a death or injury arising from the use of a refuge, and providing a policy defence similar to that applying for neighbourhood safer places.[240] The Commission also notes that the relevant legislation about neighbourhood safer places offers councils some protection against legal actions arising from the places' designation and operation.[241] It has not considered in detail the operation or adequacy of the policy defence, though. The Commission urges the State to consider the impact liability could have on councils' decisions to designate community refuges and develop protections to ensure this does not operate as a disincentive. This assessment should consider all options, including a policy defence, an indemnity or an immunity.

The Commission repeats its view that active defence of shelter locations, particularly by the CFA, is an essential element of the policies that underpin those locations. The concept of community fire units, as used by New South Wales Fire Brigade, might have merit when considering community refuges and bushfire shelters. These units are staffed by trained volunteers in specific streets and have access to water, a pump and hoses to assist with local protection.[242] The Commission does not suggest this approach for Victoria because it is concerned that it could encourage residents to stay rather than leave. For refuges and shelters, however, the placement of such units could provide an additional element of protection without any reliance on fire agency resources being present. This approach should be investigated.

Although the Commission did not nominate a deadline for the State to revise the refuges policy and accepts that this is a complex task, it is disappointed that more progress has not been made. It is also concerned about the estimate that a standard for refuges could take years, rather than months, to develop.[243] Refuges must undoubtedly sit within the broader bushfire safety policy, but development of standards for refuges is a relatively discrete component of the policy and could be completed early in the overall policy review.

The Commission is concerned that isolated communities surrounded by forest, where evacuation is unlikely to be a safe option once a fire is burning, need options such as community refuges for people who are unable or unwilling to leave early. Councils should be considering community refuges as part of their local contingency planning but are effectively unable to do so until the state policy is finalised. The Commission repeats its earlier proposal that the State give priority to developing a new refuges policy, to enable councils to implement the contingency options that will form a central element of Victoria's bushfire safety policy in the future.

Neighbourhood safer places

In the Commission's interim report 'neighbourhood safer places' were conceived of as an alternative place in which people might seek shelter. As discussed in this section, the State has published assessment guidelines for NSPs, established a legislative framework in which they operate, and assessed potential sites against the guidelines.[244] The legislation has it that councils, rather than the State, are responsible for designating NSPs. By 21 May 2010 the CFA had assessed 534 potential sites and councils had designated 81 such places in 23 municipalities; a further 186 were undergoing council designation. By 7 July 2010, 94 NSPs had been designated.[245] The Commission welcomes this progress, but it considers that improvements could be made to the terminology, process and criteria used by councils to designate these places.

The Commission was informed that New South Wales has about 600 NSPs and notes that the NSW framework for designating such places is substantially different from that in Victoria. Significantly, the NSW Rural Fire Service has sole responsibility for designating NSPs, and there is no statutory obligation on the service to designate them. There is a single criterion for designation—exposure to radiant heat—and the question of liability has not yet been determined.[246] It is not clear from the evidence which authority is responsible for factors such as maintenance, access and egress. In addition, while Victoria has focused on areas of very high risk, it is not clear whether NSW has taken this approach. The Commission did not examine the NSW model in sufficient detail to be able to offer a view as to its desirability, but it does note NSW's achievements. Mr Esplin said work to identify and designate NSPs was continuing in Victoria. A comprehensive review of NSP policies and procedures based on the experiences of the 2009–10 fire season has begun. It is not known when the results of this review will be delivered.[247]

The State's original proposal defined an NSP as 'a space which is a place of last resort for individuals to access and remain in during the passage of fire through their neighbourhood, without the need to take a high risk journey. They are intended to provide a place of relative safety'.[248] The State has since adopted the term Neighbourhood Safer Place—Places of Last Resort.[249] The Commission notes that the State and councils have quite deliberately—through the relevant legislation, community education material and signage—positioned NSPs as places of last resort that provide relative, rather than guaranteed, safety. Promotional material, including signage at the sites, includes a range of caveats about the level of safety to be expected.[250]

The Commission appreciates that people using NSPs must be informed about the limitations to the protection NSPs provide and the risk of using them. It considers, however, that the current terminology is clumsy, and it urges the State to adopt a more suitable name. 'Bushfire shelter' more accurately describes the intent and function of NSPs, and the Commission uses this term in this final report. The Commission has not, however, made a detailed assessment of the most suitable description and considers that more work is needed. Research into terminology for a range of concepts is discussed in Chapter 11.

In addition to its concern about terminology, the Commission considers that the way NSPs have been promoted might actually discourage people from using them.

Figure 1.10 is an example of NSP signage.

The Municipal Association of Victoria argued that NSP signage plays 'an important community education function' and that councils should not, 'by omission, mislead people about what NSPs provide so as to induce or encourage more people to attend NSPs'.[251] The State argued, 'It is important that individuals are aware that the shelter offered by an NSP is not complete'.[252] The Commission considers that the signage, as it currently is, is evidence of a reluctance on the part of councils to endorse the use of NSPs during the passage of a fire. The Municipal Association of Victoria disputes this, but the Commission nevertheless considers there is scope to improve the language used and encourages the association to reframe its education materials, including signage, to focus on the purpose and benefits of bushfire shelters as well as their limitations.[253]

Figure 1.10 Daylesford NSP signage

WARNING

THIS DESIGNATED NEIGHBOURHOOD SAFER PLACE (NSP) IS A PLACE OF LAST RESORT DURING THE PASSAGE OF A BUSHFIRE. WHILST IT MAY OFFER SOME PROTECTION FROM BUSHFIRE, THE SAFETY OR SURVIVAL OF THOSE WHO ASSEMBLE HERE IS NOT GUARANTEED.

BEFORE DECIDING TO HEAD TOWARDS, OR ENTER, THIS NSP IN THE EVENT OF BUSHFIRE, BE AWARE THAT:

- MANY HOUSES MAY OFFER BETTER PROTECTION THAN THIS NSP
- TRAVELLING TO THIS NSP WHEN THERE IS BUSHFIRE CAN BE EXTREMELY DANGEROUS. THERE IS NO GUARANTEE THAT YOU WILL BE SAFE DOING SO
- THIS NSP MAY NOT PREVENT DEATH OR INJURY FROM FIRE, EMBERS OR RADIANT HEAT WHEN YOU GET HERE
- YOU SHOULD ONLY USE THIS NSP WHEN YOUR PRIMARY BUSHFIRE PLAN HAS FAILED OR CANNOT BE IMPLEMENTED
- THIS NSP ONLY HAS LIMITED CAPACITY
- THERE IS NO GUARANTEE THAT CFA OR OTHER EMERGENCY SERVICES WILL BE PRESENT AT THIS NSP DURING A BUSHFIRE
- NO FACILITIES ARE PROVIDED FOR PEOPLE WITH SPECIAL NEEDS, INCLUDING THOSE REQUIRING MEDICAL ATTENTION
- THIS NSP MAY BE UNCOMFORTABLE AND NO AMENITIES SUCH AS FOOD AND DRINKS WILL BE PROVIDED
- THERE IS NO PROVISION FOR ANIMALS.

VICTORIAN BUSHFIRE INFORMATION LINE – 1800 240 667

Source: Exhibit 840 – The Victorian Bushfire Royal Commission Implementation Monitor – Delivery Report.[254]

Box 1.5 The legislative framework for neighbourhood safer places

The legislative framework underpinning NSPs came into operation on 2 December 2009. Responsibility for designating NSPs is divided between the CFA and councils. The CFA develops criteria for assessing nominated NSPs, assesses proposed NSPs nominated by a council, and if a proposed site meets the criteria provides written certification of that fact.

Councils identify proposed NSPs within their municipality, but they may designate a site only if it has been certified by the CFA. Councils are not required to designate all sites certified by the CFA as NSPs and may decline to do so if 'satisfied on reasonable grounds that it is not appropriate to designate the place as a neighbourhood safer place'. The Act does not provide any guidance on what would constitute 'reasonable grounds'. The legislation's explanatory memoranda do, however, note that a valid consideration might be ease of access to the proposed NSP. If a proposed NSP is not located on council land, the consent of the occupier must be obtained before the NSP can be designated.[255]

For each NSP within each district a council is also required to provide appropriate identifying signage, maintain the NSP, and conduct an annual review to determine if the NSP is still suitable. The annual review must include a re-assessment by the CFA of the NSP criteria and, if a venue is no longer compliant with those criteria, it must be decommissioned by the council.[256]

Although the Commission's interim recommendations assigned responsibility for identifying and establishing NSPs to the State, the amended CFA Act clearly allocates that responsibility to councils. The State did not explain why it decided to allocate responsibility for designating and maintaining NSPs to councils when councils had indicated they preferred the State to control the process and provide the necessary funding.[257]

Legal liability also sits with councils. The Act does, however, offer them some protection against legal action arising out of the designation, non-designation or operation of NSPs. To be entitled to protection from liability, councils must establish a Neighbourhood Safer Places Plan. This documents the identification, suitability and designation of sites as NSPs and the inspection, maintenance and decommissioning of NSPs. If a council acts in accordance with its NSP Plan, it will not be liable for death or injury arising out of the use of a designated NSP or the failure to designate an NSP, unless the NSP Plan is so unreasonable that no reasonable council could have made the plan. Although the CFA Act does not make it mandatory for councils to prepare and publish an NSP Plan, a council without such a plan will be unable to make use of this policy defence.[258]

In October 2009 the CFA published the document entitled *Neighbourhood Safer Places, Places of Last Resort During a Bushfire: Interim Assessment Guideline (2009/10 Fire Season).*[259] The guideline defines the required distance between the outer edge of an NSP and fire hazards (especially vegetation):

- for open spaces, 310 metres or such distance as ensures that the maximum potential radiant heat impacting on the site is no more than 2 kilowatts per square metre
- for buildings, 140 metres or such distance as ensures that the maximum potential radiant heat impacting on the building is no more than 10 kw/m2.[260]

Mr Terrence Hayes, the CFA officer with overall responsibility for implementing the NSPs program, explained that, although the guideline nominates separation distances, what is most important is radiant heat. If a site complies with the radiant heat limit, a lesser separation distance might be allowed. He could not, however, nominate any sites where a lesser separation distance had been approved by the CFA.[261]

Council's designation of neighbourhood safer places

As discussed, councils have statutory responsibility for identifying potential NSPs and referring these to the CFA for assessment. In an effort to expedite the first round of NSPs, however, the CFA accepted nominations from a wider variety of sources, including community groups and local CFA brigades. The priority areas for identification and assessment of NSPs were the 52 high-risk bushfire townships identified by the State Government.[262]

In late 2009 about 20 CFA staff took a one-day training course to enable them to carry out NSP assessments. The assessment process was then managed at the regional level.[263]

Certification by the CFA that a site complies with NSP criteria does not guarantee that the site will be designated an NSP. On receiving notice of certification, a council will consider the CFA's assessment and then make a final decision on the basis of additional factors, among them safety of access routes; ability to gain access to and operate the NSP 24 hours a day, seven days a week; defendability of the venue; traffic management; ownership of the land; the presence of hazardous objects around the NSP; access for people with a disability; and liability insurance.[264]

The Commission heard evidence from Ms Samantha Dunn, councillor for the Shire of Yarra Ranges, and Mr Robert Spence, CEO of the Municipal Association of Victoria, that one of the more complex questions for councils was obtaining the occupier's consent to designate NSPs on non-council land, including private and public land.[265] Mr Spence said that obtaining consent from private landowners or occupiers was time consuming partly because landowners need to take legal advice and that use of Crown land generally requires ministerial consent. He advised that dealings with non-council landowners had involved questions of access (both for maintenance and during a bushfire), potential conflict with other uses of the land, and the security of the facility.[266]

Notwithstanding these difficulties, councils have designated a broad range of places that meet the CFA's assessment criteria—from a car park to a river bank, a football oval and a shopping strip.[267] The diversity of venues highlights that shelter options will vary depending on the particular community, its risk profile and the available places.

The Commission considers that shelters offer a valuable 'second-tier' safety option, and should not be subject to the same requirements as refuges. It notes the evidence from lay witnesses about the strong community desire for this type of shelter and frustration at not having some locations designated as NSPs. Councils have obviously been assigned a complex task without commensurate resourcing.[268] Nevertheless, the Commission is concerned that the additional level of scrutiny imposed by councils—beyond the CFA's radiant heat requirements might be too onerous for what is intended to be a 'safer' but not 'safe' shelter option.

The Municipal Association of Victoria advised the Commission that extensive efforts had been made to identify and designate NSPs in the 52 high-risk townships identified by the State in 2009. NSPs have been designated in at least 29 of those townships, but there are a number of townships that have no places that comply with the CFA's assessment guidelines.[269] The Commission notes the efforts of councils in this regard but is concerned that some areas of high risk—especially popular holiday destinations, including Apollo Bay—remain without a shelter. This emphasises the need for a range of options in high-risk areas and the importance of local planning in these areas to determine whether other options such as evacuation, refuges and shelters should be promoted. In the case of high-risk areas where evacuation is likely to be unsafe and shelters are not available, the Commission notes its recommendation in Chapter 6 that the State adopt a voluntary program of assisting resettlement. It is the Commission's strong view that people should be helped move away from areas of unacceptably high risk if safe options cannot be provided.

Future shelter options

Mr Esplin canvassed the possibility of NSPs and refuges being supplemented by a third option—'safer precincts'. These are used in South Australia to provide an additional place for people to go to during bushfires. The South Australian policy provides that a safer precinct might be 'any area that is further than 500 metres from continuous bushlands or forest or more than 200 metres from continuous grassland'.[270] In his evidence in December 2009 Mr Spence from the Municipal Association of Victoria also acknowledged that safer precincts might be worth considering in the Victorian context.[271] The Commission did not reach a conclusion about safer precincts but encourages the State to investigate their merits. The State has acknowledged that the stay or go policy did not, as at 7 February, cater for those who could not implement their bushfire plan and has recognised that additional shelter options are required for those who might be unable to shelter in their homes or who are caught in the open during a bushfire.[272] The efforts made to date in relation to NSPs have started to redress the need for additional options. With many of the 52 high-risk townships still lacking a designated NSP, however, there is a great deal of further work to be done.[273]

1.8.7 PLANNING FOR EVACUATION

The policy and legal framework for evacuation as at 7 February is set out in detail in Chapter 6 of the Commission's interim report.[274] In summary:

- The *Country Fire Authority Act 1958* and the *Emergency Management Act 1986* provide for a limited form of compulsory evacuation of areas threatened by fire, subject to a broad 'pecuniary interest' exception.
- Consistent with the State Emergency Response Plan, a decision to recommend that people evacuate rested with the control agency, in conjunction with police and other expert advice. The SERP noted that there were instances when evacuation might not be the best strategy and, specifically in relation to bushfires, advised there should be no attempt to evacuate in the face of a fire.
- Police had responsibility under the SERP for carrying out a recommended evacuation. Victoria Police emergency response coordinators also had responsibility for ensuring that the control agency considered whether evacuation was necessary.
- The CFA's policy was that the decision to leave an area or stay with a property was an individual decision that should be made well in advance of a fire and that late evacuation was dangerous.
- CFA personnel were advised not to provide specific directions as to whether an individual should stay or leave and to discourage late evacuation.

The CFA's policy was generally consistent with AFAC's 2005 position paper on bushfires and community safety: those who choose to leave early should do so well before the impact of a fire, because late evacuation is dangerous. While AFAC noted that in some cases 'selective early relocation of vulnerable people may be appropriate', it did not support large-scale evacuations as the preferred option. Another important element of the AFAC position was that in some circumstances it might be appropriate to consider evacuation, in which case the lead fire combat authority would be best placed to decide whether evacuations should be ordered. It noted, however, that 'adequately prepared and resourced people should not be forcibly removed from adequately prepared properties' and that 'forcible evacuation of residents who resist should not be pursued at the cost of missing out on notifying others, or where this would unreasonably endanger the lives of police officers or others'.[275]

The Commission's analysis suggests that some of the subtleties of the AFAC position on evacuation were not reflected in Victorian policy or practice. The CFA did not recommend evacuation once a fire was burning, and its policies on evacuation did not take account of evacuation of vulnerable locations. On 7 February no Incident Controller recommended evacuation of an area threatened by fire. There were some instances of assisted evacuation of vulnerable residents, which were initiated by the facilities responsible for those people and, in one instance, by Victoria State Emergency Service rather than by an Incident Controller (see Section 1.4.4).[276]

In its interim report the Commission recommended that the 'CFA and DSE amend operational policies to require the Incident Controller to assess whether relocation should occur and to recommend relocation when warranted'. In response to this recommendation the CFA and DSE adopted a joint standard operating procedure—JSOP4.01, Incident Information and Warnings. It requires the Incident Controller to provide advice to threatened communities on appropriate responses, including relocation. The Commission is concerned, however, that the State did not go far enough in implementing this recommendation since JSOP4.01 does not require an Incident Controller to actively assess whether evacuation should be recommended. The recommendation called for a fundamental change in the fire agencies' approach, moving active assessment of the need for relocation as an integral part of the response to a fire. This has not occurred.

Fire agencies' reluctance to use evacuation as an emergency response appears to be strongly grounded in the evidence available before 7 February that most civilian deaths in Australian bushfires have occurred during late evacuations.[277] The experiences of those who died and those who survived on 7 February challenge previous research results and suggest there might be greater opportunities for evacuation—particularly when an intense fire approaches—than previously considered.

The Commission reiterates its conclusion in the interim report: compulsory evacuation should not be the policy of Victoria's fire agencies and the pecuniary interest exception should remain.[278] The Commission is, however, of the

view that the State should reassess its approach to evacuation, so that it is planned for, considered as a viable option for saving lives even after a fire has started, and used where it is likely to offer a higher level of protection than other contingency options in the circumstances. As part of Victoria's revised bushfire policy, the State should introduce a more comprehensive approach to evacuation that focuses on the following:

- *Relocation.* This involves an undertaking by individuals and households independently deciding to leave (preferably early) a threatened or potentially threatened area.
- *Assisted evacuation for vulnerable people who require support.* This involves vulnerable people who are living in facilities or in the community being given tailored warnings and being helped to move away from the danger zone well before a fire arrives.
- *Emergency evacuation.* This is planned agency-initiated evacuation in the face of an actual threat. It is implemented by police on the recommendation of an Incident Controller.

All these actions need to be planned and, ideally, carried out before the arrival of a bushfire. In the worst case, noting the increased dangers, evacuation can occur later, when there is a perilous tension between sheltering in a dangerous place and moving in a dangerous environment. Local planning will be essential for the development of options for communities implementing evacuations. As discussed in Section 1.9.2, whether or not emergency evacuation is a viable or likely option should be determined well in advance of a fire. Successful evacuations will depend on people having information about the evacuation process, so that they know what to expect, are familiar with evacuation routes and are able to respond quickly when necessary.

Assisted evacuation for vulnerable people who require support

The Commission recognises that there are people who might be vulnerable to varying degrees in bushfires. The concept of vulnerability can encompass different people, depending on the circumstances. Similarly, the extent to which a person's vulnerability affects their ability to make decisions and do certain things in a bushfire situation will differ. It is important to identify the groups of individuals referred to when classifying them as vulnerable. The Department of Human Services has determined that special consideration needs to be given to the following 'client groups' to facilitate safe movement during bushfires:

> children, young people, people with a disability, frail aged people, non-ambulant people, people who require support in daily living, women and families escaping domestic violence, and people with a mental illness who are vulnerable and may have status under the *Mental Health Act.*[279]

This is not an exhaustive list but, since the Commission heard only limited evidence in relation to particular groups, it adopted the groups identified by the department for this report. The Commission appreciates, of course, that some individuals who come within one of these categories will not see themselves as such, while others who are not identified in the listing might also be vulnerable.

Vulnerable people living in bushfire-prone areas, and the people who care for them, face particular challenges because they might need more time, and sometimes extra support, to relocate. The Commission therefore emphasises the need for contingency planning, noting that the act of moving some vulnerable people, such as frail aged people or people in ill-health, has major implications for their health and wellbeing. Mr Esplin recognised in his evidence that it is the Government's responsibility to plan and execute evacuation plans for locations where vulnerable people are likely to be, such as schools and aged care facilities.[280]

As noted in Section 1.4.4, a range of mechanisms exist for ensuring that facilities where vulnerable people are located appropriately plan for and effect evacuations during bushfires. What is missing is a means of ensuring that these locations are considered in any decision to recommend evacuation and are given tailored advice about a threatening fire and a specific recommendation to evacuate. Such locations should be identified in advance of a fire, mapped on the Victorian Fire Risk Register and documented in a way that is accessible and useful to decision makers and agencies. These include the Incident Controller (as the person who recommends an evacuation), the police (as the agency with legislative responsibility for carrying out evacuations) and other organisations, such as Victoria State Emergency Service, that might have a role in assisted evacuation. The State should consult with these agencies to determine the most effective way of documenting and disseminating this information. The Commission considers that including this information in all relevant local plans would be appropriate.

Attention must also be paid to the needs of people who are living independently in the community but might be vulnerable in the event of a bushfire. The Commission did not specifically consider the level and types of assistance such people might require or who could or should provide that assistance. These variables are likely to differ depending on personal circumstances, but at a minimum this group of people would need tailored advice of a recommendation to evacuate. They might well need physical assistance to evacuate and a place to go to. If this is the case, local agencies would need to do much more substantial forward planning.[281]

The means by which vulnerable people are identified would need to be established in advance. This is a matter for local councils and health and welfare support organisations. The Commission urges the State and councils to implement systems for identifying and helping people who might be particularly vulnerable during bushfires. It notes that some work is already under way for clients of Home and Community Care services, who are 'frail older people and younger people with moderate, severe or profound disabilities residing in the community'. For example, HACC assessment services (local councils and district nursing services) and aged care assessment services are developing agreed indicators of vulnerability and helping vulnerable clients develop emergency management plans. In cases where a client uses multiple services, the Department of Human Services is working with the Municipal Association of Victoria to identify a worker to assist them. For clients of other services, such as in-home mental health services, the department has also determined that it might, in conjunction with councils, need to provide coordination for and relocation of some clients.[282]

The Commission notes a modest but highly effective initiative taken by Marysville VICSES. It compiled a list of residents who might need assistance to evacuate in an emergency and provided that assistance in the late afternoon of 7 February.[283] Local governments in bushfire-prone areas should also, as part of the municipal emergency management planning process, develop and maintain a list of vulnerable residents living independently who might need additional support during a bushfire. The register could also be used to identify in advance what, if any, assistance beyond early warning is required and the appropriate agency or agencies to provide such assistance. Residents would need to 'opt in' to the service, and privacy considerations would need to be considered and resolved well in advance of an emergency.

1.9 DURING A BUSHFIRE

Several crucial actions are needed leading up to and during a bushfire. Some of these are policy positions that were clarified ahead of the 2009–10 fire season and others are specific actions:

- issuing specific and timely warnings
- encouraging the use of shelters and refuges
- Incident Controllers considering and recommending evacuation and individuals responding
- supporting people to stay and defend—except on the most dangerous days, when evacuation is recommended as the only option
- suspending the existing Prepare. Act. Survive. framework on days when ferocious fires are expected and replacing it with a Black Saturday Upgrade that firmly recommends evacuation from all bushfire-prone areas likely to be threatened by fire.

1.9.1 WARNINGS ON SPECIFIC BUSHFIRE THREATS

In its interim report the Commission said there were serious problems with the timing, content and delivery of warnings on 7 February. As outlined in Section 1.5.2, the State has done much to redress these shortcomings. The evidence before the Commission suggests there is a strong case for continuing, increasing, attention to the preparation, delivery and receipt of warnings.

In order that they can make informed decisions about the best options for protecting themselves from bushfires, communities and individuals need specific fire information and advice during, as well as before and after, the fire. The State must provide timely warnings to the community and should distribute them through every available means,

embracing new initiatives and technology and using local arrangements such as sirens where they are favoured. This will improve the suite of tools available to meet the widest possible audience.

Warnings must be concise during the passage of a bushfire. They cannot contain all the detailed information on the many variables that will inform people's planning and decision making: this is the domain of education and information before the event. But they must resonate with people so that they take the best course of action in their particular circumstances. This balance is not easy to achieve. Follow-up information should include the reasons fires did not eventuate after warnings were provided in certain instances. This completes the cycle of effective public information and reduces the risk that people become complacent and ignore future warnings or lose confidence in the authority of warnings.

Effective warnings rely on the availability of good information and sound technology for dissemination. If they are to be effective, the recipient needs to understand what the information contained in the warning means for their personal circumstances and to act accordingly. Provision of reliable, timely information from the fireground is vital, but the dynamic nature of fires often makes it difficult, particularly in the early stages, to obtain a good understanding of a fire's behaviour and its potential to threaten communities. In addition, by its nature fire poses challenges for the issuing of warnings because it destroys much within its path, and even the most basic warnings generally rely on electricity, telecommunications or radio signals.

The Commission recognises that, despite their best endeavours, fire authorities might be unable to issue timely warnings in every case—for example, if a fire breaks out and threatens people or homes very quickly. It considers, however, that in most situations it should be possible. Whether people receive a warning ultimately depends on whether they listen to the radio, contact relevant websites, telephone the Victorian Bushfire Information Line, or answer their phone. Even when people receive warnings, there is also no guarantee that they will act in the manner intended. The Commission was told of individuals who, despite explicit warnings on 7 February of the dangers they faced and in some cases their unlikely ability to defend, refused to leave their homes. Some of these people died. Nevertheless, greatly improving warnings is one of the fundamental ways the State can increase people's chances of surviving a bushfire.

The Commission welcomes the implementation of the One Source One Message system and web-based template messages for bushfire warnings. It includes important information such as the size, nature and specific location of the fire, the expected time of impact, the extent of spotting, and the expected wind change. The availability of this information will considerably improve the speed with which warnings are created and disseminated. Warnings could be further improved by including more information about important variables, helping people determine the best action to take. This further information could include details of road closures, expected wind changes and locations likely to be affected. The State should continue to evaluate the One Source One Message templates regularly to ensure that the content, delivery methods and technology remain up to date.

Warnings also need to support the types of action envisaged in the State's bushfire safety policy. The Commission recommends a number of changes to this policy, and warnings need to be adapted to facilitate the new approach. For example:

- On days when catastrophic conditions are expected, warnings should reinforce the notion that most homes in bushfire-prone areas might not be defendable and strongly urge people to evacuate the area early.
- Warnings should also include triggers for vulnerable people or those responsible for their safety to activate their evacuation plans.
- For people who are evacuating, warnings must be specific about the time frames for this option to be enacted, the recommended routes, the types and locations of community shelters to go to, and any known hazards involved in reaching them.
- In communities where emergency evacuation is included in the local plan and when the fire situation allows evacuation as a safe option, bushfire warnings should provide advice about evacuation.

1.9.2 EMERGENCY EVACUATION

Fire agencies need to play an active role in managing people during fires. This reinvigorated role would mainly involve assessing when evacuation should be recommended, providing timely and specific warnings to communities and enlisting the assistance of Victoria Police to carry out the evacuation.

Once a fire is burning the Incident Controller and the incident management team (if one has been established) will typically have access to more information than residents and will be better placed to determine the best option for a community threatened by fire.[284] The Incident Controller must assess whether evacuation should be recommended to communities potentially threatened by fire and provide that advice through every available means as early as possible.

Incident Controllers in Victoria have not previously been required to make these assessments. Chapter 2 discusses this expanded responsibility and the advantages of co-locating a municipal emergency coordination centre with the incident control centre so that municipal and incident managers can readily share information and determine how best to protect the community. This would include understanding local plans that outline whether evacuation is likely to be an option for the community and, if so, possible evacuation routes. Section 1.8.4 outlines the content of and responsibility for these plans.

Associate Professor Cova identified a list of dynamic factors that influence decision making associated with protective action. His research suggests that the most important factors for an Incident Controller are those that influence fire behaviour and fire intensity.[285] In Victoria, Incident Controllers and their incident management teams have ready access to detailed weather forecasts. They now also have access to detailed fire prediction maps showing fire spread, flame height and ember spread that can be quickly generated by FireMap once information about the fire comes in from the fireground. These prediction maps can be verified by information from ground and air observers dispatched to the fire. As a result, in most situations incident management teams should have access to the information needed to issue timely warnings to communities.[286]

Incident Controllers will need guidelines to assess whether evacuation is the safest option for a community. The decision would be informed by:

- forecast and actual weather conditions
- the point of ignition
- predictions of fire spread and intensity
- observations of fire spread and intensity
- topography, vegetation and fire history
- location of communities under threat
- evacuation plans of communities under threat including safety of designated routes
- shelter options
- whether a decision has been made to apply a Black Saturday Upgrade.

The guidelines should also cover arrangements such as communicating to the public a decision to evacuate and enlisting the assistance of police to carry out the evacuation. As discussed, Victoria Police is responsible under the State Emergency Response Plan for facilitating a recommended evacuation. The Commission notes that training and resourcing requirements might need to be considered in view of the likelihood of more frequent evacuations during bushfires.[287] As part of its deliberations, the Commission considered some of the experiences of the United States in managing mass evacuations.

Box 1.6 Lessons learned in the 2007 Ramona evacuation

On 21 October 2007 at 12.35 pm the Witch Creek fire started about 10 miles east of Ramona—a town of 40,000 people in San Diego Country, California. At 9.14 pm a mandatory evacuation for the entire town was issued on the emergency broadcast system (radio and TV) because winds greater than 70 miles (110 kilometres) an hour were pushing the fire towards the town.

About half the town population lives in the Estates, which had two roads in and out, and one of these was towards the fires. Wildcat Canyon Road was open most of the night but was severely backed up, although many people avoided using it because of deaths that had occurred during a fire four years before. Residents were stuck in traffic for three to five hours. Many people turned around and went home, deciding it was safer at home than sitting in a 'steel coffin'.

There had been mock fire drills in the past, but they did not take account of such fast-moving fires. The visible smoke and flames added to the difficulty of evacuation. The County Supervisor observed that evacuation of the entire town of Ramona was dangerous and slow.

Three main lessons were learnt from the evacuation:

- Warnings spaced out over time and staggered evacuations, as used in the past, might help reduce road congestion.
- Police need to be in position before warnings are issued.
- The roads were too narrow and needed to be widened considerably.

Source: Exhibit 106 – Statement of McCaffrey, Attachment G.[288]

1.9.3 STAY AND DEFEND

Many people were unable to defend their houses against the fires on Black Saturday, but others were successful. Even people whose houses were destroyed told the Commission they would stay and defend in future, although many said they would improve their fire plans considerably in the light of what they learned on the day.[289]

The Commission considers that staying to defend a properly prepared and defendable home is a viable option in some circumstances but that Victoria's bushfire policy needs to be revised to make it very clear that people should do this only if they fully understand and accept the risks. Staying to defend should be considered only if the following criteria are met:

- Professional advice (including from the CFA) suggests that the house is defendable, noting both the available defendable space and the location of the house relative to any surrounding forest.
- The house is well constructed, preferably in accordance with the relevant Australian standard. Whether or not the house has been built or retrofitted to comply with the most recent Australian standards, there are a range of voluntary measures that should be taken to increase its chance of protecting people as the firefront passes (see Chapter 6).
- The house is well prepared. This must include robust independent water and power supplies and non-plastic, fire-resistant water systems such as sprinklers, hoses and fittings, as well as firefighting equipment and adequate defendable space.
- There are at least two able-bodied adults to defend the house and they have suitable protective clothing and are aware of the likely and possible conditions they will face and are confident in their physical and emotional ability to cope.
- There are no children or vulnerable people whose presence will interfere with the attention of their carers if those carers are needed to defend the property and secure their survival.

The Commission considers that advice should be strengthened to stress the following:

- Some houses will not be defendable, even in a relatively small bushfire.
- Under extreme fire conditions it might be impossible to defend a normally defendable house—in which case anyone present should evacuate.
- Things do not always go according to plan—even in fires that are not severe—and contingency options such as personal shelters are essential in case active defence fails.

The State needs to give people the right information to understand the risks and make informed decisions. Sections 1.4.1–8 outline particular areas, such as the defendability of houses, where further information is required.

1.9.4 THE BLACK SATURDAY UPGRADE

One of the Commission's themes is that standard approaches to mitigating bushfire are not applicable on days such as 7 February, and this needs to be acknowledged by fire authorities and clearly communicated to the public. Although much of the proposed bushfire safety policy will be effective for most of the fires that occur in Victoria, the most ferocious fires require a different, more dramatic approach. Essentially, this approach involves encouraging people to remove themselves from the face of danger because the fire cannot readily be controlled. The Commission calls this the Black Saturday Upgrade.

Measures for countering bushfires on lesser days will be largely irrelevant on days like Black Saturday. Fortunately, these days are generally predictable—usually coming at the end of a severe drought and bringing scorching temperatures and gale-like winds. But, infrequent though they might be at present, the Commission notes in the introduction to this volume that they could start to occur more often as climate change further influences our environment. Victorian communities need to be aware of this new survival policy every summer. Our fire authorities must be responsible for reminding us all when we next face the most severe fire weather and must ensure that every effort is made to encourage people to place protection of their lives ahead of protection of their property.

1.10 AFTER A BUSHFIRE

1.10.1 GATHERING INFORMATION AND RESEARCH

The gathering of information since Black Saturday has been comprehensive. Extensive local and national resources were deployed to identify, gather and collate a wide range of information in order to learn about the circumstances of individual deaths and the experiences of people who survived. More research is pending.

Rapid collection of materials after a bushfire is crucial. The Commission commends all involved in the gathering of material and in subsequent research. The approach adopted after Black Saturday is fundamental to identifying what happened and understanding how to further develop policy and practices to reduce the likelihood of a similar event in the future.

The Commission notes that continuing research should be a central element of the emergency management framework—in particular, reviewing the lessons learnt from events such as Black Saturday. It supports the reference to the value of research in the 2004 report of the Council of Australian Governments National Inquiry on Bushfire Mitigation and Management.[290] The Commission benefited from extensive research conducted by the Bushfire Cooperative Research Centre, the Australasian Fire and Emergency Service Authorities Council, and numerous other research bodies. In a dynamic policy area such as emergency management, it is essential that research is automatically taken account of in policy development. The role of research and research priorities are discussed in Chapter 11.

1.10.2 MONITORING AND REVIEW

Education and public awareness programs should be continuously reviewed and updated so that new research findings are incorporated in policy and practice and the information and messages remain relevant to the audience. Evaluations should also regularly measure the manner in which the community embraces and responds to messages and communications. The findings of such reviews can then be used to improve policy.

The 2004 Council of Australian Governments report on natural disasters in Australia noted that traditionally this has not been done well in the area of natural hazards such as bushfires. This is because public awareness programs have lacked resources and professional design and delivery, been targeted at limited audiences and have not been evaluated to assess their effectiveness.[291] The Commission recognises these deficiencies. A well-resourced, professionally designed and delivered community education and engagement program that is evaluated regularly is the platform on which community bushfire safety is built (see Chapter 11).

Apart from technical research and analysis, obtaining feedback from communities is an essential element of effective policy. It allows researchers to determine whether community expectations are being met and to find out why things have and have not occurred. For example, explaining to communities why a warning did not result in a fire event helps to build connection with communities, expands their knowledge of weather and fire, and helps dispel negative attitudes towards agencies.

1.11 THE BIGGER PICTURE

Victoria's bushfire safety policy is a fundamental element of making Victoria safer from bushfire. It relies on the shared responsibility approach discussed in Chapter 9. This approach is at the basis of all other mitigation efforts—for example, land-use planning in bushfire-prone areas; building standards to improve the ability of houses to withstand the passage of a firefront; prescribed burning to reduce fuel loads and better manage forests; and education in schools so that Australian children, regardless of where they live, have some awareness of the dangers of bushfire and the history of their impact on communities. All these elements, discussed throughout this report, need to be reviewed and revised to ensure that the State's bushfire strategy remains relevant, is updated as necessary, and is achievable.

1.11.1 SCHOOL EDUCATION

Inquiries into bushfires in Australia have repeatedly found that teaching school children about fire is fundamental to improving community bushfire safety.[292] Each new generation must be properly prepared for living in an environment that is hazardous. The Commission is of the view that educating children about the history of fire in Australia and about safety in the event of a bushfire will probably influence not only the children but also their parents, siblings and extended family and community. Despite this, fire education remains an optional inclusion in most Australian school curricula.[293]

The 2004 report of the Council of Australian Governments National Inquiry on Bushfire Mitigation and Management noted that since the Stretton Royal Commission of 1939 school and adult education has been seen as the best means of fire prevention and protection. That inquiry recommended that national and regional bushfire education be delivered to all Australian children as a basic life skill, with an emphasis on preparedness and survival as well as the role of fire in the Australian landscape.[294] This Commission notes with regret that this recommendation has never been implemented.

The sheer volume of material to deal with and the time constraints the Commission faced meant that little evidence was presented on fire education in schools. Despite this, the Commission notes that during consultations with fire-affected communities, fire education in the school curriculum was raised. The Australian Curriculum, Assessment and Reporting Authority noted that, beyond reference to the causes of major natural events in the science curriculum fire is likely to receive minimal attention in the K–10 Australian curriculum that is at present under development.[295] This is troubling. To fail to educate our children about the history of bushfire, its impact on the environment and how to survive bushfire is to fail to appreciate that each generation must then learn these lessons anew—often the hard way.

The risk of bushfires is likely to increase. More Australian families are living on the fringes of our cities and towns, and many more travel to bushfire-prone coasts during summer. A concerted education program—the need for which has been noted since as early as 1939—remains the most effective approach to instilling the necessary knowledge in Australian families. The Commission strongly supports teaching Australian school students about the history of bushfire in Australia and about bushfire safety within existing curriculum areas such as history, geography, science, environmental studies, civics and citizenship. Engendering in school children an understanding of bushfire and the attendant risks should be seen to be as important as ensuring that all Australian children learn to swim.

1.11.2 REMEMBERING

Remembering an event such as Black Saturday is important, not only for paying tribute to the people who died and those who came to the assistance of others, but also for ensuring that the survival lessons learned as a result of the event are not lost. As history has shown, the risk of complacency—of forgetting the lessons of 7 February and the risks that bushfires present for us all—is real. The Commission heard ample evidence of communities that did not think they would be affected by fire and of communities lulled into a false sense of security by recent experiences with less dangerous fires.[296]

Educating the community about the risks of fire and the ways people can protect themselves is a long-term project. But it is especially important because communities are subject to rapid and constant change: people move in and out of areas, taking with them their knowledge and experience. New residents might have no experience of bushfire and thus have little understanding of how to prepare and survive. If communities do not understand the risks they face, they are less likely to be open to community education messages. Memorials, museums and monuments can play an important part in creating a community that remembers and recognises the risks bushfires have posed and will continue to pose for all Victorians and thereby make community members more receptive to education and more willing to take action to properly prepare themselves.

Severe bushfires occur relatively infrequently, so most people have limited personal experience of them and their opportunities to gain first-hand experience of the hazard are limited. They are also less able to assess how effective their fire plan is at mitigating the risks of the most ferocious fires.[297] This makes it even more important that a memory of the 2009 fires and the lessons therefrom is sustained.

While the fires remain fresh in all our minds it is easy to think they will always remain at the forefront of our thinking. Evidence the Commission heard, however, described how people's motivation to prepare for a bushfire decreases dramatically if they perceive the risk is not likely to arise within 12 months.[298] Similarly, once the shock and grief caused by an event such as Black Saturday subside in the months and years that follow, there is a serious risk that the motivation to prepare and plan also subsides.

The Commission heard that the degree to which people regularly discuss bushfire-related subjects with each other is an important predictor of whether people will prepare for bushfires. People must therefore have access to social contexts within which discussion of bushfire-related matters can and does occur. It is important that the content of such 'memorialisation' is carefully developed, so that the general sense is not one of catastrophe in the face of which no human efforts will be effective. Expert witnesses advised the Commission that, if people believe a potential hazard would be too calamitous and complex for their personal actions to be effective if it were to come to pass, they are highly likely to disregard any information about that hazard and to avoid taking precautions.[299]

Essentially, there are three kinds of changes that can be taken in order to make Victoria safe: changes that would reap immediate benefits, policy and infrastructure changes that will take longer to achieve, and the long-term education and cultural changes that are required to ensure that Victorians can adapt to living with fire. The Commission urges the State to be mindful of these various perspectives when implementing Victoria's revised bushfire safety policy.

Image 1.2

Source: Courtesy of the *Herald & Weekly Times*.

RECOMMENDATION 1

The State revise its bushfire safety policy. While adopting the national Prepare. Act. Survive. framework in Victoria, the policy should do the following:

- enhance the role of warnings—including providing for timely and informative advice about the predicted passage of a fire and the actions to be taken by people in areas potentially in its path
- emphasise that all fires are different in ways that require an awareness of fire conditions, local circumstances and personal capacity
- recognise that the heightened risk on the worst days demands a different response
- retain those elements of the existing bushfire policy that have proved effective
- strengthen the range of options available in the face of fire, including community refuges, bushfire shelters and evacuation
- ensure that local solutions are tailored and known to communities through local bushfire planning
- improve advice on the nature of fire and house defendability, taking account of broader landscape risks.

RECOMMENDATION 2

The State revise the approach to community bushfire safety education in order to:

- ensure that its publications and educational materials reflect the revised bushfire safety policy
- equip all fire agency personnel with the information needed to effectively communicate the policy to the public as required
- ensure that in content and delivery the program is flexible enough to engage individuals, households and communities and to accommodate their needs and circumstances
- regularly evaluate the effectiveness of community education programs and amend them as necessary.

RECOMMENDATION 3

The State establish mechanisms for helping municipal councils to undertake local planning that tailors bushfire safety options to the needs of individual communities. In doing this planning, councils should:

- urgently develop for communities at risk of bushfire local plans that contain contingency options such as evacuation and shelter
- document in municipal emergency management plans and other relevant plans facilities where vulnerable people are likely to be situated—for example, aged care facilities, hospitals, schools and child care centres
- compile and maintain a list of vulnerable residents who need tailored advice of a recommendation to evacuate and provide this list to local police and anyone else with pre-arranged responsibility for helping vulnerable residents evacuate.

RECOMMENDATION 4

The State introduce a comprehensive approach to shelter options that includes the following:

- developing standards for community refuges as a matter of priority and replacing the 2005 Fire Refuges in Victoria: Policy and Practice
- designating community refuges—particularly in areas of very high risk—where other bushfire safety options are limited
- working with municipal councils to ensure that appropriate criteria are used for bushfire shelters, so that people are not discouraged from using a bushfire shelter if there is no better option available
- acknowledging personal shelters around their homes as a fallback option for individuals.

RECOMMENDATION 5

The State introduce a comprehensive approach to evacuation, so that this option is planned, considered and implemented when it is likely to offer a higher level of protection than other contingency options. The approach should:

- encourage individuals—especially vulnerable people—to relocate early
- include consideration of plans for assisted evacuation of vulnerable people
- recommend ‘emergency evacuation’.

RECOMMENDATION 6

Victoria lead an initiative of the Ministerial Council for Education, Early Childhood Development and Youth Affairs to ensure that the national curriculum incorporates the history of bushfire in Australia and that existing curriculum areas such as geography, science and environmental studies include elements of bushfire education.

RECOMMENDATION 7

The Commonwealth lead an initiative through the Ministerial Council for Police and Emergency Management, facilitated by Emergency Management Australia, to develop a national bushfire awareness campaign.

1 Exhibit 9 – Living in the Bush (TEN.001.001.0004) at 0012, 0032; Exhibit 9 – 2005 AFAC Community Safety Paper (TEN.001.001.0077) at 0080–0082

2 Exhibit 9 – National Approach to Prepare Stay and Defend or Go Early (TEN.001.001.0100) at 0101

3 Exhibit 9 – 2005 AFAC Community Safety Paper (TEN.001.001.0077)

4 Exhibit 11 – Statement of Esplin (WIT.005.001.0001) [81], [84]; Exhibit 6 – Supplementary Statement of Waller, Annexure 4 (WIT.002.001.0137)

5 Exhibit 9 – 2005 AFAC Community Safety Paper (TEN.001.001.0077) at 0080–0081

6 For example: Exhibit 9 – Make a Bushfire Plan (TEN.001.001.0055)

7 Exhibit 9 – Living in the Bush (TEN.001.001.0004) at 0032

8 Exhibit 9 – 2005 AFAC Community Safety Paper (TEN.001.001.0077) at 0082–0083

9 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0011–0015, 0019

10 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0011–0015, 0028

11 In Mount Macedon, where the fires had destroyed 234 of 455 houses and killed 6 people, 89 per cent of attended houses survived whereas only 44 per cent of unattended houses survived (of which one third were assisted by neighbours, brigades or returning occupants): Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0147) at 0147, 0149. The Otway Ranges study also concluded that the presence of occupants and their firefighting activities (extinguishing small ignitions before fires became uncontrollable) significantly reduced the relative risk of house destruction: Exhibit 9 – Building in a Fire-Prone Environment: Research on Building Survival in Two Major Bushfires (TEN.001.001.0102) at 0106, 0108; Exhibit 126 – Bushfire CRC Interim Report (CRC.300.001.0001_R) at 0137_R

12 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0147) at 0149–0151

13 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0147) at 0152

14 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0154) at 0160, 0166

15 Exhibit 126 – Bushfire CRC Interim Report (CRC.300.001.0001_R) at 0136_R

16 Exhibit 16 – Statement of Haynes (WIT.001.001.0001_R) [20], [25]

17 Exhibit 16 – Statement of Haynes (WIT.001.001.0001_R) [25]

18 Exhibit 16 – Statement of Haynes (WIT.001.001.0001_R) [25]

19 Exhibit 101 – Statement of Rhodes (WIT.3004.002.0001) [81], [143]–[145], [227]

20 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.002.0796) at 0853–0859

21 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0275) at 0277

22 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0275) at 0278–0280

23 Exhibit 679 – Statement of Gilmore, Attachment 89 (WIT.3018.001.1559) at 1563

24 Exhibit 11 – Statement of Esplin, Attachment 28 (WIT.005.001.1949) at 1956

25 Exhibit 11 – Statement of Esplin, Attachment 28 (WIT.005.001.1949) at 1953–1954

26 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [4.12]

27 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [7.72]

28 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0098) at 0123–0124

29 Exhibit 101 – Statement of Rhodes (WIT.3004.002.0001) [67], [75], [185]–[211], Annexure C (WIT.3004.003.0243) at 0266–0267; Exhibit 9 – Prepare, Stay and Defend or Leave Early – Evidence for the Australian Approach (TEN.001.001.0151) at 0160–0161

30 Exhibit 126 – Bushfire CRC Interim Report (CRC.300.001.0001_R) at 0413_R; Exhibit 214 – Statement of Hollowood (WIT.3010.001.0338) [63], [65]; Exhibit 980 – Correspondence – Houses Destroyed – Breakdown by Fire (CORR.1003.0048_R); Handmer T18619:1–T18619:8

31 Handmer T18603:13–T18603:19, T18619:05, T18630:8–T18630:11

32 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001)

33 Exhibit 935 – Use of Informal Places of Shelter and Last Resort on 7 February 2009 (CFA.600.005.0317)

34 Exhibit 935 – Where Are They Going? – People Movement During Bushfires (RESP.3001.014.0117)

35 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001)

36 Exhibit 902 – Review of Key Bushfire Research Findings (WIT.3007.001.0041)

37 Exhibit 902 – Review of Key Bushfire Research Findings (WIT.3007.001.0041) at 0044–0047

38 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0034

39 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0034

40 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0008

41 Exhibit 902 – Review of Key Bushfire Research Findings (WIT.3007.001.0041) at 0044–0045, 0080–0083

42 Exhibit 902 – Review of Key Bushfire Research Findings (WIT.3007.001.0041) at 0045

43 Exhibit 11 – Statement of Esplin, Attachment 22 (WIT.005.001.1816) at 1824

44 Exhibit 9 – Living in the Bush (TEN.001.001.0004) at 0032

45 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0034–0035

46 Exhibit 362 – Statement of Glenn (WIT.066.001.0001_R) [7]

47 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0034

48 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0035

49 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0035

50 Exhibit 10 – Statement of Odgers (WIT.008.001.0001_R) [8]; Exhibit 586 – Statement of Buntine (WIT.127.001.0001_R) [12]

51 Exhibit 10 – Statement of Odgers (WIT.008.001.0001_R) [6], [11]–[12]

52 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0034–0035, 0043

53 Exhibit 902 – Review of Key Bushfire Research Findings (WIT.3007.001.0041) at 0092–0093

54 Exhibit 87 – Statement of Ananiev (WIT.040.001.0001_R) [14]–[25]; Exhibit 212 – Statement of Edmonds (WIT.063.001.0001_R) [23], [25], [27]; Exhibit 91 – Statement of Scott (WIT.045.001.0001_R) [15]–[28]; Exhibit 323 – Statement of Kenealy (WIT.101.001.0001_R) [21]–[45]; Exhibit 459 – Statement of Siddle (WIT.115.001.0001_R) [1], [17]–[19]; Ananiev T2776:21–T2780:8; Edmonds T6572:9–T6574:29; Scott T2919:4–T2926:7; Kenealy T8123:4–T8132:6; Siddle T10290:18–T10295:11

55 Exhibit 750 – Statement of Petreis (WIT.142.001.0001_R) [15]

56 Exhibit 772 – Interactive Presentation – INTMEN 001826 (EXH.772.0001); Exhibit 771 – Statement of Richings (WIT.143.001.0001_R) [1]; Exhibit 134 – Statement of Hainsworth (WIT.059.001.0001_R) [20]–[21], [24]; Exhibit 680 – Statement of Cook (WIT.131.001.0001_R) [17]–[19]; Exhibit 103 – Statement of Barber (WIT.046.001.0001_R) [22]–[24]; Exhibit 823 – Statement of Brida (WIT.3026.001.0181) [28]; Exhibit 768 – Interactive Presentation – INTMEN 001824 (EXH.768.0001); Hainsworth T4536:11–T4536:31, T4538:3–T4538:13; Cook T13913:8–T13915:24; Barber T3340:11–T3344:28; Brida T16931:30–T16932:31, T16934:3–T16935:30

57 Exhibit 351 – Statement of Hamill (WIT.3010.006.0194) [11]–[20]; Exhibit 39 – Statement of Hull (WIT.030.001.0001_R) [14]–[15]; Collyer T8843:18–T8844:14; Hamill T8598:6–T8598:23, T8599:14–T8599:23, T8600:24–T8601:11; Dwight T2068:18–T2069:9

58 Exhibit 16 – Statement of Haynes (WIT.001.001.0001_R) [25(ii)]

59 Exhibit 804 – Interactive Presentation – INTMEN 001852 (EXH.804.0001)

60 Exhibit 298 – Interactive Presentation – INTMEN 001841 (EXH.298.0001)

61 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0024; Hanscombe T20479:4–T20479:7

62 Exhibit 10 – Statement of Odgers (WIT.008.001.0001_R) [13]; Exhibit 586 – Statement of Buntine (WIT.127.001.0001_R) [19]; Exhibit 686 – Statement of Collins (WIT.129.001.0001_R) [13]

63 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0007

64 For further detail, see Chapter 21 in Volume I

65 Hollowood T20213:26–T20213:31

66 Exhibit 935 – Where Are They Going? – People Movement During Bushfires (RESP.3001.014.0117) at 0124, 0127; Exhibit 95 – Statement of Fraser (WIT.048.001.0001_R) [7]–[18]; Edmonds T6565:10–T6565:15; Fraser T3051:18–T3051:21, T3052:1–T3052:4; Collins T14063:24–T14063:27, T14064:14–T14064:15; Gobbett T1493:11–T1493:26; Barber T3338:30–T3339:2; O'Halloran T3681:23–T3682:10

67 Rogers T605:8–T605:12

68 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0034

69 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0009, 0039; Exhibit 97 – Statement of O'Neill (WIT.047.001.0001_R) [36]; Exhibit 61 – Statement of Olorenshaw (WIT.034.001.0001_R) [117]; Exhibit 182 – Statement of Moore (WIT.076.001.0001_R) [19]–[20], [23]; Exhibit 785 – Statement of Enden (WIT.147.001.0001_R) [18]; Exhibit 898 – Statement of Nowak (WIT.159.001.0001_R) [10]; Brown T3547:29–T3548:4, T3501:1–T3501:19; Ferguson T955:9–T955:21; Olorenshaw T1901:16–T1901:27

70 Exhibit 492 – Interactive Presentation – INTMEN 001843 (EXH.492.0001); Exhibit 567 – Interactive Presentation – INTMEN 001887 (EXH.567.0001); Exhibit 489 – Interactive Presentation – INTMEN 001797 (EXH.489.0001); Exhibit 808 – Interactive Presentation – INTMEN 001792 (EXH.808.0001); Exhibit 877 – Interactive Presentation – INTMEN 001837 (EXH.877.0001); Exhibit 770 – Interactive Presentation – INTMEN 001877 (EXH.770.0001); Exhibit 380 – Statement of Lynch (WIT.094.001.0001_R) at 0003_R; Exhibit 519 – Statement of Zealley (WIT.117.001.0001_R) at 0002_R–0003_R; Hollowood T10690:2–T10690:22, T10693:9–T10693:17, T12331:21–T12332:8, T12429:29–T12430:3, T16098:30–T16099:4, T16669:20–T16669:23; Richards T20309:26–T20310:2

71 Exhibit 901 – Protective Actions in Wildfires: Evacuate or Shelter-in-Place? (TEN.268.001.0022) at 0028

72 Exhibit 680 – Statement of Cook (WIT.131.001.0001_R) at 0004_R–0005_R

73 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0006

74 For further detail, see Chapter 6 in this volume. Exhibit 108 – Statement of Brown (WIT.053.001.0001_R) [4]–[44]; Exhibit 195 – Statement of Berry (WIT.071.001.0001_R) [2], [6]–[18], [49]–[77]; Exhibit 390 – Statement of Wiggington (WIT.100.001.0001_R) [8]–[20]; Exhibit 775 – Interactive Presentation – INTMEN 001891 (EXH.775.0001); Exhibit 769 – Interactive Presentation – INTMEN 001876 (EXH.769.0001)

75 Exhibit 678 – Pine Ridge Road – Post Fire Aerial Photography (TEN.196.001.0008); Exhibit 680 – Statement of Cook (WIT.131.001.0001_R) [27], [32]–[34]; Hainsworth T4545:6–T4545:13; Cook T13902:25–T13902:27, T13920:5–T13921:13. For further detail, see Chapter 6 in this volume and Chapter 21 in Volume I

76 Exhibit 108 – Statement of Brown (WIT.053.001.0001_R) [25]–[26]; Exhibit 61 – Statement of Olorenshaw (WIT.034.001.0001_R) [57]–[68]; Exhibit 348 – Statement of Rice (WIT.3004.016.0091) [89]; Exhibit 498 – Statement of Liesfield (WIT.7528.001.0001) at 0003; Exhibit 361 – Statement of Anderson (WIT.3032.001.0001) [33(a)], [38], [58]–[63], Annexure 8 (WIT.3032.001.0034) at 0042, Annexure 11 (WIT.3032.001.0048); Exhibit 563 – Interactive Presentation – INTMEN 001884 (EXH.563.0001); Hollowood T10769:20–T10769:23, T20136:22–T20136:24, T20139:5–T20139:20; Rice T8533:15–T8534:15; Jones T8640:13–T8641:8; Anderson T8795:5–T8796:26, T8798:11–T8800:3

77 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0027

78 Exhibit 297 – Interactive Presentation – INTMEN 001788 (EXH.297.0001); Exhibit 173 – Statement of Wiltshire (WIT.075.001.0001_R) [19]–[22]; Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [42]; Exhibit 46 – Statement of Gobbett (WIT.026.001.0001_R) [6]–[8]; Exhibit 880 – Interactive Presentation – INTMEN 001849 (EXH.880.0001)

79 Hollowood T20064:16–T20064:18, T16677:27–T16678:8, T16003:5–T16003:9, T20169:26–T20170:4

80 Ferguson T944:18–T944:28, T950:17–T950:19

81 Exhibit 877 – Interactive Presentation – INTMEN 001837 (EXH.877.0001); Exhibit 294 – Interactive Presentation – INTMEN 001827 (EXH.294.0001); Exhibit 785 – Statement of Enden (WIT.147.001.0001_R) [24]; Exhibit 208 – Statement of Hughes (WIT.080.001.0001_R) [14]; Exhibit 522 – Statement of Mortimer (WIT.118.001.0001_R) [49]

82 Exhibit 244 – Statement of Easterbrook (WIT.085.001.0001_R) [52]

83 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0018

84 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0027–0029

85 Exhibit 596 – Statement of Hoff (WIT.125.001.0001_R) [22]–[30], [37]–[48], [70], [76], [79], Annexure 3 (DSE.HDD.0005.0942); Exhibit 597 – Statement of Halligan (WIT.3010.009.0371) [3], [16]; Exhibit 591– Statement of Teer (WIT.3010.005.0143) [31], Attachment 13 (WIT.3010.005.0250) at 0251; Exhibit 598 – Statement of Wright (WIT.3002.001.0001) [21], [25]; Hoff T12958:2–T12958:28, T12960:10–T12960:21, T12964:28–T12974:13, T12979:19–T12979:21, T12980:2–T12980:4, T12981:10–T12981:13, T12999:2–T12999:7, T12999:18–T12999:26; Smith T12872:17–T12873:15; Halligan T13000:1–T13000:7, T13001:28–T13001:31, T13002:1–T13002:3, T13003:4–T13003:23, T13003:28–T13003:30; Wright T13014:29–T13015:1, T13021:7–T13021:21

86 Exhibit 367 – Statement of Hunter (WIT.3009.001.0001) [13], [16]–[22]; Exhibit 323 – Statement of Kenealy (WIT.101.001.0001_R) [29], [31]; Hunter T8953:13–T8953:25, T8955:2–T8955:15, T8956:4–T8956:23, T8957:11–T8958:7, T8958:23–T8959:3; Kenealy T8126:14–T8127:2

87 Exhibit 367 – Statement of Hunter (WIT.3009.001.0001) [13]; Hunter T8952:27–T8954:7

88 Exhibit 377 – Statement of Ellett, Attachment 2 (WIT.4006.001.0021) at 0050; Exhibit 377 – 2009 Victorian Bushfires Royal Commission (CORR.0910.0081)

89 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0015–0016

90 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0018

91 Exhibit 296 – Interactive Presentation – INTMEN 001828 (EXH.296.0001); Hollowood T7747:7–T7747:16

92 These figures are drawn from an analysis of the evidence of the fire related deaths

93 For example: Exhibit 10 – Statement of Odgers (WIT.008.001.0001_R) [6], [10]; Exhibit 586 – Statement of Buntine (WIT.127.001.0001_R) [12]

94 Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [7]–[22], [25]–[28], [33]–[38]; Exhibit 13 – Statement of Newman (WIT.009.001.0001_R) [2], [5]–[6], [13], [22]; Exhibit 864 – Statement of Sorraghan (WIT.156.001.0001_R) [4]–[11], [37]–[38]

95 Exhibit 537 – Statement of Whitford (WIT.120.001.0001_R) [1], [9]–[17]; Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [25]–[29], [58]; Exhibit 13 – Statement of Newman (WIT.009.001.0001_R) [5]–[8], [22]; Exhibit 244 – Statement of Easterbrook (WIT.085.001.0001_R) [6]–[18], [69]; Exhibit 200 – Statement of Bennett (WIT.078.001.0001_R) [1], [3]–[5]; Exhibit 690 – Statement of Wainscott (WIT.130.001.0001_R) [3], [40]–[60]

96 For example: Exhibit 29 – Statement of Ferguson (WIT.022.001.0001_R) [6]; Exhibit 864 – Statement of Sorraghan (WIT.156.001.0001_R) [9]–[11]; Exhibit 244 – Statement of Easterbrook (WIT.085.001.0001_R) [10], [12]–[14]; Exhibit 785 – Statement of Enden (WIT.147.001.0001_R) [12]–[13], [15]; Exhibit 898 – Statement of Nowak (WIT.159.001.0001_R) [9]–[13]; Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [8]–[22], [25]–[28]; Exhibit 43 – Statement of Glassford (WIT.028.001.0001_R) [9]; Exhibit 13 – Statement of Newman (WIT.009.001.0001_R) [4], [6]

97 For example: Exhibit 29 – Statement of Ferguson (WIT.022.001.0001_R) [14]–[21]; Exhibit 898 – Statement of Nowak (WIT.159.001.0001_R) [9]–[10]; Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [29]–[33]; Exhibit 743 – Statement of Szepe (WIT.140.001.0001_R) [27]–[31]; Exhibit 173 – Statement of Wiltshire (WIT.075.001.0001_R) [6]

98 For example: Exhibit 29 – Statement of Ferguson (WIT.022.001.0001_R) [19]–[30], [39]–[44]; Exhibit 43 – Statement of Glassford (WIT.028.001.0001_R) [15]–[19], [23]; Exhibit 864 – Statement of Sorraghan (WIT.156.001.0001_R) [12]–[21]; Exhibit 13 – Statement of Newman (WIT.009.001.0001_R) [10]–[17], [22]; Exhibit 898 – Statement of Nowak (WIT.159.001.0001_R) [18]–[33]; Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [30]–[55], [61]–[64]; Exhibit 221 – Statement of Dixon (WIT.067.001.0001_R) [8]–[49]; Exhibit 173 – Statement of Wiltshire (WIT.075.001.0001_R) [29]

99 Exhibit 181 – Statement of Wasley (WIT.073.001.0001_R) [59]; Easterbrook T7176:7–T7176:16

100 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0016–0019

101 Hollowood T20170:12–T20170:24

102 Exhibit 672 – Building and Land-use Planning Research After the 7th February 2009 Victorian Bushfires Preliminary Findings (CRC.300.007.0135) at 0185–0189; Exhibit 602 – Bushfire CRC Supplementary Report (CRC.301.001.0001) at 0039–0040, 0077

103 Exhibit 9 – Living in the Bush (TEN.001.001.0004) at 0012

104 Exhibit 114 – Statement of O'Halloran (WIT.058.001.0001_R) [49]–[50]; Exhibit 108 – Statement of Brown (WIT.053.001.0001_R); Exhibit 429 – Statement of Weir (WIT.111.001.0001_R); Exhibit 39 – Statement of Hull (WIT.030.001.0001_R); Exhibit 379 – Statement of Jowett (WIT.109.001.0001_R) [45]–[46]; Exhibit 935 – Use of Informal Places of Shelter and Last Resort on 7 February 2009 (CFA.600.005.0317) at 0320, 0325–0355; Exhibit 46 – Statement of Gobbett (WIT.026.001.0001_R) [7]–[10], [12]–[13], Attachment 2 (WIT.026.001.0009); Exhibit 195 – Statement of Berry (WIT.071.001.0001_R) [23]–[45], [70]–[77], [87]; Exhibit 189 – Statement of Baruta (WIT.070.001.0001_R) [6]–[8], [23]–[28], [63]; Gobbett T1494:21–T1495:7, T1498:26–T1499:14; Baruta T5973:1–T5976:3, T5979:14–T5979:23, T5984:3–T5985:27, T5995:2–T5996:3; Berry T6114:4–T6117:18, T6120:1–T6120:19, T6122:8–T6123:29

105 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0036, 0043

106 Exhibit 935 – Victorian 2009 Bushfire Research Response Household Mail Survey (CRC.001.001.0001) at 0036, 0043

107 Exhibit 935 – Use of Informal Places of Shelter and Last Resort on 7 February 2009 (CFA.600.005.0317) at 0325–0355; Exhibit 822 – Supplementary Statement of Fitzgerald (WIT.3026.001.0176) [11]; Brida T16936:15–T16936:24

108 Exhibit 545 – Statement of Ruhr (WIT.122.001.0001_R) [60]–[63]

109 Exhibit 935 – Use of Informal Places of Shelter and Last Resort on 7 February 2009 (CFA.600.005.0317) at 0321

110 Exhibit 46 – Statement of Gobbett (WIT.026.001.0001_R) [7]–[10], [12]–[13], Attachment 2 (WIT.026.001.0009); Exhibit 189 – Statement of Baruta (WIT.070.001.0001_R) [6]–[8], [23]–[28], [63]; Exhibit 195 – Statement of Berry (WIT.071.001.0001_R) [23]–[45], [70]–[77], [87]; Exhibit 61 – Statement of Olorenshaw (WIT.034.001.0001_R) [61], [64], [89]; Gobbett T1494:21–T1495:7, T1498:26–T1499:14; Baruta T5973:1–T5976:3, T5979:14–T5979:23, T5984:3–T5985:27, T5995:2–T5996:3; Berry T6114:4–T6117:18, T6120:1–T6120:19, T6122:8–T6123:29

111 Exhibit 39 – Statement of Hull (WIT.030.001.0001_R) [14]–[19]; Hull T1171:1–T1178:6

112 Exhibit 108 – Statement of Brown (WIT.053.001.0001_R) [11], [26]–[33]; Brown T3516:16–T3517:30

113 Exhibit 422 – Statement of Gissara (WIT.112.001.0001_R) [22]–[29]; Exhibit 429 – Statement of Weir (WIT.111.001.0001_R) [17]–[29]; Exhibit 763 – Interactive Presentation – INTMEN 001873 (EXH.763.0001); Exhibit 955 – Interactive Presentation – INTMEN 001875 (EXH.955.0001); Gissara T9700:12–T9704:22

114 Exhibit 764 – Interactive Presentation – INTMEN 001785 and INTMEN 001979 (EXH.764.0001)

115 Exhibit 805 – Interactive Presentation – INTMEN 001854 (EXH.805.0001)

116 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report 2,* Parliament of Victoria, Melbourne, November 2009 [15]

117 Exhibit 811 – Statement of Edgar (WIT.3024.005.0353) [106], [111]; Exhibit 335 – Statement of Lauder (SUMM.044.002.2177_R) at 2179_R; Edgar T16756:6–T16756:31; Lauder T8249:10–T8249:28

118 Exhibit 444 – Statement of Elder (WIT.114.001.0001_R) [29]–[43]; Exhibit 362 – Statement of Glenn (WIT.066.001.0001_R) [22]–[25]; Exhibit 181 – Statement of Wasley (WIT.073.001.0001_R) [44]–[48]; Exhibit 173 – Statement of Wiltshire (WIT.075.001.0001_R) [22]–[25]; Exhibit 880 – Interactive Presentation – INTMEN 001849 (EXH.880.0001); Exhibit 208 – Statement of Hughes (WIT.080.001.0001_R) [37]–[42]; Exhibit 342 – Statement of Collery (SUMM.044.003.0706_R) at 0709_R–0710_R; Glenn T8818:19–T8818:25

119 Exhibit 20 – Statement of Rogers (WIT.015.001.0001_R) [7]

120 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0024; Handmer T18566:13–T18568:21

121 Exhibit 535 – McFarlane Report (EXP.007.002.0005) [3]–[4], Attachment 3 (EXP.007.001.0060), (EXP.007.001.0115), (EXP.007.001.0139)

122 Exhibit 536 – Valent Report (EXP.009.001.0001); Exhibit 895 – Statement of Toikka (WIT.160.001.0001_R) [28], [61], [71]; Exhibit 224 – Statement of Cowdrey (WIT.081.001.0001_R) [31]; Exhibit 545 – Statement of Ruhr (WIT.122.001.0001_R) [96]; Toikka T18643:21–T18644:31, T18649:26–T18650:2

123 Exhibit 459 – Statement of Siddle (WIT.115.001.0001_R) [31]; Exhibit 780 – Statement of Morrow (WIT.150.001.0001_R) [35]–[36]; Exhibit 46 – Statement of Gobbett (WIT.026.001.0001_R) [14]; Exhibit 545 – Statement of Ruhr (WIT.122.001.0001_R) [86]; Exhibit 906 – Statement of Kenney (WIT.161.001.0001_R) [35]–[37]; Kenney T19099:26–T19100:19

124 Exhibit 545 – Statement of Ruhr (WIT.122.001.0001_R) [96]

125 Exhibit 535 – McFarlane Report (EXP.007.002.0005) [3]–[5]

126 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009, Recommendation 7.1–7.5

127 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0010, 0046, 0051–0055, 0058–0060

128 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0060–0064, 0066

129 Exhibit 988 – Schedule One – MAV Initiatives (DOC.MAV.003.0001) at 0003; Exhibit 988 – Schedule Two – Council Initiatives (DOC.MAV.003.0005) at 0008–0009, 0011, 0014, 0016

130 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0064–0067

131 Exhibit 831 – Summer Fire Campaign Wave 2 Research (RESP.3001.025.0328) at 0336

132 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0053

133 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0439) at 0440

134 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0439) at 0440–0441, (WIT.3004.003.0448) at 0462

135 Exhibit 984 – Country Fire Authority Post-Fire Qualitative Research – Final Report (CFA.600.006.0046) at 0052; Exhibit 983 – A Review of the Role of Community Fireguard in the 2009 Victorian Bushfires – Final Report – May 2010 (CFA.600.006.0021) at 0026, 0042–0044

136 Exhibit 984 – Country Fire Authority Post-Fire Qualitative Research – Final Report (CFA.600.006.0046) at 0066

137 Exhibit 984 – Country Fire Authority Post-Fire Qualitative Research – Final Report (CFA.600.006.0046) at 0053, 0064, 0066

138 Exhibit 984 – Country Fire Authority Post-Fire Qualitative Research – Final Report (CFA.600.006.0046) at 0068

139 Exhibit 984 – Country Fire Authority Post-Fire Qualitative Research – Final Report (CFA.600.006.0046) at 0052–0053

140 Exhibit 983 – A Review of the Role of Community Fireguard in the 2009 Victorian Bushfires – Final Report – May 2010 (CFA.600.006.0021) at 0026

141 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009, Recommendations 4.1–4.8, 5.1–5.5, 9.3–9.5

142 Exhibit 865 – Australia's Revised Arrangements for Bushfire Advice and Alerts (RESP.7500.002.0001) [4.2]

143 Exhibit 865 – Australia's Revised Arrangements for Bushfire Advice and Alerts (RESP.7500.002.0001) [1]

144 Exhibit 865 – Australia's Revised Arrangements for Bushfire Advice and Alerts (RESP.7500.002.0001) [4.1]–[4.2]

145 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0055–0056; Exhibit 831 – Prepare. Act. Survive. Use this Kit to Help You Prepare for Bushfire (RESP.3001.001.0034); Exhibit 831 – Understanding Your Environment – What is My Bushfire Risk? (RESP.3001.001.0035); Exhibit 831 – Preparing Your Property – Make Your Home Bushfire Ready (RESP.3001.001.0047); Exhibit 831 – Leaving Early – Prepare and Act Early to Survive (RESP.3001.001.0063); Exhibit 831 – Bushfire Survival Plan – Your Leaving Early Planning Template (RESP.3001.001.0075); Exhibit 831 – Defending Your Property – Prepare and Act Early to Survive (RESP.3001.001.0083); Exhibit 831 – Your Bushfire Survival Plan – Defending Your Property Planning Template (RESP.3001.001.0111)

146 Exhibit 831 – Prepare. Act. Survive. Use this Kit to Help You Prepare for Bushfire (RESP.3001.001.0034); Exhibit 831 – Leaving Early – Prepare and Act Early to Survive (RESP.3001.001.0063) at 0064; Exhibit 831 – Defending Your Property – Prepare and Act Early to Survive (RESP.3001.001.0083) at 0086

147 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0102; *Country Fire Authority Act 1958,* s. 50D

148 Exhibit 828 – Statement of Duckmanton (WIT.3004.041.0056) [19]–[44]

149 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0021–0023, 0039–0041

150 Exhibit 828 – Statement of Duckmanton (WIT.3004.041.0056) [14.9]–[14.12]

151 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0032–0033

152 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0029

153 Exhibit 327 – Australia's Revised Arrangements for Bushfire Advice and Alerts – 2009/10 Fire Season (RESP.7500.001.0001); Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0021–0023, 0040

154 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0026–0029

155 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0029–0032

156 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0033–0039

157 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0033–0039

158 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0023–0025

159 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0041–0043, 0102

160 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0032–0033

161 Comrie T17435:30–T17436:31

162 Comrie T17446:15–T17446:30

163 Comrie T17444:25–T17444:31; Esplin T18908:29–T18909:11

164 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009, Recommendation 12.2

165 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0120–0122

166 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009, Recommendations 6.1–6.4, 8.1–8.13, 9.1–9.5

167 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009, Recommendation 6.1

168 Exhibit 443 – Statement of Overland, Annexure 1 (WIT.3010.009.0244) at 0271–0273; Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0044

169 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [8.19]–[8.133], Recommendation 8.4–8.10

170 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0074–0077; Exhibit 831 – Statewide NSP Locations Spreadsheet (RESP.3001.014.0158)

171 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [8.105]

172 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0073; Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [84]; Submissions of the State of Victoria – Revising the Prepare Stay and Defend or Leave Early Policy (RESP.3000.006.0349) [145]–[156]

173 Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [15]

174 Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [65]

175 Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [22.11]–[22.12]; Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0091–0094, 0126; Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) [28]–[29]

176 Exhibit 831 – Bushfire Response – Clients and Service Policy 2009–10 October 2009 (RESP.3001.014.0333) at 0336–0340

177 Exhibit 896 – Statement of Streblow (WIT.158.001.0001) [1], [70]–[78], [94]–[97], [109]–[110], Attachment 9 (RSCH.029.001.1700); Exhibit 106 – Statement of McCaffrey (WIT.038.001.0001) [10], [15]–[19], [29], Attachment D (WIT.038.001.0024); Streblow T18715:14–T18716:20, T18718:20–T18719:3, T18720:1–T18720:27, T18723:26–T18726:10, T18733:11–T18733:17, T18744:2–T18744:18; McCaffrey T3454:1–T3454:17

178 Exhibit 896 – Statement of Streblow (WIT.158.001.0001) [80]–[81], [86]

179 Exhibit 896 – Statement of Streblow (WIT.158.001.0001) [102]–[108]; Streblow T18728:23–T18728:30

180 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0087–0090

181 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0091–0093; Exhibit 148 – Statement of Cook (WIT.3029.001.0001) [64]–[76]; Cook T4751:15–T4751:24, T4752:16–T4752:28

182 Exhibit 796 – Statement of Appleford (WIT.3024.005.0295) [18]–[21], Annexure 3 (DSE.HDD.0144.0004), Annexure 4 (DSE.HDD.0144.0007), (DSE.HDD.0002.8072), Annexure 5 (DSE.0017.0115.0180)

183 Exhibit 796 – Statement of Appleford (WIT.3024.005.0295) [23], Annexure 6 (DSE.HDD.0144.0069)

184 Exhibit 796 – Statement of Appleford (WIT.3024.005.0295) [23], [25.2], [28], Annexure 7 (DSE.HDD.0144.0012)

185 Exhibit 796 – Statement of Appleford (WIT.3024.005.0295) [12], [25]–[26], [30], [36]–[39], Annexure 3 (DSE.HDD.0144.0004) at 0005, Annexure 6 (DSE.HDD.0144.0069) at 0070–0071, Annexure 8 (DSE.HDD.0144.0017) at 0018, 0028–0030, Annexure 12 (DSE.HDD.0144.0062)

186 Exhibit 810 – Statement of Esnouf, Annexure 48 (WIT.3004.040.0002) at 0023–0031

187 Handmer T18546:14–T18547:17

188 Esplin T18917:4–T18917:9

189 Exhibit 865 – Australia's Revised Arrangements for Bushfire Advice and Alerts (RESP.7500.002.0001) at 0006–0007

190 Exhibit 935 – Where Are They Going? – People Movement During Bushfires (RESP.3001.014.0117) at 0125

191 Submissions of the State of Victoria – Interim Report (SUBM.100.005.0001) [72]–[73]

192 Exhibit 101 – Statement of Rhodes (WIT.3004.002.0001) [88]

193 Exhibit 935 – A Qualitative Report on CFA Community Engagement – Reference No.18670 – September 2009 (TEN.280.001.0001) at 0007, 0009, 0011; Exhibit 935 – Exploring the Bushfire Experience from a Domestic Perspective (TEN.272.001.0027) at 0029; Exhibit 1000 – Understanding Social Complexity Within the Wildland-Urban Interface: A New Species of Human Habitation? (IAWF.001.001.0208) at 0217

194 Exhibit 101 – Statement of Rhodes (WIT.3004.002.0001) [123]–[124]

195 Exhibit 1000 – Understanding Social Complexity Within the Wildland-Urban Interface: A New Species of Human Habitation? (IAWF.001.001.0208)

196 Exhibit 101 – Statement of Rhodes (WIT.3004.002.0001) [6], [122]–[240]; Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [29]–[32], Attachment 3 (WIT.3003.002.0076)

197 Submissions of Counsel Assisting – A New Bushfire Safety Policy – Replacing the Stay or Go Policy (SUBM.1100.001.0001) [2.32]

198 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.002.0796) at 0801

199 Exhibit 935 – A Qualitative Report On CFA Community Engagement – Reference No.18670 – September 2009 (TEN.280.001.0001) at 0016, 0019, 0023

200 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0046; Exhibit 3 – Statement of Rees (WIT.004.001.0001) [234.3]

201 Exhibit 831 – Prepare. Act. Survive. Use this Kit to Help You Prepare for Bushfire (RESP.3001.001.0034); Exhibit 831 – Understanding your Environment – What Is My Bushfire Risk? (RESP.3001.001.0035); Exhibit 831 – Preparing Your Property – Make Your Home Bushfire Ready (RESP.3001.001.0047); Exhibit 831 – Leaving Early – Prepare and Act Early to Survive (RESP.3001.001.0063); Exhibit 831 – Bushfire Survival Plan – Your Leaving Early Planning Template (RESP.3001.001.0075); Exhibit 831 – Defending Your Property – Prepare and Act Early to Survive (RESP.3001.001.0083); Exhibit 831 – Your Bushfire Survival Plan – Defending Your Property Planning Template (RESP.3001.001.0111)

202 For example: Exhibit 806 – Interactive Presentation – INTMEN 001847 (EXH.806.0001); Exhibit 294 – Interactive Presentation – INTMEN 001827 (EXH.294.0001); Exhibit 785 – Statement of Enden (WIT.047.001.0001_R) [24]; Exhibit 208 – Statement of Hughes (WIT.080.001.0001_R) [14]; Exhibit 522 – Statement of Mortimer (WIT.118.001.0001_R) [49]; Exhibit 244 – Statement of Easterbrook (WIT.085.001.0001_R) [52]

203 Submissions of Counsel Assisting – A New Bushfire Safety Policy – Replacing the Stay or Go Policy, Appendix 1 (SUBM.1100.001.0168)

204 Exhibit 687 – Bushfire Penetration Into Urban Areas in Australia: A Spatial Analysis (CRC.304.001.0001) at 0021

205 Exhibit 701 – Hansen Report (EXP.021.001.0001) [3.13]–[3.14]

206 Exhibit 871 – CFA – DSE – Pre-Season Update – Issues 2 of 2 (DSE.HDD.0157.0056) at 0059; Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0060

207 *Country Fire Authority Act 1958,* ss. 50P, 92

208 Esplin T18908:29–T18909:21, T18913:3–T18913:26, T18920:14–T18921:17, T18930:30–T18932:13, T18935:17–T18936:22

209 Exhibit 901 – Protective Actions in Wildfires: Evacuate or Shelter-in-Place? (TEN.268.001.0022) at 0031; Cova T18856:18–T18857:21

210 Exhibit 896 – Statement of Streblow (WIT.158.001.0001) [80], [97]

211 Streblow T18716:13–T18716:20

212 *Emergency Management Act 1986,* ss. 20, 21

213 *Country Fire Authority Act 1958,* s. 55A(1)

214 Exhibit 832 – Statement of Thompson (WIT.3004.040.0263) [34]–[35], Annexure 5 (WIT.3004.040.0306_R)

215 Exhibit 996 – Township Protection Plans – Neighbourhood Safer Places – Places of Last Resort – Development, Implementation and Evaluation CFA Progress Report (RESP.3001.026.0012) at 0019; Exhibit 324 – Further Material of the State of Victoria (RESP.3000.001.0001) [7]

216 Submissions of the State of Victoria – Interim Report (SUBM.100.005.0001) [85]–[87]

217 Exhibit 996 – Township Protection Plans – Neighbourhood Safer Places – Places of Last Resort – Development, Implementation and Evaluation CFA Progress Report (RESP.3001.026.0012) at 0015, 0020, 0024; Exhibit 831 – Bendigo Township Protection Plan (Bushfire) (RESP.3001.005.0223); Exhibit 833 – Bright/Wandiligong Township Protection Plan (Bushfire) (ASC.001.001.0040_R)

218 Exhibit 832 – Statement of Thompson (WIT.3004.040.0263) [58], [66], Annexure 8 (WIT.3004.040.0366) at 0437–0438

219 Exhibit 92 – Statement of Free (WIT.049.001.0001) [24]

220 Exhibit 92 – Statement of Free (WIT.049.001.0001) [56]; Exhibit 92 – The Integrated Fire Management Planning Framework (TEN.029.001.0002) at 0007

221 Exhibit 92 – The Integrated Fire Management Planning Framework (TEN.029.001.0002) at 0005, 0008

222 Exhibit 92 – The Integrated Fire Management Planning Framework (TEN.029.001.0002) at 0008

223 Farmer T17203:9–T17203:17

224 Exhibit 92 – Statement of Free (WIT.049.001.0001) [68], [75]–[80], [84], [86], [92]; Exhibit 832 – Statement of Thompson (WIT.3004.040.0263) [32]; Free T2982:15–T2983:2, T3007:22–T3007:27; Thompson T17168:9–T17168:17

225 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [8.14]–[8.18]; Exhibit 831 – Victorian Fire Risk Register Progress as at 3 February 2010 (RESP.3001.018.0268); Exhibit 831 – Victorian Fire Risk Register Implementation – 1st 22 Municipalities (RESP.3001.017.0076)

226 Exhibit 834 – Statement of Kittel (WIT.4026.001.0001_R) [92]–[93]; Kittel T17219:19–T17220:27, T17224:11–T17224:15

227 Exhibit 831 – Emergency Management Manual of Victoria (RESP.3001.003.0001_R)

228 Exhibit 377 – Statement of Ellett (WIT.4006.001.0001) [27], [33], Attachment 2 (WIT.4006.001.0021) at 0037, Attachment 4 (WIT.4006.001.0259), Attachment 5 (WIT.4006.001.0262); Submissions of Counsel Assisting – Murrindindi Fire (SUBM.202.009.0001) [7.13], [9.5]

229 Exhibit 834 – Statement of Kittel (WIT.4026.001.0001_R) [89]–[91]; Kittel T17223:3–T17223:6

230 Exhibit 92 – The Integrated Fire Management Planning Framework (TEN.029.001.0002) at 0008; Submissions of the State of Victoria – Revising the Prepare Stay and Defend or Leave Early Policy (RESP.3000.006.0349) [211]

231 Exhibit 904 – Leonard Report (EXP.3031.001.0018) at 0031; Exhibit 905 – 't Hart Report (EXP.3031.001.0001) at 0007; 't Hart T19048:6–T19049:11

232 McCaffrey T3412:11–T3412:19

233 Paulet T9456:29–T9457:4

234 For example: Exhibit 903 – Statement of Clements (WIT.162.001.0001_R) [8], [20]; Exhibit 785 – Statement of Enden (WIT.147.001.0001_R) [21]; Exhibit 898 – Statement of Nowak (WIT.159.001.0001_R) [5], [18], [21], [33]; Exhibit 809 – Interactive Presentation – INTMEN 001818 (EXH.809.0001)

235 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [8.98]–[8.113], [8.133]

236 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [8.28]–[8.72]

237 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0072; B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [8.58]–[8.61]

238 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [8.74]–[8.80]

239 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009, Recommendation 8.3, [8.109]–[8.110]

240 Exhibit 831 – Fire Refuges Discussion Paper – June 2010 (RESP.3001.026.0042) [113]–[114]

241 *Country Fire Authority Act 1958,* Part IIIA, Divisions 3 and 4

242 Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0169

243 Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [84]–[85]

244 Exhibit 614 – Statement of Hayes (WIT.3004.032.0147) [12], Annexure 1 (WIT.3004.032.0164), Annexure 3 (RESP.3001.001.0127); Hayes T13274:12–T13275:24

245 Submissions of the State of Victoria – Revising the Prepare Stay and Defend or Leave Early Policy (RESP.3000.006.0349) [162.5], [163]; Submissions of the Municipal Association of Victoria – A New Bushfire Safety Policy – Replacing the Stay or Go Policy (RESP.4000.011.0001) [68]; Exhibit 1003 – Update from the Municipal Association of Victoria and 77 Municipal Councils on the Designation of Neighbourhood Safer Places (DOC.MAV.004.0001) [3]

246 Submissions of the Municipal Association of Victoria – A New Bushfire Safety Policy – Replacing the Stay or Go Policy (RESP.4000.011.0001) [79]–[80]; Submissions of the State of Victoria – Revising the Prepare Stay and Defend or Leave Early Policy (RESP.3000.006.0349) [169]–[170]

247 Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [89]; Esplin T18910:18–T18910:29

248 Exhibit 324 – Further Material of the State of Victoria (RESP.3000.001.0001) [16]

249 Exhibit 615 – Letter from M Bourke (CFA) to R Spence (MAV) Dated 10 December 2009 (EXH.615.0001)

250 Exhibit 324 – Further Material of the State of Victoria (RESP.3000.001.0001) [16]; Exhibit 620 – Bushfire Neighbourhood Safer Place (DOC.MAV.002.0001); Exhibit 831 – Neighbourhood Safer Places, Only a Last Resort (RESP.3001.018.0438); Submissions of the Municipal Association of Victoria – A New Bushfire Safety Policy – Replacing the Stay or Go Policy (RESP.4000.011.0001) [50], [57], [62]; Comrie T17484:18–T17484:30

251 Submissions of the Municipal Association of Victoria – A New Bushfire Safety Policy – Replacing the Stay or Go Policy (RESP.4000.011.0001) [57], [59]

252 Submissions of the State of Victoria – Revising the Prepare Stay and Defend or Leave Early Policy (RESP.3000.006.0349) [182]

253 Submissions of the Municipal Association of Victoria – A New Bushfire Safety Policy – Replacing the Stay or Go Policy (RESP.4000.011.0001) [50]–[56]; Spence T13394:13–T13395:19

254 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0083–0084

255 Exhibit 614 – Statement of Hayes, Annexure 1 (WIT.3004.032.0164) at 0166–0168; Exhibit 831 – Emergency Services Legislation Amendment Bill 2009 – Explanatory Memorandum (RESP.3001.002.0001) at 0007; Hayes T13274:12–T13275:24

256 Exhibit 614 – Statement of Hayes, Annexure 1 (WIT.3004.032.0164) at 0169–0170

257 Exhibit 614 – Statement of Hayes, Annexure 1 (WIT.3004.032.0164) at 0168; Submissions of the Municipal Association of Victoria – Interim Report (SUBM.100.006.0001) [116]; Hayes T13275:4–T13275:9; Spence T13401:23–T13401:27; Lyon T5083:21–T5084:26

258 Exhibit 614 – Statement of Hayes, Annexure 1 (WIT.3004.032.0164) at 0167, 0171–0172; see discussion at Hayes T13276:28–T13277:17; Spence T13374:14–T13374:27, T13375:14–T13375:31

259 Exhibit 614 – Statement of Hayes (WIT.3004.032.0147) [12], Annexure 3 (RESP.3001.001.0127)

260 Exhibit 614 – Statement of Hayes, Annexure 3 (RESP.3001.001.0127) at 0130

261 Exhibit 614 – Statement of Hayes (WIT.3004.032.0147) [20]; Hayes T13242:9–T13249:31

262 Exhibit 614 – Statement of Hayes (WIT.3004.032.0147) [24], Annexure 9 (WIT.3004.032.0430); Spence T13377:21–T13377:27, T13318:30–T13319:7; Hayes T13262:20–T13262:25

263 Exhibit 614 – Statement of Hayes (WIT.3004.032.0147) [11]

264 Exhibit 614 – Statement of Hayes (WIT.3004.032.0147) [10.5]; Exhibit 620 – Municipal Council Neighbourhood Safer Places Plan – Place of Last Resort During a Bushfire (TEN.168.001.0001) at 0011–0016; Hayes T13279:2–T13280:3

265 Exhibit 614 – Statement of Hayes, Annexure 1 (WIT.3004.032.0164) at 0168; Dunn T13356:15–T13356:20; Spence T13383:7–T13383:15

266 Exhibit 620 – Municipal Council Neighbourhood Safer Places Plan – Place of Last Resort During a Bushfire (TEN.168.001.0001) at 0011–0012; Spence T13383:22–T13384:29, T13396:29–T13397:2

267 Exhibit 908 – Extract from CFA Website as at 27 April 2010 – Neighbourhood Safer Places (TEN.275.001.0001) at 0001–0005

268 Submissions of Counsel Assisting – A New Bushfire Safety Policy – Replacing The Stay or Go Policy (SUBM.1100.001.0001) [9.53]–[9.55]; Exhibit 1003 – Update from the Municipal Association of Victoria and 77 Municipal Councils on the Designation of Neighbourhood Safer Places (DOC.MAV.004.0001) [11]–[12]

269 Submissions of the Municipal Association of Victoria – A New Bushfire Safety Policy – Replacing the Stay or Go Policy (RESP.4000.011.0001) [94]–[98]

270 Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [60]

271 Spence T13398:27–T13398:30

272 Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [15.4], [22.10]

273 Submissions of the Municipal Association of Victoria – A New Bushfire Safety Policy – Replacing the Stay or Go Policy (RESP.4000.011.0001) [94]–[99]

274 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [6.8]–[6.22]

275 Exhibit 9 – 2005 AFAC Community Safety Paper (TEN.001.001.0077) at 0083–0084

276 Submissions of Counsel Assisting – Bunyip Fire (SUBM.202.002.0001) [8.1]–[8.40]; Submissions of Counsel Assisting – Murrindindi Fire (SUBM.202.009.0001) [9.10]–[9.12]; Exhibit 19 – Revised Statement of Walshe (WIT.003.002.0001) [131]–[132]; Walshe T657:25–T658:5

277 Exhibit 16 – Statement of Haynes (WIT.001.001.0001_R) [25(ii)]; B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [6.1]–[6.22]

278 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [6.30]

279 Exhibit 831 – Bushfire Response – Clients and Service Policy 2009–10 – October 2009 (RESP.3001.014.0333) at 0338

280 Exhibit 902 – Supplementary Statement of Esplin (WIT.3007.001.0001) [78]; Esplin T18921:2–T18921:5

281 Exhibit 831 – Bushfire Response – Clients and Service Policy 2009–10 October 2009 (RESP.3001.014.0333) at 0342

282 Exhibit 831 – Bushfire Response – Clients and Service Policy 2009–10 October 2009 (RESP.3001.014.0333) at 0342

283 Submissions of Counsel Assisting – Murrindindi Fire (SUBM.202.009.0001) [9.10]–[9.12]

284 Cova T18860:8–T18860:30

285 Exhibit 901 – Statement of Cova, Attachment 2 (TEN.268.001.0022) at 0026; Cova T18853:9–T18853:29

286 Exhibit 24 – Statement of Griffiths (WIT.018.001.0001) [33]–[41]; Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [33]–[68]; Exhibit 874 – Statement of Corbett (WIT.3004.043.0298) [10]–[29]

287 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [6.68]–[6.70]

288 Exhibit 106 – Statement of McCaffrey, Attachment G (WIT.038.001.0137) at 0138–0141

289 Cherry T9167:28–T9168:2; Frazer-Jans T5254:1–T5254:7; Glassford T1334:27–T1335:3; Sorraghan T18071:16–T18071:25

290 Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0087

291 Exhibit 45 – Natural Disasters in Australia (TEN.004.002.0037) at 0173–0174

292 Exhibit 171 – Statement of Tucker, Attachment 102 (WIT.7501.005.0285) at 0294

293 Exhibit 961 – Letter from Robert Randall (ACARA) to Val Gostencnik (CORR.1004.0197) at 0197

294 Exhibit 171 – Statement of Tucker, Attachment 102 (WIT.7501.005.0285) at 0294; Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0021

295 Exhibit 961 – Letter from Robert Randall (ACARA) to Val Gostencnik (CORR.1004.0197) at 0197

296 For further detail, see Chapters 5, 10, 12 in Volume I

297 Exhibit 69 – Statement of Paton (WIT.031.001.0001) [8]–[9]

298 Exhibit 69 – Statement of Paton (WIT.031.001.0001) [14.10]

299 Exhibit 69 – Statement of Paton (WIT.031.001.0001) [14.2]–[14.6]

EMERGENCY AND INCIDENT MANAGEMENT

2

2 EMERGENCY AND INCIDENT MANAGEMENT

The State's emergency management framework is fundamental to the effective delivery of emergency services. The framework provides for planning of and preparation for the management of crises and natural disasters; coordinating the actions of government, response agencies and communities in the lead-up to and during disasters; and assigning priorities to response and recovery efforts. On 7 February 2009 state-level emergency management arrangements faltered as a result of confusion about responsibilities and accountability.

At the incident level, AIIMS (the Australasian Inter-service Incident Management System) is an effective tool for fire managers. It relies not on technical application alone but also on individual competencies and commitment, sound operational leadership and effective planning at every level. This was evident to varying degrees on Black Saturday.

Days such as 7 February, however, highlight the crucial need for incident- and state-level management teams to prepare, plan and direct operations on the ground and to ensure that information and warnings are provided to firefighters and the community. People risking their lives at the firefront need information about the current status of and predictions for a fire, as well as warnings on safety-related matters such as the arrival of a wind change. Incident management also involves the issuing of warnings to those in the predicted path of a fire—something that is vital for community safety. These are not easy tasks, and they call for experienced, competent and well-prepared incident controllers to lead incident management teams. Fire agencies also need to judiciously select, train and prepare these teams so that they are well positioned to cope with the pressures they will face.

This chapter explores the arrangements for incident and emergency management at the local, regional and state levels as they applied on 7 February, the conduct of some individuals with statewide responsibilities, deficiencies in some emergency management arrangements, and ways in which the arrangements can be improved.

2.1 PRIMARY CONCERNS

The Commission heard evidence about management of the 15 fires detailed in Volume I. Some fires were generally well managed—for example, the slower moving 'campaign' fires of Delburn and Bunyip and a number of the more rapidly burning ones, including those at Coleraine, Horsham, Redesdale, Pomborneit–Weerite, Upper Ferntree Gully and Beechworth–Mudgegonga. The management of other fires exposed a series of systemic shortcomings that impeded incident management and the state-level emergency management arrangements and contributed to the catastrophic consequences arising from 7 February.

The Commission identified the following primary concerns in relation to emergency and incident management:

- The State command and control arrangements for level 3 fires were inadequate and should be revised.
- The potential advantages of declaring a state of disaster were not considered by senior agency and government personnel and were not raised with the Premier at any time.
- The heads of the Country Fire Authority, the Department of Sustainability and Environment and Victoria Police did not demonstrate effective leadership in crucial areas such as ensuring that prompt and accurate warnings were issued to communities in the path of the fires.
- AIIMS proved mostly to be an effective management framework but should be refined.
- The flow of information from the fireground to the integrated Emergency Coordination Centre was at times seriously inadequate.
- Agency integration was insufficient to provide seamless fire management across the state.
- Level 3 Incident Controllers from both DSE and the CFA were not consistently trained, exercised and pre-positioned.
- Although emergency management arrangements at the municipal level generally worked well, there were coordination difficulties with some incident management teams.

2.2 PREPARATION AND PLANNING

2.2.1 PREPARATIONS FOR 7 FEBRUARY

Control of incidents on 7 February (as described in Chapter 2 of Volume I) rested with incident management teams in CFA and DSE regions; some of these IMTs were pre-planned while others were formed on the day. Inconsistencies in the levels of preparedness of IMTs and the facilities of incident control centres, the duplication of management between the CFA and DSE, and ambiguities in the allocation of authority and responsibility at the incident level are all described in detail in Part One of Volume I. Ultimately, responsibility for the operational preparedness of the fire agencies rests with the Chief Officer of the CFA and the Chief Fire Officer of DSE.

The need for a heightened state of preparedness was apparent before 7 February. On Thursday 5 February 2009 the Chief Officers warned the public that weather conditions on the Saturday were forecast to be worse than those on Ash Wednesday, a message reiterated by the Premier on 6 February.[1]

Victoria has a history of exceptionally dangerous fire danger days, among them days now known as Black Friday (13 January 1939) and Ash Wednesday (16 February 1983), both of which were characterised by temperatures above 40°C and a Forest Fire Danger Index of 100 or more, resulting in many fatalities.[2]

Another Black Saturday, on 12 February 1977, was also an important day in Victoria's fire history. The fires of that day were the subject of the *Report of the Board of Inquiry into the Occurrence of Bush and Grass Fires in Victoria,* by Sir Esler Barber. Sir Esler rejected the notion that poor preparation for an emergency can be excused by 'saying that our prevention preparations were adequate except on such an unexpectedly ferocious day'. He said this is particularly the case where the 'ferociousness' of the emergency is not in fact unexpected but instead predicted.[3] The Commission makes the same point about 7 February 2009: the weather conditions and resulting fire behaviour, although extreme in terms of outcome, were not unexpected (as discussed in Chapter 1 in Volume I). They had been forecast and taken note of, and the potential danger had been publicised several days before 7 February. The fire and emergency services' standard of preparation must be viewed in this context.

On 5 February each Chief Officer made clear to his senior staff and regional managers the arrangements that needed to be in operation for incident-level command and control on 7 February. Mr Russell Rees of the CFA asked that pre-designated ICCs be ready for a 'hot start', with 'people there, all the facilities, the equipment … up and running and tested'. Similarly, Mr Ewan Waller of DSE conveyed the message that personnel should be on standby at their work locations and ready to go.[4] Despite these instructions for the highest level of preparedness, the actual state of readiness of level 3 IMTs on the day varied across regions and agencies. This affected the quality of the overall operational response.

The lowest levels of compliance with the Chief Officers' directives appear to have been in the areas affected by the most catastrophic fires—Kilmore East and Murrindindi. The CFA's Region 12 Duty Officer and Coordinator for the North East Area, Mr Peter Creak, gave evidence that, given the personnel available, it would not have been possible to have each level 3 incident control centre staffed in his area at the 'hot start' level required by Mr Rees.[5] The standard of preparedness at Kilmore ICC, in Region 12, certainly fell well short of this. DSE's Land and Fire Manager for the North East, Mr Peter Farrell, did not take sufficient steps to ensure the allocation of qualified level 3 staff to ICCs in his area, resulting in the seriously underprepared Alexandra ICC, which ultimately had control of the Murrindindi fire. Chapter 10 in Volume I provides details about the preparations made in the North East Area.

The CFA and DSE did do some effective interagency planning in Regions 4 and 6, where they both worked to strengthen relationships and complement each other in order to manage incidents effectively. Region 6 met 'regularly on the days beforehand … [to] formulate what manning or what people … [they] have to fill all the major roles in the IMT and support roles'.[6] The IMT in Region 4 consisted of 'joint teams … with the people in the IMT having practised together and worked together many times'.[7]

Senior officers of Victoria Police also made efforts to ensure that police were prepared. An email Chief Commissioner Ms Christine Nixon sent to all members and staff directed that municipal emergency coordination centres be ready to activate, that divisional coordination centres be on standby and that regional operations centres be activated

by no later than 10.00 am on the Saturday. Police at the local level were also asked to make contact with local representatives of the CFA, DSE and Parks Victoria. Similar messages were conveyed in an email on 6 February from Deputy Commissioner Mr Kieran Walshe to all regional assistant commissioners. The evidence in relation to the individual fires demonstrates that Victoria Police succeeded in achieving a high level of preparedness, enabling police to provide valuable support to the fire agencies, both on the ground and through the municipal emergency coordination centres.[8]

Additionally, the Victorian Emergency Management Council Coordination Group met on 5 February to share information about operational preparations and advice to the community. At this meeting, the CFA and DSE representatives informed Police and Emergency Services Minister the Hon. Bob Cameron MP that the agencies were 'ready in all the key high danger areas'.[9]

2.2.2 PLANNING FOR JOINT INCIDENT MANAGEMENT TEAMS

Joint CFA–DSE Standard Operating Procedure J2.03 (Planning for Joint Incident Management Teams), which was in force on 7 February, stipulated that a level 3 IMT requires a minimum of 14 positions. The direction from the Chief Officers to achieve the highest level of preparedness required that these 14 positions be filled on 7 February, that ICC facilities be tested and activated, and that a level 3 Incident Controller be in position.[10] The purpose of this was to allow IMTs to immediately assume management of fires that could not be suppressed by initial attack. As described in detail in Part One of Volume I, implementation of this direction was not consistent across all IMTs, some of which fell well short of what was demanded.

A revised Joint SOP J2.03, issued on 16 November 2009, has increased to 30 the number of personnel required for a full level 3 IMT. It also identifies four levels of IMT preparedness—from Preparedness Level A (the highest, with facilities tested on the day and a core IMT of eight in position from 10.00 am on the day and the remaining 22 IMT members being in position within 60 minutes of a fire starting) to Preparedness Level D (facilities tested in the preceding week, basic staffing to be in position within 60 minutes of a fire starting and a core IMT of eight in position within 90 minutes).[11]

The default minimum preparedness level required for a location is set by reference to the fire danger index—the Grassland Fire Danger Index or the Forest Fire Danger Index, depending on the risk profile of the location in question—but a higher level of preparedness can be prescribed for any ICC on any particular day. The Commission supports this improved planning for IMT preparedness, although it notes that the CFA and DSE will need to monitor and audit compliance with the mandated preparedness levels. During the 2009–10 fire season local mutual aid plans did not consistently reflect the IMT preparedness levels stipulated in the revised SOP, and this should be rectified.

The Commission is also concerned that the revised SOP does not require either that a full IMT be pre-emptively established on the most serious fire danger days or that level 3 IMTs be led by a level 3 Incident Controller. Even at the highest level of preparedness, the SOP requires only that there be a core IMT and a level 2 Incident Controller in position by 10.00 am, with capacity to expand and scale-up within one hour of a fire starting.[12]

On days and in areas where the fire danger forecast is code red, a full IMT of 30 people should be in position from 10.00 am. This would be suitable recognition of the potential consequences if fires occur on such days and of the probability that initial attack will fail. In its interim report the Commission recommended that further work be done to explore the options for re-examining the fire danger ratings and the severity scale.

It is also unacceptable that fire agencies continue to prepare for days like 7 February without level 3 Incident Controllers placed in at least the highest risk locations. The events of 7 February (as discussed in Volume I) demonstrate the value of having experienced, qualified level 3 Incident Controllers in charge from the beginning of major fires. There are now about 100 qualified level 3 Incident Controllers in Victoria, and this appears to be a sufficient number to allow level 3 Incident Controllers to be allocated to the locations considered at highest risk on a particular day.[13] If this number is insufficient, the agencies must give priority to the training of more level 3 Incident Controllers.

The agencies acknowledge the value of IMTs training together before an incident—in particular, joint IMTs that will have management of complex level 3 incidents. A number of expert witnesses also stressed the importance

of training for emergencies; this is discussed in Chapter 10.[14] The Commission considers that if an IMT can train together as a unit before a major event, that IMT will be in a better position to develop effective teamwork skills for coping in the high-pressure situation of managing a level 3 fire. The fire agencies should provide as many opportunities as possible for joint level 3 IMTs to form, practise and train.

Mr John Haynes, CFA Deputy Chief Fire Officer, described a 'strong history' of the CFA and DSE conducting joint training exercises and other activities. The CFA does not, however, prescribe the level of participation in joint training exercises required of members. In view of the vital importance of joint training, the CFA and DSE should prescribe the minimum number and the nature of joint training exercises in which personnel (including volunteers) must participate in order to maintain their accreditation to fulfil roles in a level 3 IMT. Compliance with the prescribed minimum should be monitored through annual audits of attendance.

RECOMMENDATION 8

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures to require the following:

- that at locations that attract preparedness levels A or B there be a full incident management team under the leadership of an accredited level 3 Incident Controller in position by 10.00 am on days of code red fire danger and a core incident management team (eight personnel) under the leadership of an accredited level 3 Incident Controller in position by 10.00 am on days of extreme fire danger
- that a full level 3 IMT be led by a level 3 Incident Controller unless the State Controller determines otherwise.

RECOMMENDATION 9

The Country Fire Authority and the Department of Sustainability and Environment prescribe and audit the minimum number and nature of level 3 joint training exercises in which incident management team staff (including volunteers) are required to participate.

2.3 LEADERSHIP AND COMMAND

2.3.1 PRIMARY FUNCTIONS OF EMERGENCY MANAGEMENT: COMMAND, CONTROL AND COORDINATION

In accordance with the State Emergency Response Plan, the response to emergencies in Victoria relies on three management functions—command, control and coordination.[15]

Command operates vertically in an agency. In the case of the CFA, DSE and Victoria Police, the ultimate command function on 7 February lay with Mr Russell Rees, Chief Officer of the CFA, Mr Ewan Waller, Chief Fire Officer of DSE, and Ms Christine Nixon, Chief Commissioner of Police.

Control is exercised at the incident level by the IMTs and Incident Controllers. In this regard, strong and effective leadership was displayed in dealing with the Bunyip, Pomborneit–Weerite, Horsham, Redesdale and Coleraine fires, where careful planning and proactive management of both the IMT and crews on the ground resulted in the best possible outcomes given the conditions. At other fires inadequate preparation and a failure to appoint experienced and suitably qualified Incident Controllers led to a lack of leadership and sub-optimal outcomes in a number of cases. In some instances there was confusion about who was exercising the control function; this is discussed in Section 2.6.1.

On 7 February the emergency response coordination function was exercisable by Victoria Police and involved a requirement to ensure that adequate consideration was given to alerting the public to existing and potential dangers.[16] It appears to the Commission that the concept of coordination became rather distorted on 7 February, with senior fire agency personnel describing their role as 'coordinating' the response to the fires rather than actively exercising control or command.[17] In the emergency management context 'coordination' describes a specific role, one that on 7 February belonged to Victoria Police. The role necessitated active monitoring of an emergency situation and ensuring that specific outcomes were being achieved—that is, that warnings were being issued to communities under threat. The term 'coordination' should not be used loosely to describe a passive style of management or to avoid responsibility.

2.3.2 THE PRIMARY POSITIONS ON 7 FEBRUARY

Victoria's emergency management arrangements, and the arrangements for bushfire in particular, are detailed in Chapter 2 of Volume I. On 7 February the main state-level emergency management and agency command functions were exercised by the following agencies and individuals:

- State Emergency Management
  - the Hon. Bob Cameron MP, Minister for Police and Emergency Services—Coordinator in Chief of Emergency Management (s. 5 of the *Emergency Management Act 1986*)
  - Ms Christine Nixon, Chief Commissioner of Police—Deputy Coordinator in Chief of Emergency Management (s. 5 of the Emergency Management Act) and State Coordinator of the State Emergency Response Plan (s. 11 of the Emergency Management Act)
  - Mr Kieran Walshe, Deputy Commissioner of Police—Deputy State Coordinator of the State Emergency Response Plan (s. 11 of the Emergency Management Act)[18]
  - Mr Bruce Esplin—Emergency Services Commissioner
- Victoria Police
  - Mr Stephen Fontana, Assistant Commissioner for Counter Terrorism and Emergency Management. Although not the subject of any statutory power and not in receipt of any formal delegation in respect of the powers of Ms Nixon or Mr Walshe, Mr Fontana's portfolio of responsibilities in Victoria Police embraced responsibilities in relation to emergency management, including 'many of the functions of the Deputy Coordinator in Chief'[19]
  - Mr Rod Collins, Superintendent, Victoria Police—State Emergency Response Officer. This position, created by Victoria Police, is not the subject of any statutory functions, although the responsibilities of the office are stated to include ensuring that the State Coordinator of the State Emergency Response Plan is informed of 'all significant developments' and ensuring the 'ongoing efficient operation' of the State Emergency Response Coordination Centre[20]
- the Country Fire Authority
  - Mr Russell Rees—Chief Officer
  - Mr Geoff Conway—State Coordinator, day shift 7 February
  - Mr Peter Baker—State Coordinator, night shift 7–8 February
  - Mr Gregory Paterson—State Duty Officer, day shift 7 February
  - Mr Thomas Glover—State Duty Officer, night shift 7–8 February
  - Mr Steven Warrington—'Strategic Planning', day shift 7 February
  - Mr John Haynes—State Coordinator during the Delburn fires (29–30 January) and media spokesperson, day shift 7 February

- the Department of Sustainability and Environment
  - Mr Ewan Waller—Chief Fire Officer
  - Mr Alen Slijepcevic—Chief Officer Contact, day shift 7 February
  - Mr Andrew Graystone—State Duty Officer, day shift 7 February
  - Mr Graeme Davis—State Duty Officer, night shift 7–8 February
  - Mr Andrew Brown—shared rotating position of Chief Officer Contact. Was not rostered but attended the integrated Emergency Coordination Centre during the day shift on 7 February to assist Mr Slijepcevic and Mr Waller
  - Ms Caroline Douglass—State Duty Officer, day shift 3–6 February (including during the running of the Bunyip fire) and media spokesperson, day shift 7 February.

2.3.3 THE MAIN FACILITIES AND FUNCTIONS ON 7 FEBRUARY

The state-level functions of the CFA and DSE were exercised from the integrated Emergency Coordination Centre. Functional units—Information, Resources, Logistics, Planning and Mapping—from both agencies were co-located at the iECC, although they operated independently. The DSE's Fire Behaviour Analysis Unit, the joint CFA–DSE State Air Desk, and various representatives of other agencies (among them the MFB, Victoria State Emergency Service, Telstra and SP AusNet) also operated from the iECC on 7 February. Emergency Services Commissioner Mr Esplin was at the iECC for much of the day. The operation of the iECC is discussed in Section 2.8.1.[21]

At the state level, Victoria Police functions on 7 February were divided between the Police Operations Centre, the State Emergency Response Coordination Centre and the iECC. The POC and the SERCC were co-located at Police Headquarters on Flinders Street in Melbourne; the iECC was at the opposite end of the city, on Nicholson Street in East Melbourne. The POC was responsible for directing the police operational response to the fires; the SERCC was intended to be the venue from which Victoria Police exercised its coordination function; and the police presence at the iECC was intended to provide a liaison service, allowing senior police to keep up to date with the progress of and response to the fires. In the event, however, the role of the SERCC on 7 February was minimal: senior police personnel (among them Assistant Commissioner Fontana and the State Emergency Response Officer, Superintendent Collins) operated predominantly from the iECC. Dividing senior police resources and policing functions between three state-level facilities was inefficient and created confusion about the responsibilities of each facility. Allocation of emergency management functions between these facilities—in particular, the role and purpose of the SERCC—during major bushfires needs to be reviewed.

RECOMMENDATION 10

The State clarify whether, during major fires, Victoria Police should discharge its coordination functions from the State Emergency Response Coordination Centre or from the State Control Centre.

2.3.4 CONTROL AT THE STATE LEVEL

State level

There was no single agency or individual in control of the emergency response on 7 February. Control of the various fires was divided between the CFA and DSE. DSE was the control agency for the Murrindindi, Beechworth–Mudgegonga and Bunyip fires (although control of the Bunyip fire was handed to the CFA at about 1.45 pm on 7 February). The CFA was the control agency for the other fires the Commission considered.

Although the *Country Fire Authority Act 1958* vests responsibility for controlling the prevention and suppression of fires in country Victoria in the Country Fire Authority as an organisation, CFA standard operating procedures make it clear that within the agency 'ultimate responsibility for the suppression of fires' rests with the Chief Officer.[22]

In this the Chief Officer is assisted by the State Coordinator, who is responsible for ensuring that 'all relevant information relating to fires and incidents is available to the Chief Officer', and the State Duty Officer, who is 'the first point of contact for Regional Duty Officers for all operational matters'.[23] On 7 February this senior management team of Chief Officer Mr Rees, State Coordinator Mr Conway and State Duty Officer Mr Paterson was assisted by Mr Warrington in a 'strategic planning' role.[24] Mr Warrington defined this role as being to 'support the Incident Controller and the state duty officer and indeed the Chief Officer by advising him of any potential significant fires'.[25] Mr Warrington sat 'to the side' of the CFA's ordinary command and control structure.[26]

Within DSE, statutory responsibility for carrying out 'proper and sufficient work for the prevention and suppression of fire in every State forest and national park and on all protected public land' lies with the Secretary of the Department (on 7 February Mr Peter Harris).[27] This statutory function is performed by departmental delegation, as opposed to formal delegation, to the Chief Fire Officer of DSE.[28] It is the Commission's view (discussed in more detail in Chapter 10) that this position of Chief Fire Officer in the organisational structure of DSE is an unsatisfactory arrangement because it lacks a solid statutory base for the powers and responsibilities that are in practice associated with the role.

The Chief Fire Officer is supported during an emergency by a Chief Officer Contact (on 7 February Mr Slijepcevic), whose role is representing the Chief Officer and making decisions on his behalf when he is not there, and the State Duty Officer (Mr Graystone), who provides 'statewide coordination of fire and emergency incidents'.[29]

New state command and control arrangements

The lack of a single individual with clear responsibility for control of the response to major bushfires has been redressed through the revised State Command and Control Arrangements for Bushfire in Victoria, adopted by the CFA, DSE and the MFB in October 2009 following a review of command and control arrangements led by Chief Commissioner of Police Mr Simon Overland.[30] The purpose of the new arrangements is to provide 'clear and unambiguous command and control of, preparedness for, and response to, level 3 bushfires in Victoria'. The new arrangements are to be read in conjunction with the revised State Emergency Response Plan and the *Emergency Management Manual Victoria.*[31]

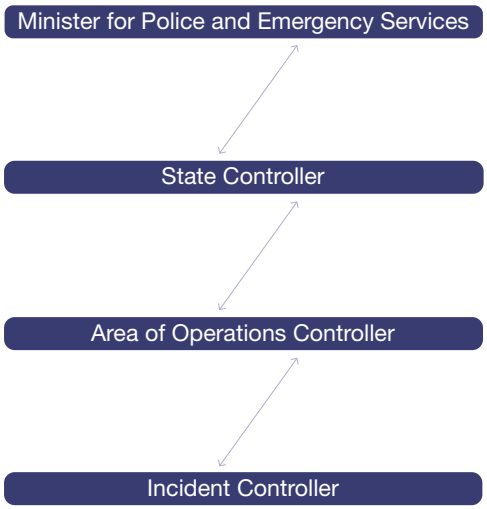
The new arrangements apply only if specified 'triggers', including any one or more of the following, occur: a forecast of severe, extreme or catastrophic fire danger; one or more level 3 bushfires or the potential for a level 3 bushfire; and significant threat to life or property from bushfire. Normal agency positions and structures continue to apply during 'routine' operations and times of high operational activity where the trigger points for the level 3 command and control arrangements are not met.[32]

The new arrangements provide for three levels of control for emergency management during a level 3 bushfire—State, Area of Operations, and Incident—and detail the roles, responsibilities and reporting arrangements for each tier. A 'Controller' is appointed at each tier to provide leadership and management; this is consistent with the approach adopted by AIIMS.[33]

Where appointed, the State Controller will have overall operational control of the response activities in relation to a fire. In the absence of the appointment of a State Controller under s. 16 of the *Emergency Management Act 1986*, the Chief Officer of the CFA is to assume the role. The State Controller reports to the Minister for Police and Emergency Services as Coordinator in Chief.[34]

The new arrangements therefore provide for a single, direct line of control for level 3 bushfires (see Figure 2.1).

Figure 2.1 Current single line of control model for level 3 incidents

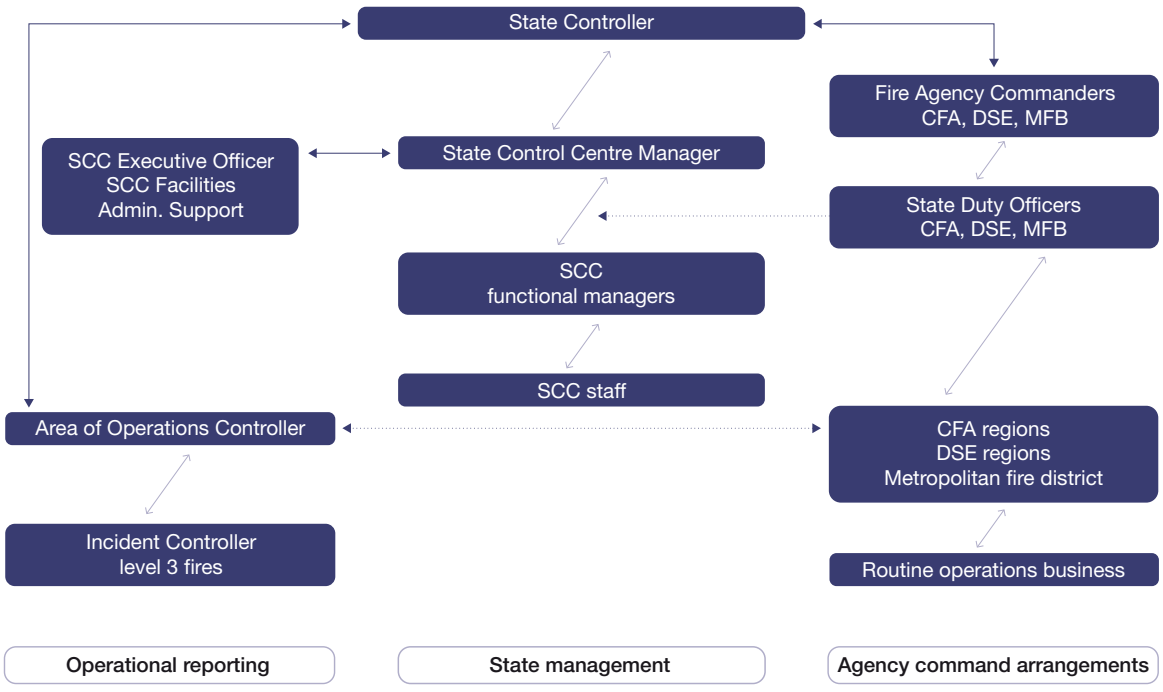


Source: Exhibit 547 – Staffing, Training and Resourcing of IMTs and ICCs – PowerPoint presentation by Haynes and Slijepcevic.[35]

The new arrangements also rename the integrated Emergency Coordination Centre the 'State Control Centre', a move designed to focus attention on the fact that the centre's primary function is one of control rather than coordination.[36]

Command of each fire agency's resources remains the responsibility of the agency's Chief Officer, who must provide advice to the State Controller on agency readiness, capability and operational activity.[37] Figure 2.2 shows the reporting arrangements that will apply where a State Controller and an Area of Operations Controller have been appointed; operational reporting is shown on the left, state management in the centre and fire agency command on the right.

Figure 2.2 The state command and control structure



Source: Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria.[38]

The Commission considers that the new arrangements have helped to clarify and strengthen lines of control to apply during major bushfires in Victoria, but it notes that the possibility of Area of Operations Controllers and State Duty Officers operating concurrently could result in an overlap in responsibilities and therefore confusion about accountability.

Further, although the new arrangements are a welcome improvement, the Commission is concerned that introducing the position of State Controller only on some days and in response to specific triggers could be less effective than a more permanent arrangement. Switching lines of responsibility and reporting either just before or during a major incident might cause dangerous confusion. These concerns and a proposed solution are discussed in Chapter 10.

2.3.5 THE FUNDAMENTAL RESPONSIBILITY OF THOSE IN COMMAND

The *CFA Red Book*, which was produced during the 1980s as an operational guide for CFA members, contains the following statement on leadership:

> The leader is not a passive person, he is not someone whose main function is to be 'up in the front'. Leadership is a working relationship among members of a group in which the leader acquires status through active participation and demonstration of his capacity for carrying cooperative tasks through to completion.[39]

The Commission endorses this idea of an active leader: during a statewide disaster or an emergency it is this type of leadership that is needed. On 7 February strong leadership would have required not only the presence of the leaders at all crucial times but also the active oversight of those further down the chain of command. 'Active oversight' does not necessarily mean issuing directions to the incident management team or responding personnel: rather, it means monitoring the activities of those with direct control of response activities, informing oneself of the situation on the ground, and seeking information and feedback from subordinates. Performing these tasks puts a leader in the position of being able to make a judgment about whether his or her intervention is necessary.

Command and control, including the need to demonstrate leadership, are distributed between various levels and functions in the fire and emergency services agencies. Important leadership roles rest with the brigade captain on the fireground, the Incident Controller in charge of the incident management team, and the police officer at the roadblock. These duties must be performed in accordance with known standard operating procedures, incident control systems, and command and control arrangements. Effective emergency management requires the successful execution of leadership functions at all levels, but it is the individuals with statewide responsibility, those who communicate with and are accountable to government, to whom the highest expectations are attached.

On 7 February 2009 the leaders with ultimate responsibility for the operational response to the bushfire emergency were the Chief Officer of the Country Fire Authority, Mr Russell Rees, the Chief Fire Officer of the Department of Sustainability and Environment, Mr Ewan Waller, and the Chief Commissioner of Police, Ms Christine Nixon. Ms Nixon not only had ultimate command and control over the resources and personnel of Victoria Police: she also had statutory functions as Deputy Coordinator in Chief of Emergency Management and Coordinator of the State Emergency Response Plan. Although many of the functions associated with each individual's role might have been delegated to subordinates, this delegation of powers and functions (formal or informal) does not amount to an abrogation of responsibility or a transfer of accountability.

In organisational terms Ms Nixon was at the apex of Victoria Police command, with a direct reporting relationship to the Minister for Police and Emergency Services. In contrast, Mr Rees reported through the Chief Executive Officer to the Board of the Country Fire Authority, which in turn reported to the Minister (see Chapter 10). The CEO of the CFA has responsibility for carrying out the functions of the CFA and must comply with directions of the CFA, as given through the board. The *Country Fire Authority Act 1958* does not clearly set out the relationship between the Chief Officer and the CEO, and there is potential for operational responsibilities to become confused. The Chief Fire Officer of DSE, Mr Waller, reported through an Executive Director and General Manager to the Secretary of the department, who in turn reported to the Minister for Environment and Climate Change (see Chapter 10). Again, responsibility for operational matters over which the Chief Fire Officer has control is not clear.[40]

Effective control of operational decisions in connection with fire prevention, mitigation and suppression seems crucial to agencies' effective honouring of their responsibilities in this regard. It follows that clear lines of authority for operational matters are necessary to support the command and control arrangements that have been established since 7 February. But the current arrangements do not achieve this: they are uncertain, ambiguous and confusing, and they should be reviewed so as to vest clear operational responsibility in the Chief Officers of the CFA and DSE, subject to the organisational changes the Commission recommends in Chapter 10.

The Commission also notes the evidence of the Secretary of the Department of Justice that the Government is reviewing the roles and organisational placement of the Chief Officer of the CFA and the Chief Fire Officer of DSE. These reporting relationships and accountabilities are discussed in Chapter 10.

The Commission acknowledges that Ms Nixon, Mr Rees and Mr Waller all had very different capacities to control the directions of their organisations, to influence decisions about budgets and staffing, and to operate autonomously.

The strategic directions of Victoria Police, the CFA and DSE and the decisions taken by each organisation in the years leading up to Black Saturday all affected the capacity of the agencies and their leaders to perform effectively on the day. The impact of previous decisions can be negative (for example, Victoria Police's inflexible arrangements for the management of roadblocks, the CFA's poorly equipped incident control centres, and DSE's poor record of meeting its prescribed burning targets) or positive (for example, Victoria Police's strong coordination arrangements at the municipal level, the CFA's improved focus on firefighter safety since the Linton inquiry, and DSE's successful use of the Networked Emergency Organisation to provide emergency 'surge' capacity). All such decisions have affected the capacity of fire agency personnel to perform effectively, and the performance of the leaders on 7 February must be viewed against the backdrop of these factors.

The Commission nevertheless considers that the leaders of each of the major agencies involved in the response to Black Saturday—Mr Rees, Mr Waller and Ms Nixon—should in significant measure be held accountable for the performance of their organisations as well as for the execution of their personal responsibilities and leadership functions at that time. The Commission observed a disturbing tendency among senior fire agency personnel—including the Chief Officers—to consistently allocate responsibility further down the chain of command, most notably to the incident control centres.[41] Although incident management teams certainly have direct management responsibility for the response to the fires, under the AIIMS arrangements this should be seen as a delegation of authority, rather than a shifting of responsibility or accountability. This principle that accountability must rest ultimately at the top of the chain of command applies to Victoria Police as well as to the CFA and DSE.

The Commission notes that the examinations of Mr Rees, Mr Waller, Ms Nixon and Mr Cameron (whose role and activities are discussed in Section 2.4) varied in length and manner of questioning. These variations can be explained by reasons such as the level and accuracy of detail available in written statements, the willingness of witnesses to make sensible concessions as to areas that could have been improved or actions that were ill-judged, and the time constraints facing the Commission. The Commission rejects, however, any suggestion that counsel assisting's questioning of these witnesses was unfair, unbalanced or otherwise inappropriate, and it considers it has sufficient evidence to make decisions in relation to the state of leadership and state-level command and control exhibited on 7 February 2009. These individuals were senior public officials with leadership responsibilities in each of their respective organisations, and it is within ordinary expectations that these positions be subjected to rigorous public examination of their own performance and the performance of those they led.

2.3.6 CHIEF OFFICERS

Although the Chief Officer of the CFA and the Chief Fire Officer of DSE were undoubtedly in command of the resources in their respective agencies, neither was directly controlling the response to any of the fires. Nor is it either Chief Officer's role to take direct control while the operational response is sound and incident-level management structures are operating effectively. Ensuring that those structures are operating effectively, however, required that Mr Rees and Mr Waller make inquiries and actively oversee the preparedness and then the activities of the incident management teams. Without such active oversight, neither Chief Officer could judge whether personal intervention was necessary.

Mr Rees did not speak to the Incident Controller of any of the major fires. He said it was the responsibility of the CFA's State Coordinator or State Duty Officer and of the regional emergency coordination centres to ensure that competent Incident Controllers were in position across the state. The State Coordinator relied on the State Duty Officer to ensure the preparedness of incident management teams, but the information in relation to preparedness on which the State Duty Officer was relying was later demonstrated to be inaccurate or at least incomplete.[42]

Mr Rees justified his delegation of IMT supervision by saying he risked 'losing focus' if he drilled down into the detail of any particular fire. He therefore remained operationally removed from the fires and as a result was not in a position to appreciate the deficiencies in the staffing and expertise of some incident management teams whose activities the Commission examined (see Part One of Volume I). The chain of command for which Mr Rees was responsible also failed to bring these matters to his attention.[43]

Mr Rees did not review the warnings being issued for the Kilmore East fire, despite the fire's obviously disastrous potential. He did not review any predictive maps for any of the fires and would therefore not have been in a position—even had he reviewed the warnings being issued—to assess whether it was appropriate to warn communities in the predicted fire path. Neither Mr Rees nor Mr Waller had any system for monitoring the quality of warnings being issued by Incident Controllers.[44]

Although during the afternoon the CFA State Coordinator took steps to develop priorities in relation to the fires, including making his own predictions of the fire paths, he then stepped back from active oversight and instead relied on the State Duty Officer and the integrated Emergency Coordination Centre's Information Unit to monitor the situation of those fires he had identified as being of major concern. The State Coordinator took no steps to ensure that suitable warnings were being issued. The State Duty Officer, on whom the State Coordinator was relying, did authorise a number of warnings but did so without checking their content: he was of the view that the content of warnings was the responsibility of the Incident Controller and that he ought not 'second-guess' information coming in from the field.[45] These senior personnel—the State Duty Officer and the State Coordinator—failed to keep Mr Rees adequately apprised of the situation on the fireground.

Like Mr Rees, Mr Waller did not descend into the detail of the fires. Although both Chief Officers discussed the potential of the various fires and made some efforts to rank them according to priority, there is no evidence that this led to actions being taken or directions given. Mr Waller conceded that the warnings that were issued to the community did not adequately convey the significance of the wind change but said that responsibility for ensuring that this information was conveyed lay with the incident management teams and that if there was any deficiency in warnings he would have expected the State Duty Officer to bring this to his attention. It was the DSE State Duty Officer's view, however, that his role was not to 'value-add' to warnings or do anything in the authorisation process other than check for 'obvious error'. The State Duty Officer also took the view that warnings in relation to CFA-controlled fires were primarily a matter for the CFA, which appears reasonable.[46]

The Commission notes that the situation on 7 February 2009—whereby fire information releases prepared at incident control centres had to be uploaded to the CFA website by central personnel at the integrated Emergency Coordination Centre—no longer pertains. The One Source One Message portal allows personnel at incident control centres to upload information directly to both the CFA and the DSE websites.[47] The Commission welcomes the use of this tool to speed up the release of information to the public but notes that this does not take away from the responsibility of those at the state level to monitor the content of warnings issued by incident control centres and to 'value-add' where required.

The Commission understands the logic in the notion that senior DSE and CFA personnel at the integrated Emergency Coordination Centre were the ones with primary responsibility for ensuring that all functions performed by elements under their control were working effectively, given that the agencies were not operating as a single integrated team. They were two teams working together in a common location, sharing information but not responsibility.

In this situation, senior officers' quality checks of warnings did not extend, in the Commission's view, to each other's operations. The organisational separation of the agencies on 7 February weakened the management oversight that might have been expected had there been in charge a single agency with responsibility for the total operation

and having unified, rather than duplicated, management arrangements. Introduction of a single State Controller to manage bushfire emergencies following Chief Commissioner of Police, Mr Simon Overland's review is a step in the right direction, but it still leaves the fire agencies divided at the operational level.

The significance of a south-westerly wind change in the Victorian fire context is well known. Such a change was a feature of the destructive Ash Wednesday fires in 1983, and Sir Esler Barber noted, in relation to the 1977 Black Saturday fires, that it was an important and dangerous feature not only of the 1977 fires but of Victorian bushfires generally.[48]

Mr Rees and Mr Waller were both aware of the impact the south-westerly wind change would have on the fires. Mr Rees said information about the wind change should have been included in warnings to the communities 'as a routine'. This did not happen. When the wind change arrived sooner than expected across the state, the Chief Officers did direct staff at the iECC to issue a public warning about it. In what appears to have been a failure of the chain of command, however, a warning was prepared but never issued.[49]

These examples are illustrative of the deficiencies in the oversight role of the two Chief Officers and the senior staff supporting them in the iECC. The Commission, however, also notes its concern in relation to the following:

- Resourcing decisions were often made without regard to predictive maps and therefore without a full understanding of the potential run of the major fires.
- No statewide plan was finalised on 7 February to assist with assigning priority to the most threatening fires and allocating resources with that in mind.
- The focus on maintaining a 'strategic' or 'statewide' overview appears to have come at the expense of a detailed awareness of the performance of incident management teams, including in connection with the central task of warning the community.[50]

The Commission concludes that CFA Chief Officer Mr Rees and DSE Chief Fire Officer Mr Waller should have done more in relation to warnings, supporting incident management teams and statewide planning. To the extent that they relied on their subordinates to perform these tasks, this reliance was ineffective. Responsibility for the failure of the chain of command must rest at the top. Further, Mr Rees and Mr Waller were in a unique position—with the ability to oversee and assess the potential of multiple fires as they developed across the state and to monitor the progress of the south-westerly wind change—to appreciate the need for a strong emphasis on warnings to the public and for increased support for incident management teams that would inevitably be sorely stretched by events on the day. Although the Commissioners were repeatedly told the Chief Officers were managing at a strategic level and taking a statewide view, there was little of greater strategic importance than monitoring the passage of the wind change because of its deadly potential. This was not done in a manner that would have led to the maximum advantage being gained from the meteorological information.

A number of relatively simple practices would have greatly assisted in identifying shortcomings in warnings and in the composition and effectiveness of incident management teams:

- once a fire had been reported, requiring the responsible incident management team to provide to the iECC as soon as practical an incident action plan summary, which should have been used to ascertain whether critical matters such as warnings, resourcing and firefighter safety were being factored into the strategy for the fire
- requiring provision of predictive maps—either by the IMT or by the fire behaviour analysis unit within the iECC itself—and a list of all warnings issued for an incident (and updated as required)
- on the basis of the predictive map and the list of warnings
  - confirming that communities in the probable path of the fire had been warned
  - ensuring that the warnings took adequate account of known weather information, such as forecast wind changes
  - issuing additional warnings as required
- on the basis of predictions for all the fires, developing priorities for the fires according to the greatest threat to life and safety and allocating state resources with that in mind.

These things were not effectively done by either of the Chief Officers or by their senior staff on 7 February.

This kind of systematic gathering and analysis of information should be standard practice. If the Chief Officers had adhered to these practices on Black Saturday or directed their senior staff to do so, the Commission would not—regardless of the outcome—have needed to criticise the Chief Officers in the way it does.

Both Mr Rees and Mr Waller conceded there were serious failures on the part of the fire agencies in relation to warnings. The failures occurred notwithstanding Mr Rees' acknowledgment that, once it became obvious that the most serious of the fires were unstoppable, high priority should have been given to warning communities in the probable paths of those fires.[51] This level of emphasis was not given to warnings, and it appears that to have given them the emphasis they merited would not have reflected the 'normal' warning protocols of the fire agencies.

Traditionally, and unsurprisingly, the fire agencies' focus has been the suppression of fires, which goes some way towards explaining why insufficient priority was given to warnings on 7 February. This lack of prominence attached to warnings should also be seen in the context of the 'Prepare, Stay and Defend or Leave Early' policy, which, with its emphasis on individual fire plans and making decisions in advance of a fire, tends to diminish the importance given to the provision of targeted warnings to communities in the potential path of a fire. A central message of the Prepare, Stay and Defend or Leave Early policy is that householders are 'on their own' in terms of their individual safety because the fire authorities will be fully engaged in fire suppression. The policy is discussed in Chapter 1.

On a day such as 7 February 2009—when the predictions were for a day more dangerous in terms of fire behaviour than any previously faced in Victoria—the fire agencies needed a change in mindset to recognise that the most effective way of protecting communities would not be through fire suppression (which would probably prove ineffective) but by giving much more prominence to timely and accurate warnings. The tragic outcome of the fires brought this need for a change in priorities into sharp focus.

In the week leading up to 7 February the State and the fire agencies put considerable effort into encouraging people to implement their fire plans and to leave early if they were not suitably prepared and ready to actively defend. This reinforced the traditional approach whereby the fire agencies would be responsible for fire suppression and individuals were expected to have their own plans to enact. Although not wishing to play down the need for people to take a suitable degree of responsibility for their own safety, the Commission considers that a more innovative approach to the partnership between fire agencies and the community was called for on 7 February: greater emphasis on warnings by the fire agencies would have placed communities and individuals in a better position to make decisions about their own safety. It was for the leaders of the Country Fire Authority and the Department of Sustainability and Environment to call for this change of emphasis, but the call did not come.

2.3.7 VICTORIA POLICE

Among Victoria Police's coordination functions was ensuring that consideration had been given to alerting the public to existing or potential dangers arising from the emergency.[52] Superintendent Collins understood this to be a requirement to ensure that warnings were being issued (and he was satisfied that this did occur) and not a requirement to assess the content or accuracy of such warnings.[53] As discussed in Chapter 10 of the Commission's interim report, there was ambiguity about the precise duties of emergency response coordinators at any level in Victoria Police in connection with the issuing of warnings and the content of those warnings.

Ms Nixon agreed that it was the practice of Victoria Police to leave the content of warnings to the fire agencies. On 7 February she did not seek assurances that warnings were being issued but assumed from the size of the fires and the consequent danger to the community that the fire agencies would be issuing warnings.[54] The Commission accepts that the fire agencies are best placed to design the content of warnings, but the situation on 7 February was that Victoria Police had a degree of responsibility in relation to warnings as part of its coordination function. There was at the time ambiguity as to how far Victoria Police had to go to ensure that fire agencies were properly exercising their functions in relation to warnings. The Commission welcomes the steps the Government has since taken to remove that ambiguity: inclusion of the new ss. 50B, 50C and 50D in the amended *Country Fire Authority Act 1958* means that responsibility for issuing warnings now clearly rests with the fire authorities under the leadership of the Chief Officer of the CFA. This is referred to in Chapter 10.

2.3.8 THE CHIEF COMMISSIONER OF POLICE

On 7 February Ms Nixon took a 'hands-off' approach to her responsibilities as State Coordinator of the State Emergency Response Plan and Chief Commissioner of Police. She arrived at the State Emergency Response Coordination Centre at about midday. Although she spent some time there being briefed on the developing fire situation, she also spent about an hour-and-a-half attending to matters unrelated to the fires, including personal matters. At about 3.30 pm she attended the integrated Emergency Coordination Centre and received a series of briefings from Assistant Commissioner Fontana, Superintendent Collins and Chief Officers Rees and Waller. During these briefings Ms Nixon was told that a number of major fires were burning across the state, that important elements of state infrastructure were under threat, that the Kilmore East fire had the potential to kill people in at least Strathewen, that a wind change was forecast, and that it was possible the situation would deteriorate.[55]

Ms Nixon's meeting with the fire chiefs, at about 5.00 pm, left her with the clear impression that Victoria was 'facing a disaster'.[56] Despite this, she left the integrated Emergency Coordination Centre at 6.00 pm, returned to her home and then attended a dinner with her husband and some friends between about 7.00 pm and 8.15 pm. Although her phone was switched on and she believed she would be contacted if her assistance was needed, Ms Nixon neither made nor received any phone calls, nor did she write or receive any text messages, during this time. While at dinner she was also not in a position to monitor media sources.[57]

On returning home, Ms Nixon's first contact was a phone call from the Victoria Police media liaison officer at about 9.00 pm. Between about 6.00 and 9.00 pm, therefore, Ms Nixon neither received nor initiated any contact with her subordinate officers or other personnel involved in the emergency response.[58] It is not satisfactory that at this time—when she was aware of the potential for disaster and, in fact, while the magnitude of the disaster was becoming apparent with confirmation of fatalities—Ms Nixon was absent from both the State Emergency Response Coordination Centre and the integrated Emergency Coordination Centre and did not take action to inform herself of events as they unfolded.

Ms Nixon considered that her leadership functions were discharged by establishing a competent team and being available if needed.[59] But on a day when conditions were predicted, and then proved, to be worse than Ash Wednesday something more was required. This is especially so in Ms Nixon's case: for most of the crucial period from 6.00 pm until 9.00 pm her delegates were not in their position.

Deputy Commissioner Walshe, the only recipient of a formal delegation of emergency management powers from Ms Nixon, was not on duty on 7 February. He remained at home, 'on standby' to assist Ms Nixon if required, until the evening. At 6.30 pm he learnt that Ms Nixon had gone home and—partly as a consequence of this but also because of his concern about the situation with the fires and reports of fatalities—he decided to come on duty. His arrival at Victoria Police headquarters was, however, delayed until 8.50 pm because the fires were threatening his son-in-law's family and he became involved in inquiries about their welfare.[60]

Assistant Commissioner Fontana appears to have taken primary responsibility for discharging Victoria Police's state-level emergency coordination functions on 7 February, despite not being the subject of any direct or delegated statutory responsibility. Mr Fontana began active duty at 6.00 am and moved during the day between the integrated Emergency Coordination Centre, the State Emergency Response Coordination Centre and the Police Operations Centre. He attended numerous interagency meetings and briefings and worked to stay fully abreast of the fire situation throughout the day, including making detailed personal notes and regularly forwarding information by text message to Chief Commissioner Nixon and other senior police personnel. Although he remained on duty until 1.10 am on 8 February, for part of the time from 6.00 to 9.00 pm when neither Ms Nixon nor Mr Walshe was present at the state-level control centres, Mr Fontana was also absent. He went home at 7.15 pm to take a short break and collect some computer equipment. By this stage he had been on duty for almost 13 hours. He did, however, make and receive a number of phone calls during this time, and he tried (unsuccessfully) to participate remotely in the State Emergency Strategy Team meeting at 8.00 pm. He returned to the Police Operations Centre at 9.30 pm and did not attend the integrated Emergency Coordination Centre again until 11.00 pm.[61]

The Commission considers that Ms Nixon's approach to emergency coordination and the manner in which she purported to execute her statutory responsibilities left much to be desired. Ms Nixon herself acknowledged that leaving the integrated Emergency Coordination Centre and going home was an error of judgment: 'In hindsight I … should have stayed'.[62] The Commission shares this view.

The Commission also expresses dismay at Ms Nixon's approach to giving evidence before it. Her written statement dated 22 January 2010 and her oral testimony on 6 April 2010 were in a number of respects inaccurate and incomplete. After her first appearance before the Commission, Ms Nixon released a media statement providing additional information about her movements on 7 February: this meant the Commission had to recall her on 14 April 2010 to clarify her initial evidence. Ms Nixon attributed the deficiencies to poor memory, to making assumptions on the basis of how she would normally act during an emergency, and to a lack of support in preparing her statement.[63]

The inconsistencies in Ms Nixon's evidence were the subject of extensive comment in submissions both from counsel assisting (who sought a finding that Ms Nixon attempted to mislead the Commission) and from counsel representing Ms Nixon (who resisted such a finding). Counsel for Ms Nixon further submitted that the questioning of Ms Nixon by counsel assisting was unfair, a submission the Commission rejects. The examination of Ms Nixon was, albeit certainly thorough and testing, entirely appropriate.[64]

Despite the foregoing, the Commission does not find that Ms Nixon tried to mislead the Commission. It is notoriously difficult to make an accurate assessment of whether a witness is lying or intentionally trying to mislead. Moreover, during her second appearance Ms Nixon made a number of concessions in relation to the inadequacy of her earlier testimony, her lack of attention to the contents of her written statement and her failure to properly prepare for giving evidence—all of which helped the Commission form the view that Ms Nixon did not intentionally mislead it.[65]

The difficulties associated with Ms Nixon's evidence—in particular, her inability to refresh her memory by referring to contemporaneous notes about her movements and activities on 7 February—constitute a salutary reminder to emergency services personnel at all levels of the importance of keeping an activity log. Ms Nixon did not have a practice of keeping notes or a logbook during her tenure as Chief Commissioner.[66] Such a practice would have served her well. It would also have been prudent had Ms Nixon obtained copies of her telephone records from 7 February before adopting her written statement and giving oral evidence: in the absence of written notes, these records helped her verify some of her activities and contacts on the day.[67]

2.4 THE MINISTER AND EMERGENCY MANAGEMENT

2.4.1 ROLE OF THE MINISTER

Pursuant to s. 5(1) of the *Emergency Management Act 1986*, the Minister for Police and Emergency Services is the Coordinator in Chief of Emergency Management. The Coordinator in Chief's role is to ensure that government agencies take adequate emergency management measures and to coordinate the activities of government agencies carrying out their statutory functions, powers, duties and responsibilities in relation to emergency management. The Minister is also required to arrange for the preparation and review of the State Emergency Response Plan.[68] Additionally, the Minister oversees a series of state committees responsible for emergency mitigation, response planning and recovery planning. The Emergency Management Act established the Victorian Emergency Management Council to advise the Minister.[69]

In relation to the interaction between the minister as Coordinator in Chief and the Chief Commissioner of Police as State Coordinator of the State Emergency Response Plan, Mr Cameron said he was responsible for the 'overall system of continuous emergency management' while the State Coordinator was responsible for 'actions around a response' to a particular emergency. He opined that the purpose of the Emergency Management Act was not to give the minister operational responsibilities in relation to an emergency, although he acknowledged that the designation 'Coordinator in Chief' might give an 'operational impression'.[70]

The Commission agrees that the designation 'Coordinator' and the description of the role as including coordination of agency activities can lead to confusion about the minister's role. The Commission is clear that it was not intended for the legislation to imply that the minister had any operational responsibilities and that the responsibilities of the

control agency are separate and distinct from those of the ministers; rather, the minister is responsible for monitoring the emergency services' planning and preparation for and responses to emergencies, providing an interface between the agencies and government and generally being accountable to parliament for the maintenance of an effective emergency management system.

It would be preferable if the minister were referred to in the Emergency Management Act not as 'Coordinator in Chief' but simply as 'the Minister' (being the minister responsible for the Emergency Management Act, at present the Minister for Police and Emergency Services). The Act should then specify the powers and responsibilities of the minister and make it clear that, in relation to emergency management (including planning and response), the State Coordinator of the State Emergency Response Plan is subject to the direction of the minister.

Other than in relation to consideration of a state of disaster (see Section 2.5), Mr Cameron's performance during the February 2009 fires was in accordance with the Commission's expectations of 'the Minister'. On 5 February, in the light of the forecast for 7 February as being a day worse than Ash Wednesday, Mr Cameron sought and received assurances from the agencies that they 'were ready to perform their functions' and 'would all be doing whatever they could'. On 7 February, although located for most of the day at his home in Bendigo, Mr Cameron was regularly updated on the fire situation by the Emergency Services Commissioner and his staff and, on one occasion, by Mr Fontana. When told at about 5.30 pm that Victoria was facing substantial losses and potential loss of life, Mr Cameron formed the view that he should come to Melbourne to determine the size and nature of the recovery effort that would be required of government and to institute the necessary arrangements.[71]

Mr Cameron arrived at the integrated Emergency Coordination Centre at 8.00 pm. He spoke with other ministers and with the Opposition, apprising them of the fire situation, and arranged for a meeting of the Security and Emergencies Committee of Cabinet to take place on 8 February.[72] His actions were appropriate. Having taken steps to satisfy himself before the event that the system for emergency response was prepared, he then endeavoured to keep aware of the situation and, as soon as it became apparent that the state was facing a disaster, took active steps to ensure the effectiveness of the recovery phase.

2.4.2 KEEPING THE MINISTER INFORMED

Although Mr Cameron ultimately received the vital piece of information he needed in order to make the decision to go to Melbourne—that losses were significant and there was potential for loss of life—the Commission considers the process for informing the minister in relation to emergency situations is inadequate.

On 7 February the Minister had no direct liaison with the Chief Officers of the fire services before arriving at the integrated Emergency Coordination Centre. Nor was there substantial contact between the Minister and senior Victoria Police officers. Ms Nixon spoke to the Minister twice before he came to Melbourne, but neither Ms Nixon nor Minister Cameron could recall details of the conversations. Mr Walshe (who was not formally on duty) had no contact with the Minister. Mr Fontana briefed the Minister once, at 5.25 pm, but for the greater part all agencies relied on Mr Esplin, as Emergency Services Commissioner, to be the conduit of information to the Minister.[73]

In 2001, at the request of the then Minister, the Office of the Emergency Services Commissioner assumed the role of coordinating the provision of information to the minister during emergencies. Thereafter the liaison role of the Emergency Services Commissioner became 'standard practice'. This meant that the Emergency Services Commissioner needed to obtain accurate and timely information, which was not always the case on 7 February. Although the practice had been adopted through a protocol accepted by the fire agencies, the Commission is of the view that allocating the role of providing information to the minister through a non-operational official will not necessarily produce to the best outcomes.[74]

The Commission accepts that requiring the heads of the fire agencies to be primarily responsible for informing the minister could be a distraction from their operational duties, but it considers that Victoria Police, and the State Coordinator specifically, would be well positioned to fulfil this role. As coordinator of the emergency response, Victoria Police itself requires all the information that should be conveyed to the Minister.

RECOMMENDATION 11

The State consider amending the *Emergency Management Act 1986* and the *Emergency Management Manual Victoria* in order to achieve the following:

- remove the title of Coordinator in Chief of Emergency Management from the Minister for Police and Emergency Services
- clarify the function and powers of the Minister
- designate the Chief Commissioner of Police as Coordinator in Chief of Emergency Management, who would have primary responsibility for keeping the Minister informed during an emergency.

2.5 A STATE OF DISASTER

Section 23(1) of the *Emergency Management Act 1986* provides as follows:

> If there is an emergency which the Premier of Victoria after considering the advice of the Coordinator in Chief and the State Coordinator is satisfied constitutes or is likely to constitute a significant and widespread danger to life or property in Victoria, the Premier may declare a State of Disaster to exist in the whole or in any part or parts of Victoria.

If a state of disaster is declared the minister assumes responsibility for directing and coordinating the activities of all government agencies and for the allocation of all available resources of government that he or she considers necessary or desirable for responding to the disaster. The minister may also do the following:

- direct any government agency to do any act or to exercise any function, power, duty or responsibility
- relieve government agencies of compliance with subordinate instruments if compliance would inhibit response or recovery
- take possession of and make use of property
- control and restrict entry into and movement within disaster areas
- compel the evacuation of people from a disaster area.[75]

2.5.1 LACK OF ADVICE

A state of disaster has never been declared in Victoria, and the senior figures in Victoria's emergency management structure gave no active consideration to advising the Premier to consider making such a declaration on or in the aftermath of 7 February. Each of Ms Nixon, Mr Walshe, Mr Esplin and Mr Rees gave evidence that they either did not consider whether a state of disaster should be declared or that they did not discuss it with each other or with the Minister. The Minister did not discuss the question with the Premier; nor did he seek or receive any advice about whether a declaration should be made.[76]

Mr Cameron, Ms Nixon, Mr Rees and Mr Esplin all expressed the view that declaration of a state of disaster was not necessary since the additional powers conferred by virtue of such a declaration were not required.[77] These comments reflect a very narrow reading of the purpose of the 'state of disaster' provisions in the Emergency Management Act—namely, that a state of disaster ought to be declared only if the coercive powers conferred by s. 24 are required. There is, however, nothing in the Act that supports this restrictive interpretation.

The Commission considers that declaring a state of disaster would offer benefits beyond the grant of additional powers. First, it would provide symbolic recognition of the gravity of a situation—a recognition that on 7 February might have sharpened the focus of emergency services agencies on community safety factors such as warnings. Second, it would place the State's political leaders firmly in charge of the emergency, reassuring the public that their government had the situation in hand and facilitating rapid mobilisation of Cabinet and high-level government attention if required.

These benefits could also be achieved through the declaration in relation to a particular emergency that falls short of a full-blown state of disaster. The Commission notes the South Australian model, whereby the *Emergency Management Act 2004* provides for a scale of emergency declarations—major incident, major emergency and state of disaster. The first two can be declared by the Commissioner of Police as State Coordinator, but only the State Governor may declare a disaster.[78]

The circumstances on 7 February met the statutory precondition for declaring a state of disaster: the emergency constituted a significant and widespread danger to life or property in Victoria. The Commission considers that where such a situation exists, or there is a reasonable possibility that it might exist, the Minister and Chief Commissioner of Police should formally discuss with the Premier the prospect of declaring a state of disaster. The discussion should involve an assessment of the status of the emergency and the provision to the Premier of advice on whether a declaration would be of benefit (in the broad sense just discussed). Even if the decision is not to declare a state of disaster, to have had such a discussion allows the matter to be raised at the highest level of government and ensures that the Premier is briefed on a matter of importance to the State.

RECOMMENDATION 12

The State consider either amending the *Emergency Management Act 1986* or adopting a standing practice to require the Minister for Police and Emergency Services or the Chief Commissioner of Police to consult the Premier about the possibility of declaring a state of disaster for all of or any part of Victoria whenever the Minister or the Chief Commissioner of Police becomes aware of circumstances that make it a reasonable possibility that the criteria for making such a declaration will be satisfied.

RECOMMENDATION 13

The State consider amending the *Emergency Management Act 1986* to introduce a graded scale of emergency declarations short of a state of disaster.

2.6 USING AIIMS AND WHAT CAN BE IMPROVED

The AIIMS framework was used to manage incidents on 7 February. The framework's effectiveness varied from incident to incident as a result of the way it was planned and prepared for and the competency of and resources available to those who were implementing it. Apart from relatively isolated incidents, AIIMS appears well understood and accepted by fire agencies. No-one suggested to the Commission that AIIMS should not be used.

The Commission supports the continued use of AIIMS in the management of fire incidents in Victoria. It offers a consistent approach to incident management throughout Australia, as well as allowing for effective interoperability with fire management personnel from New Zealand, the United States and Canada, where comparable incident control systems are used. In Victoria, it provides a consistent framework for incident management between fire agencies and, although it is not identical to the incident command and control system used by police, both systems follow the same principles and are very similar in operation and function.[79]

Although the Commission supports the continued use of AIIMS, it notes that the interaction of AIIMS structures with the new State command and control arrangements will need to be carefully managed. Further, although AIIMS operates at the incident level, there is a need to ensure that the common language and consistent approach and understanding are applied at the area of operations and state levels in order to respond to the challenges posed by managing multiple incidents. Agencies should take account of the interaction between these levels in order to avoid ambiguities in relation to control and lines of reporting.

2.6.1 CONTROL OF INCIDENTS

AIIMS makes it clear that the Incident Controller is in charge of an incident. This is reflected in Country Fire Authority standard operating procedures, whereby the officer in charge of the first responding brigade or the most senior officer on the scene will be the Incident Controller until a more formal incident management structure is in position and control is transferred.[80] The transfer of control did not always operate smoothly on 7 February.

In the absence of a pre-established level 3 incident management team, CFA resources responding to the Murrindindi fire were initially managed from the Yea CFA Group headquarters. Although a DSE IMT in Alexandra was subsequently established and took control of the fire at 4.15 pm, there was no handover from the Yea Group and CFA resources continued to report to Yea. This was not the fault of those in charge at the Yea headquarters: they were not told that control of the fire had nominally been transferred to the Alexandra IMT.[81] When the Alexandra IMT was established, the Alexandra Group continued to coordinate CFA resources and, although in the same town as the IMT, operated independently.

In Bendigo, control of the fire was initially assumed by the senior officer on the ground. He was not told for nearly two hours that control had been formally assigned to the IMT at the Adam Street incident control centre. Even after this information had been conveyed, there was no formal handover of control.[82]

The Commission accepts that, in the absence of an established IMT, reverting to CFA Group command is a fall-back position. Under AIIMS, however, an Incident Controller is with the first arriving crew and once an incident control centre is established to manage a particular fire (such as the Alexandra ICC for the Murrindindi fire) it is unacceptable, and indeed potentially dangerous, that a CFA Group continues to manage CFA resources. Such a practice must stop, and all in the CFA must commit to AIIMS incident control throughout all incident management—regardless of which agency is providing incident management staff. When an IMT is established during a fire, that IMT must pay careful attention to ensuring that proper transfers of control are effected.

2.6.2 THE INFORMATION UNIT

Management of information by means of the AIIMS structure proved unsatisfactory on 7 February. The Information Unit deals not only with collection of information from the fireground and from media and state and regional levels of emergency management but also with dissemination of information to fireground personnel, other agencies and the community (via agency websites and the media).[83]

The existing AIIMS structure, which positions the Information Unit as a sub-function of Planning, fails to reflect the quantity, demands and priority surrounding information management in the 21st Century. These demands are particularly heavy during a fast-moving multi-agency emergency event. On days such as 7 February, when the prevailing conditions might render first attack ineffective, the information function becomes as important as, if not more important than, that of operations.

A number of witnesses highlighted the merits of separating the information function from the planning section to give it greater priority and prominence in the AIIMS structure. Mr Rees, for example, said, 'the information function needs to become a discrete function of ICS [predecessor to AIIMS] in itself for major events and it needs to get a more prominent focus'.[84] Chief Commissioner of Police Mr Simon Overland gave evidence that 'Victoria Police considers the function of public information to be vital in responding to bushfires and therefore this function should be separated from the planning function and be reported directly to the controller'.[85] Mr Waller was more cautious, fearing that if too many people report directly to the Incident Controller he or she might become overloaded. Nevertheless, he acknowledged the importance of information flow during fires of the type experienced on 7 February and said, '… if I was an incident controller I may well have pulled the information [unit] out and had them reporting to me direct'.[86]

Since 7 February the CFA and DSE have modified AIIMS to introduce the position of Public Information Officer, or PIO. Joint Standard Operating Procedure J4.01 describes the PIO as being 'responsible for the preparation and dissemination of information and warnings to the community during an incident'. Such a person is to be appointed where the Incident Controller considers it necessary, and they will report directly to the Incident Controller. The Information Unit more broadly remains part of the Planning section and is responsible for 'movement of non-

operational incident information and dissemination of public information to communities, stakeholders, volunteers and staff'. The purpose of having the PIO report directly to the Incident Controller is to emphasise the importance of warnings to the public.[87]

Although SOP J4.01 notes that appointment of a PIO is at the discretion of the Incident Controller, SOP J2.03 requires that a full incident management team (30 members) contain a PIO as one of the 'foundation' positions. Mr John Beasley of the CFA was asked about this apparent inconsistency: his understanding was that a PIO would be a mandatory position for a 'level 3 fire of significance' but that otherwise the Incident Controller has discretion to appoint a PIO where required.[88]

In its interim report the Commission noted that the role and status of the Information Unit needed to be elevated; but at that stage there was insufficient evidence to allow a definitive recommendation that the Information Unit be given a separate and more important identity within the AIIMS structure.[89] Evidence is now before the Commission to support such a recommendation. The inadequacies in information highlighted in Part One of Volume I of this final report extended not only to warnings and community advice but also to the flow of information between agencies and across various levels of emergency management.

The Information Unit as a whole should be given increased prominence through the creation of a separate function, sitting alongside, rather than underneath, Planning, Operations and Logistics and reporting directly to the Incident Controller. This is consistent with the approach adopted by Victoria Police.

The Commission considers that a Public Information Officer whose focus is community information and warnings would be a valuable addition to the Information Unit but should not be separated from the rest of the information function. Formulation of warnings that are accurate and timely and take full account of the situation on the fireground depends on an adequate flow of information; this flow of information is the responsibility of the Information Unit and the role of the Public Information Officer should not be divorced from it.

For smaller, less complex incidents the Information Unit might consist of only one member, who will combine the roles of unit leader and Public Information Officer. For larger incidents, there might be a dedicated PIO as well as a number of information officers supporting the unit leader. For all level 3 fires, where a full IMT is required by SOP J2.03, a dedicated PIO should be mandatory.

Although noting that this would deviate from the existing national approach to AIIMS, the Commission considers this matter to be of such importance that a deviation is appropriate. It also notes that any concerns about too many people reporting to the Incident Controller might be alleviated if more effective use were made of a Deputy Incident Controller.

2.6.3 THE DEPUTY INCIDENT CONTROLLER

Much is asked of the Incident Controller, and the demands will increase as a result of the Commission's recommendations, including those relating to warnings and evacuation.

AIIMS contemplates that an Incident Controller may appoint a deputy to 'assist in managing the number and array of issues involved at an incident' and, indeed, a Deputy Incident Controller was appointed on 7 February for each of the major fires. A good example of the type of role a deputy could play is the effective manner in which Mr Ivan Smith assisted Incident Controller Mr David Nugent on 7 February during the Bunyip fire. Mr Smith took on the role of team leader of the Operational Contingency Planning Team on 5 February and prepared an operations plan to be used on 7 February in the event that the fire escaped Bunyip State Park. The existence and subsequent execution of this plan led to a well-ordered and effective operational handover from DSE to the CFA when the fire did in fact escape the park.[90]

Valuable assistance was also provided by Mr Rocky Barca, deputy to Mr Jason Lawrence at the Kangaroo Ground Divisional Command. As part of his role, Mr Barca maintained a constant focus on analysing fire information and assessing the likely direction of the fire. He used this information to oversee the preparation of warnings and recommend to the Incident Controller that a red flag warning be issued to firefighters. In the Redesdale IMT, the Incident Controller and his deputy agreed that the deputy would be responsible for internal management of the IMT while the Incident Controller concentrated on external relationships and keeping the integrated Emergency Coordination Centre and the public informed.[91]

The role of Deputy Incident Controller should be to reduce the burden on the Incident Controller by providing leadership and oversight in relation to specified areas within the Incident Controller's field of responsibility. Such oversight should not, however, be confused with a handover of responsibility: the Incident Controller remains in control of the fire and accountable for the overall performance of the incident management team.

It would be valuable if the CFA and DSE were to agree on a set of specific functions that, in the absence of an alternative arrangement being agreed between a specific Incident Controller and their deputy, will come under the oversight of the Deputy Incident Controller. This 'default' list of functions could include the following:

- predictions of fire spread
- warnings and public information
- liaison with police in relation to evacuation
- preparation of the incident action plan.

2.6.4 LOCAL KNOWLEDGE

The benefits of incorporating local knowledge in an incident management team cannot be overstated. An understanding of local geography, infrastructure and community concerns can help the IMT identify priorities for both asset protection and community warnings. Local knowledge was used to good advantage in the Bunyip fire, where a local CFA captain was assigned to help the team preparing the operational plan by 'providing local knowledge of the area'. In contrast, a greater appreciation of local conditions could have been of benefit in the Churchill IMT. The importance of local knowledge was also highlighted by Mr Ewan Waller, who noted that the issuing of warnings requires not only accurate predictions of the run of a fire but is also dependent on 'local knowledge'.[92]

The existing AIIMS structure does not specify that an IMT include people with knowledge of the area in which the incident is occurring. Indeed, in a level 3 fire it is likely that personnel will have been drawn from across a region or even from elsewhere in the state. The Commission considers local knowledge to be invaluable to IMTs in relation to both operations and community warnings.

DSE and the CFA should modify the AIIMS incident management structure to require that IMTs for level 3 incidents include an individual whose function is to advise on local matters. This role could be incorporated in the Planning, Operations or Information Units but should be responsible for advising generally wherever local knowledge is required. For incidents below level 3, DSE and the CFA should emphasise the value of local knowledge and give the Incident Controller discretion to appoint a local adviser if required. Ensuring the incorporation of local knowledge in an IMT does not necessarily require a separate position, but if the IMT consists predominantly of personnel drawn from outside the local area the Incident Controller should appoint a dedicated local adviser.

RECOMMENDATION 14

The Victorian fire agencies amend the AIIMS framework before the 2010–11 fire season in order to do the following:

- designate the Information Unit as a separate section reporting directly to the Incident Controller and require that the Information Unit contain a dedicated Public Information Officer whenever a full incident management team is required
- specify a set of functions in relation to which the Deputy Incident Controller for a level 3 incident will have oversight, which may be adjustable for a particular incident by agreement between the Incident Controller and the Deputy Incident Controller
- ensure that an individual with local knowledge is incorporated in an incident management team.

The Commission is conscious that AIIMS is a nationally adopted standard for emergency services. The Commission's recommendations focus on the use of AIIMS by Victorian fire authorities and the changes proposed are aimed at remedying weaknesses exposed by the 2009 bushfires. They may well have a wider relevance to authorities elsewhere in Australia, but that is a matter for those authorities. At a general level, the Commission supports the adoption of common terminology and operational practices among fire agencies. This brings considerable advantages when during major emergencies support is provided by personnel moving between states and territories. In this way the national capability is strengthened.

2.7 INFORMATION SHARING ON 7 FEBRUARY

Information gathering, analysis and subsequent distribution are vital functions of incident management teams. Information about a fire comes from various sources, among them spot fire weather forecasts, predictive maps, air reconnaissance and reports from the fireground. This information needs to be provided to the IMT while it is still current and to be distributed, with appropriate analysis, within the IMT and externally to support agencies and the community. An effective flow of information is crucial to the IMT's ability to formulate a strategy for managing community protection, fire response and firefighter safety.

Some IMTs managed this function well on 7 February. Efficient gathering and sharing of information by the IMT for the Redesdale fire enabled the IMT to develop a suitable firefighting strategy and to deliver timely community warnings. Other IMTs were hampered by a lack of information or failed to analyse and make use of the information that was available. The Alexandra IMT lacked information on which to base planning and decision making for the Murrindindi fire: information that should have been provided was not; information that should have been sought was not sought; and information that was available was not analysed or used effectively.

The IMTs that functioned well on 7 February were able to use and interpret incoming information, convert information into 'intelligence' in order to develop a strategy, and document the information in summary form so that it was understood up and down the chain of command. In contrast, IMTs that were characterised by poor preparation, inadequate numbers of level 3–trained officers and under-qualified Incident Controllers generally demonstrated poor information flows to and from both the field and the integrated Emergency Coordination Centre.

The link between effective information flows and safety also warrants emphasis: in general, those fires where the IMTs were unsuccessful in managing information flows were also the fires that resulted in fatalities and exposed firefighters to greater danger.

Examples of IMTs' collection, dissemination and use of information are provided in Part One of Volume I. In summary, the fires of 7 February revealed deficiencies in the sharing of information between the integrated Emergency Coordination Centre and incident control centres, within some IMTs, between some IMTs and the fireground, and between some IMTs and municipal emergency coordination centres.

The Commission notes in particular the failures in information flow from the iECC to ICCs. Specialists trained in weather forecasting, fire behaviour analysis and predictive mapping were at the iECC, and yet for some fires these capabilities were not made use of or in some cases even known about. The Incident Controllers for both the Murrindindi and Kilmore East fires were not aware that the iECC could have offered predictive mapping assistance. Similarly, the Churchill Incident Controller was not aware that Bureau of Meteorology forecasters were at the iECC. Fire agencies should ensure that all IMT personnel are aware of the services that can be provided by the iECC (now the State Control Centre).[93]

2.7.1 INFORMATION SHARING: INCIDENT ACTION PLANS

An incident action plan is one of the primary tools available to an IMT to improve information flows and help with the development of a strategy for fire management based on information available to the Incident Controller.

The AIIMS manual states, 'An Incident Action Plan should provide critical information to users to enable them to do their job. Lack of information may compromise safety and hinder efficiency'. Under AIIMS, an incident action plan must be approved by the Incident Controller.[94]

On 7 February Joint Standard Operating Procedure J3.03 governed the development of an incident action plan during an integrated response to an incident. It provided that responsibility for incident planning rested with the Planning section of an IMT, that an incident action plan must be prepared for all incidents and that the plan be based on the following priorities:

- safety of incident personnel
- protection of members of the community
- protection of critical infrastructure and community assets
- aggressive first attack on new outbreaks of fire
- protection of conservation and environmental values.[95]

SOP J3.03 did not stipulate a time frame within which the incident action plan should be developed, but it did note that during the first-attack phase the incident action plan could simply be recorded in a log, whereas any incident progressing 'beyond extended first attack' required a formal incident action plan.[96]

The Commission recognises that it is extremely difficult to produce an incident action plan during the first shift or the early stages of a fast-running fire. One of the reasons for this difficulty is that the incident action plan, in its complete form, is a complex document that has attached to it a number of maps and can be up to '70 or 80 pages long'.[97]

Nevertheless, in the stressful environment of a level 3 incident the development of an incident action plan operates as a trigger to ensure that important aspects of fire management are taken into account. The absence of a written plan could mean that important matters requiring the Incident Controller's consideration are neglected.[98]

Before 7 February fire agencies were aware of the difficulty of developing an incident action plan in the early stages of a fire as a result of being overrun by events or suffering from 'data overload'. They had sought to implement the abridged incident shift plan in order to limit the difficulties. Despite the challenges of 7 February, some IMTs were in fact able to produce a documented plan.[99]

The incident action plan summary developed for the Redesdale fire used the incident action plan summary template DSE had created. This template provided a concise format to document essential information necessary to communicate a strategy for managing the fire. Anyone reading the summary developed for the Redesdale fire could quickly ascertain where the fire was, where it was travelling, the towns it was near, and the Incident Controller's objectives. The IMT for the Redesdale fire was first notified of the fire at about 3.11 pm; the incident action plan summary was produced at 5.46 pm, about two-and-a-half hours later.[100]

In the Commission's view the DSE incident action plan summary is a useful template for all IMTs. The CFA and DSE should ensure that the template is readily available in all incident control centres by including it in the online IMT Tool Box available through the CFA and DSE internal websites.[101]

The IMTs managing the Beechworth–Mudgegonga, Bendigo, Churchill, Kilmore East and Murrindindi fires did not produce an incident action plan, incident action plan summary or incident shift plan on 7 February 2010.[102] Of those fires, all but the Beechworth–Mudgegonga one are criticised by the Commission for poor incident management (see Part One of Volume I).

Neither of the IMTs managing the Kilmore East and Murrindindi fires had pre-positioned level 3 Incident Controllers, and each IMT fell short of constituting a full IMT (14 people as at 7 February).[103] Many of the functional leaders within those IMTs lacked level 3 qualifications for the roles they were performing.[104] In such circumstances preparing an incident action plan is even more difficult.

In contrast, the Redesdale IMT had a number of characteristics that facilitated exemplary management of that fire and enabled the IMT to develop an incident action plan summary within only two-and-a-half hours of being notified of the fire:

- The team was staffed with level 3–qualified personnel from both fire agencies. In particular, all functional units were led by experienced and properly qualified personnel.

- Members of the team were familiar with each other and aware of each other's skills and experience, and key staff had worked together previously.
- Members of the team did predictive work before and after the fire began in order to plot the expected path of the fire and identify vulnerabilities.
- The team was pre-positioned such that when the fire broke out the team could react instantly.
- The team had a pre-planned trigger for assuming control of the fire: if crews were unable to control the fire within 30 minutes the IMT would take over management of the fire.[105]

The team's level of planning and preparedness allowed it to operate effectively on the day and is the level at which all IMTs must be prepared in future. This, in conjunction with the initiatives introduced by the fire agencies since 7 February 2009, will facilitate the vital task of gathering, analysing and disseminating information in relation to bushfires.

2.7.2 INCIDENT ACTION PLANS: THE WAY AHEAD

On 3 February 2010 the CFA and DSE approved a revised joint standard operating procedure for incident action planning.[106] Revised SOP J3.03 requires the production of a written incident action plan for a level 2 or 3 incident as soon as practicable but 'generally within four hours' of an incident appearing to progress beyond 'extended first attack'.[107] It also requires that, at a minimum, the incident action plan consist of a summary of incident objectives and primary risks and attach an incident map, communications plan and incident structure chart. The incident action plan is to be developed with reference to input from ground commanders, available local knowledge, any relevant township protection plans, and the location of any designated 'neighbourhood safer places' that are likely to be threatened. The plan must be communicated to personnel at the incident.[108]

The Commission supports the idea of having a defined time frame in which an incident action plan must be produced but considers that linking the time frame to the concept of extended first attack could create confusion and ambiguity. Instead, the requirement should be for an incident action plan summary to be produced within four hours of reported ignition.

It should also be mandatory for the incident action plan summary to be provided to the State Control Centre (and to the relevant Area of Operations Command Centre if established) since this would help senior fire agency personnel maintain their oversight of IMTs and fulfil their leadership responsibilities. If an incident action plan summary has not been provided for an incident within four hours, that would be a clear sign to those at the higher levels that an IMT might not be functioning effectively.

Both the CFA and DSE are working on finding better ways of gathering data and turning it into usable information. Examples are technology for automatic vehicle location and an updated portable IT field kit with geospatial capability, which could collate data and send it to an ICC in the form of a map or footage.[109] The Commission encourages these and other similar initiatives.

RECOMMENDATION 15

The Country Fire Authority and the Department of Sustainability and Environment:

- amend their procedures to require that an incident action plan summary be completed within the first four hours of an incident being reported and be provided to the State Control Centre and, where established, to the relevant Area of Operations Control Centre
- adopt DSE's incident action plan summary as the template to be used by all incident management teams and ensure that the template is included in the online IMT Tool Box
- provide regular training to IMT staff, highlighting the importance of information and reinforcing the support available from specialists within the State Control Centre.

2.8 AGENCY INTEGRATION

2.8.1 THE INTEGRATED EMERGENCY COORDINATION CENTRE

As noted, the CFA's and DSE's state-level functions were exercised on 7 February from the integrated Emergency Coordination Centre in Melbourne. Also present were representatives of many other agencies, among them Victoria Police, the MFB, the Department of Human Services, Networked Emergency Organisation partners (Parks Victoria, the Department of Primary Industries and Melbourne Water), the Bureau of Meteorology, Ambulance Victoria, the Office of the Emergency Services Commissioner, Victoria State Emergency Service, SP AusNet and Telstra—in all, about 200 people from nearly 30 agencies.[110] The Commission discussed the history of the iECC and made some preliminary comments about its operation on 7 February in its interim report.

Mr Ewan Waller described the benefits of the iECC as being 'effective strategic level planning and coordination … enhanced information sharing … and quicker decision making'.[111] True integration, however, was not achieved in practice. The CFA and DSE operated according to separate standard operating procedures, using separate technology systems and in many cases doing the same things. Apart from the State Air Desk, which is a joint operation of the CFA and DSE, other iECC functions continued to be performed by both agencies in separate units; these units were at best cooperative but more often they operated independently.

The Commission identified a number of shortcomings in the logistical operation of the iECC, including in relation to the location of various units, security procedures, deficiencies in systems and technology, and duplication in connection with weather forecasts and media releases and requests for resources. Some of the problems identified might be attributable simply to the fact that the 2008–09 fire season was the first in which the iECC had operated. Mr Gregory Paterson of the CFA said that on the 'blow-up day' of 7 February the individual agencies 'went back to our level of training … and [CFA] went back into our cell and DSE went back into their cell and we'd come together for five or 10 minutes'.[112] Nevertheless, the new model of co-location did deliver substantial benefits for interagency communication and coordination.

Since 7 February the emergency services agencies have adjusted the physical layout of the iECC, upgraded its communications systems, developed joint standard operating procedures to govern its operations, and renamed the facility the 'State Control Centre'—a name favoured by Chief Commissioner of Police Mr Simon Overland because it emphasises that the centre's function is 'control' and not 'coordination'.[113]

Although there were obviously problems with the operation of the iECC on 7 February, it is of note that the overwhelming majority of people who worked from the centre on the day thought the consequences of the fires would have been far worse had the agencies not been positioned together at the iECC.[114] The Commission agrees that the iECC represents an important step in achieving a more coordinated approach to emergency management and response at the state level. Taking into account the changes that have been implemented since 2009, the Commission supports continued use of the iECC—with its new name, the State Control Centre—to achieve an integrated approach to emergency management.

2.8.2 A LACK OF INTEGRATED SYSTEMS

The Commission identified a number of systems that effectively reinforced single-agency approaches. Among them are mapping, global positioning and fire prediction.

Mapping

Fire agencies use maps in all aspects of emergency management—prevention, preparation, response and recovery.[115] Good mapping systems, as well as effective sharing of the available spatial information, are particularly important in responding to fires and in incident management. The maps fire agencies use range from the hastily sketched map on the bonnet of a vehicle to the well-thumbed spatial vision VicMap books kept in a fire truck and fire-prediction maps produced through computer modelling of fire behaviour.[116]

Victoria has a well-established spatial information strategy within DSE, and VicMap is a central component of this.[117] VicMap is a digital geographic information database that is continually updated. It uses data from a wide range of sources and is available to Victorian government agencies, local government and the private sector.[118] At present DSE has free access to the VicMap database, while the CFA pays an annual licence fee.[119] The Commission cannot see any justification for charging the CFA (and other emergency response agencies) for publicly owned data essential to CFA operations: the CFA should have access to the VicMap database on the same basis as DSE.

DSE uses FireMap, a mapping system accessed through FireWeb (DSE's primary source of integrated fire management information) to create and view maps. FireWeb offers weather information, incident support, IRIS (Incident Resources Information Systems) and mapping. FireMap is used to create and view maps. It was built using the suite of GIS software used by the CFA and is a networked service that, like FireWeb, is available to DSE, Networked Emergency Organisation members and CFA personnel.[120]

FireMap was designed to be a single source for map-based fire information but was not based on VicMap data. The CFA uses two systems—ArcGIS and, in response to difficulties with achieving and maintaining proficiency when using this complex software, EIMS Mapper. Both systems use VicMap data, so that data entered into one application can readily be exported to the other.[121]

The operational requirements for EIMS Mapper were that it should be able to operate both in the CFA's 'tin shed' brigades without an internet connection and in a sophisticated technical environment.[122] EIMS Mapper is designed to work during the initial bushfire attack before specialised GIS support can be provided and uses VicMap books as the basis for all mapping.[123] The CFA trialled EIMS Mapper during the 2008–09 fire season and it performed well under pressure.[124] The system was rolled out across the CFA in the 2009–10 fire season.[125]

The CFA, DSE and other emergency services personnel also distribute the spatial vision VicMap books to operational staff. The VicMap books consist of a series of five hard-copy regional map books covering Victoria. The books used on 7 February 2009 contained numerous errors.[126] Although the Commission did not hear evidence that any firefighters were endangered or unduly delayed in responding because of these errors, it notes that such inaccuracies create obvious and concerning risks for firefighters and other emergency services personnel. Despite this, the Commission accepts that there is a satisfactory process for continuing improvement and updating of the VicMap database.

The Commission considers it crucial that adequate systems exist for the CFA and DSE to automatically share fire mapping information. Despite the fact that the CFA and DSE use different systems, the systems are interoperable in that both use the same software and the VicMap database. The Commission notes, however, that although the systems are capable of exchanging spatial data, it is vital that formal arrangements exist for integrating the two systems.

As the 2008–09 fire season approached, the CFA and DSE mapping teams had agreed how they would support the integrated Emergency Coordination Centre and, through this, field operations.[127] The main features of their agreement were as follows:

- integrating wherever possible with mapping tasks and map production
- VicMap data being loaded into DSE's FireMap before the season, so that CFA users had a familiar mapping background
- EIMS Mapper being installed on a DSE mapping computer
- the CFA using FireMap to map fires during the fire season.[128]

Most of the actions identified in this agreement failed to materialise. DSE did not load VicMap data onto FireMap and, although all CFA Mapping Unit staff had 'write' access to FireMap, they produced most of their maps using their own system, ArcGIS.[129]

DSE and the NEO have more than 3,700 registered FireMap users, and this led to huge demand on 7 February. Within the CFA, FireMap is available for viewing by all with access to the CFA's network, but only a limited number of CFA staff had write access, enabling them to add data about a fire to FireMap.[130] The huge demand on 7 February resulted in the Fire Systems Duty Officer having to restart the system a number of times.[131] The result was that FireMap was unavailable for a total of about 25 minutes. DSE has since upgraded the server infrastructure so that FireMap can now handle the level of demand experienced on 7 February.

There were also numerous instances on 7 February when useful spatial information was not available to the relevant incident management team or between the CFA and DSE. In particular, crucial prediction, situation and line scan maps for the Kilmore East, Murrindindi and Coleraine fires—which were available at the integrated Emergency Coordination Centre or the Regional Emergency Coordination Centre—failed to reach the relevant incident control centres and Incident Controllers either at all or in time to be of any use.[132]

Further, there was wide variation in the IMTs' mapping capabilities. For example, the Epsom ICC had several people in the Planning Unit who could produce both status and prediction maps for the Redesdale fire, yet the nearby Adam Street ICC lacked the range of paper maps it required to manage the Bendigo fire and had to obtain these from the Epsom ICC.[133] The ICCs for the Coleraine and Bunyip fires had good mapping capability, while the Traralgon IMT had adequate mapping capability but lacked vital wind change information and so did not factor this into the fire prediction maps.[134] The Kilmore ICC did not have internet access to enable staff to view available mapping products when managing the Kilmore East fire, and a power failure prevented the Beechworth IMT from using its computer mapping facilities.[135]

These differences in mapping capability highlight the importance of properly preparing facilities, communications and personnel to produce and share vital information within and between IMTs, fire agencies and broader statewide support resources.

The organisations' respective mapping teams have since reached a new agreement, documented in a memorandum dated 16 October 2009, that provides guidelines for integrating the various mapping tasks and map production.[136] An important step has been to incorporate the VicMap books in FireMap. The agreement specifies that CFA and DSE mapping teams use EIMS Mapper, FireMap and ArcGIS for iECC (now State Control Centre) and ICC mapping.[137] The agreement requires the CFA and DSE to incorporate all mapping data in FireMap, so that data are readily accessible to all agencies statewide, and that they provide incident action plan maps and media maps using FireMap where possible.

FireMap is also now used in the One Source One Message tool, which provides a geographical map–based interface to identify the area where a fire is expected to burn and generates a list of towns and localities in the area so that warnings can be issued.[138]

These arrangements will result in better integration of the two systems and should be formalised in a joint standard operating procedure before the 2010–11 fire season. To fully implement the guidelines, mapping personnel in each agency need to be more familiar with the mapping systems of the other agency. The CFA should give priority to greatly increasing the number of personnel who have 'write' access to FireMap and, where required, upgrade the ICC computers and internet facilities to enable reliable access. Until this happens there will be double-handling of spatial information, which inevitably creates inefficiencies and delays in sharing vital information.[139] This situation should be resolved by the development and delivery of a joint training program for mapping unit personnel from the CFA, DSE and the NEO to ensure that these people can successfully operate the mapping systems of both agencies.

RECOMMENDATION 16

The Country Fire Authority and the Department of Sustainability and Environment improve mapping support in the following ways:

- DSE providing mapping data free of charge to emergency response agencies
- greatly increasing the CFA's 'write' access to FireMap for incident management team staff
- establishing a joint DSE–CFA training program to ensure that mapping officers in level 2 and 3 incident management teams are fully trained in using FireMap, including in producing fire prediction maps
- requiring before the 2010–11 fire season that FireMap be used for joint incidents.

Global positioning systems

There is in the CFA no organisation-wide approach to harnessing fireground spatial data using global positioning systems. GPS units are not currently issued to brigades and are not standard equipment on CFA appliances, and no single unit or range of units is recommended.[140] Some CFA brigades have bought their own GPS units.[141] In contrast, DSE issues the same makes and models of GPS units to all operational staff. This means training and data uploaded into the units can be standardised across the organisation.[142] Until the CFA equips all its appliances with GPS units, the CFA should give its personnel guidance on the most suitable makes and models of GPS units and advice about configuring the units to record data in a format that can be imported into the CFA's mapping systems. Although maintaining far fewer brigades than the CFA, Hancock Victorian Plantations, provides GPS and automatic vehicle location systems to all its firefighting appliances: this should be a goal for both DSE and the CFA.

Although it is desirable that the CFA equip all its appliances with GPS units as soon as possible, the Commission acknowledges the work being done by the Department of Justice to develop and implement a statewide cross-agency communications framework.[143] The type of GPS unit the CFA chooses needs to be capable of interfacing with the data communications systems used by other agencies, and ensuring such interoperability could extend the time frame for use of GPS capability to all CFA appliances. This is discussed in Chapter 3.

Fire prediction

On 7 February 2009 FireMap did not offer templates, so maps produced by fire behaviour analysts were hand drawn, unavailable in FireMap, and could not easily be shared with incident management teams.[144] As noted in the Commission's interim report, the maps were not easily shared—even in the integrated Emergency Coordination Centre. This situation has now been rectified.

During the 2009–10 fire season DSE tested the Phoenix RapidFire simulation model developed by Dr Kevin Tolhurst of the University of Melbourne. The model calculates potential fire spread on the basis of topography, vegetation, fire history and forecast weather.[145] When a fire is reported and the details are entered into the agencies' incident management systems, Phoenix RapidFire is triggered to automatically generate a simulation producing maps showing the predicted hourly fire spread, flame height and ember spread.[146] Although DSE is still formally evaluating the model, the Commission commends it for conducting the trial.

2.9 FACILITIES FOR INCIDENT MANAGEMENT AND COORDINATION

2.9.1 INCIDENT CONTROL CENTRES

The ICC facilities from which level 3 IMTs operated on 7 February 2009 were in some cases deficient. Debriefing after the fire season revealed that some facilities did not have suitable 'space, power, and telephone and internet connections to rapidly serve as ICCs for large and fast moving fires'. The Kilmore and Adam Street (Bendigo) ICCs stood out in the evidence as having been ill-equipped for their roles as level 3 ICCs. Problems with communications systems had a particularly big impact; they are discussed in Chapter 3.[147]

In its interim report the Commission recommended that pre-designated level 3 ICCs be properly staffed and equipped to enable immediate operation in the event of a fire on a day of high fire risk. The State allocated $28 million to the CFA and DSE in 2009–10 to upgrade the equipment in level 3 ICCs and divisional command points to common minimum standards. The CFA and DSE identified 43 pre-designated level 3 ICCs and adopted joint minimum standards, including in relation to accommodation, networks, IT systems, and radio and telephone equipment. The ICC upgrade project is scheduled for completion by 30 June 2010; the Commission urges compliance with this time frame.[148]

2.9.2 MUNICIPAL EMERGENCY COORDINATION CENTRES

A municipal emergency coordination centre is a facility where municipal resources for supporting emergency response, relief and recovery are coordinated. Liaison between personnel at MECCs and incident control centres is essential for ensuring the timely activation of relief and recovery arrangements. MECCs and ICCs have traditionally

been established in separate locations, and on 7 February communication between the facilities was at times inadequate or delayed. This is covered in Part One of Volume I.

During the Bunyip fire, however, the MECC was located alongside the ICC at the Police and Emergency Services complex in Pakenham. This facilitated communications between the centres, allowed MECC personnel to easily attend ICC briefings, and ensured that the MECC was able to maintain an overview of the emergency response.[149] The co-location worked well. Municipal councils and the fire agencies should consider co-locating MECCs and ICCs in designated level 3 ICCs to gain the benefits of improved interagency communications in the future.

2.9.3 LEVEL 3 INCIDENT CONTROLLERS

On 7 February not all designated level 3 ICCs were properly staffed before the outbreak of fires and not enough qualified level 3 Incident Controllers were appointed and pre-positioned. The Commission accepts that each Incident Controller appointed on 7 February worked hard and tried to satisfy onerous responsibilities, but an examination of the shortage of level 3 Incident Controllers on the day revealed serious problems in the selection, training and accreditation processes for these officers.

There are important differences between the DSE system of accreditation (which involves formal assessment of a candidate against known criteria) and the CFA system of endorsement (involving the nomination or approval of a person to perform a particular role).[150] Since both agencies provide members for joint IMTs, it is highly desirable that there be uniformity in selection, to ensure that each Incident Controller, regardless of their agency, has a similar level of experience and competence.

DSE accreditation

DSE accreditation of level 3 Incident Controllers involves staff volunteering to progress from operational firefighter to Incident Controller level 1, 2 and 3. Historically, the full progression from firefighter to level 3 Incident Controller has taken 20 to 24 years, but recent opportunities to gain experience more rapidly, through overseas deployments and attending a greater number of fires have led to this period being reduced.[151] To qualify as a level 3 Incident Controller in DSE, the aspirant must be both assessed and accredited. Since 2006 DSE personnel seeking to move from level 2 to level 3 accreditation have taken the following pathway:[152]

- Staff who satisfy the full prerequisites for the role are nominated by an area manager and nominations are assessed by a nominations panel.
- Nominees undergo psychometric testing to determine their suitability for demanding and stressful roles. The results of this are fed into a development plan.
- Candidates maintain a 'work book', listing incidents they believe demonstrate their experience and knowledge.
- Candidates present a summary of their relevant experience. This includes up to three incident action plans for which the candidate has been responsible, extracts from logbooks, peer testimonials, lists of simulation exercises and leadership courses completed, and their development plan.
- Candidates are interviewed and assessed by a panel, and the assessments are validated by the Chief Officer.
- Candidates who do not meet all assessment criteria are required to undergo additional scenario-based training.

This accreditation process is both rigorous and thorough and would be suitable for use by both DSE and the CFA.

CFA endorsement

The CFA's approach to level 3 qualification is as follows:[153]

- Both career and volunteer personnel wishing to take on an IMT role must participate in a series of five AIIMS courses—in total, 145 hours of instruction and 60 hours of study.
- The Chief Officer annually endorses members to perform the roles of Incident Controller and Operations, Planning and Logistics Officers for level 3 incidents. Endorsement is 'based on competencies, endorsements and experience and an assessment of the CFA member's aptitude for the role'.[154]

- In practice, endorsement of IMT personnel occurs on the recommendation of operations managers.[155]
- The endorsement of level 3 Incident Controllers is based on a candidate's performance in level 2 roles, their aptitude for the role, and previous exposure and mentoring at level 3 incidents.[156]

The CFA acknowledges that its existing endorsement process is subjective and lacks transparency.[157]

In 2006 the CFA participated in the 'Level 2–3 Transition Project' that led to the development of the DSE accreditation process.[158] The Commission was not told why the CFA did not adopt the same process, but the situation should certainly be remedied. A standardised and rigorous approach to accreditation on the part of both agencies would deliver considerable benefits in ensuring that Incident Controllers of high calibre are appointed.

Training and performance review

The accreditation process should also involve a dedicated training course for level 3 Incident Controllers. The emphasis should be on the skills and attributes, including leadership, that were identified in the Level 2–3 Transition Project as being desirable for level 3 Incident Controllers. In addition, the CFA and DSE should introduce a performance review system for level 3 Incident Controllers to allow for effective monitoring of performance and feedback to personnel and to provide opportunities for identifying areas for improvement and additional training for people needing assistance in the role.

The system needs to be introduced before the 2010–11 fire season. Further, the CFA must implement a system for recording the endorsement and accreditation of its staff and volunteers. The system should be arranged in such a way as to allow the location, qualifications and experience of the individual concerned to be easily identified and kept in a form (such as a secure online database) that is readily accessible to regional staff and area of operations controllers.

Appointment

The Commission stresses the intent of its recommendation in the interim report that Incident Controllers be appointed on the basis of experience, qualifications and competence, as opposed to the identity of the control agency. If accreditation is standardised across agencies, however, the requirement for the 'most experienced' person to be appointed should be replaced with a 'suitably experienced' person. This will ensure that recently accredited personnel are not denied the opportunity to further their experience. The Commission considers that the requirement for a suitably experienced, qualified and competent Incident Controller to be appointed, regardless of the control agency, should be made explicit in the revised joint standard operating procedure in relation to appointment of the Incident Controller.[159]

Although CFA Deputy Chief Officer Mr Haynes said that area of operations controllers and the State Controller would ensure that the most suitable person for the job was appointed to a level 3 Incident Controller position, DSE Assistant Chief Officer Mr Slijepcevic was of the view that incorporation of suitable wording in the joint standard operating procedure would reinforce the message.[160] The Commission shares this view.

2.9.4 VOLUNTEERS

On 7 February only 14 volunteer members of the CFA were endorsed to perform the role of level 3 Incident Controller without a mentor; this represents less than 0.1 per cent of the number of operational volunteers.[161] The Commission heard evidence that there are barriers to volunteer members filling positions in level 3 incident management teams, among them difficulties attending training for senior IMT positions and a cultural preference within the CFA for using career officers rather than volunteers.[162]

The Commission considers that volunteers, with their diverse work and personal backgrounds, can bring skills and experiences to the role of Incident Controller (and other senior IMT roles) that might be extremely valuable. The CFA should increase its efforts to ensure that training for senior IMT positions is made available to volunteers and that volunteers are considered for nomination in the Incident Controller accreditation process and, once accredited, for appointment as Incident Controllers for level 3 incidents.

2.9.5 TRAINEES

At present the appointment of a mentor is a central element of the CFA process for moving from being a level 2 to a level 3 Incident Controller. Yet the CFA does not have a formal mentoring program. Mr Haynes explained that in practice mentoring was organised by appointing individuals to deputy position roles. On 7 February, however, at least one Incident Controller was appointed to lead a level 3 IMT without having received any formal or informal mentoring, including operating as a deputy.[163]

DSE uses a variety of techniques it describes as mentoring—including shadowing, supervision and on-the-job training—but acknowledges that it does not have a consistent, structured mentoring program at the statewide level. The need for a formal mentoring system was pointed out in the 2002 report of the coronial inquiry into the Linton fires, and it is unacceptable that such a system had still not been implemented by the time of the 2009 fires. DSE and the CFA have now made a commitment to develop a formal, comprehensive mentoring program: such a program should be implemented as a matter of urgency.[164]

DSE commissioned Mr Bill van Bruggen, a forester and Type 1 (level 3–equivalent) Incident Controller from the United States, to prepare a report on training and mentoring.[165] Mr van Bruggen's draft report described the coaching and mentoring required for progression through specific fire roles in the US Forest Service. The approach there involves the use of 'work books' to record experience in a range of IMT positions and the appointment of personnel as trainees in various IMT positions before they are tested and accredited in the role. Mr van Bruggen noted that IMTs in the United States can have up to 25 per cent of their additional staff operating as IMT trainees.[166]

In view of the limited number of accredited level 3 Incident Controllers who could be removed from their operational role to become mentors, the Commission supports adoption of the traineeship approach described by Mr van Bruggen in preference to sole reliance on a mentoring scheme; in other words, train personnel before they are accredited rather than mentor them after the fact. Where sufficient personnel are available, mentoring might continue to be useful in further developing the skills of accredited personnel, but it should not be used as the primary pathway to accreditation.

The Commission also supports the use of work books for recording and then assessing a candidate's demonstrated aptitude in the skills required by a level 3 Incident Controller. Use of work books is already part of the DSE accreditation process, which the Commission considers should be adopted by both agencies.

RECOMMENDATION 17

The Country Fire Authority and the Department of Sustainability and Environment establish before the 2010–11 fire season:

- a uniform, objective and transparent process based on the current DSE approach for the accreditation of level 3 Incident Controllers
- a performance review system for level 3 Incident Controllers
- a traineeship program for progression from level 2 to level 3 incident management team positions.

RECOMMENDATION 18

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures to require that a suitably experienced, qualified and competent person be appointed as Incident Controller, regardless of the control agency for the fire.

2.10 ROADBLOCKS DURING THE 2009 VICTORIAN BUSHFIRES

Roadblocks play an important role in preserving public safety and facilitating appropriate and effective responses during a bushfire and in the immediate aftermath. They can also be established or maintained in the days and weeks following a bushfire because of continuing health and safety concerns or to facilitate investigation of a fire-affected area by emergency services personnel and police.

On 7 February 2009 and in the ensuing days and weeks more than 4,500 roadblocks—referred to by Victoria Police as 'traffic management points'—were established to regulate traffic flows on roads leading into and around fire-affected areas.[167] Full and partial road closures were instituted because of the presence of fires and burning vegetation and also because of the risk of trees falling onto roads and preventing access to the fireground. Roads were also closed in order to restrict access to a fire area where a death had occurred or where the cause of the fire was suspicious, pending a coronial investigation. The legislative basis for the closures can be found in Victoria's *Country Fire Authority Act 1958* and *Coroners Act 1985*.[168]

In its interim report the Commission recommended a review of the 2006 Guidelines for the Operation of Traffic Management Points during Wildfires, under which roadblocks were established on 7 February.[169] As a consequence of this, revised guidelines were issued in October 2009. This section further reviews the 2006 guidelines and looks at the new guidelines to see how they might be improved.[170]

Roadblocks and redirection of traffic can occur on the basis of the CFA Chief Officer's powers (generally delegated to Incident Controllers) to protect life or property where a fire is burning or has recently been extinguished.[171] Police officers also have power to close a road in the vicinity of a fire, as does a coroner investigating a fire.[172]

2.10.1 PREVIOUS CORONIAL FINDINGS

The findings of two coronial inquests—one in Victoria, which concerned the death of a father and son during the Grampians fire in January 2006, and one in Western Australia, which concerned the deaths of three truck drivers in the Boorabbin fire in December 2007, highlight the potentially fatal consequences of permitting access to areas in which bushfires are burning and the need to restrict road travel in order to protect life and maintain public safety.[173]

In the case of the Victorian inquest, there was a question as to whether s. 31(3) of the Country Fire Authority Act obliged police officers to allow people who had a pecuniary interest in property to pass through a roadblock in order to return to their property.[174] The Coroner ruled that s. 31(3)(a) of the Act gave police 'power to close a road irrespective of whether nearby property owners, who were claiming a pecuniary interest, wished to travel on the road.'[175] During the course of the inquest Victoria Police, the CFA and DSE prepared the 2006 guidelines.[176]

In the case of the Boorabbin inquest, the Western Australian Coroner was critical of the decision by an Incident Controller to remove a roadblock ahead of a predicted wind change and found that the roadblock's removal contributed to the deaths.[177] The Coroner recommended a review of the Western Australian Department of Environment and Conservation's ability to manage major fires.[178] In January 2008 an interagency review of the operation of road closures during bushfires was initiated.[179] A set of guidelines developed during the ensuing month was used during the bushfires in January 2009; the guidelines were based on the Victorian 2006 guidelines.[180]

2.10.2 THE 2006 GUIDELINES

The 2006 Guidelines for the Operation of Traffic Management Points during Wildfires provided for full and partial road closures. A full road closure could be activated by police officers on their own initiative or at the request of the Incident Controller; only 'responding fire agency personnel engaged in fire fighting operations on fire appliances' were permitted entry.[181] A partial road closure could be established only by the Incident Controller, who had discretion to authorise groups or individuals (including fire agency personnel travelling by car), utility providers, private firefighters, media and people with a pecuniary interest to travel through the roadblock and to apply conditions to such authorisations.[182] Victoria Police members at roadblocks did not have discretion to allow non-authorised people to pass a partial road closure.

Under the 2006 guidelines police officers at roadblocks could upgrade a partial road closure to a full road closure, but only the Incident Controller could downgrade a full road closure to a partial road closure.[183] The Incident Controller was responsible for communicating any changes to the conditions of entry at a roadblock to Victoria Police, the public, the municipal emergency coordination centre and VicRoads.[184]

The 2006 guidelines were communicated to police by means of a reference card entitled 'Traffic Management Points during Wildfires'. The substance of the guidelines was summarised by a catchphrase on the cover of the reference card—'If in doubt, keep them out'.[185] From the point of view of Victoria Police, the roadblocks established for the fires on 7 February 2009 saved lives. Many people tried to and did breach the roadblocks, however, and one former member of the CFA was later charged with assault-related offences.[186] Sergeant Mick Salter of Victoria Police acknowledged that the use of total road closures was often excessive and counterproductive and operated to prevent people attending with private units to mop up in the wake of the firefront.[187]

Roadblocks also caused frustration for, and added to the distress of, local residents. At times the roadblocks were ineffective because people familiar with the area were able to circumvent roadblocks to reach their desired destination. Additionally, local residents experienced inflexibility and inconsistency on the part of roadblock coordinators, exacerbating their frustration and distress.[188] Agencies involved in recovery also experienced problems with roadblocks: Mr Robert Anderson, the Manager of Operations for Goulburn Valley Water, which supplies water to Buxton, Marysville and Alexandra, reported that it was not until 9 February that staff were able to enter Marysville to start repairing damaged services and restore water.[189]

A number of systemic shortcomings emerged from the evidence relating to roadblocks for each of the fires on 7 February 2009:

- *Inflexibility.* In the days following the fires people who had left their homes ahead of the fire wanted to return and people who had stayed to defend their homes needed to leave to obtain supplies and to communicate with loved ones. Under the 2006 guidelines this was not possible while full road closures remained in place. There were also instances of services that were desperately needed in the early stages of relief and recovery being delayed by roadblocks—including ambulances and contractors attending to restore essential services.[190] Police staffing the roadblocks were placed in an invidious position.[191] A system of wristband identification was successfully introduced for residents and the providers of essential services in the areas affected by the Kilmore East and Murrindindi fires.[192]
- *Communication.* A consistent theme among many fires was poor communication between the incident control centre and the police responsible for traffic management.[193] In many instances police established road closures without directions from the Incident Controller.
- *Denying access to firefighters.* In several instances roadblocks delayed or prevented firefighters and private firefighting units from reaching the fireground.[194] Strict enforcement of the 2006 guidelines by police on 7 February was a cause of frustration and conflict between police and firefighters responding to the fires. Mr Robert McGennisken, a CFA volunteer who acted as a sector commander for the Horsham fire, witnessed several occasions when firefighters and private firefighting appliances were prevented from reaching or returning the fireground. He also noted the importance of private units in the Horsham fire-suppression efforts and that most of the CFA volunteer units that were confronted by roadblocks managed to get around them by using local knowledge.[195] This serves to emphasise the need for a way of identifying CFA volunteers so that they may pass through roadblocks to reach the fireground and for effective communication between an Incident Controller and police at roadblocks.

2.10.3 THE NEW GUIDELINES

Deputy Commissioner Walshe acknowledged that the 2006 guidelines needed some refinement. The Victoria Police internal debrief process in June 2009 also identified a need to review the guidelines.[196] After broad consultation, including with community groups, revised Guidelines for the Operation of Traffic Management Points during Wildfires were agreed by Victoria Police, the CFA, DSE and VicRoads and were issued in October 2009.[197] The 2009 guidelines are referred to in a new DSE–CFA Joint Standard Operating Procedure for Traffic Management during Bushfires.[198]

Deputy Commissioner Walshe pointed out three central differences between the 2009 guidelines and the 2006 ones:

- Greater clarity about the implementation and operation of full and partial roadblocks is provided.
- The span of responsibilities an Incident Controller has when managing a fire is acknowledged, and the Incident Controller is able to delegate responsibility for the establishment and operation of roadblocks and to be supported by a dedicated traffic management police liaison officer provided by Victoria Police.
- The wristband procedure developed in the Kilmore East and Murrindindi areas in the aftermath of the 7 February fires is formalised.[199]

The 2009 guidelines provide for a roadblock to be assigned one of four levels of restricted access.[200] Each level of access has explanations and authorisations. The most restrictive level can be used because of operational dangers and permits access to emergency services only. For the least restrictive level, access is managed by the relevant road authority—that is, VicRoads or the local council—until the roadblock is removed and the road is re-opened to the public.[201]

In addition, the statement of general principles at the start of the 2009 guidelines says:

> … circumstances may occur that require TMP [Traffic Management Point] Staff to make decisions outside of the procedures detailed in this document. In all cases, the safety of all people is paramount and TMP Staff are advised to contact their supervisor for direction or clarification where possible prior to permitting access.[202]

Guidance on the exercise of discretion is provided in a document entitled *Traffic Management Points (TMPs)—frequently asked questions*, available on the police intranet.[203] That document acknowledges that police have discretion to permit access through a roadblock and may exercise that discretion in appropriate circumstances.[204] This is an important change from the advice given under the 2006 guidelines—'If in doubt, keep them out.' The Commission welcomes Victoria Police's new emphasis on compassion and commonsense in the exercise of the discretion.

Proper implementation of the 2009 guidelines depends on the member of the incident management team with responsibility for traffic management doing several things:

- establishing effective communications with police who are staffing the roadblocks
- determining early in the response whether anyone other than fire agency personnel should be given access in order to fight the fire, then communicating that determination to police staffing roadblocks
- giving consideration to downgrading the status of a roadblock from Emergency Services Access Only as soon as possible after the fire has been contained.

Proper implementation is also dependent on police who instigate roadblocks establishing contact with the Incident Controller and seeking direction from that person as soon as possible.[205] The CFA and DSE have developed a Joint Standard Operating Procedure for traffic management during bushfires (SOP J3.10) that describes 'the procedure to be followed by all CFA and DSE members involved in traffic management during bushfires' and refers to the 2009 guidelines.[206]

Deputy Commissioner Walshe's evidence about the 2009 guidelines made it clear that the guidelines were designed to facilitate access where safety permits. This change in emphasis is in keeping with recommendation 10.5 in the Commission's interim report. It is disappointing to find that SOP J3.10 does not give any particular priority to facilitating access: it should be revised to require the CFA and DSE staff responsible to limit access for no longer than is necessary for public safety.

The 2009 guidelines do little to resolve the communication problems identified in the evidence.[207] They are more dependent on effective communication between the ICC and police responsible for traffic management than the 2006 guidelines because of the graduated levels of access introduced by the 2009 guidelines. Introduction of the ability of an Incident Controller to delegate responsibility for traffic management to another member of the incident

management team and Victoria Police's commitment to provide a dedicated liaison officer to deal with traffic management should result in a big improvement in communication between the ICC and police on roadblocks during large fires.

As to the access permitted firefighters, there is little difference between the 2006 guidelines and those developed in 2009. Only fire agency personnel engaged in firefighting operations on fire appliances have access through an Emergency Services Only Access road closure. Access for contractors and private units remains a matter for the Incident Controller. The 2009 guidelines provide for CFA personnel travelling in private vehicles to be given access on production of 'a form of CFA identification agreed to by Victoria Police and CFA', but when Deputy Commissioner Walshe gave evidence in late November 2009 no agreement on the arrangements for identifying CFA volunteers had been reached.[208]

Mr John Haynes, the CFA's Deputy Chief Officer, Operations Policy and Planning, told the Commission that identification cards are issued to volunteers in some regions and that, in the absence of an identification card, a volunteer's uniform or helmet should get them through a roadblock.[209] Reference to firefighting gear might be a commonsense fall-back measure, but it is not a sufficient response to the need for proper identification arrangements to help police at roadblocks identify CFA volunteers. It is the Commission's view that the CFA should issue to all operational and operational support volunteers an identification card or other similar document to facilitate their passage through roadblocks. The 2009 guidelines leave questions of access for contractors, other emergency services and essential services to be determined by the Incident Controller or a delegate.

2.10.4 THE CORONER

Roadblocks remained in position in the Marysville and Kinglake areas until about 21 March 2009 because of a Coroner's direction restricting access to those areas.[210] The 2009 guidelines provide that where the coroner invokes the power to restrict access to a geographical area, the roadblocks used to implement these restrictions will operate as Emergency Services Only Access roadblocks.[211] At present, changing this would be a matter for negotiation between Victoria Police and the Coroner, since the 2009 guidelines do not extend to the exercise of the coroner's powers under ss. 37 and 38 of the Victorian *Coroners Act 2008*.

Like Mr Walshe, the Commission agrees that the Coroner should be a party to the next revision of the 2009 guidelines, which should incorporate advice aimed at ensuring that any restriction of access is the minimum necessary.[212]

RECOMMENDATION 19

The Country Fire Authority provide to all CFA volunteers an identification card or similar to facilitate their passage through roadblocks established in accordance with the 2009 Guidelines for the Operation of Traffic Management Points during Wildfires.

1 Exhibit 11 – Statement of Esplin (WIT.005.001.0001) [184], [194], Attachment 63 (WIT.005.001.2363), Attachment 76 (WIT.005.001.2383)

2 Exhibit 32 – Tolhurst Report (EXP.003.001.0017) at 0030

3 Exhibit 151 – Report of the Board of Inquiry Into the Occurrence of Bush and Grass Fires In Victoria (TEN.058.001.0001) at 0016

4 As to directions for CFA preparedness: Exhibit 3 – Statement of Rees (WIT.004.001.0001) [303]; Exhibit 219 – Statement of Warrington, Annexure 2 (WIT.3004.011.0177) at 0179; Exhibit 595 – Statement of Owen (WIT.3004.031.0001) [65]–[66]. For DSE: Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) [275]–[276], Annexure 39 (WIT.002.001.0832); Exhibit 408 – Statement of Tainsh (WIT.3024.003.0353) [42], Annexure 2 (DSE.HDD.0012.1560), Annexure 3 (DSE.HDD.0032.0237); Slijepcevic T6365:19–T6365:23; Graystone T6045:9–T6045:15; Rees T1852:20–T1854:18, T2622:19–T2623:27

5 Creak T10857:26–T10858:3

6 Exhibit 309 – Statement of Fallon (WIT.3004.015.0001) [42], [127]; Fallon T7956:19–T7956:28

7 Speirs T7520:12–T7520:18, T7523:19–T7523:30, T7524:11–T7524:17

8 Exhibit 852 – Statement of Fontana (WIT.3010.010.0046) [22]–[32]; Exhibit 836 – Statement of Nixon (WIT.3010.009.0377) [27]–[30], Annexure 1 (WIT.3010.009.0390)

9 Exhibit 3 – Statement of Rees (WIT.004.001.0001) [303.6]–[303.7]; Exhibit 11 – Statement of Esplin, Attachment 57 (WIT.005.001.2350); Cameron T19745:7–T19745:10

10 Exhibit 701 – Joint SOP J2.03 (as at 7 February 2009) – Planning for Joint Incident Management Teams (DSE.USB9.0035.1602); Exhibit 3 – Statement of Rees (WIT.004.001.0001) [303.1], [325], [328]; Exhibit 595 – Statement of Owen (WIT.3004.031.0001) [65]–[66]; Exhibit 219 – Statement of Warrington, Annexure 2 (WIT.3004.011.0177) at 0179; Rees T1852:20–T1854:18, T2622:19–T2623:27

11 Exhibit 547 – Statement of Haynes, Annexure 32 (WIT.3004.027.0373)

12 Exhibit 547 – Statement of Haynes, Annexure 32 (WIT.3004.027.0373)

13 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [172]; Haynes T12036:6–T12036:24, T12016:17–T12017:11

14 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [78]; Exhibit 547 – Partnerships Guidelines (CFA.300.040.0007); Exhibit 547 – Heads of Agreement (CFA.300.040.0004); Molan T18756:8–T18757:3; 't Hart T19045:22–T19046:20

15 Exhibit 831 – Emergency Management Manual Victoria (RESP.3001.003.0001_R) at 0041_R–0043_R, 0051_R

16 Exhibit 11 – Statement of Esplin, Attachment 2 (WIT.005.001.0123) at 0176

17 Exhibit 197 – Statement of Conway (WIT.3004.011.0023) [7]; Rees T21:4–T21:19; Paterson T4313:16–T4313:24; Graystone T6108:9–T6108:25

18 Exhibit 836 – Instrument of Delegation (VPO.001.081.0096_R)

19 Exhibit 852 – Statement of Fontana (WIT.3010.010.0046) [65]–[71]

20 Exhibit 836 – Coordination Officer (VPO.001.081.0150); Nixon T17309:19–T17310:3

21 Exhibit 82 – Review of the Integrated Emergency Coordination Centre (iECC) Functionality, April 2009 (OESC.001.001.0031); Exhibit 205 – Statement of Ong (WIT.5102.001.0001) [11]–[19]; Exhibit 203 – Statement of Poll (WIT.5005.001.0001) [8]; Graystone T6079:17–T6079:21

22 *Country Fire Authority Act 1958*, s. 11; Exhibit 127 – Statement of Paterson, Annexure 1 (WIT.3004.010.0015)

23 Exhibit 127 – Statement of Paterson, Annexure 1 (WIT.3004.010.0015)

24 Exhibit 219 – Statement of Warrington (WIT.3004.011.0163) [6], [19]–[20]

25 Warrington T6669:3–T6669:9

26 Warrington T6676:18–T6676:25

27 Exhibit 730 – Statement of Harris (WIT.006.001.0001) [2]; Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [79]

28 Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) [19]; Waller T20639:26–T20639:30

29 Exhibit 210 – Statement of Brown (WIT.3024.002.0280) [12]; Exhibit 191 – Guideline 5.1.1 State Duty Officer Duty Statement (WIT.3026.001.0074) at 0074

30 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300); Exhibit 443 – Statement of Overland (WIT.3010.009.0229) [8]; Exhibit 443 – Command, Control and Coordination Arrangements for Emergency Management in Victoria (EXH.443.0001)

31 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300) at 0303

32 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300) at 0303–0304

33 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300)

34 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300) at 0303–0304, 0307–0308; *Emergency Management Act 1986*, s. 16

35 Exhibit 547 – Staffing, Training and Resourcing of IMTs and ICCs – PowerPoint presentation by Haynes and Slijepcevic (CFA.001.032.0338) at 0345

36 Overland T10052:2–T10052:14

37 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300) at 0309

38 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300) at 0324 (with annotations)

39 Exhibit 133 – Operations – Tactics and Administration in the Field Volume 1 (TEN.050.001.0008) at 0011

40 Exhibit 3 – Statement of Rees (WIT.004.001.0001) [25]–[34]; Exhibit 730 – Statement of Harris, Annexure 3 (WIT.006.001.0020); Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [67]–[68], [74]–[79], Annexure 10 (WIT.3003.002.0172); Exhibit 836 – Statement of Nixon (WIT.3010.009.0377) [19]

41 Exhibit 197 – Statement of Conway (WIT.3004.011.0023) [54]–[55]; Exhibit 127 – Statement of Paterson (WIT.3004.010.0001) [10]; Rees T22:12–T22:18; Conway T6199:19–T6199:26, T6184:25–T6185:4; Paterson T4299:5–T4299:7; Waller T4361:10–T4361:16, T4366:27–T4367:2

42 Exhibit 127 – Statement of Paterson (WIT.3004.010.0001) [28]–[29], Annexure 8 (WIT.3004.010.1057); Rees T2547:7–T2547:22, T19522:8–T19522:19; Conway T6190:1–T6190:12

43 Rees T19515:4–T19515:7, T2547:7–T2547:22

44 Rees T2536:20–T2537:21, T19530:21–T19530:26, T19532:31–T19533:1

45 Conway T6180:26–T6181:4, T6183:20–T6183:26, T6187:18–T6187:31; Paterson T4290:4–T4290:31, T4292:22–T4293:29

46 Waller T4354:12–T4354:16, T4360:4–T4362:8, T4363:17–T4364:10, T4366:27–T4367:2; Graystone T6050:29–T6051:3, T6094:25–T6094:30

47 Exhibit 828 – Statement of Duckmanton (WIT.3004.041.0056) [14.6]–[14.12]

48 Exhibit 151 – Report of the Board of Inquiry Into the Occurrence of Bush and Grass Fires In Victoria (TEN.058.001.0001) at 0154–0155; Exhibit 3 – Statement of Rees (WIT.004.001.0001) [234]; Exhibit 32 – Tolhurst Report (EXP.003.001.0017) at 0022

49 Exhibit 149 – Statement of Henshaw (WIT.3004.009.0096) [65]; Rees T19508:16–T19510:31; Waller T4359:29–T4361:4

50 As to the focus on 'strategic' and 'statewide' overview, see, for example, Exhibit 127 – Statement of Paterson (WIT.3004.010.0001) [10], [15]; Exhibit 219 – Statement of Warrington (WIT.3004.011.0163) [9]; Rees T2514:14–T2514:21; Conway T6256:12–T6257:1; Paterson T4253:27–T4254:1

51 Waller T4360:31–T4361:9; Rees T19530:8–T19530:19, T19552:25–T19552:26

52 Exhibit 11 – Statement of Esplin, Attachment 2 (WIT.005.001.0123) at 0176

53 Collins T2165:10–T2166:19

54 Nixon T17339:27–T17340:12

55 Exhibit 836 – Statement of Nixon (WIT.3010.009.0377) [34]–[42]; Nixon T17315:26–T17316:2, T17334:17–T17335:26, T17338:5–T17338:23, T17351:7–T17351:17, T17702:17–T17702:30

56 Nixon T17334:24–T17334:31, T17351:27–T17351:29

57 Exhibit 836 – Statement of Nixon (WIT.3010.009.0377) [44]; Exhibit 836 – Calls to/from Nixon (TEN.259.001.0001); Nixon T17668:18–T17669:30, T17671:17–T17672:10, T17681:22–T17681:23

58 Exhibit 836 – Calls to/from Nixon (TEN.259.001.0001); Nixon T17670:8–T17670:29

59 Nixon T17673:16–T17673:24

60 Exhibit 836 – Instrument of Delegation (VPO.001.081.0096_R); Exhibit 836 – Version No.040 – *Emergency Management Act 1986*, (TEN.254.001.0001) at 0014: see further *Emergency Management Act 1986*, s. 12; Exhibit 899 – Supplementary Statement of Walshe (WIT.3010.010.0124) [20]–[21], [27]; Walshe T18802:18–T18803:13, T18813:26–T18814:2, T18818:22–T18819:23

61 See generally, Exhibit 852 – Statement of Fontana (WIT.3010.010.0046); Fontana T17605:3–T17668:10

62 Nixon T17682:27–T17683:3

63 For inaccuracies/incompleteness, compare: Nixon T17353:15, T17355:31–T17356:15 with T17668:18–T17669:11, T17681:14–T17681:23; also compare Exhibit 836 – Statement of Nixon (WIT.3010.009.0377) [44]; Nixon T17296:26–T17297:10 with Exhibit 836 – Calls to/from Nixon (TEN.259.001.0001); Nixon T17694:24–T17696:9. As to reasons for inaccuracies/incompleteness, see: Nixon T17345:24–T17345:29, T17701:2–T17701:6, T17678:29–T17679:8

64 Submissions of Counsel Assisting – Leadership, Emergency Management, Coordination, Command and Control (SUBM.1000.002.0001) [10.155]–[10.178], [15.6]; Submissions on Behalf of Christine Nixon (RESP.7512.001.0001) [7]–[39]

65 Nixon T17708:7–T17708:19, T17689:12–T17689:22

66 Nixon T17317:6–T17317:22, T17319:30–T17320:4

67 Exhibit 836 – Calls to/from Nixon (TEN.259.001.0001)

68 *Emergency Management Act 1986* (Vic), ss. 5, 6, 10

69 *Emergency Management Act 1986* (Vic), ss. 8, 9; Exhibit 11 – Statement of Esplin, Attachment 2 (WIT.005.001.0123) at 0218

70 Cameron T19709:10–T19709:16, T19763:5–T19763:19

71 Exhibit 948 – VEMCCG Brief and Minutes, 5 February (SOV.001.001.0108); Cameron T19715:16–T19715:27, T19717:2–T19721:22, T19735:22–T19735:27

72 Cameron T19750:29–T19751:30

73 Exhibit 836 – Calls to/from Nixon (TEN.259.001.0001); Nixon T17694:17–T17696:15; Cameron T19713:15–T19713:18, T19722:3–T19723:3, T19736:26–T19736:28; Walshe T18822:26–T18822:28; Fontana T17639:12–T17640:9

74 As to the protocol: Exhibit 945 – Selected Incident Notification Documents (TEN.298.001.0010), (TEN.298.001.0007_R); Exhibit 946 – Bundle of Incident Notification Documents (TEN.298.001.0001), (TEN.298.001.0002), (TEN.298.001.0004), (TEN.298.001.0006), (TEN.298.001.0011_R), (TEN.298.001.0014), (TEN.298.001.0015), (TEN.298.001.0016_R), (TEN.298.001.0018_R), (TEN.298.001.0020_R), (TEN.298.001.0022); Esplin T18879:18–T18880:18, T18887:30–T18888:10. As to delays and inaccuracies in information, see for example, the 5pm Situation Report issued by OESC: Exhibit 11 – Statement of Esplin, Annexure 19 (WIT.005.001.1661) at 1749–1753; compared with state of knowledge of fire agencies – see for example: Exhibit 4 – Supplementary Statement of Rees, Annexure Volume 1 (WIT.004.002.0018) at 0332–0334; Esplin T371:9–T371:31, T364:2–T364:5

75 *Emergency Management Act 1986*, s. 24

76 Cameron T19739:21–T19739:27, T19742:4–T19743:11; Nixon T17354:25–T17355:7; Walshe T1210:11–T1210:24, T1245:19–T1245:23; Esplin T212:14–T213:24; Rees T2407:22–T2408:17

77 Cameron T19740:29–T19743:6; Nixon T17355:10–T17355:17; Esplin T18884:3–T18885:4; Rees T2408:18–T2409:8

78 *Emergency Management Act 2004* (SA), ss. 22–24

79 Exhibit 995 – US Mentoring Program Report (DSE.HDD.0158.0234) at 0235; Exhibit 443 – Command, Control and Coordination Arrangements for Emergency Management in Victoria (Overland presentation) (EXH.443.0001) at 0019

80 Exhibit 475 – AIIMS Manual (TEN.121.001.0001) at 0038–0046; Exhibit 127 – Statement of Paterson, Annexure 3 (WIT.3004.010.0281) at 0429–0432

81 Exhibit 350 – Statement of Beer (WIT.3004.016.0016) [63]; Exhibit 347 – Statement of Farrell (WIT.3024.003.0154) [28]; Exhibit 339 – Statement of Miller (WIT.3024.003.0093) [59]; Beer T8572:10–T8572:23, T8567:26–T8567:28, T8569:5–T8569:14; Miller T8327:25–T8327:26; Webb Ware T8227:2–T8227:8; Creak T8290:13–T8290:31; Rice T8524:22–T8525:17

82 Exhibit 456 – Statement of Smith (WIT.3004.020.0219) [22]; Exhibit 457 – Statement of Rogasch (WIT.3004.019.0362) [20]; Rogasch T10249:28–T10250:1; Smith T10232:31–T10233:16

83 Exhibit 475 – AIIMS Manual (TEN.121.001.0001) at 0058–0059

84 Rees T2420:15–T2420:18

85 Exhibit 443 – Command, Control and Coordination Arrangements for Emergency Management in Victoria (Overland presentation) (EXH.443.0001) at 0020

86 Waller T4381:18–T4382:22

87 Exhibit 854 – Statement of Beasley, Annexure 18 (WIT.3004.043.0288); Beasley T17869:31–T17870:6

88 Exhibit 547 – Statement of Haynes, Annexure 32 (WIT.3004.027.0373) at 0375; Beasley T17867:15–T17868:27

89 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report*, Parliament of Victoria, Melbourne, August 2009 [9.216]

90 Exhibit 584 – Statement of Nugent (WIT.3024.004.0268) [64]–[65], [71]–[75]; Exhibit 587 – Statement of Smith (WIT.3004.030.0001) [81]

91 Exhibit 584 – Statement of Nugent (WIT.3024.004.0268) [65], [71]–[75]; Exhibit 107 – Statement of Barca (WIT.3026.001.0001) [35]–[36], [39]–[40], [56]; Exhibit 452 – Statement of Deering (WIT.3004.019.0192) [36]–[37], [75]; Deering T10154:4–T10154:27

92 Exhibit 587 – Statement of Smith (WIT.3004.030.0001) [36]; Waller T139:2–T139:11

93 Murphy T1268:8–T1268:16; Lovick T8378:29–T8379:20; Lockwood T9237:25–T9237:30

94 Exhibit 475 – AIIMS Manual (TEN.121.001.0001) at 0027, 0088–0090; Beasley T17845:18–T17846:11

95 Exhibit 701 – SOP J3.03 – Incident Action Planning (as at 7 February 2009) (DSE.0034.0291.0316) at 0317

96 Exhibit 701 – SOP J3.03 – Incident Action Planning (as at 7 February 2009) (DSE.0034.0291.0316) at 0316; Beasley T17852:9–T17852:13

97 Exhibit 475 – AIIMS Manual (TEN.121.001.0001) at 0089; Beasley T17848:15–T17849:2; Esnouf T16698:21–T16698:31, T16703:10–T16703:14

98 Beasley T17850:6–T17850:18

99 Exhibit 854 – Statement of Beasley (WIT.3004.042.0001) [112.1]–[112.5], Annexure 14 (WIT.3004.043.0173), (WIT.3004.043.0176), (WIT.3004.043.0217), (WIT.3004.043.0224); Beasley T17861:1–T17861:6; Esnouf T16702:21–T16705:9

100 Exhibit 854 – Statement of Beasley (WIT.3004.042.0001) [75], Annexure 8 (WIT.3004.043.0044); Exhibit 854 – CFA Wildfire – Redesdale – Coliban Rd – Fire 81 (DSE.0045.0363.0019); Exhibit 452 – Statement of Deering (WIT.3004.019.0192) [36]

101 Exhibit 854 – Statement of Beasley (WIT.3004.042.0001) [85]

102 Exhibit 854 – Statement of Beasley, Annexure 12 (WIT.3004.043.0081) at 0081, 0083, 0086, Annexure 14 (WIT.3004.043.0139), (WIT.3004.043.0148), (WIT.3004.043.0158), (WIT.3004.043.0189), (WIT.3004.043.0197)

103 Exhibit 701 – SOP J3.03 – Planning for Joint Incident Management Teams (DSE.USB9.0035.1602) at 1603. Under the revised standard operating procedure endorsed on 17 November 2009, a full level 3 IMT consists of 30 personnel: Exhibit 701 – Incident Management Teams – Preparedness Arrangements (DSE.HDD.0082.0241) at 0244

104 Submissions of Counsel Assisting on the Kilmore East Fire (SUBM.202.004.0001) [2.4]–[2.8]; Submissions of Counsel Assisting on the Murrindindi Fire (SUBM.202.009.0001) [5.14]

105 Submissions of Counsel Assisting on the Redesdale and Bendigo Fires (SUBM.202.010.0001) [5.5]–[5.7], [5.9], [11.3], [11.5]–[11.7]; Deering T10155:1–T10155:9

106 Exhibit 542 – SOP J3.03 – Incident Action Planning (RESP.3001.018.0323)

107 Exhibit 542 – SOP J3.03 – Incident Action Planning (RESP.3001.018.0323) at 0323–0324. 'Extended First Attack Incident' is defined as 'A fire that has not been contained by initial attack resources'

108 Exhibit 542 – SOP J3.03 – Incident Action Planning (RESP.3001.018.0323) at 0324–0325

109 Exhibit 854 – Statement of Beasley (WIT.3004.042.0001) [128.1]; Beasley T17861:21–T17863:12

110 Exhibit 82 – Review of the Integrated Emergency Coordination Centre (iECC) Functionality, April 2009 (OESC.001.001.0031) at 0033

111 Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) [162]

112 Exhibit 82 – Review of the Integrated Emergency Coordination Centre (iECC) Functionality, April 2009 (OESC.001.001.0031); Exhibit 193 – iECC Debriefs (DSE.HDD.0030.0252); Paterson T4322:9–T4322:27

113 Exhibit 210 – Statement of Brown (WIT.3024.002.0280) [31]–[46], [69]; Overland T10052:2–T10052:14

114 Exhibit 82 – Review of the Integrated Emergency Coordination Centre (iECC) Functionality, April 2009 (OESC.001.001.0031) at 0035, 0039

115 Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [21]–[22]

116 Exhibit 853 – Supplementary Statement of Griffiths (WIT.3024.005.0332) [29]–[31], [38]; Exhibit 458 – Statement of Gilmore, Annexure 3 (WIT.3004.019.0043)

117 Exhibit 817 – Victorian Spatial Information Strategy 2008–2010 (TEN.248.001.0001); Exhibit 819 – Statement of Thompson (WIT.3024.005.0317) [7]–[8], [13], [33]; Thompson T16786:24–T16787:6, T16789:28–T16790:7

118 Exhibit 819 – Statement of Thompson (WIT.3024.005.0317) [9], [13]–[14], [20]–[29]; Thompson T16789:2–T16789:4, T16790:8–T16790:11

119 Thompson T16792:25–T16793:21; Garvey T16842:11–T16842:12

120 Exhibit 24 – Statement of Griffiths (WIT.018.001.0001) [10]–[12], [29]; Exhibit 853 – Supplementary Statement of Griffiths (WIT.3024.005.0332) [9]; Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [30]; Griffiths T17713:24–T17714:8

121 Exhibit 24 – Statement of Griffiths (WIT.018.001.0001) [28]; Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [33]–[35], [41], Annexure 4 (WIT.3004.034.0189)

122 Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [36]; Garvey T16826:17–T16827:3

123 Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [41]

124 Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [42]–[43]; Garvey T16835:6–T16835:16; Clelland T17137:30–T17138:12; Cowan T3735:22–T3736:14

125 Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [45]

126 Exhibit 336 – Statement of Rishworth (WIT.098.001.0001_R) [11], [14]–[15]; Attachment 3 (WIT.098.001.0026) at 0026–0027

127 Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [70], Annexure 7 (WIT.3004.035.0006); Garvey T16816:25–T16816:30

128 Exhibit 820 – Statement of Garvey, Annexure 7 (WIT.3004.035.0006); Garvey T16817:2–T16818:30

129 Exhibit 820 – Statement of Garvey, Annexure 7 (WIT.3004.035.0006); Garvey T16821:1–T16821:15, T16824:6–T16824:14; Griffiths T17718:21–T17719:14

130 There are a total of about 58 CFA staff with write access to FireMap, including a number of IT staff who do not do mapping work: Exhibit 24 – Statement of Griffiths (WIT.018.001.0001) [29]; Griffiths T17715:11–T17715:16; Garvey T16812:25–T16813:19

131 Griffiths T17726:19–T17726:31

132 Exhibit 345 – Statement of Steer (WIT.3024.003.0026) [48], Annexure 7 (DSE.HDD.0048.0041); Exhibit 340 – Statement of Lovick (WIT.3024.003.0001) [69], Annexure 7 (DSE.HDD.0052.0215); Exhibit 277 – Statement of Speirs (WIT.3004.014.0001) [165]–[166]; Exhibit 505 – Statement of Murphy (WIT.3004.021.0001) [78]; Murphy T1268:8–T1268:16; Steer T8483:7–T8485:19, T8493:17–T8494:7; Lovick T8379:2–T8380:17; Farrell T8509:3–T8510:3

133 Exhibit 452 – Statement of Deering (WIT.3004.019.0192) [66]; Exhibit 457 – Statement of Rogasch (WIT.3004.019.0362) [37]; Rogasch T10257:31–T10258:3

134 Exhibit 277 – Statement of Spiers (WIT.3004.014.0001) [31], [104], [166]; Exhibit 393 – Statement of Pridgeon (WIT.3024.004.0110) [26]–[29]; Pridgeon T9344:1–T9357:1; Nugent T12748:26–T12749:8

135 Exhibit 245 – Statement of McKenzie (WIT.3024.002.0144) [57]; Slijepcevic T6363:20–T6363:28

136 Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [72], Annexure 8 (WIT.3004.035.0010)

137 Exhibit 820 – Statement of Garvey, Annexure 8 (WIT.3004.035.0010); Garvey T16823:14–T16824:14

138 Garvey T16848:6–T16848:25, T16849:11–T16849:19

139 Garvey T16813:26–T16814:15

140 Exhibit 874 – Statement of Corbett (WIT.3004.043.0298) [80], Annexure 11 (WIT.3004.044.0363); Garvey T16809:15–T16809:22

141 Garvey T16810:22–T16811:5; Corbett T18232:15–T18232:31

142 Exhibit 872 – Third Supplementary Statement of Slijepcevic (WIT.3024.006.0113) [46]–[50]; Slijepcevic T18189:29–T18190:15

143 Exhibit 869 – Further Statement of Lloyd (WIT.3028.001.0070) [13]–[14], [21]–[23]

144 Griffiths T17729:25–T17730:6

145 Exhibit 853 – Supplementary Statement of Griffiths (WIT.3024.005.0332) [29]; Griffiths T17730:23–T17731:20

146 Exhibit 853 – Supplementary Statement of Griffiths (WIT.3024.005.0332) [30]–[31], Annexure 3 (DSE.HDD.0152.0008), Annexure 4 (DSE.HDD.0152.0009); Griffiths T17732:8–T17732:21

147 Exhibit 192 – Operational Debrief Report 2008/09 Fire Season (DSE.HDD.0030.0102) at 0122, 0130; as to Kilmore and Adam Street ICCs, see, for example, Rogasch T10257:23–T10257:26; Hunter T1718:3 T1718:16

148 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0095–0097; Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [200]–[201], Annexure 36 (WIT.3004.027.0393)

149 Exhibit 593 – Statement of Dickson (WIT.4018.001.0001) [50], [60]–[63]

150 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [52]–[53], [56], [62], Annexure 11 (WIT.3004.024.0321) at 0321–0324

151 Exhibit 202 – Statement of Slijepcevic, Annexure 3 (DSE.HDD.0012.2145); Slijepcevic T12106:13–T12106:20

152 Exhibit 551 – Second Supplementary Statement of Slijepcevic (WIT.3024.005.0001) [93]

153 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [55], [57]

154 Exhibit 547 – Statement of Haynes, Annexure 11 (WIT.3004.024.0321) at 0323

155 Exhibit 547 – Statement of Haynes, Annexure 13 (WIT.3004.024.0333); Haynes T11991:6–T11991:12, T11999:17–T12000:18

156 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [54]

157 Haynes T12073:5–T12073:9, T12075:7–T12075:9

158 Exhibit 551 – Second Supplementary Statement of Slijepcevic, Annexure 17 (DSE.HDD.0074.0284) at 0286

159 Exhibit 547 – SOP J3.08 Appointment of Incident Controller (CFA.001.032.0334)

160 Haynes T12014:25–T12015:2; Slijepcevic T12112:13–T12112:18

161 Small T12155:14–T12155:19

162 Exhibit 553 – Statement of Monti (WIT.7530.001.0001) [23], [37]; Monti T12162:3–T12163:2; Haynes T12016:24–T12016:27

163 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [54], [62]–[64]; Haynes T12001:19–T12002:4; Lockwood T9202:15–T9202:22

164 Exhibit 551 – Second Supplementary Statement of Slijepcevic (WIT.3024.005.0001) [98], [103], Annexure 20 (DSE.HDD.0074.0348); Exhibit 546 – Linton Report (TEN.132.001.0001) [23.6.16]

165 Exhibit 995 – Report of Van Bruggen (DSE.HDD.0158.0234)

166 Exhibit 995 – Report of Van Bruggen (DSE.HDD.0158.0234) at 0236

167 Exhibit 540 – Statement of Walshe (WIT.3010.009.0300) [9]

168 The *Coroners Act 2008* (Vic) replaced the *Coroners Act 1985* (Vic) on 1 November 2009. Similar provisions enabling the restriction of access to a fire affected area are also contained in the new *Coroners Act 2008*

169 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report*, Parliament of Victoria, Melbourne, August 2009, Recommendation 10.5

170 Exhibit 273 – Statement of Arthur, Annexure 6 (WIT.3010.004.0648); Exhibit 540 – Statement of Walshe (WIT.3010.009.0027) at 0030, Attachment 8 (WIT.3010.009.0361)

171 *Country Fire Authority Act 1958*, ss. 30(1), 44A(1)

172 *Country Fire Authority Act 1958*, s. 31(3)(a); *Coroners Act 2008,* ss. 37–38

173 Exhibit 542 – Record of Investigation into Death – Case No. 289/06 (SUMM.022.038.0059); Exhibit 542 – Western Australia – Record of Investigation into Death – Ref. No. 27/09 (TEN.142.001.0001)

174 Walshe T682:22–T682:26

175 Exhibit 542 – Record of Investigation into Death – Case No. 289/06 (SUMM.022.038.0059) at 0072

176 Exhibit 273 – Statement of Arthur, Annexure 6 (WIT.3010.004.0642)

177 Exhibit 542 – Record of Investigation into Death – Ref. No. 27/09 (TEN.142.001.0001) at 0053

178 Exhibit 542 – Record of Investigation into Death – Ref. No. 27/09 (TEN.142.001.0001) at 0062

179 Exhibit 542 – Findings and Actions from Inquiries Conducted by the Department of Environment and Conservation into the Boorabbin Fire (TEN.144.001.0001) at 0009

180 Exhibit 542 – Findings and Actions from Inquiries Conducted by the Department of Environment and Conservation into the Boorabbin Fire (TEN.144.001.0001) at 0009–0010, 0024–0035

181 Exhibit 273 – Statement of Arthur, Annexure 6 (WIT.3010.004.0648) at 0649; Exhibit 19 – Revised Statement of Walshe (WIT.003.002.0001) [150]

182 Exhibit 273 – Statement of Arthur, Annexure 6 (WIT.3010.004.0648) at 0649; Walshe T683:16–T683:23

183 Exhibit 19 – Revised Statement of Walshe (WIT.003.002.0001) [151]; Walshe T683:28–T684:2

184 Exhibit 273 – Statement of Arthur, Annexure 6 (WIT.3010.004.0648); Exhibit 19 – Revised Statement of Walshe (WIT.003.002.0001) [149]

185 Exhibit 269 – Statement of Russell, Annexure 23 (WIT.3004.013.0299); Walshe T683:3–T683:10

186 Exhibit 273 – Statement of Arthur (WIT.3010.004.0483) [84]; Exhibit 275 – Statement of Salter (WIT.3010.004.0726_M) [29]; Exhibit 654 – Statement of Humberstone (WIT.3010.002.0108) [33], [35]

187 Exhibit 275 – Statement of Salter (WIT.3010.004.0726_M) [35]

188 Exhibit 369 – Statement of Brown (WIT.108.001.0001_R) [32]; Exhibit 385 – Statement of Cherry (WIT.107.001.0001_R) [37]; Exhibit 362 – Statement of Glenn (WIT.066.001.0001_R) [38]–[40]; Exhibit 349 – Statement of Kennedy (WIT.102.001.0001_R) [33], [35]–[36]; Exhibit 77 – Statement of Walter (WIT.041.001.0001_R) [74]–[79]; Exhibit 903 – Statement of Clements (WIT.162.001.0001_R) [21], [30]–[31]; Exhibit 67 – Statement of Harvey (WIT.036.001.0001_R) [34]–[36]; Exhibit 898 – Statement of Nowak (WIT.159.001.0001_R) [51]–[52]

189 Exhibit 361 – Statement of Anderson (WIT.3032.001.0001) [33]

190 Exhibit 28 – Statement of Sigmund, Attachment 3 (WIT.020.001.0015) at 0025–0027; Exhibit 272 – Statement of McGennisken (WIT.089.001.0001_R) [32]–[39], [41]–[45]; Exhibit 125 – Statement of Williams (WIT.055.001.0001_R) [70]–[72]; Exhibit 522 – Statement of Mortimer (WIT.118.001.0001_R) [63]; Sigmund T913:11–T913:22; McGennisken T7485:3–T7487:27, T7489:1–T7489:19; Williams T4231:11–T4231:24

191 Walshe T685:18–T686:13

192 Exhibit 541 – Statement of Lanyon (WIT.3010.002.0001) [16]–[17]; Exhibit 13 – Statement of Newman (WIT.009.001.0001_R) [19]; Collery T8424:6–T8425:11; Barton T8876:22–T8877:11

193 Exhibit 272 – Statement of McGennisken (WIT.089.001.0001_R) [36]–[45]; Exhibit 253 – Statement of Ryan (WIT.3010.004.0408) [40]; Exhibit 649 – Statement of Scully (WIT.3010.001.0418) [16], [26]–[27]; Exhibit 657 – Statement of Murphy (WIT.3010.001.0362) [24], [34]; Exhibit 473 – Statement of Brundell (WIT.3010.006.0215) [20]–[22]; McGennisken T7487:1–T7487:27; Gaffee T10345:27–T10346:3; Moore T13082:19–T13083:7, T13084:13–T13086:3

194 Exhibit 275 – Statement of Salter (WIT.3010.004.0726_M) [35]. The location of the roadblocks for the Horsham fire is set out in: Exhibit 269 – Statement of Russell, Annexure 22 (WIT.3004.013.0297); Exhibit 273 – Traffic Management Points – Suggested Options for Improvements to Enhance Fire Fighting Capabilities (WIT.3010.004.0722); Exhibit 272 – Statement of McGennisken (WIT.089.001.0001_R) [38]–[50]; Exhibit 28 – Statement of Sigmund, Attachment 3 (WIT.020.001.0015) at 0025; Exhibit 277 – Statement of Speirs (WIT.3004.014.0001) [169]; Exhibit 283 – Statement of New (WIT.3010.004.0062) [51]; McGennisken T7485:3–T7487:27, T7489:1–T7489:19; Sigmund T913:11–T913:22

195 Exhibit 272 – Statement of McGennisken (WIT.089.001.0001_R) [40]

196 Exhibit 540 – Statement of Walshe (WIT.3010.009.0300) [36]–[40]; Exhibit 398 – Statement of Wilson (WIT.3010.009.0147) [41]–[47], Attachment 3 (WIT.3010.009.0183). For the response to Sergeant Wilson's recommendations: Exhibit 542 – Letter from VGSO – TMP Report of Sergeant Wilson (CORR.1001.0011) Walshe T11781:1–T11781:12

197 Exhibit 540 – Statement of Walshe (WIT.3010.009.0300) [41]–[48], Attachment 3 (WIT.3010.009.0336), Attachment 8 (WIT.3010.009.0361); Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0113; Walshe T11781:15–T11782:11

198 Exhibit 542 – Standard Operating Procedure J3.10 – Traffic Management During Bushfires (RESP.3001.018.0332) at 0335

199 Exhibit 540 – Statement of Walshe (WIT.3010.009.0300) [52]–[55]

200 Exhibit 540 – Statement of Walshe, Attachment 8 (WIT.3010.009.0361) at 0364–0366; Walshe T11788:31–T11796:22

201 Exhibit 540 – Statement of Walshe (WIT.3010.009.0300) [64]–[76], Attachment 8 (WIT.3010.009.0361) at 0364–0366; Walshe T11788:31–T11796:22

202 Exhibit 540 – Statement of Walshe, Attachment 8 (WIT.3010.009.0361) at 0363

203 Exhibit 540 – Statement of Walshe (WIT.3010.009.0300) [60], Attachment 7 (WIT.3010.009.0357)

204 Exhibit 540 – Statement of Walshe, Attachment 7 (WIT.3010.009.0357) at 0358; Walshe T11804:30–T11805:1, T11808:2–T11809:16

205 Exhibit 540 – Statement of Walshe, Attachment 8 (WIT.3010.009.0361) at 0367

206 Exhibit 542 – Standard Operating Procedure J3.10 – Traffic Management During Bushfires (RESP.3001.018.0332); SOP J3.10 also implements Recommendation 10.6 of the Commission's interim report; B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission*: *Interim Report*, Parliament of Victoria, Melbourne, August 2009

207 Walshe T11803:15–T11804:1, T11814:17–T11814:22

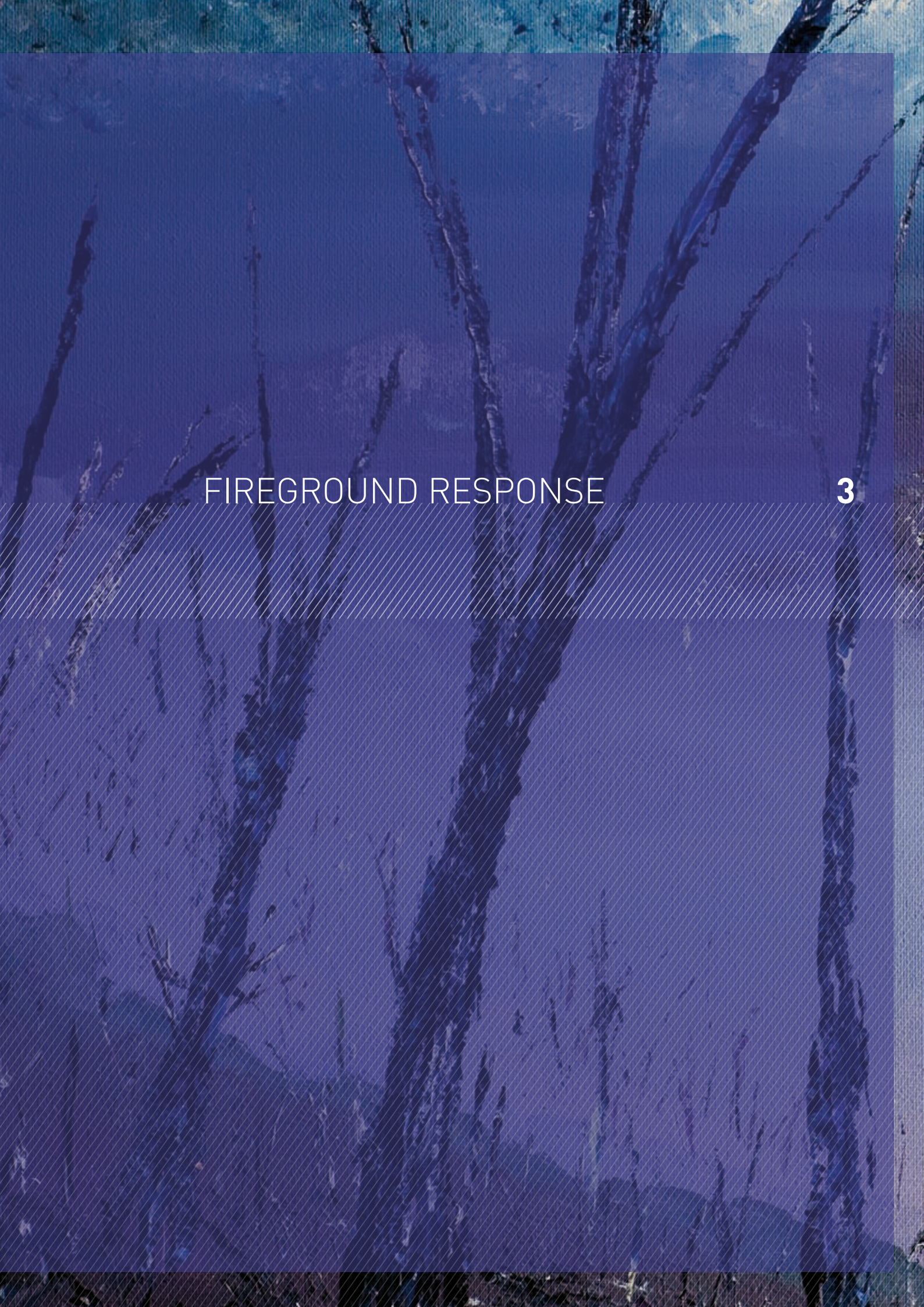
208 Walshe T11789:31–T11790:25

209 Haynes T12044:9–T12044:23

210 Walshe T11817:5–T11817:18; Billing T8918:29–T8919:19

211 Exhibit 540 – Statement of Walshe, Attachment 8 (WIT.3010.009.0361) at 0366

212 Walshe T11801:9–T11801:19



FIREGROUND RESPONSE 3

3 FIREGROUND RESPONSE

In the lead-up to 7 February 2009 firefighters took precautionary measures, and when a response was required it was rapid and apt. The preparations of many brigades were exemplary. Some localities pre-positioned firefighting resources in readiness and others responded to nearby districts to support firefighting efforts. The Commission heard evidence of responsive and resourceful activity from firefighters on the day, and it commends their efforts.

Many operational systems worked well, particularly considering the weather conditions. There were, however, some areas—such as timely fireground warnings to firefighters and appointing safety officers to incident management teams—where systemic problems emerged. Communications also fell short and this affected the safety of some fire crews caught unexpectedly when the wind changed. Aerial firefighting preparations and dispatch systems did not always provide the required response and need review to make them more responsive. Essential requirements such as access to water and electricity also caused problems.

Successful response to a fire relies on a blend of personnel, resources and processes. These include systems for rapid fire detection, deployment of appropriate equipment and personnel to assist suppression, accurate and timely intelligence about fires and weather conditions, and good communication. In addition, robust systems are required to support firefighters on the ground and ensure their safety. Timely and precise information from the firefront is also critical to enable accurate warnings for the community.

Given its terms of reference, the Commission focused on Victorian fire management systems, agencies and structures, while recognising that in many cases these are not unique to Victoria. The Commission acknowledges that particular facets of this report will apply in the broader Australian fire management context and welcomes any action to adopt a national position in the interests of community and firefighter safety.

It should be noted that on 7 February many things worked well. For example, the Commission heard few complaints about firefighting equipment, which the Country Fire Authority has invested heavily in recently.[1] This chapter, however, focuses on areas where problems were identified. It explores the operational elements of firefighting and discusses the role they played on 7 February. It also points to areas where important changes need to be made.

3.1 INITIAL ATTACK

The best opportunity to bring a fire under control is at or near the point of ignition when the fire is small. The role of first attack is to contain the bushfire swiftly at this initial stage and minimise the risk to life and property.[2] Initial attack is successful when ground crews and/or aircraft can quickly gain access to and make an effective and safe attack on the fire to limit its size. Resources and systems, such as deployment of firefighters and equipment, communications and remote detection tools, are critical. Initial attack usually occurs before an incident management team has been established. In Victoria more than 80 per cent of fires are contained as small fires (less than 5 hectares); the remaining 20 per cent result in 90 per cent of areas burnt annually. In remote areas of Victoria aggressive first attack is very difficult.[3]

In the days leading up to 7 February senior fire officers planned for initial attack and had resources on standby.[4] The CFA sent emails to its personnel the day before, outlining the extreme fire weather and the prediction that first attack was likely to be ineffective unless conducted soon after ignition.[5] Pager messages were sent to CFA personnel the night before to ensure adequate crews would be on hand the following day and that relief crews would be available. Many fire stations had personnel on standby at the station on the day to respond to any reports of fire.[6] Department of Sustainability and Environment staff were also at the ready to respond to incidents. DSE District Duty Officer Mr Stephen Grant observed, 'I don't recall ever having activated staff on standby to this extent before'.[7]

3.1.1 FACTORS THAT DETERMINE THE SUCCESS OF INITIAL ATTACK

A number of factors determine the success of initial attack, particularly once the fire danger indices reach the extreme range. These include the delay between ignition and when the fire is reported, the size of the fire when crews arrive, the fuel load, the resources committed, and adequate firefighter safety.[8] The weight of the first attack is another factor. In addition to fire agency personnel, private units, industry brigades, aircraft and crews on foot can all improve the chances of success. Topography influences access to the fire and water sources and the spread of the fire during firefighting. Weather conditions also influence how quickly the fire spreads.[9]

Various vehicles are used on the ground to perform initial attack activities. The CFA has over 1,200 tankers, which come in two- and four-wheel-drive truck combinations and carry either 2,000 or 3,000 litres of water.[10] Fire agency slip-on units (also referred to as 'pigs' and 'one-fours') are favoured by land management agencies; they carry 200–400 litres.[11] DSE and the Networked Emergency Organisations prefer these smaller vehicles for their mobility. During the 2008–09 fire season 359 four-wheel-drive slip-on units were used.[12] The State also has a fleet of aircraft for firefighting and related work.

Initial attack on 7 February

As noted, in the lead-up to 7 February fire agencies upgraded their levels of readiness in order to be able to respond at short notice.[13] In many cases on the day, however, once resources arrived at the fire initial attack was either not possible or unsuccessful.

At Murrindindi, where initial attack failed, Glenburn CFA captain Mr David Webb Ware was on the scene 10 minutes after the first report. He noted the fire was a 'very fast running grass fire that had already entered the blue-gum plantation to the west of the mill … [the fire] activity was very, very intense'.[14] When the Churchill fire was reported, Hancock Victorian Plantations sent a first-attack helicopter, followed by 21 firefighters on three tankers, five slip-on units and two bulldozers.[15] DSE crews did not attempt initial attack as it appeared to be too dangerous.[16] At Kilmore East five brigades responded simultaneously requesting another 20 tankers while en route to the fire.[17] First attack commenced within 10 minutes of the initial pager call but the fire was out of control within 30 minutes of ignition.[18] At Pomborneit crews arrived before officially being called out but they could not contain the initial grass fire.[19]

The difficulties for crews making a first attack were caused in some areas by severe weather conditions and high fuel loads. There were also system problems. For example, delays in members of the public being able to report the Bendigo fire via 000 meant that CFA resources did not arrive until 20 to 30 minutes after it had started. Despite crews being on standby at their station, the fire was already out of control by the time they arrived, making any initial attack impossible.[20]

In contrast, the initial fast response to the Upper Ferntree Gully fire prevented widespread damage. This fire had the potential to spread to the Dandenongs, which could have had disastrous results.[21]

3.2 RESOURCES AND SYSTEMS

This section discusses the various resources, systems and tools required to respond to a fire effectively and, in particular, provide a successful initial attack. These include aerial firefighting equipment and processes, firefighting resources and personnel on the ground, tools to enable remote detection of fires, information technology, systems to track firefighting resources, communication tools, and independent sources of water and electricity.

3.2.1 AERIAL FIREFIGHTING

Aircraft are an integral part of initial attack and, together with ground crews, provide ongoing support during an extended fire. Depending on where they are stationed and their dispatch protocols, aircraft can often get to a fire and begin the initial attack before ground crews arrive. In addition to fire-bombing, aircraft can transport firefighting personnel and facilitate large-scale prescribed burning. Aircraft can also observe and report on the fire, which is critical to the success of initial attack. Aerial observation and reconnaissance provide intelligence on the fire location, size and path. This is achieved through regular patrols, maps, verbal situation reports, or more sophisticated means such as infrared line scans. Highly skilled personnel crewing aerial observation aircraft assist ground crews with related information. It should be noted that aircraft are not effective in extinguishing a fire without the ongoing suppression efforts and support of firefighting personnel on the ground.[22] In some situations, such as during extreme weather conditions, aircraft are of little value in fighting fires.

Management of firefighting aircraft

In the 80 years since the first aerial reconnaissance aircraft was deployed in Victoria, aerial firefighting in Victoria has developed to include a mix of fixed- and rotary-wing aircraft. These are coordinated by the State Aircraft Unit, which is managed jointly by DSE and the CFA. Within the State Aircraft Unit the State Air Desk oversees preparedness, coordination and dispatch of aircraft.[23]

In Victoria the majority of aircraft are contracted by the State, with supplementary aircraft contracted through the National Aerial Firefighting Centre, which was established in 2003 to provide a nationally coordinated approach to the procurement and regulation of firefighting aircraft. The states and territories are the 'owners' of NAFC and, with the Commonwealth, share the funding of aircraft contracted through NAFC.[24]

Aerial firefighting in the 2009 bushfires

Aircraft played an important role in the response to the bushfires in late January and February 2009. On 2 February aircraft helped ground crews contain nine fires caused by lightning strikes in the Dandenongs and Bunyip State Park.[25] On 7 February aircraft helped crews protect some areas at Bendigo, Narre Warren and Ferntree Gully. At Bendigo a fire-bombing helicopter helped protect houses after the wind change.[26] Although no houses were destroyed in the Upper Ferntree Gully fire, it spread very rapidly among homes and, as noted, had the potential to spread into the Dandenongs. Aircraft caught the fire just in time, preventing damage to houses in Tremont and Ferny Creek.[27]

One hundred and fifty aircraft were on the call-when-needed register; 17 of them were used on 7 February.[28] This register provides secondary aerial firefighting resources on an ad hoc basis. The following aircraft were actually contracted during the 2008–09 fire season:

- 10 type 3 helicopters—the smallest helicopters in the fleet, generally used for air attack supervision, air observations and support roles. One of these was contracted by Hancock Victorian Plantations and was used as an initial attack aircraft for fire-bombing
- five type 2 helicopters—medium-volume helicopters used for fire-bombing and crew transportation
- four type 1 helicopters—heavy volume helicopters used for fire-bombing
- 12 fixed-wing single-engine air tankers—small aircraft used for fire-bombing
- two infrared-mapping aircraft—for line scan operations
- an observation aircraft.[29]

In the lead-up to 7 February plans were made to ensure that aircraft were on standby to respond to reports of fires. As the manager of the State Aircraft Unit, Mr Nicholas Ryan, noted in his email of 5 February, however, the conditions predicted for 7 February would impede or severely limit the ability of most types of aircraft to operate effectively.[30] Air attack supervisor Mr Shaun Lawlor said of the Murrindindi fire, 'On this occasion the retardant dispersed and blew away before reaching the tree canopy level due to the strength of the wind'.[31] At the Churchill fire air attack supervisor Mr David O'Toole commented that the 'wind certainly impaired the effectiveness of the firebombing on the day'.[32]

Notwithstanding the weather conditions at the Kilmore East fire, aircraft assisted in combating the southern flank of the blaze. Kilmore CFA captain Mr Gregory Murphy commented that without aerial firefighting more losses would have been sustained in and around Wandong.[33] The DSE Incident Controller at the Bunyip fire, Mr David Nugent, indicated he had six or seven aircraft available at various times and that he 'was very comfortable with the level of aircraft resources at that fire'.[34] Even when the aircraft were not able to help suppress the fires, some were able to provide intelligence to incident control centres.[35] Aircraft flew a total of 190 hours on 7 February, with over half of this time dedicated to fire-bombing activities.[36] Many more hours were flown on the days following 7 February to gather information on the extent of the damage and to capture aerial records of the fire path (see Table 3.1).[37]

Table 3.1 Number of hours flown, by fire, by task, 7 February

Task	Beechworth—Library Road	Bunyip State Park—Bunyip Ridge Track	Churchill—Jeeralang	Kilmore East—Murrindindi Complex North	Kilmore East—Murrindindi Complex South	Redesdale—Coliban Park Road	Eaglehawk—Bracewell Street	Coleraine—Glenelg Highway	Weerite—Danedite Road	Horsham—Remlaw Road	Berwick	Ferntree Gully—Quarry Road	**Grand total**
Aerial detection					1.20								**1.20**
Aerial reconaissance		9.68								5.97	0.22		**15.87**
Air attack supervision	1.58	16.50	4.41	2.42	15.61	1.52	1.50	2.50	2.13	1.72	2.31		**52.20**
Ferry—aircraft		2.31		1.50	1.99					0.82	0.17		**6.79**
Ferry—aircraft									0.15				**0.15**
Fire-bombing	1.43	43.94	9.82	4.23	29.48		2.20	3.28	2.08	5.37	2.18	1.90	**105.91**
Forward-looking infrared			1.40										**1.40**
Infrared line scan		2.96			2.05		1.68						**6.69**
Total	**3.01**	**75.39**	**15.63**	**8.15**	**50.33**	**1.52**	**5.38**	**5.78**	**4.36**	**13.88**	**4.88**	**1.90**	**190.21**

Source: Exhibit 859 – February 7 2009 – Numbers of hours flown.[38]

Preparedness and dispatch of aircraft

During the Commission's hearings various concerns were raised about the use of aircraft on 7 February, particularly the dispatch process. This process occurs via a request-based system. Requests for aircraft pass through three layers of authority before they are actioned by the State Air Desk. A request for aircraft is made to, or by, the Incident Controller, then to the CFA operations staff or the DSE Area Duty Officer. The final stage of approval is made by the State Duty Officer.[39] At their highest state of readiness aircraft in Victoria are on standby to take off with 15 minutes' notice.[40] Approval to launch is given only when the request is actioned by the State Air Desk. This is a cumbersome system.

Evidence before the Commission shows that some firefighting aircraft were delayed in their response on 7 February. For example, the Murrindindi fire was reported from a fire lookout tower at 2.55 pm. The Incident Controller was aware of the fire within minutes of its detection, but two fixed-wing fire-bombing aircraft did not take off from the air base at Mansfield until 3.45 pm.[41] This delay meant fire-bombing aircraft arrived too late to support the initial attack.

Two infrared line scanning aircraft were available on 7 February: the King Air and a second smaller aircraft. Only one aircraft was requested for use.[42]

Comments from witnesses and post-incident debriefs also highlighted problems with aircraft communications, such as the following:

- overuse and poor discipline on radios by ground crews
- call-when-needed aircraft not always having the necessary infrastructure
- aircraft experiencing difficulties communicating with incident control centres. Some aircraft did not receive time-critical messages and warnings from ICCs about matters such as the timing of the wind change.[43]

Aircraft dispatch in other jurisdictions

Alternative methods for rapid dispatch are used elsewhere in Australia and overseas. The Chief Officer of the South Australian Country Fire Service, Mr Euan Ferguson, explained that in high-risk bushfire zones in South Australia aircraft are dispatched to respond at the same time as ground crews. When a fire is reported to ground crews, pilots and air crews receive the same message via pager and enact a rapid response. In many cases aircraft are over the fire before the arrival of ground crews.[44] Fire-bombing aircraft are able to drop one load of suppressant on the fire. Subsequent bombing operations require authorisation by the Incident Controller or regional duty officer.[45]

California has similar dispatch protocols: aircraft are dispatched on initial reports of a fire. Pilots are trained to make their own assessments and drop aerial suppressants before the ground crew arrives.[46] In a report produced from an international best-practice visit to the United States, France and Canada, a group of senior Australian aviation managers remarked:

> There is a clear worldwide trend towards ensuring sufficient weight of initial aerial attack. Effective response by aerial resources can be achieved by directing sufficient weight of attack in the first instance and not relying upon the continued presence of aerial resources after the fire has grown.[47]

The Bushfire Cooperative Research Centre reported on the cost-effectiveness of aerial firefighting in Australia. It determined that conventional approaches in conjunction with aerial suppression techniques are the most cost-effective means to fight fires. The arrival of aircraft prior to ground crews 'buys time for the ground forces to arrive and complete the containment. Rapid deployment of aerial suppression resources is important'.[48]

The need for a different approach

On the basis of evidence provided to the Commission it appears that Victorian agencies have not considered the option of a faster response system for aircraft. They are also not eager to implement such a protocol, despite the evidence that other jurisdictions use 'automatic dispatch'.[49] The Commission considers that the current request-driven system has inherent delays and does not necessarily allocate aircraft to areas of greatest risk. The example of the infrared line scanning aircraft that remained on the ground on 7 February as it 'was not requested' is an obvious oversight.[50] This problem is much more likely in a system where request-based allocations are the only way to mobilise aerial resources. Protocols that enable the State Aircraft Unit to allocate aerial resources based on an assessment of risk are overdue, and the Commission considers that state policy should be changed. In addition, the State Air Desk should:

- identify and monitor fires at which aerial firefighting may be effective
- advise State Duty Officers on the allocation of aerial resources on the basis of where those resources would be most effective and in the light of the lives and assets threatened by each fire
- ensure that the State's infrared line scanning aircraft are deployed effectively.

RECOMMENDATION 20

The Country Fire Authority and the Department of Sustainability and Environment amend their policies on aerial preparedness and standby arrangements, their dispatch protocols and the management of aircraft in order to do the following:

- require that at locations that attract the risk assessment or preparedness level A on code red days all personnel needed for air operations must be on standby by 10.00 am
- establish a system that enables the dispatch of aircraft to fires in high-risk areas without requiring a request from an Incident Controller or the State Duty Officer.

Use of Commonwealth resources

A Commonwealth RAAF AP-3C Orion aircraft based at Edinburgh, South Australia, was not deployed until 9 February. It was then used to collect high-resolution infrared imagery over fire-damaged areas until 17 February.[51] This type of aircraft can operate in conditions that preclude smaller aircraft and should be considered, along with other potentially suitable resources, as part of aerial firefighting preparedness at the state level.[52]

The Defence Assistance to the Civil Community policy enables Commonwealth aerial resources to be used by the states. Under this policy resources are provided following a request from a state. The request, through Emergency Management Australia, can only be actioned when local resources are inadequate or have been exhausted.[53] In its interim report the Commission made the following recommendation:

> The Commonwealth facilitate discussions between relevant Commonwealth agencies (including Emergency Management Australia, Defence, Defence Imagery Geospatial Organisation, and Geoscience Australia) and state and territory fire services to identify ways in which Commonwealth resources might be applied more rapidly and effectively during extremely dangerous bushfires, including investigating the potential for these resources to be used for detecting, tracking and suppressing bushfires.

The Victorian Bushfire Royal Commission Implementation Monitor—delivery report outlined the progress in implementing this recommendation.[54] It advised that a pre-season operational briefing, involving states and territories, was held at Parliament House, Canberra, on 25 September 2009 to share information on available resources and capabilities for fire agencies.[55] The Commission considers there is scope for the pre-emptive positioning of Commonwealth resources in the event of major emergencies like the fires in late January and February 2009.[56] In the light of the evidence presented, the Commission encourages ongoing collaboration between state and Commonwealth agencies where they are able to share resources for the early detection and management of fire. Fire detection is discussed later in this chapter.

RECOMMENDATION 21

The State, in conjunction with Emergency Management Australia and the Department of Defence, develop an agreement that allows Commonwealth aerial resources that are suitable for firefighting and support activities to be incorporated in preparedness plans and used on days of high fire risk.

Very large air tankers

During the summer of 2009–10 Victoria funded the trial of a very large air tanker to assess its fire-bombing suitability in Victoria. A DC-10 aircraft was contracted from the United States by the National Aerial Firefighting Centre and trials were assessed by the Bushfire Cooperative Research Centre, whose final report is due in late June 2010.[57] The total cost of the trial was about $10 million.[58]

There are practical constraints on using a very large air tanker in Victoria. Because of the weight and size of the DC-10, Avalon Airport (near Geelong) and Melbourne Airport (the main airport in Melbourne) are the only suitable air bases from which the aircraft can operate.[59] The DC-10 requires a smaller lead plane to fly ahead and provide assessments before aerial firefighting. The DC-10 might also have limitations during poor weather.[60] Once airborne, the aircraft must discharge its load of up to $45,000 worth of aerial suppressant to enable a safe landing. This has economic and environmental costs if the suppressant is not used on the fire and needs to be jettisoned.[61]

The Commission notes that a number of witnesses were ambivalent about the very large air tanker. NAFC General Manager Mr Richard Alder stated that, given its limitations and requirements for operating in Australia, the DC-10 may not be a cost-effective option for Victoria. Reports from the very large air tanker trials are not complete, so the Commission has not formed a view about the suitability of the aircraft for Victorian conditions.[62]

3.2.2 PRIVATE FIREFIGHTING RESOURCES

Private units

Although not well known, private units are a very important part of firefighting on the fireground in many parts of Victoria. Private units can form a rapid and effective attack on a fire prior to the arrival of larger CFA units and then work collaboratively to fight the fire with the CFA. With their knowledge of local conditions and terrain, private units can gain access to properties quickly and in some regions outnumber CFA resources by eight to one.[63] Private units are generally operated by farmers or landowners and usually consist of a multi-purpose small farm utility that has a portable tank and pump mounted on the rear. Operators may be members of the CFA but often this is not the case.[64]

Historically, private unit operators have freely provided their units to protect not only their own properties but also those of others in their district.[65] To coordinate the safe and effective use of private fire units the CFA has developed detailed guidelines; the onus is on private unit operators to make sound decisions about their use.[66]

Forest industry brigades

In November 1997 the Victorian Government introduced legislation requiring forest plantation companies to form fire brigades. The legislation applies to plantations with a combined size of more than 500 hectares within a radius of 25 kilometres. Forest industry brigades are only required to service a company's plantation assets for 'wildfire' response and fire management planning. If, however, the parent plantation company desires, the brigade can operate outside its designated area.[67] Hancock Victorian Plantations has seven forest industry brigades registered with the CFA. All HVP firefighters have completed CFA minimum skills training for firefighters and plantation firefighting training. HVP personnel participate in fire prevention committees and meet with local agencies to plan a coordinated approach to firefighting.[68]

Involvement on 7 February

Private units and forest industry brigades featured in firefighting efforts on 7 February. During his evidence to the Commission, CFA lieutenant Mr Kenneth McKenzie, described the 'bonus factor' of private units: 'They don't carry much water, but they can nip off on the side of a hill or where a truck can't get to'.[69] The Commission notes the valuable contribution of private units to Victoria's firefighting efforts.

At the Horsham fire private units from the local area were plentiful. They were prevalent in the Wimmera region due to the open cropping and the desire of property owners to protect their crops.[70] Mr McKenzie and Mr Webb Ware also commented on the contribution private units made at the Murrindindi fire. Mr Webb Ware was in direct contact with the units via UHF radio.[71] Some private units responded to the Kilmore East fire.[72] HVP helped fight the Delburn complex of fires and provided a surveillance aircraft circling around the Latrobe Valley, staff at fire lookout towers, incident management personnel ready to respond, and heavy machinery and firefighting personnel on standby at various depots across HVP properties.[73]

The Commission acknowledges the firefighting support provided by forest industry brigades. Continued cooperation between public and private operators is encouraged. It is a practical and valuable expression of mutuality that strengthens the state's overall firefighting capacity.

3.2.3 FIRE DETECTION AND INTELLIGENCE

The early and precise detection of fires enables firefighters and Incident Controllers to rapidly mobilise resources, inform the community, and mount a significant initial attack. In addition, effective firefighting requires ongoing timely and accurate intelligence. This allows fire managers to allocate resources and minimise the risk to human life. Fires pose unique and dynamic challenges for those collecting intelligence.

Fire reporting

Fires can be identified and reported to fire agencies by members of the public, fire surveillance aircraft, fire lookout tower personnel, or from satellite imagery. The response to the fire is dependent on the quality of the information about the size, location and intensity of the fire. Collecting and relaying information on the ground can be hindered by smoke, flames, vegetation and the priority of fighting the fire. A two-dimensional view from the fireground is often inadequate for assessing how best to respond to a fire or gaining an overall view of its size and direction.

Aircraft can assist with observations but have limitations, as discussed. Satellites can detect fires and report on their size; the time and number of passes they take over a specific area of land can, however, delay the capture and transfer of information. Satellite imagery can also be hampered by weather, vegetation canopy, cloud and smoke.[74] In the absence of alternative sources Incident Controllers need to rely on ground observers to obtain information about a fire.[75]

Fire detection tools

A range of fire detection tools, including fire cameras, smoke detection and infrared systems, help incident managers suppress and monitor fires. Fire detection equipment can operate in dangerous conditions and cover 24-hour periods. Despite improvements in technology, however, fire lookout tower personnel continue to provide valuable intelligence once a fire is initially detected; this information can be used to warn the community about a fire in their area.

The options for, and capacity of, technology that can supplement lookout personnel are increasing. EYEfi-SPARC, for example, enables users logged into the system to identify the location of a fire quickly using a single camera. On 7 February camera equipment had been installed in four fire tower lookout sites and testing of SPARC was under way, but the system was not operational. The Commission heard evidence about potential SPARC applications such as linking the system to Telstra's Community Information Warning System. This is being explored by DSE and the Office of the Emergency Services Commissioner. The Commission also learned of a smoke detection system called FireWatch, which is automated and works by taking two photos six minutes apart and comparing the images.[76]

Sentinel is a web interface available to the public. It shows the location of hot spots that generally indicate the presence of a fire. When a hot spot is detected it is mapped onto satellite imagery, referred to as MODIS images. MODIS images are updated daily. Satellites owned by the United States are equipped with thermal infrared sensors that detect elevated ground temperatures and send the data to Geoscience Australia for use in Sentinel. There is a maximum of four MODIS satellite overpasses each day, which limits their capability. For example, if a fire starts and is extinguished between satellite overpasses it might not be detected. Sentinel might also fail to detect fires where they are small or obscured by smoke, cloud or vegetation. Geoscience Australia staff do not support Sentinel out of hours and the system can fail if demand for the service is high. Sentinel is best suited for detecting and mapping large ongoing fires.[77]

Line scanning is done from aircraft flying over the fire area. An infrared picture is taken of the fire then analysed for differences in the heat rising from the earth's surface to determine the fire edge. The electronic image can then be transposed onto a map. DSE owns two line scanners mounted in fixed-wing aircraft and can access the completed scan once it has been uploaded onto the DSE Fireweb system.[78] This can be achieved without the aircraft landing.

The Commonwealth Government provided to the Commission a summary of imagery functions that could be available to assist bushfire detection and tracking. For example, AP-C3 Orion aircraft have a range of capabilities including electro-optic and infrared imagery.[79] Defence also has geospatial survey and imagery capability within the Defence Imagery and Geospatial Organisation.[80]

The Australian Customs and Border Protection Service conducts aerial surveillance along Australia's border. Aircraft have satellite capability and can provide live video footage to their command centre in Canberra. Most aircraft are fitted with infrared optical systems and would be able to send footage of a fire from a remote location, even in smoky conditions.[81]

The Australian Maritime Safety Authority has contracts with aircraft operators who provide search and rescue services over land and water. Aircraft are fitted with infrared sensing equipment which could potentially provide still and video footage of a firefront through smoke haze.[82]

There was insufficient time to discuss the topic of remote detection in detail during the hearings but the Commission is aware of recent trials of FireWatch in several high-risk areas of Victoria. It is of the view that personnel in fire lookout towers should not be replaced with fire detection technology. The Commission encourages further exploration and testing of technology to improve intelligence gathering about fires. Fire detection technology and fire tower personnel complement each other.

Remote detection and sensing on 7 February

On 7 February Sentinel provided information about hot spots detected during the three satellite passes made over Victoria. These passes occurred at 2.10 am, 11.28 am and 3.49 pm, with hot spots displayed on the Sentinel web page within 20 to 40 minutes of each pass. Demand for Sentinel was unusually high between 7 and 9 February. On a normal hot summer day the site receives about 135,000 hits. On 7 February it received 1.8 million hits, mostly in the afternoon. The following day the site had 5.2 million hits and experienced some failures due to the high volume. Staff adjusted the site to provide only core features to users; it was fully restored on 13 February.[83] The Commission notes that Geoscience Australia, in collaboration with the Department of Defence, is considering options for increasing the number of satellite passes.[84]

Only one line scanning aircraft flew over some of the fires on 7 February. It had to land at about 2.30 pm because weather conditions made it unsafe to fly. From the evidence provided to the Commission there were instances where line scanning images were not available to either Incident Controllers or fire behaviour analysts. For example, the Kilmore ICC could not access a line scan taken of the Kilmore East fire at 12.40 pm. In his evidence to the Commission integrated Emergency Coordination Centre situation unit leader Mr Joseph Nichols advised he did not get a copy of the Kilmore East fire line scan until late in the afternoon.[85]

The Commission notes that although Commonwealth resources were not used on 7 February to detect and track fire—apart from Sentinel, as discussed—extensive mapping and imagery were produced after that date.[86] These Commonwealth products provided detailed aerial reports of the extent and location of the damage.

3.2.4 INFORMATION TECHNOLOGY

Remote detection tools are effective when combined with other systems used by fire agencies. On 7 February Incident Controllers had an array of technology available to assist them in managing the fires (see Box 3.1). This included radios, GPS units in firefighting vehicles, and sophisticated computer and satellite systems to capture and share intelligence.

Box 3.1 Fire management technology: an overview

IRIS is the DSE incident resource information system used to record and track resources and personnel allocated to an incident.

Firemap is a network-based system that enables users to view and create maps. It is used by DSE but can be accessed by CFA personnel in their regional offices and incident control centres.

Fireweb is an integrated fire management system used by DSE. It contains many services, such as fire mapping, weather reports, incident reporting, aircraft dispatch information, incident support, resources, training and accreditation, occupational health and safety, messages and contact lists. It also incorporates IRIS. It can be accessed by registered users via the internet. Particular data from Fireweb, such as fire dispatch information, can be accessed from the DSE public website, which is updated every five minutes.

The CFA Incident Management System holds information about resources dispatched from the Emergency Services Telecommunications Authority, and other information received from sources such as the Bureau of Meteorology. IMS is linked by a computer interface to ESTA's computer-aided dispatch system. The CFA manages its resources though a resource management system.

The CFA's Emergency Information Management System is under development and will eventually replace IMS. The Emergency Information Management System was not formally funded at the time evidence was provided to the Commission.

EIMS Mapper is part of EIMS and will assist incident management teams by making spatial data readily available for use in scenario modelling, tactical support and control of incidents. The emphasis is on providing a user-friendly system. Prior to EIMS Mapper, CFA operational mapping was cumbersome and required highly trained personnel. EIMS Mapper can be used online or offline (with reduced capabilities) and installed in vehicles, offices and incident control centres.[87]

Use of technology on 7 February

On 7 February there were various problems with fire management technology at incident control centres. The CFA and DSE used different systems to do similar tasks. Access to the systems for all incident management team staff was not always possible. This made the use and transfer of information, such as warnings, maps, and situation reports, difficult. A detailed CFA investigation into communications and technology in 2008–09 was completed by independent consultants Mingara Services. It revealed the following about 7 February:

- The networks were too slow to run the applications required (like mapping) and were not coordinated between agencies. A lack of shared drives across the CFA and DSE for Incident Controllers and bottlenecks caused slow access.
- User profiles were not transferrable and personnel could only log on in their own region and were unable to add printers.
- CFA personnel did not have access to the internet (on their Telstra Next G™ cards) and were unable to access many relevant websites.
- Many ICCs and regional emergency coordination centres did not have high-speed colour printers.
- The CFA and DSE used different electronic incident and resource management systems and the reporting structure for the same incident was duplicated.[88]

CFA Operations Manager in Region 14 Mr John Deering advised the Commission that having the CFA and DSE on separate IT systems caused problems. He stated that each agency's website had similar reporting and resource tracking, which resulted in duplication of work. He said, 'These issues did not particularly impact on our effectiveness as an IMT but it would have been ideal if we had a common IT system'.[89]

Personnel arriving at some ICCs were not given a computer and many used their personal laptops. At the Bendigo ICC in Adam Street there was no access to the CFA IMS and only two computers and A4-size printing were available. Although the centre housed the local CFA Group, it was not planned to be used as a level 3 ICC.[90]

But not all aspects of technology on 7 February were inadequate. In Cardinia Shire there was a 'fully portable' Municipal Emergency Coordination Centre alongside the Packenham ICC. Wireless communications technology enabled the MECC to be set up in any location. If major utilities at a specific site failed, the MECC could be moved to another location.[91]

The Commission notes the work done by the CFA and DSE since February 2009 to rectify many of the shortcomings identified in the evidence. Such work includes an extensive level 3 ICC upgrade project to redress technology problems. The State allocated $28 million to the CFA and DSE to upgrade equipment (including IT and transmission links) for level 3 ICCs in 2009–10. This includes upgrading command points to common minimum standards. The project began in July 2009 and the schedule for completion of these upgrades was as follows:

- 16 level 3 ICCs by 31 October 2009
- 21 level 3 ICCs by 31 December 2009
- the remaining six level 3 ICCs by 30 June 2010.

In relation to the 30 June 2010 time frame the *Bushfires Royal Commission Implementation Monitor—delivery report* provided information about potential difficulties with achieving the time frame, such as ICC relocations and technical challenges with cabling and broadband in remote areas.[92] The Commission urges maintenance of original time lines where possible.

3.2.5 RESOURCE MANAGEMENT AND TRACKING

In order to safely and effectively manage a fire the Incident Controller needs to know where various resources are, including vehicles, personnel, plant and aircraft. An accurate resource summary ensures that information, such as red flag warnings or critical weather information, reaches the right people when needed.

Currently resource tracking is mostly a manual and time-consuming process. When CFA and DSE personnel respond to an incident they manually fill out a T-card (see Figure 3.1) with the names of crew members and resources. The T-card is then passed to a fireground supervisor and information goes to the IMT to collate resource summaries. This system can potentially occupy phone lines and radio air space for a lengthy period.[93]

Figure 3.1 T-cards

Source: Exhibit 415 – Three examples of T-cards.[94]

DSE and NEOs use the IRIS system (see Box 3.1) to manage and track resources during an incident. IRIS tracks the dispatch of people and vehicles and, in particular, which incident they are assigned to. It provides a real-time snapshot of resource allocation and the duration of a crew's deployment. Information added to the system can be viewed by others on the DSE network. It should be noted that this system is still partly reliant on T-cards. Information collected on T-cards is passed to the IMT to be added to IRIS because electronic tracking of vehicles is not a feature of IRIS.[95] The CFA uses its Incident Management System to keep track of dispatched resources; by its own admission, however, IMS has not kept up with emerging technology.[96] It is unclear why the CFA has not adopted IRIS, which is already used or being trialled by seven interstate agencies.[97] The Commission encourages the CFA to consider trialling or adopting IRIS.

Resource tracking on 7 February

Given events of 7 February, it is not surprising that the tracking of resources at fires was difficult. A large volume of firefighting resources were dispatched within a very short time to deal with rapidly developing fire activities. Incident Controllers often found themselves in a catch-up situation, trying to ascertain what resources were where. Many resources did not respond through staging areas, and there were examples of fire agency resources self-responding instead of being dispatched via the Emergency Services Telecommunications Authority.[98] Mr Geoff Kennedy, Operations Officer at the Churchill fire, told the Commission he did not see a summary of resources or a list compiled from T-cards about who was on the fireground and under his command.[99]

There were widespread problems with radios and phones, making it difficult to collate and disseminate resource summaries. At the Kilmore East fire the ICC was unable to track fires or personnel because the CFA computer system was overloaded.[100] A serious burnover event highlighted the need to know where firefighters and equipment were. It appears the tanker involved was not fitted with a GPS or a vehicle locator device.[101]

To monitor the location of vehicles and personnel and use that information to plan and respond to incidents fire agencies need to provide appropriate technology for firefighters in the field. Computer systems must also be in place to monitor information and make it available to the Incident Controller, regional office and state coordinator. The Commission encourages fire agencies to give all components of this system priority.

Global positioning systems and automatic vehicle locators

The CFA was unable to tell the Commission how many GPS units have been fitted to its vehicles and the types or models of units in use.[102] GPS units have been fitted where the individual brigade has funded and purchased the unit.[103] The Commission is concerned that GPS units are not fitted to all CFA and DSE vehicles as a matter of course. The units should be compulsory and standardised across and within the agencies. The CFA was also unable to tell the Commission how many CFA vehicles have automatic vehicle locators installed to enable real-time tracking of a vehicle by an incident management team or dispatch centre.

DSE has GPS units in many vehicles, heavy plant and aircraft, but is yet to fit them to all other firefighting vehicles.[104] It has been trialling a resource-tracking system, RATS, which uses a combination of Telstra Next G™ mobile phone technologies, satellite and radio networks.[105] Over the next two years DSE will be rolling out a new radio system into all the vehicles it uses for firefighting. The system will incorporate GPS technology.[106] The Commission notes that in response to a serious workplace accident in 2007 the Hancock Victorian Plantations industry brigade installed GPS tracking systems in all 64 of its vehicles. This cost $500,000 over two years.[107]

The CFA has been trialling several systems that might be incorporated in its new Emergency Information Management System in the future.[108] The CFA would benefit from standardising many of its operational systems and technologies. The lack of consistency between CFA and DSE systems also needs to be dealt with. Improved interoperability would ensure better resource tracking during incidents.

RECOMMENDATION 22

The Country Fire Authority and the Department of Sustainability and Environment standardise their operating systems and information and communications technologies with the aim of achieving greater efficiency and interoperability between agencies.

3.2.6 COMMUNICATION TOOLS

Communication is another key element of effective emergency management and is critical for safe firefighting.[109] Communication tools include radios, mobile and landline phones, pagers, computers and mobile data networks. These systems are often dependent on complex technical infrastructure.

Background

The Victorian Government and emergency services have long recognised the need for robust and reliable communications systems to ensure good communication between emergency services and with the public. Traditionally, each emergency agency has been responsible for its own communication systems and has used different systems and equipment. This has created challenges such as poor communications coverage, lack of interoperability between emergency service agencies, and insufficient investment in new technologies. To remedy this, the State developed the Statewide Integrated Public Safety Communications Strategy, which became Victorian government policy in 2001.[110] The strategy aimed to maximise the benefit of investment in multi-agency communications systems by coordinating technology planning and procurement and sharing common infrastructure and resources.[111] The State has implemented a number of multi-agency communications initiatives under the strategy:[112]

- the Emergency Services Telecommunications Agency's centralised call taking and dispatch for the CFA, the Metropolitan Fire and Emergency Services Board, Victoria Police (metropolitan) and Ambulance Victoria
- the Metropolitan Mobile Radio network used by Victoria Police (metropolitan), Ambulance Victoria and the MFB (costing $261 million)
- the Mobile Data Network, which links Ambulance Victoria and Victoria Police (metropolitan) in-vehicle computers to operational databases and dispatchers (costing $187 million)
- the statewide paging system, known as the Emergency Alerting System.

DSE, rural police, Ambulance Victoria and the CFA have continued to use StateNet Mobile Radio, a VHF trunked radio network. On 7 February the main components of Victoria's emergency services communications infrastructure were the State Managed Radio and Metropolitan Mobile Radio networks, the Emergency Alerting System, the Mobile Data Network and the Emergency Services Telecommunications Agency's centralised call taking and dispatch.

The Commission made a number of recommendations in its interim report about improving the operation of the emergency call system on days of extreme demand, such as during bushfires. The State has largely implemented those recommendations. There has also been work to rectify problems with national emergency call service arrangements, including the interface between 000, the Emergency Services Telecommunications Agency, and other emergency service answering points. This work is progressing and the Commission is satisfied the State is improving emergency call services.[113]

The State has also developed a new strategic framework to guide the delivery of emergency services communications projects; this is discussed at the end of this section.

The statewide paging system

A high-priority project under the Statewide Integrated Public Safety Communications Strategy was establishing a reliable statewide paging system; the emergency alerting system. The EAS became operational in 2006 at a cost of $212 million. It provides coverage to about 96 per cent of Victoria through more than 220 remote transmitter sites. The system is managed by the Emergency Services Telecommunications Agency on behalf of the State and is used by the CFA, VICSES and Ambulance Victoria (rural) to alert approximately 37,400 personnel, mostly volunteers, to an incident. It has recently been extended to a small number of DSE and MFB staff.[114]

Under the EAS there are three levels of message priority: emergency, non-emergency, and administrative. Within each category the system sends messages on a first-in, first-out basis. This means queued emergency messages are sent before any other message type and non-emergency messages have priority over administrative messages.[115]

A problem with the transmission speed and coverage of messages was identified in 2006. The CFA expressed concern that areas already experiencing marginal coverage would suffer additional message loss when the system reached its limits during peak events.[116] To ensure statewide coverage for all pagers, in November 2006 EAS users decided to restrict transmission speed and respond to the capacity problems by upgrading the system.

An additional problem with the EAS was caused by linking. The EAS can be configured to link messages by automatically sending a copy of a message to another pager address. If multiple copies of a message are sent the overall load on the system increases.[117] By February 2008 linking had increased by 25 per cent.[118] During the 2008 windstorm in Victoria the EAS was significantly short of delivery targets for non-emergency and administrative messages. The Emergency Services Telecommunications Agency subsequently reviewed how different agencies were using the system, including their message type selection and message linking. It recommended that the agencies establish business rules about the use of linking and processes for authorising and monitoring de-linking.[119]

The planned upgrade was designed to ensure the EAS could cope better with more messages without the use of linking.[120] The upgrade was delayed several times and rescheduled for February 2009; it had not been rolled out by the time of Black Saturday. Unfortunately this affected the system on that day, after which the upgrade was postponed indefinitely.[121]

The Commission does not criticise the decision to restrict transmission speed, which was made on the basis of a detailed analysis of various options. The decision was, however, predicated on concurrent works to reduce linking and therefore EAS message volume. Efforts to de-link the system were insufficient and a range of problems were experienced on 7 February as a result. The Commission finds it troubling that the Minister for Police and Emergency Services was not briefed about the decision to restrict the EAS transmission speed and subsequent delays in implementation. At the very least the Minister should have been briefed on the fact that this might result in the system being unable to deliver messages without delay during major emergencies.[122] On the contrary, the Minister was assured on 5 February 2009 at the Victorian Emergency Management Council Coordination Group meeting that the State and all agencies would be at their highest level of preparation on 7 February.[123]

Table 3.2 shows the message delivery performance of the EAS on 7 February. Message volumes exceeded all records and there were extensive delivery delays, particularly for non-emergency and administrative messages. Emergency messages were delivered well: 93.3 per cent were delivered within 30 seconds (76 seconds was the longest delay). However, only 26.7 per cent of non-emergency messages were delivered within 120 seconds, with delays of up to 161 minutes. Only 69.7 per cent of administrative messages were delivered within five minutes, and the longest delay was 12 hours.[124] This was problematic because the slower administrative and non-emergency message categories were being used to broadcast urgent information in some instances.[125] It demonstrated a lack of understanding and awareness at an operational level of the implications of the restriction in transmission speed, and a lack of discipline in the failure to manage the linked traffic to avoid the congestion that was inevitably created. Non-emergency and administrative message levels in EAS were not designed for use during peak activity periods.[126]

Table 3.2 Message delivery performance of the Emergency Alerting System, 7 February

	Time (seconds)	Pages (no.)	Percentage of total
Emergency	0–30	4,053	93.19
	30–40	173	3.98
	40–50	76	1.75
	50–60	31	0.71
	60–70	11	0.25
	70–80	5	0.11
			0.00
	Total	**4,349**	**100**

	Time (minutes)	Pages (no.)	Percentage of total
Non-emergency	Up to 2	757	9.90
	2–30	767	10.03
	30–60	1,476	19.30
	60–90	1,055	13.79
	90–120	1,077	14.08
	120–150	2,504	32.74
	150–161	13	0.17
	Total	**7,649**	**100**

	Time (minutes)	Pages (no.)	Percentage of total
Administration	Up to 5	817	42.98
	5–40	58	3.05
	40–120	0	0.00
	120–180	8	0.42
	180–240	5	0.26
	240–300	75	3.95
	300–360	59	3.10
	360–420	56	2.95
	420–480	116	6.10
	480–540	222	11.68
	540–600	96	5.05
	600–720	389	20.46
	Total	**1,901**	**100**

Source: Exhibit 867 – Percentage of Messages and Time Delay for February.[127]

The CFA uses about 29,400 EAS pagers to dispatch brigades and provide information to field personnel.[128] It engaged Mingara Services to assess the performance of its radio and communications systems during the fires in late January and February 2009. Mingara's report identifies the shortcomings that significantly contributed to the very high EAS message volume on 7 February. Message linking and the sending of duplicate non-emergency messages for each emergency message were among them.[129] Mingara recommended that the CFA revise its notification messages and collaborate with ESTA and the system provider, to rationalise and reduce linking in the EAS database.[130]

Work to implement Mingara's recommendations has largely removed linking and no new linking is permitted. The EAS contractor stated that if this de-linking work had been done before 7 February delivery delays for all message categories would have reduced considerably.[131] The Commission considers the CFA should have achieved substantial de-linking well before February 2009. Inadequate steps were taken before 7 February to respond to the known risk that the system might not cope with multiple incidents or a single very large incident.

The 2009–10 Victorian Budget allocated $21.5 million to increase EAS network coverage and reduce transmission delays during peak events. The Government's preferred solution is to increase the permanent transmission rate to 1,200 bits per second and commission extra transmitter sites to prevent an ensuing reduction in coverage.[132] Because the State has identified, funded and started implementing a solution to the problem of EAS message overload, the Commission does not consider it necessary to make recommendations in this regard.[133]

Agency communications systems

The CFA and DSE use a range of methods and technologies to communicate during an emergency.

Country Fire Authority

The CFA radio communication system has three different layers: dispatch, incident management and fireground.[134] Dispatch covers emergency call taking through ESTA (for fire agencies this is known as VicFire) and brigade alerting and dispatch through the EAS. Once ESTA has dispatched brigades to respond to a reported fire it maintains contact with responding brigades. Metropolitan brigades maintain contact via Telstra's VHF network. This is a wide-area open-channel network that allows one-to-many communications. Rural and regional brigades maintain contact via the 'Country CAD' (computer-aided dispatch) system.[135]

During an incident the CFA uses incident management channels, or IMCs, which provide open channel communications between management personnel on the fireground and the ICC. The CFA owned and operated 24 sites on 7 February. It now has 33 sites, and 30 more are planned, subject to funding. CFA radios are also programmed to access DSE incident management channels and IMC sites are strategically positioned to avoid coverage duplication.[136]

Fireground communications use open-channel simplex radio transmission, which relies on line of sight for successful transmission. This can facilitate one-to-one and one-to-many communications.[137] The CFA has a range of transportable equipment to extend radio coverage and support incident communications—for example, transportable repeaters that can be positioned to remedy known radio black spots, where there is very poor or no radio coverage.[138]

The CFA has default communication plans that identify the dispatch and command channels to be used in each region until alternative channels are allocated for a specific incident. All CFA firefighters are trained in radio network operation, standard operating procedures for equipment use, and transmission of information during an incident. More advanced training is provided to crew leaders, strike team leaders and sector commanders. Some CFA personnel also attend DSE's communications planner courses.[139]

The CFA radio fleet is nearing the end of its life, and the CFA has begun a radio replacement project, due for completion by June 2012.[140] The aim is to ensure radio compatibility with other agencies and the statewide radio network envisaged by the new Emergency Services Communications Strategic Framework, discussed shortly.

The CFA does not advocate using mobile phones as a primary incident communications tool, but the standard operating procedures contemplate using mobile phones in certain limited circumstances.[141]

Department of Sustainability and Environment

DSE fire personnel use three radio networks. The StateNet Mobile Radio network is used only for day-to-day operations, back-up, and some dispatch and fire-spotting coordination. It is not used for operational communications during a fire because it is unmanageable in heavy traffic loads (the CFA does not use the trunking feature of the SMR network as it too does not cope with very heavy traffic loads).[142] There are 81 Telstra-managed Incident Channel Network sites (76 as at 7 February 2009). These sites provide open-channel communications for command and control.[143] There are also 36 DSE-owned Fire Contingency Network sites for infill coverage and redundancy.[144] Operational personnel also use non-networked simplex radio-to-radio communications to talk with one another on the fireground. DSE personnel can access the CFA's IMCs and monitor the CFA's dispatch radio network.[145]

DSE has funding for a radio replacement project, to commence in 2010–11. The replacement radios will continue to be compatible with radios purchased under the CFA radio replacement project.[146] DSE personnel communicate between offices and with other agencies and ICCs by telephone and fax. In 2009–10 DSE started providing EAS pagers to operational staff so that they would be notified of all fire incidents reported by the public. DSE intends to deliver further pagers to fire crews over the next two years.[147]

Interoperability

CFA and DSE radio communications systems are technically interoperable. Bringing the systems together during an incident, however, relies on good communications training and planning. DSE and the CFA have documented joint default plans for command and initial fireground communications for each area or region. As an incident escalates the IMT's communications planner develops and implements a communications plan.[148]

The CFA and DSE also have arrangements to ensure practical interoperability with other agencies. For example, CFA radios are installed in all MFB appliances and CFA vehicles operating on the urban fringe have been provided with portable Metropolitan Mobile Radio equipment (used by the MFB). DSE maintains a cache of radios that it provides to other agencies and has access to Victoria Police's secure radio network in Melbourne. Radios used by the New South Wales and South Australian fire services in border areas are programmed with CFA and DSE radio channels.[149]

Communication problems on 7 February

The evidence highlighted a number of communication difficulties encountered by CFA personnel and Victoria Police on 7 February. These include paging performance (as discussed above), radio black spots, radio channel congestion, insufficient channel availability, radio transmission failures attributed to smoke effects, and fire-damaged or -destroyed radio communications infrastructure.[150]

Radio

The CFA's radio systems are affected by black spots (where radio coverage is unavailable) and brown spots (where coverage is unreliable). Coverage is influenced by a range of factors, including atmospheric conditions, terrain, vegetation, buildings, the number of base sites and system design. The CFA's IMCs are particularly vulnerable to coverage deficiencies because they operate from stand-alone, rather than networked, transmitter sites.[151]

Black and brown spots can be dealt with in a number of ways, and these solutions are often documented in regional default communication plans.[152] A 1999 to 2001 coverage review mapped black and brown spots in the CFA's IMCs. Those maps were used to improve coverage but they did not eliminate the problem. The CFA now has mapping software (the Statewide Coverage Mapping Application) that enables it to predict radio coverage for an area, but it still has no program to identify radio black spots systematically and implement technical solutions.[153] Until the statewide communications system envisaged by the new Strategic Framework becomes a reality, the CFA should continue to improve its existing communications system systematically, including by making efforts to resolve coverage deficiencies.

RECOMMENDATION 23

The Country Fire Authority review and improve its communications strategy as a matter of priority and develop a program for identifying and responding to black spots in radio coverage.

Radio congestion means firefighters have to wait until others finish before they can use the radio system. According to Mingara Services channel congestion may be exacerbated by users not using the channel efficiently, taking too long to get their message across, or not moving to the allocated channel.[154] Mr Ian Powell, Manager, Planning and Strategy, CFA Technology Services, stated that congestion on open radio channels is typically the result of inadequate communications planning and poor radio discipline.[155] According to the joint CFA–DSE *Operational Debrief Report*, the expanding coverage of mobile phones freed up radio by less use of trunk radio but complicated communications planning.[156] There were also instances of too few portable radios for crews away from vehicles.[157]

The CFA reinforced the need for radio discipline in briefings before the 2009–10 fire season. The Commission urges the CFA and DSE to repeat this practice for future fire seasons.[158] The CFA is implementing Mingara's recommendation to establish key performance indicators with ESTA for the CFA dispatch radio channels. This will enable them to monitor performance and implement strategies to reduce congestion as required.[159]

Evidence from senior CFA staff suggested there were too few radio channels available to each region on 7 February. Mr Powell disagreed, seeing the problem as a lack of proper communications planning. On the day there were 10 CFA fireground channels available in each region and additional DSE channels. Mr Powell's analysis of the Kilmore and Traralgon ICCs demonstrated that a number of the available CFA channels were not allocated.[160] The Commission accepts that there were sufficient fireground channels on 7 February. There are now three additional fireground channels available for each region, which will provide valuable redundancy capacity. It is the communications planner's responsibility to assign these channels properly in an emergency. Agencies should ensure that management teams for significant incidents include experienced communications planners.[161]

The Commission heard anecdotal reports that fire and smoke interfered with radio communications. This was confirmed by the Mingara report. Past studies have suggested several explanations about smoke interference but the matter is not properly understood so a technical solution cannot be developed. It is a matter of grave concern that fire agencies' radio systems might not function reliably in the presence of smoke. The Commission considers that the Emergency Services Heads of Agency Committee should further investigate why the smoke has this effect.[162] Any research on this should consider whether there are technical solutions. The findings of this work should be specifically taken account of in communications planner training conducted by the CFA and DSE.

Until a technical solution is identified, fire agencies must work around smoke interference to maintain radio communications during an incident. A strategically located relay point, such as a temporary repeater, is a readily available alternative. The CFA and DSE should include in their communications planner training courses information about the potential for, and operational solutions to, smoke interference with radio communications.[163] The Commission suggests that further research be conducted into the effects of smoke on radio communications.

Telephones

The Commission was informed of various instances where communications to, from and between ICCs was hampered by problems with fixed-line telephones. For example, at Kilmore ICC 339 of 530 incoming calls went unanswered.[164] This contributed to the Kangaroo Ground ICC being unable to release a number of public information messages: personnel were unable to contact Kilmore ICC to obtain authorisation for the messages' release.[165]

Telstra's fixed-line network proved to be robust, and there was little evidence of it being unable to carry calls. Most witnesses identified the engaged signal as 'congestion'. In many cases this was due to operational, rather than infrastructure, problems and the sheer volume of incoming calls. The significant problems at the Kilmore ICC were caused by a lack of personnel available to answer telephones. There was also a failure to program the Commander™ telephone system properly, which would have cascaded phone calls to an alternative line if the primary line was in use.[166] This was rectified on 9 February 2009.

Victoria Police

Police in metropolitan Melbourne use the Metropolitan Mobile Radio digital network. It suits their operational requirements better than the StateNet Mobile Radio analogue network because it facilitates encrypted communications and 'private chat' channels. The SMR network is still used by rural and regional police because MMR has no coverage outside the metropolitan area.[167] Police also use the Mobile Data Network managed by ESTA. This network enables data to be directly downloaded to terminals in police vehicles from the Victoria Police law enforcement and ESTA call-taking and dispatch databases.[168]

The Commission heard evidence of communications difficulties because the MMR and SMR networks are not intra-operable. On the metropolitan fringe police vehicles are equipped with radios for both the analogue and digital networks, and officers are trained to operate both systems. Metropolitan police members deployed to rural areas on 7 February were, however, often without a means of communication. Some police had vehicles with only digital equipment. Even when they were given a radio compatible with the rural SMR network, many did not know how to operate it. Similarly, rural police deployed to urban areas serviced by the MMR network did not have radio coverage or where there was coverage it was often intermittent and prone to frequent drop-outs.[169] A further communications problem experienced by some police was congestion on regional D24 dispatch channels: this occurred during the Redesdale, Bendigo and Murrindindi fires.[170]

The Strategic Framework discussed in the following paragraphs aims to rectify these difficulties. In the interim, Victoria Police will need to ensure its members are provided with radio handsets compatible with the network for the area to which they are deployed. Appropriate training—as well as back-up communications systems such as mobile phones and CFA radios—is also required.

Emergency Services Communications Strategic Framework

In April 2009 the Department of Justice's Emergency Services Policy and Support Unit began a review of the Statewide Integrated Public Safety Communications Strategy. The review identified six priorities: seamless statewide communication, call taking and dispatch, consistent statewide quality of service, improved data services, location-based services, and community communication.[171]

In April 2010 the State adopted the Emergency Services Communications Strategic Framework to replace SIPSaCS. The framework covers communication from and to the public and communication within and between emergency services organisations. Communication to the public is a new addition since SIPSaCS. The Commission welcomes the framework and its focus on 'a much higher level of integration' of community warning systems with operational communications systems.[172]

By March 2010 the State had identified the future high-level technical needs of Victoria's emergency services communications. It will now examine what products and technologies exist to meet those requirements.[173] For Victoria Police the framework will ultimately lead to intra-operability between metropolitan and rural radio networks. Technical solutions to the current lack of intra-operability, and the timing of their implementation, have not been determined.[174] It is also unclear whether the CFA will continue to maintain its own incident management radio channels or move to a new statewide radio network. The design of the statewide radio communications system will take into account the CFA's requirements. It is therefore crucial that the CFA clearly identifies those requirements. The CFA began a review of its communications strategy and now that the framework is in place this review should proceed.[175]

The framework contains a clear and comprehensive vision for the future of emergency services communications. If implemented, it would improve or resolve the communications challenges identified in evidence before the Commission. For this reason, no recommendation is proposed on the framework's subject matter. The Commission urges those responsible for implementing the framework to bear in mind the EAS message overload experienced on 7 February 2009. Emergency services communications systems must be designed and built with capacity to operate in large-scale emergencies involving multiple agencies. This capacity must be maintained throughout the life of the system. Implementation of the framework will require significant public funds and take time. The Commission notes the State's commitment to this task and considers there is the potential for the State to deliver an integrated, flexible and reliable emergency services communications system.

3.2.7 WATER AND ELECTRICITY

The Commission heard evidence about the failure of fire plans because of loss of power and subsequent loss of water, loss of mains pressure, and pumps catching fire. There was also evidence about the effect of fire on hoses and water storage sources.[176] Firefighters are reliant on ready access to water in order to fight fires, and water access can be affected by drought, as well as interruptions to electricity, during a fire.

Water for firefighting

CFA and DSE firefighters have the legislative power to take water from any waterway or water source for firefighting purposes. Where water is taken for firefighting, the water owner can request water replacement under the Victorian Government's Essential Water Replacement Scheme.[177] The array of domestic water supplies potentially available for firefighting can vary from large static water tanks holding a few thousand litres to swimming pools, dams and rainwater tanks. Although over 90 per cent of households in Australia are connected to mains or town water, the water supply to semi-rural or rural areas is likely to come from sources other than reticulated water. Local water sources such as dams, rivers, bores and rainwater tanks provide water to homes where mains water is not available or not provided.

The CFA recommends that households have a minimum of 10,000 litres of water (independent of mains water) specifically for firefighting. It also recommends water pumps for firefighting able to operate without mains power and hoses long enough to reach around the home.[178]

Water points are established and maintained on public land to assist with fire suppression, including aerial firefighting. DSE is required to ensure adequate signage and access for firefighting vehicles and aircraft to these water points.[179]

Some municipal fire prevention plans currently set out objectives to ensure access to and provision of water supplies for firefighting in rural areas.[180] These are linked to township protection plans, which provide greater detail on the locations and types of static water supplies available for firefighting.[181] Mr Darryl Farmer, a municipal fire prevention officer with Alpine Shire, emphasised the problem of the decreasing supply of water for firefighting:

> With the drought we've had over numerous years, the rivers have been slowed up and a lot of the springs have slowed up. Therefore farmers' dams don't have as much water in them, so that's an issue we have been looking at and we have actually been putting in static water supply systems in certain areas that we believe are required for firefighting purposes.[182]

The impact of interruptions to power and water supplies on 7 February

Instances where water supply failed at critical times on 7 February are described elsewhere in this report. There are examples of loss of pressure in the water supply system and fire damage to pipework in Marysville and the closure of the control valve on the Buxton pipeline.[183]

Once power was lost at the Beechworth DSE office, the incident management team struggled without lighting, air conditioning and the Commander™ phone system; a back-up generator was obtained but it was barely able to support computers and other systems. At Murrindindi the local radio station, UGFM, lost transmission once the power at the main transmitter site went off.[184] Loss of power also affected community water supplies and delivery systems at Buxton.[185]

Past inquiries and fire inquests have clearly demonstrated the importance of independent water and power supplies. Poor planning and lack of preparedness for interruptions to electricity or water supply were highlighted after the Canberra bushfires of 2003.[186] Despite this, the Commission heard that on 7 February reliance on mains power and water was again a concern for fire agencies and those who stayed to defend their properties. This is worrying. Although land-use regulation (discussed in Chapter 6) can help to redress this problem, more effort is obviously required to ensure that houses in bushfire-prone areas have independent access to water and electricity.

3.3 PEOPLE

It is impossible to respond to a fire effectively without personnel who are appropriately trained in how to fight fires safely. This section discusses firefighter safety and the long-term psychological impact of fighting fires. It also celebrates the enormous contribution made by firefighters—particularly CFA volunteers—to the Victorian community.

3.3.1 FIREFIGHTERS' SAFETY AND WELFARE

Improving firefighters' safety has been a clear focus for the CFA and DSE, especially since the Linton inquiry into the deaths of five firefighters in 1998.[187] Both agencies are to be commended on the wide range of safety initiatives that have been introduced and maintained. Additional developments to improve firefighter safety have also been implemented since 7 February.[188]

Safety in February 2009

In the days before 7 February there was a strong emphasis on the safety of firefighters.[189] Crews were given safety briefings in person and via pager messages the day before and on the morning of 7 February.[190] Despite this, the Commission heard from numerous witnesses that there is scope to improve firefighter safety. Regrettably, two firefighters died in February 2009. The first, Mr Joe Shepherd, a CFA member, left his crew to help a relative on 7 February. He was subsequently caught by the fire as he tried to leave. Although Mr Shepherd did not die responding as a CFA firefighter, the CFA have recognised his death for the purposes of compensation. The second fatality occurred on 17 February, when Mr David Balfour, a firefighter with the ACT Fire Brigade, was struck by a falling tree while working in the Cambarville area.[191]

There were numerous occasions when firefighters were in extreme danger in February 2009. Some of the most dangerous situations occurred during burnovers. AFAC (the Australasian Fire and Emergency Service Authorities Council) defines a burnover as a 'section of fire that overruns personnel and/or equipment'.[192] More than 20 burnover incidents occurred on 7 February, many of them being a result of the wind change that occurred in the late afternoon.[193]

A number of crews praised the equipment and safety measures available to them during the burnovers.[194] The Commission heard of the considerable investment by the CFA since the Linton inquiry to improve firefighting safety policies, procedures and equipment.[195] CFA investigations into the burnovers were also generally positive about the operation of safety equipment and procedures. A central concern, however, was why firefighters were caught in burnovers. There is evidence that if firefighters had had accurate and timely information, they might have been able to avoid the risk.[196] Inadequate briefings, communication, maps and weather information were common concerns raised in many of the burnover incident investigations. The poor performance of intercoms between the rear crew haven area and tanker cabins was also a problem for many of the tankers caught in burnovers.[197] Crew in Mirboo East Tanker 1 were involved in a burnover when the wind changed as they were trying to protect homes. They did not receive the red flag warning provided to other crews in the area because they were not on the resource list. They were also not attached to a strike team and, like others in the Glendonald Road area, were acting as a single resource.[198] Communications problems were confirmed in other evidence before the Commission, there being problems in several fundamental areas.

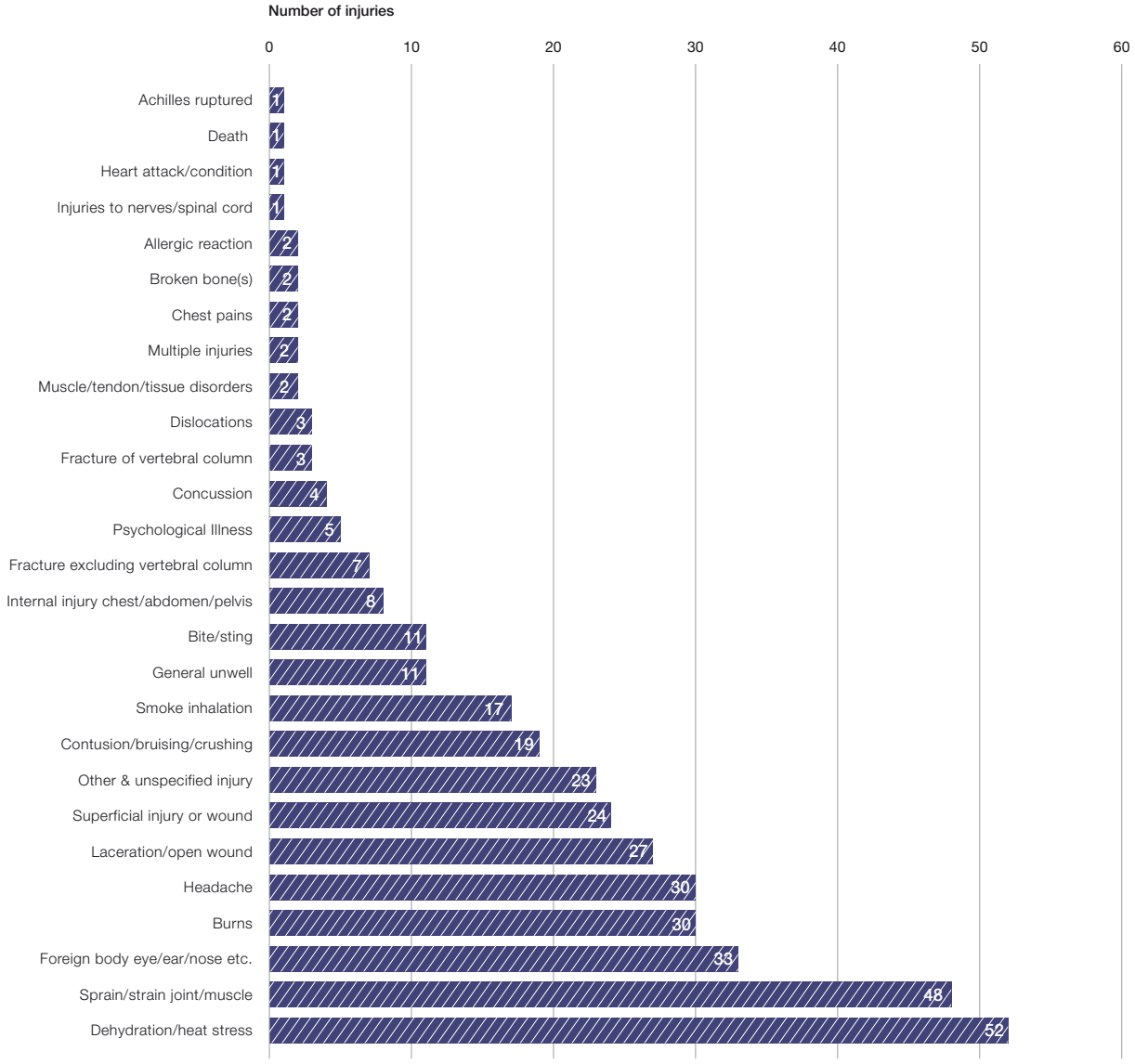
The Commission identified several deficiencies in the investigation of safety incidents such as burnovers. Feedback loops following CFA investigations of burnover events were not completed in the case of the Churchill fire. Members of the relevant IMT were not consulted about the incident; nor were they given a copy of the

investigation report.[199] The failure to inform people whose actions are criticised in the reports of internal CFA investigations deprives those individuals of the opportunity to comment. It also deprives the CFA of the opportunity to learn all it might from the event.

Recommendations from the Linton inquiry sought to strengthen fire agencies' occupational health and safety incident and near-miss investigations, but there appears to be scope for further improvement.[200] The Commission notes that the CFA is considering a method of investigation and review. This new method must ensure that all contributing factors—at both the management and the crew level—are properly identified and taken into account.[201]

CFA statistics show that from 7 February to 20 March 2009 there were 369 injuries to CFA personnel. Figure 3.2 shows the main injuries people sustained.

Figure 3.2 CFA injuries, 7 February to 20 March 2009



Source: Exhibit 810 – Statement of Esnouf.[202]

DSE recorded 64 injuries to firefighters on 7 February. Nearly half of those injuries were sustained at the Bunyip fire, many in the early hours of the morning.[203] Three of the injuries to DSE firefighters were serious. CFA firefighters also suffered serious injuries. A Wollert brigade firefighter at the Kilmore East fire sustained serious burns when he was separated from his crew during asset protection. Erratic fire behaviour coupled with the wind change surprised the crew and, as they took shelter, one of the firefighters went to the pump, where he was badly burnt.[204] A member of the Warrandyte North Tanker 1 was seriously injured after he removed his seatbelt to activate the crew protection system during a burnover and the tanker struck a culvert after the crew made a wrong turn on the way to St Andrews. The crew became disoriented in thick smoke, and issued a mayday message but were unable to provide their location to rescuers.[205] At the Upper Ferntree Gully fire a firefighter sustained three crushed vertebrae when a branch fell on him during strong winds and fire activity. Crews had been on the point of relocating because of their hazardous position when the firefighter was struck by the branch.[206]

Back-burns

Evidence before the Commission identified a number of safety concerns about back-burns lit by DSE and Parks Victoria personnel at Kinglake West and Marysville. This was a dangerous fire-suppression tactic at both locations. Despite their experience and good intentions, those in charge did not have all the relevant information and did not know their back-burns would be affected by a wind change. Evidence before the Commission showed, however, that the back-burns had little or no effect on overall fire behaviour. Of concern is that in both cases approval to conduct the back-burn was not specifically sought from the Incident Controller, which is a contravention of DSE fire management procedures.[207] Following 7 February DSE has reinforced the requirement with personnel responsible for lighting back-burns to seek approval from the Incident Controller.[208]

After thorough examination and consideration of the evidence relating to the back-burn lit in Kinglake National Park, the Commission finds that this back-burn did not contribute to the deaths of people in Pine Ridge Road, Kinglake West.

The Commission considers that fire agencies should focus on ensuring they have thorough processes for identifying and approving particularly dangerous activities such as back-burns.

RECOMMENDATION 24

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures for investigating safety incidents and 'near-misses' to ensure that all dangerous incidents, including back-burns, are fully investigated and that all relevant people are consulted and informed of the results.

RECOMMENDATION 25

The Country Fire Authority and the Department of Sustainability and Environment require without exception that all relevant staff be trained in the need for Incident Controller approval to be obtained before a back-burn is lit.

Safety advisers

Safety advisers provide advice, guidance and support to the incident management team in identifying and dealing with safety concerns. They also provide strategic safety and risk management advice, monitor the development of the incident action plan, ensure safety inputs into operational briefings, review red flag warnings, and conduct risk assessments on elements of the incident. The role involves reporting on all aspects of potential and current safety and risk management present at a level 2 or level 3 incident. Safety advisers must also ensure that safety is promoted as a priority within the IMT and in incident operations.[209]

On 7 February there were about 200 trained DSE and CFA safety advisers but only two were appointed to IMTs.[210] The CFA and DSE joint standard operating procedures require safety advisers to be appointed for level 3 incidents. The low priority given to the appointment of safety advisers within IMTs on 7 February is of concern. The Commission is disappointed that despite the appointment of safety advisers being mandatory for level 3 incidents, on 7 February this standard operating procedure was largely ignored. In addition, CFA debrief report summaries did not raise the question of the absence of safety advisers.[211] CFA updates produced to brief personnel before the 2009–10 fire season also did not reinforce the requirement for safety advisers.[212] Safety advisers are an important aspect of the way the CFA and DSE cope with and mitigate occupational health and safety risks. Given the role of safety advisers was largely ignored on 7 February, further work is required in this area.

The Linton report sought to raise the profile and priority of safety at bushfires and recommended that safety officers (not advisers) be appointed for all fires. The inquiry heard that the AIIMS structure allowed for the appointment of safety officers but that none had been appointed at Linton or at any bushfires in Australia. The CFA and DSE did not support the appointment of safety officers: they felt that appointment of such officers would shift the focus of safety from being everyone's responsibility to one role. They were also concerned that if safety officers were able to veto decisions made by other incident managers it could undermine the capacity of the Incident Controller and the operations section of the IMT to manage the fire.[213]

During evidence to the Commission, the CFA and DSE reiterated their view that a safety officer should not have a power of veto over decisions made by the Incident Controller.[214]

In view of the evidence on firefighter safety, the lack of safety advisers, and the breach of fire agency standard operating procedures that require the appointment of safety advisers to all level 3 incidents, the Commission considers it imperative that an officer responsible for safety be appointed to all level 3 incidents. In addition, safety advisers should be re-named safety officers—consistent with the recommendations from the Linton inquiry. The use of 'officer' is also consistent with the title given to other key managers within an IMT.

The recommended new title underscores the importance of the safety officer role within the IMT. The Commission notes, however, that the safety officer should not have the power to veto decisions made by the Incident Controller, who should continue to retain ultimate responsibility for safety. The Commission is conscious that the make-up of IMTs under the AIIMS structure has been adopted following national consideration. At present in Victoria the safety adviser does not have a veto power. Although it is understood that practice varies between the states, the Commission does not recommend any change to this position. Should the national position change in the future, it is expected that Victoria would follow suit to maintain national consistency.

RECOMMENDATION 26

The Country Fire Authority and the Department of Sustainability and Environment adopt the title 'safety officer' (as opposed to 'safety adviser') and require without exception that a safety officer be appointed to every level 3 incident management team.

Red flag warnings

A red flag warning is issued to firefighters when there is a major change to critical information that might affect the safety of personnel. The warning is usually issued by radio to fire crew leaders down the chain of command. This allows the message to be passed quickly to all personnel and acknowledgment recorded. A red flag warning can be issued by a range of senior operational and incident management personnel.[215]

On 7 February red flag warnings were mainly used to advise crews of changes to weather conditions—in particular, a wind change. Evidence presented to the Commission showed that on many occasions red flag warnings did not reach fire crews due to communication problems, as discussed. Given the number of crews caught in burnovers or who were unaware of the imminent wind change, the importance of red flag warnings requires more attention on the part of Incident Controllers. The introduction of electronic resource tracking, combined with new mapping initiatives, would provide an achievable and accountable method of ensuring that all crews are warned in a timely manner.

Taken as a whole, the performance of the CFA and DSE in managing the safety of their personnel deserves commendation. The number of fires that needed to be tackled at the same time, and their intensity, created enormous challenges and risks for firefighters. At times conditions were chaotic on the fireground, communications were difficult, and large numbers of supervisors and crew leaders with responsibility for others were required to manage under extreme conditions.

The fact that there were no deaths during firefighting on 7 February, when conditions were at their worst and when thousands of personnel were deployed, speaks volumes for the prior emphasis given by the CFA and DSE to training and safety awareness. Although this report deals with some shortcomings and the lessons that can be learned, overall the attention the agencies paid to safety and the protection of their crews warrants recognition.

The psychological impacts of 7 February

The physical injuries sustained on 7 February are easy to quantify, but the long-term psychological impacts are not. People affected by disasters can face serious risks to their mental health. The Commission received differing statistics on the proportion of emergency responders who develop mental health problems, but there is agreement that the rates of mental illness increase after such an event.[216] Among the kinds of mental health problems firefighters can encounter as a result of exposure to bushfires are the following:

- post-traumatic stress disorder
- major depressive disorder
- anxiety disorders such as panic disorder and agoraphobia.[217]

Two mental health experts wrote after the 2009 bushfires, ‘Members of the emergency services … deserve particular attention because of the prolonged intensity of their exposure, particularly in light of the high number of fatalities’.[218]

As well as the impact of responding to the fires on 7 February, many emergency service personnel lost family, friends, colleagues and their homes. Over 30 DSE staff lost loved ones or homes.[219] Almost 300 CFA volunteers and their families were affected by the fires.[220]

During February 2009 a range of services were provided to assist members in the aftermath of the fires. From February 2009 to March 2010 the CFA provided extensive additional support and education to its members. In the affected areas psychologists have spent over 2,000 hours developing and delivering ongoing welfare plans. Chaplains have provided 3,900 hours of pastoral care, and peers have spent about 4,500 hours supporting CFA members and their families.[221]

DSE established a staff resilience program. It includes activities aimed at supporting staff, recognising the effects of the fires on local communities, and counselling and awareness of the impacts of such an event.[222] Counsellors were deployed to affected areas on and following 7 February. Post-fire welfare sessions, pre-fire season education briefings, and increased counselling and support at the first anniversary of the fires were implemented for firefighters and IMTs.[223]

Professor Alexander McFarlane told the Commission about the importance of continuing support for fire agency personnel:

> I think the critical issue is that there are proper quality assurance networks in place within their organisations because these are people who don't easily complain; by their nature people who ignore danger don't make good patients. You can't expect these people necessarily to come forward because they will put up with their suffering often at considerable personal cost.[224]

The Commission strongly encourages fire agencies to continue their efforts in providing support for the psychological welfare of personnel.

3.3.2 VOLUNTEERS

Throughout its inquiry the Commission was often told of the commitment and loyalty of CFA volunteers. The majority of CFA services are provided by people who volunteer to support or respond to fires across Victoria. Nearly 60,000 volunteers are part of the CFA. Along with paid staff, they attend emergencies in all country areas and 60 per cent of Greater Metropolitan Melbourne.[225]

The CFA has 1,211 brigades; all but 31 are volunteer brigades. The others are a combination of career staff and volunteers. Consistent with CFA board policy, there are no brigades consisting solely of career staff.[226] CFA volunteers are recruited from their local community into non-operational and operational roles. Tasks performed include brigade administration, finance, training, maintenance, catering, communications, firefighting, peer support, community education, and people management.[227] Over the past 10 years volunteer membership numbers within the CFA have remained steady. Despite the events of 7 February, the number of resignations has been comparable with previous years. A report by the Bushfire Cooperative Research Centre found that CFA volunteer retention rates were the highest in Australia when compared with other volunteer fire agencies.[228] During an emergency CFA volunteers fill a range of roles, such as firefighter and crew leader on the fireground, information officer and Incident Controller in the incident control centre. They may also be deployed as fire investigators, air observers, fire weather planners and ground observers.[229] In addition, CFA volunteers are involved in brigade administration, equipment maintenance, training, educating the local community and fund raising. These are often the unseen activities that keep the CFA running.[230]

In his evidence to the Commission CFA volunteer and staff member Mr Philip Hawkey said the 'CFA is almost like a family'. The connectedness of the CFA in the community was highlighted by Mr Hawkey and other witnesses, who described how community minded volunteers are. Their diversity of background, socio-economic status and occupation brings experience and depth to the CFA.[231] The CFA General Manager of the Yarra Area, Mr Lex de Man, explained that generalisations about CFA volunteers are difficult to make as the CFA is a very diverse organisation. CFA volunteers do not fit a particular profile or demographic. At 31 March 2010 there were 47,836 male and 11,836 female CFA volunteers.[232]

Information collected by a survey in 2007 showed the following:

- CFA members were more likely to be married when compared with the general community.
- About one in four CFA members surveyed lived on a farm property.
- Compared with the general community, CFA members were more likely to have lived at their current address for more than five years.
- Seventy per cent of CFA members were working full time, as opposed to 39 per cent of the general community. This is linked with the higher percentage of males in the CFA as compared with the general population.
- Thirteen per cent of CFA members were not in paid work, as opposed to 41 per cent of the general population. Of those not in paid work, 68 per cent were retired, 15 per cent were performing home duties, 8 per cent were actively looking for work and 9 per cent were students.
- CFA members were more likely to work in the agriculture, forestry and fishing sector, with 44 per cent of surveyed members who were in paid employment working in this sector.

- Forty-eight per cent of surveyed CFA volunteers owned their own business.[233]

A number of submissions argued that CFA volunteers should not be paid for their services. Mr David Ackland, a lieutenant with the Seymour CFA brigade, commented on the commitment of volunteers.

> Volunteers feel strongly about their role and the fact that they are voluntarily contributing to their community. Paying volunteers will represent a significant shift away from the values associated with volunteerism and will significantly change the culture of the CFA. This is an issue I feel very strongly about.[234]

Other CFA members conveyed similar sentiments in their evidence to the Commission:

> Since joining the CFA as a volunteer I have not looked back. My 32 years in the CFA have given me great satisfaction and pride, particularly in being a member of a voluntary organisation, one that is respected throughout Victoria, in both rural and city areas and throughout Australia.[235]

> Being a CFA volunteer is about being passionate about your community and wanting to look after your friends, family and neighbours. I believe strongly in that if you are passionate about your community you will naturally want to protect it. I hold this belief strongly and expect this from members of my brigade. I am proud that all of our members share that passion.[236]

Mr Rodney Holland, a CFA Group Officer with the Whittlesea – Diamond Valley Fire Brigades Group, said the 'CFA can be the central focus point of the local community'.[237] Volunteer Fire Brigades Victoria also summarised the influence the CFA and its members have on their local communities:

> In many local communities the CFA is at the heart of the community; the CFA station is the local meeting place and CFA volunteers are often deeply involved in community activities and leadership roles beyond their fire and emergency function. These cultural aspects exemplify the identity of an organisation that is strongly supported within the State of Victoria and is deserving of recognition and respect.[238]

The Commission also heard of the impact of volunteering on the family members of CFA volunteers. On 7 February many were left to wonder if their partner, son, daughter, mother or father would return home.[239] Family members supported CFA volunteers by freeing them to protect the community while they stayed to defend the family home. Further support was provided with catering for brigades, maintaining households, or running the family business. The Commission acknowledges the essential role played by the families of CFA volunteers in enabling the volunteers to give priority to their communities during emergencies.

It is difficult to quantify the benefit for the State of CFA volunteers. In 2001 an in-depth analysis of the value of CFA volunteers was conducted by economist Ms Margaret Hourigan. She estimated CFA volunteers contributed about $621 million a year to the Victorian community. This equates to almost $840 million today.[240]

Recognition of volunteers

Some of the strengths of the CFA volunteer base were evident on 7 February. These include its surge capacity, the local knowledge of its members, and the rapid response. The Commission heard of volunteers preparing for the day, warning local residents, and assisting with the confronting task of locating and identifying the deceased. It was told that on 7 February over 20,000 CFA volunteers responded to 632 operational incidents in Victoria.[241] Countless more volunteers took support roles. During the weekend of 7 February, some volunteers were already fatigued because of fires burning in their areas earlier in the week.[242] Volunteer with the Walhalla CFA brigade Mr Simon Seear told the Commission how he and another brigade member doorknocked Walhalla residents the night before, and again on the morning of 7 February, delivering CFA pamphlets and CDs: 'I also advised anyone I spoke to if they felt they were not prepared they may wish to consider leaving'.[243] Mr Seear visited camping sites to warn campers of the fire danger. He also went to a meeting at the local hotel and advised people to shelter in a local underground mine. The Erica brigade canvassed the entire area of Erica, Rawson and Walhalla.[244]

Mr Peter Wiltshire and his wife, Mrs Felicity Wiltshire, are volunteer members of the St Andrews CFA brigade and their home was destroyed on 7 February. They telephoned everyone who was a member of their CFA Fireguard Group telephone tree and 'virtually begged them to depart the area that … Saturday morning'.[245] Kinglake West CFA brigade lieutenant Ms Karen Barrow told the Commission she was operational for six weeks following 7 February and worked shifts of up to 12 hours a day during this time. Her brigade remained operational and members were putting out hot spots and assisting the community with their immediate needs.[246]

The efforts of volunteers in dealing with the hundreds of fires in February 2009 and helping out in their local communities during the recovery process were outstanding. Victoria should be proud of the CFA's commitment to its community. The Commission pays tribute to those CFA volunteers who distinguished themselves in trying to deal with some of the most intense fires the state has experienced. Volunteers are a vital part of Victoria's firefighting response, and all Victorians owe them gratitude.

The Commission agrees with Mr David McGahy, Captain of the Arthurs Creek CFA brigade. Although he was referring to his own brigade, the sentiment is equally true of the entire state:

> I never cease to be amazed to this day at the absolute bravery and professionalism of the men and women of my brigade. There were people in charge of trucks that had no idea—they were from Strathewen—whether their houses were there, they had no idea if their families were alive, and they continued to do what was requested of them. They stayed on the line and helped other people. My admiration for the bravery, as I said, of the members of my brigade knows no bounds.[247]

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1 Exhibit 810 – Statement of Esnouf (WIT.3004.037.0348) [115]

2 Exhibit 862 – Statement of Alder, Attachment 8 (WIT.7541.001.0200_R) at 0220_R; Exhibit 679 – Statement of Gilmore, Attachment 28 (WIT.3018.001.0356) at 0414

3 Exhibit 11 – Statement of Esplin, Attachment 21 (WIT.005.001.1776) at 1786

4 Exhibit 456 – Statement of Smith (WIT.3004.020.0219) [8]–[9], [11]; Exhibit 458 – Statement of Gilmore (WIT.3004.019.0001) [12]; Exhibit 196 – Statement of Haynes (WIT.3004.011.0058) [18]; Hendrie T855:19–T855:30, T880:20–T881:11

5 Exhibit 508 – Statement of Armstrong, Annexure 2 (WIT.3004.008.0282)

6 Jones T8627:11–T8627:23

7 Exhibit 667 – Statement of Grant (VPO.001.041.0107) at 0109

8 Waller T104:17–T104:22

9 Exhibit 733 – Bradstock Report (EXP.012.001.0001) at 0010

10 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0143

11 Exhibit 254 – Statement of Farrell, Annexure 11 (DSE.HDD.0012.1044) at 1086

12 Exhibit 130 – Statement of Waller, Annexure 8 (DSE.HDD.0012.2764)

13 Murphy T1260:21–T1260:30; Russell T7316:1–T7316:5; Court T10960:19–T10960:23

14 Webb Ware T8226:7–T8226:13, T8227:29–T8228:2

15 Exhibit 425 – Statement of Sewell (WIT.7519.001.0001) [57]–[59]

16 Exhibit 400 – Statement of Kennedy (WIT.3024.003.0294) [47]

17 Exhibit 505 – Further Statement of Murphy (WIT.3004.021.0001) [9]–[10], [13], [17]; Exhibit 513 – Statement of Court (WIT.3004.021.0292) [34]

18 Exhibit 652 – Statement of Dixon (WIT.3004.021.0348) [72.1]

19 Exhibit 309 – Statement of Fallon (WIT.3004.015.0001) [69]–[72]; Place T7868:29–T7870:12, T7872:4–T7872:13

20 Exhibit 460 – Statement of Cutting (WIT.3004.020.0001) [47]; Cutting T10322:16–T10323:1

21 Submissions of Counsel Assisting – Narre Warren, Cranbourne & Upper Ferntree Gully Fires (SUBM.202.003.0001) [1.4]–[1.5]

22 Exhibit 862 – Statement of Alder, Attachment 8 (WIT.7541.001.0200_R) at 0206_R, 0211_R–0212_R

23 Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [13], [19]–[25], [32]; Exhibit 254 – Statement of Farrell, Annexure 11 (DSE.HDD.0012.1044) at 1064

24 Exhibit 862 – Statement of Alder (WIT.7541.001.0001) [31]–[34]

25 Nugent T12729:29–T12730:7

26 Exhibit 456 – Statement of Smith (WIT.3004.020.0219) [27]; Smith T10235:14–T10235:31

27 Brown T13062:11–T13062:17

28 Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [34]
29 Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [30]; Sewell T9723:25–T9723:30
30 Exhibit 470 – Statement of Manning, Annexure 3 (DSE.HDD.0052.0875) at 0876
31 Exhibit 337 – Statement of Lawlor (WIT.3024.003.0190) [17]
32 O'Toole T9565:12–T9565:14
33 Exhibit 505 – Further Statement of Murphy (WIT.3004.021.0001) [22]
34 Nugent T12778:27–T12778:28
35 Exhibit 337 – Statement of Lawlor (WIT.3024.003.0190) [16]
36 Exhibit 859 – February 7th 2009 – Number of Hours Flown (TEN.262.001.0002)
37 Exhibit 859 – Major Fires Summary – Number of Hours Flown on Selected 2008/2009 Fires by Date (TEN.262.001.0004)
38 Exhibit 859 – February 7 2009 – Number of Hours Flown (TEN.262.001.0002)
39 Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [26]–[27]; Ryan T17982:21–T17982:24
40 Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [85]; Ryan T17980:15–T17980:29
41 Exhibit 347 – Statement of Farrell (WIT.3024.003.0154) [25]; Exhibit 337 – Statement of Lawlor (WIT.3024.003.0190) [8]
42 Ryan T17989:17–T17989:26
43 Exhibit 859 – State Aircraft Unit Victoria Aviation Debriefs 2008–2009 Fire Season (DSE.HDD.0158.0043) at 0059–0060; Exhibit 271 – Statement of Coulthard (WIT.088.001.0001_R) [19], [23], [25]; Exhibit 413 – Statement of O'Toole (WIT.3024.004.0165) [34], [50], [71]; O'Toole T9567:14–T9568:25
44 Ferguson T10462:20–T10463:15
45 Ferguson T10463:15–T10463:20
46 Streblow T18698:1–T18698:15, T18708:6–T18708:8, T18734:25–T18735:14
47 Exhibit 862 – Statement of Alder, Attachment 5 (WIT.7541.001.0117) at 0137
48 Exhibit 859 – The Cost-Effectiveness of Aerial Fire-Fighting in Australia (RSCH.001.001.0782) at 0786
49 Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [182]–[187]; Exhibit 862 – Statement of Alder (WIT.7541.001.0001) [90], Attachment 5 (WIT.7541.001.0117) at 0134–0137; Ferguson T10462:17–T10463:22
50 Ryan T17989:22
51 Exhibit 845 – Commonwealth Response and Recovery Assistance Following the 2009 Victorian Bushfires (RESP.6007.001.0001) at 0009
52 Power T10818:12–T10819:3
53 Exhibit 845 – Commonwealth Response and Recovery Assistance Following the 2009 Victorian Bushfires (RESP.6007.001.0001) at 0006
54 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004)
55 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0118
56 Exhibit 847 – Second Supplementary Statement of Haynes, Annexure 35 (WIT.3004.036.0146)
57 Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [209]–[214]
58 Ryan T18006:1–T18006:9; Alder T18036:31–T18037:14
59 Ryan T18006:23–T18006:29
60 Ryan T18007:7–T18007:31
61 Ryan T18008:1–T18008:6
62 Alder T18041:3–T18041:30
63 Exhibit 269 – Statement of Russell (WIT.3004.013.0001) [14]; Russell T7449:10–T7449:29; McGennisken T7482:21–T7482:30
64 Exhibit 914 – Statement of Beer (WIT.7551.001.0001_R) [20]
65 Exhibit 269 – Statement of Russell, Annexure 1 (WIT.3004.013.0021) at 0026
66 Exhibit 3 – Statement of Rees, Annexure 2 (WIT.004.001.0141) at 0150–0158
67 Exhibit 425 – Statement of Sewell, Appendix 2 (WIT.7519.001.0028) at 0030
68 Exhibit 425 – Statement of Sewell (WIT.7519.001.0001) [4], [9], [14], [16]–[18]
69 McKenzie T8618:2–T8618:30
70 Russell T7449:10–T7450:5
71 Webb Ware T8234:1–T8234:4
72 Murphy T1260:30–T1261:1
73 Exhibit 425 – Statement of Sewell (WIT.7519.001.0001) [56]
74 Exhibit 503 – Statement of Barr (WIT.6003.001.0001) [16]
75 Rees T2632:17–T2632:22
76 Exhibit 31 – Statement of Langdon (WIT.016.001.0001) [17], [19], [46]; Exhibit 24 – Statement of Griffiths (WIT.018.001.0001) [49]–[52]
77 Exhibit 503 – Statement of Barr (WIT.6003.001.0001) [9]–[16]

78 Exhibit 24 – Statement of Griffiths (WIT.018.001.0001) [34]–[36]; Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) [86(f)]; Slijepcevic T6363:1–T6363:12

79 Exhibit 502 – Statement of Power (WIT.6002.001.0001) [23]

80 Exhibit 502 – Statement of Power (WIT.6002.001.0001) [19]

81 Exhibit 676 – The Imaging Capabilities of the Commonwealth of Australia (AGD.912.0001) at 0001–0002

82 Exhibit 676 – The Imaging Capabilities of the Commonwealth of Australia (AGD.912.0001) at 0002–0003

83 Exhibit 503 – Statement of Barr (WIT.6003.001.0001) [24], [26]–[28]

84 Exhibit 502 – Statement of Power (WIT.6002.001.0001); Exhibit 503 – Statement of Barr (WIT.6003.001.0001) [32]–[33]; Power T10821:3–T10821:29

85 Nichols T6601:9–T6601:12

86 Exhibit 502 – Statement of Power, Attachment B (WIT.6002.001.0073)

87 Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [33]–[51]; Exhibit 874 – Statement of Corbett (WIT.3004.043.0298) [10]–[22]; Exhibit 3 – Statement of Rees (WIT.004.001.0001) [120]–[126]

88 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060)

89 Exhibit 452 – Statement of Deering (WIT.3004.019.0192) [110]

90 Exhibit 457 – Statement of Rogasch (WIT.3004.019.0362) [12], [36]–[39]; Rogasch T10257:20–T10258:19

91 Exhibit 593 – Statement of Dickson (WIT.4018.001.0001) [50]

92 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0095

93 Exhibit 254 – Statement of Farrell, Annexure 11 (DSE.HDD.0012.1044) at 1098; Exhibit 874 – Statement of Corbett (WIT.3004.043.0298) [37]–[40]; Slijepcevic T18185:12–T18185:28

94 Exhibit 415 – Three Examples of T-cards (EXH.415.0001)

95 Exhibit 24 – Statement of Griffiths (WIT.018.001.0001) [18]–[27]; Exhibit 872 – Third Supplementary Statement of Slijepcevic (WIT.3024.006.0113) [25]

96 Exhibit 874 – Statement of Corbett (WIT.3004.043.0298) [29]

97 Exhibit 872 – Third Supplementary Statement of Slijepcevic (WIT.3024.006.0113) [12]

98 Place T7869:4–T7869:11, T7870:5–T7870:18, T7871:4–T7871:13

99 Kennedy T9485:1–T9485:18

100 Exhibit 640 – Statement of Butera (WIT.3010.001.0098) [38]

101 Exhibit 548 – Report of the Investigation Team – North Warrandyte Tanker 1 – 7 February 2009 – Kinglake Fire Complex (CFA.001.027.0235) at 0244–0245

102 Exhibit 874 – 2009 Victorian Bushfires Royal Commission – Systemic Issues: Resource Management and Tracking (CORR.0902.0005); Corbett T18232:22–T18232:31

103 Corbett T18232:22–T18232:31

104 Exhibit 875 – Statement of Davis (WIT.7540.001.0001) [10]; Exhibit 872 – Third Supplementary Statement of Slijepcevic (WIT.3024.006.0113) [59]–[62]; Slijepcevic T18192:1–T18193:15

105 Exhibit 872 – Third Supplementary Statement of Slijepcevic (WIT.3024.006.0113) [51]

106 Exhibit 872 – Third Supplementary Statement of Slijepcevic (WIT.3024.006.0113) [69]; Slijepcevic T18192:18–T18192:23, T18193:2–T18193:15

107 Sewell T9717:10–T9719:9

108 Exhibit 874 – Statement of Corbett (WIT.3004.043.0298) [75]–[78]

109 Overland T10093:21–T10093:26

110 Exhibit 868 – Statement of Lloyd (WIT.3028.001.0001) [13]

111 Exhibit 867 – SIPSaCS Phase 8 Report – The Strategy 2001 (DOJ.001.004.0134) at 0150

112 Exhibit 868 – Statement of Lloyd (WIT.3028.001.0001) [16]; Lloyd T18121:19–T18125:4

113 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0118–0122

114 Exhibit 868 – Statement of Lloyd (WIT.3028.001.0001) [16(d)]; Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0072–0073; Lloyd T18661:28–T18662:18

115 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [33]–[33], Annexure 10 (WIT.3004.045.0060) at 0073

116 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0073; Exhibit 867 – Coverage Commissioning – 2400 Bits Per Second (DOJ.001.005.0017_R); Exhibit 867 – Coverage Commissioning – 2400 Bits Per Second (DOJ.001.005.0072_R); Lloyd T18663:22–T18664:4, T18664:25–T18664:28

117 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [32], Annexure 10 (WIT.3004.045.0060) at 0073–0076; Powell T18167:17–T18167:27

118 Exhibit 867 – EAS Contract Director's Report February 2008 (ESPS.001.001.0048) at 0056; Lloyd T18672:6–T18672:9

119 Exhibit 867 – Impact of Victoria's Storm Activity 2nd April 2008 to CFA Operations Statewide (DOJ.001.004.0117) at 0119, 0127; Exhibit 867 – Message Type Use Review (DOJ.001.003.0267) 0270–0272, 0275

120 Exhibit 867 – EAS Data Rate Options Meeting #4 (ESPS.001.001.0015) at 0019; Exhibit 867 – EAS CMG Meeting #2 (ESPS.001.001.0064) at 0067; Lloyd T18669:13–T18670:31, T18666:22–T18666:31, T18667:7–T18667:25

121 Lloyd T18673:21–T18675:1

122 Cameron T19747:10–T19747:30; Lloyd T18670:23–T18670:26; Judd T20386:2–T20386:4

123 Cameron T19709:28–T10709:31, T19715:10–T19715:27, T19716:31–T19717:8

124 Exhibit 867 – EAS Performance to CFA Operations Statewide on Saturday 7 February and Sunday 8 February 2009 (DOJ.001.005.0140) at 0142

125 Exhibit 653 – Statement of Holland (WIT.3004.021.0209) [30]; Exhibit 595 – Statement of Owen (WIT.3004.031.0001) [191]–[193]

126 Exhibit 653 – Statement of Holland (WIT.3004.021.0209) [30]; Lloyd T18676:22–T18676:28

127 Exhibit 867 – Percentage of Messages and Time Delay for February 7 (TEN.279.001.0002)

128 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [31]

129 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0074–0076

130 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0076–0083, 0091

131 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [52]–[57], Annexure 25 (CFA.600.005.0188); Powell T18172:8–T18172:31

132 Exhibit 868 – Statement of Lloyd (WIT.3028.001.0001) [17]; Lloyd T18123:17–T18124:1, T18680:8–T18680:22

133 Lloyd T18680:23–T18680:30, T18682:11–T18682:14

134 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [9]–[15]; Powell T18145:20–T18145:28

135 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [19]–[24], Annexure 8 (WIT.3004.045.0050); Exhibit 113 – Statement of Cowan (WIT.5001.001.0001) [34]–[35]; Powell T18145:29–T18147:4

136 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [12]–[14], [25], [27]; Exhibit 113 – Statement of Cowan (WIT.5001.001.0001) [55(a)]

137 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [15], [16.1]

138 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [37]; Powell T18163:28–T18164:19

139 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [71]–[86], Annexure 13 (WIT.3004.045.0352); Powell T18147:17–T18147:28. As to Default Communications Plans see for example: Exhibit 870 – Statement of Powell, Annexure 19 (WIT.3004.046.0101), Annexure 20 (WIT.3004.046.0122)

140 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [113]

141 Exhibit 127 – Statement of Paterson, Annexure 3 (WIT.3004.010.0281) at 0519–0520; Exhibit 867 – Emergency Services Communications Strategic Framework (DOJ.001.005.0159) at 0178

142 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic (WIT.3024.006.0067) [17]–[19]; Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) [176]; Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [42]

143 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic (WIT.3024.006.0067) [17]–[19], [21]–[22], [26]–[27], Annexure 7 (DSE.HDD.0157.0011); Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) [176]; Exhibit 113 – Statement of Cowan (WIT.5001.001.0001) [54]–[55]

144 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic (WIT.3024.006.0067) [29]–[36]; Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) [177]

145 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic (WIT.3024.006.0067) [10]–[12], [16]; Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) [176]–[177]

146 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic (WIT.3024.006.0067) [132]

147 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic (WIT.3024.006.0067) [6], [99]–[101]; Lloyd T18662:19–T18662:22

148 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic (WIT.3024.006.0067) [44]–[52], [105]–[112], [115]–[123]; Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [38]–[42]; Exhibit 828 – Statement of Duckmanton, Annexure 14 (WIT.3004.041.0171_R); Powell T18149:16–T18150:10

149 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic (WIT.3024.006.0067) [113]–[114]; Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [43]–[45]; Walshe T672:16–T672:24

150 Exhibit 533 – Statement of Barrow (WIT.121.001.0001_R) [123]–[126]; Exhibit 439 – Statement of Brittain (WIT.3004.020.0251) [60], [62]–[64]; Exhibit 462 – Pastoria RFB De-Briefing Report Redesdale Fire 7th February 2009 (CFA.001.011.0043) at 0044; Exhibit 462 – Redesdale Fire Debrief – Kyneton Fire Station (CFA.001.011.0033) at 0034; Exhibit 269 – Statement of Russell (WIT.3004.013.0001) [100]; Exhibit 272 – Statement of McGennisken (WIT.089.001.0001_R) [53]–[58]; Exhibit 587 – Statement of Smith (WIT.3004.030.0001) [210]; Exhibit 389 – Statement of Lockwood (WIT.7520.001.0001) [63]; Exhibit 417 – Statement of Mongan (WIT.3004.018.0216) [67]; Exhibit 460 – Statement of Cutting (WIT.3004.020.0001) [83]; Exhibit 113 – Statement of Cowan (WIT.5001.001.0001) [77]–[101]; Brittain T9980:25–T9982:2; Williamson T4473:30–T4474:29; Barrow T11555:6–T11555:10, T11568:4–T11569:27; Sigmund T898:8–T898:17; Webb Ware T8228:14–T8228:21; Gilmore T10273:12–T10274:11; Rogasch T10260:6–T10260:18; McGennisken T7491:15–T7491:18

151 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0103–0104

152 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [64], Annexure 10 (WIT.3004.045.0060) at 0105–0106

153 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [64]; Powell T18162:8–T18162:10

154 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0107

155 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [69]–[70], Annexure 12 (WIT.3004.045.0338) at 0338; Powell T18157:3–T18157:16

156 Exhibit 192 – DSE and CFA – Operational Debrief Report – 2008/09 Fire Season (DSE.HDD.0030.0102) at 0121

157 Exhibit 192 – DSE and CFA – Operational Debrief Report – 2008/09 Fire Season (DSE.HDD.0030.0102) at 0121, 0129

158 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [69]–[70], Annexure 12 (WIT.3004.045.0338) at 0338; Powell T18157:3–T18157:16

159 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [66], Annexure 10 (WIT.3004.045.0060) at 0121; Powell T18163:2–T18163:11

160 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [88], Annexure 10 (WIT.3004.045.0060) at 0107; Exhibit 460 – Statement of Cutting (WIT.3004.020.0001) [83]; Powell T18156:8–T18156:20

161 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [85]; Powell T18156:28–T18157:2

162 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0111, Annexure 23 (WIT.3004.046.0171) at 0180–0188; Exhibit 868 – Statement of Lloyd, Annexure 4 (WIT.3028.001.0059) at 0066–0067; Submissions of the State of Victoria – Communications (RESP.3000.006.0196) [49]

163 Exhibit 870 – Statement of Powell, Annexure 10 (WIT.3004.045.0060) at 0111, Annexure 23 (WIT.3004.046.0171) at 0189–0190; Powell T18159:19–T18160:14

164 Exhibit 592 – Statement of Smith (WIT.3010.006.0001) [24]; Exhibit 245 – Statement of McKenzie (WIT.3024.002.0144) [20], [46]; Exhibit 269 – Statement of Russell (WIT.3004.013.0001) [80]

165 Exhibit 504 – Second Supplementary Statement of Creak (WIT.3004.021.0148) [175]–[176]; Exhibit 50 – Statement of Lawrence (WIT.3004.001.0197) [20], [37]–[42]

166 Exhibit 112 – Statement of Beresford (WIT.5002.001.0001) [49]–[51]; Exhibit 504 – Second Supplementary Statement of Creak (WIT.3004.021.0148) [175]–[176]; Exhibit 52 – Statement of Caughey (WIT.3004.001.0154) [19]; Exhibit 245 – Statement of McKenzie (WIT.3024.002.0144) [20], [46]; Caughey T1706:14–T1706:24; Creak T10892:17–T10893:3

167 Exhibit 868 – Statement of Lloyd (WIT.3028.001.0001) [16(b)], Annexure 3 (WIT.3028.001.0056); Walshe T669:20–T670:16, T1239:5–T1239:19

168 Exhibit 62 – Statement of Foster (WIT.012.001.0001) [21], [25]

169 Exhibit 19 – Statement of Walshe (WIT.003.002.0001) [115]–[117]; Exhibit 592 – Statement of Smith (WIT.3010.006.0001) [30]; Exhibit 365 – Statement of Billing (WIT.3010.005.0018) [48]; Billing T8912:16–T8913:19, T8914:24–T8915:1, T8934:12–T8934:24; Barton T8881:19–T8881:25; Hamill T8596:8–T8596:21; Thompson T10527:8–T10527:9

170 Exhibit 473 – Statement of Brundell (WIT.3010.006.0215) [17]; Exhibit 454 – Statement of Bull (WIT.3010.009.0001) [38]–[40], Attachment 12 (WIT.3010.009.0129), Attachment 13 (WIT.3010.009.0134) at 0137; Bull T10175:12–T10176:28; Hamill T8596:8–T8596:21

171 Exhibit 867 – Review of Emergency Services Communications (DOJ.001.004.0001) at 0003

172 Exhibit 867 – Emergency Services Communications Strategic Framework (DOJ.001.005.0159) at 0167, 0170; B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009, Chapters 4 (Warnings), 5 (Information), 9 (Incident Management)

173 Exhibit 867 – Emergency Services Communications Strategic Framework (DOJ.001.005.0159) at 0194; Exhibit 867 – Emergency Services Heads of Agencies – Part 1: High Level Technical Requirements and Standards (DOJ.001.003.0342); Lloyd T18659:9–T18659:17, T18130:12–T18130:15

174 Lloyd T18661:5–T18661:12, T18133:28–T18134:24

175 Exhibit 870 – Statement of Powell (WIT.3004.045.0001) [63], Annexure 10 (WIT.3004.045.0060) at 0119; Powell T18160:21–T18161:1; Lloyd T18661:13–T18661:26

176 Exhibit 672 – Human Behaviour & Community Safety (CRC.300.007.0082) at 0119

177 *Country Fire Authority Act 1958*, s. 30(1)(e); Exhibit 838 – VIC Government Policy – Replacement of Essential Water Used During Bushfire Fighting Operations – 2009–10 Bushfire Season (TEN.250.004.0001)

178 Exhibit 831 – Defending Your Property – Prepare and Act Early to Survive (RESP.3001.001.0083) at 0088–0091

179 Exhibit 679 – Statement of Gilmore, Attachment 28 (WIT.3018.001.0356) at 0389

180 Exhibit 832 – Statement of Thompson, Annexure 5 (WIT.3004.040.0306_R) at 0335_R; Exhibit 594 – Statement of Venville, Attachment 4 (WIT.4022.001.0351) at 0365, 0381

181 Exhibit 614 – Statement of Hayes, Annexure 16 (WIT.3004.032.0469) at 0472, 0489, 0490, 0493

182 Farmer T17199:15–T17199:22

183 Exhibit 361 – Statement of Anderson (WIT.3032.001.0001) at 0007–0008

184 Exhibit 370 – Statement of Weeks (WIT.105.001.0001_R) [22]

185 Exhibit 348 – Statement of Rice (WIT.3004.016.0091) [89]; Exhibit 556 – Statement of Creighton (VPO.001.040.0177) at 0183; Exhibit 361 – Statement of Anderson (WIT.3032.001.0001) [33]; Exhibit 555 – Statement of Ackerman (VPO.001.034.0294) at 0297; Rice T8533:15–T8534:15; Jones T8640:13–T8641:8; Anderson T8793:6–T8793:28, T8795:5–T8795:27, T8798:11–T8800:3

186 Exhibit 9 – Chapter 6 – Prepare, Stay and Defend or Leave Early – Evidence for the Australian Approach (TEN.001.001.0151) at 0160–0161

187 Exhibit 546 – Linton Report (TEN.132.001.0001)

188 Exhibit 811 – Statement of Edgar (WIT.3024.005.0353) [165]–[184]; Exhibit 810 – Statement of Esnouf (WIT.3004.037.0348) at [292]–[300]

189 Exhibit 202 – Statement of Slijepcevic, Annexure 4 (DSE.HDD.0006.3020); Exhibit 408 – Statement of Tainsh, Annexure 2 (DSE.HDD.0012.1560) at 1560; Exhibit 6 – Revised Statement of Waller (WIT.002.002.0001) at 0041; Exhibit 269 – Statement of Russell, Annexure 7 (WIT.3004.013.0227) at 0229

190 Exhibit 41 – Statement of Murphy (WIT.3004.001.0001) at 0004; Exhibit 508 – Statement of Armstrong (WIT.3004.008.0255) at 0257–0258

191 Exhibit 574 – Statement of Incoll (WIT.7546.001.0001)

192 Exhibit 127 – Statement of Paterson, Annexure 3 (WIT.3004.010.0281) at 0587–0594

193 Exhibit 548 – Summary of Burn Over Incidents on 7 February 2009 (TEN.143.001.0001); Haynes T12046:5–T12046:6; Edgar T16757:29–T16758:11

194 Exhibit 353 – Investigation Report Burn Overs of Yarck Tankers 1 and 2 (CFA.001.028.0001) at 0012; Exhibit 418 – Statement of Chesterton (WIT.3004.018.0353) at 0357

195 Exhibit 810 – Statement of Esnouf (WIT.3004.037.0348) [42]

196 Exhibit 389 – Investigation Report Hazelwood North Tanker 1 (CFA.001.026.0153) at 0165; Exhibit 389 – Investigation Report Glengarry West Tanker 1 (CFA.001.026.0138) at 0149

197 Exhibit 548 – Report of the Investigation Team – Sunbury Tanker 2 – 7 February 2009 – Kilmore East Fire (CFA.001.027.0355) at 0359, 0364–0365, 0369; Exhibit 548 – Report of the Investigation Team – Epping Tanker 1 Burn Over – 7 February 2009 – Kilmore East Fire (CFA.001.027.0128) at 0132, 0135, 0137–0138; Exhibit 548 – Report of the Investigation Team – Greenvale Tanker 1 Burn Over – 7 February 2009 – Kilmore East Fire (CFA.001.027.0147) at 0151, 0154–0157, 0159; Exhibit 548 – Report of the Investigation – Whittlesea Tanker 2 Burn Over – 7 February 2009 – Kilmore East Fire (CFA.001.027.0421) at 0425, 0429–0431

198 Exhibit 548 – Investigation Report – Mirboo East Tanker 1 – 7 February 2009 – Churchill Fire (CFA.001.027.0208) at 0220–0221

199 Lockwood T9245:26–T9246:6

200 Exhibit 546 – Linton Report (TEN.132.001.0001) at 0655–0663

201 Exhibit 810 – Statement of Esnouf (WIT.3004.037.0348) [292]–[293]

202 Exhibit 810 – Statement of Esnouf, Annexure 63 (WIT.3004.040.0167)

203 Exhibit 811 – Statement of Edgar (WIT.3024.005.0353) [153]

204 Exhibit 548 – Investigation Report – Incident at 55 Hilliers Road, Whittlesea (Wollert Fire Brigade) – 7 February 2009 (CFA.600.001.0107) at 0110–0111, 0119

205 Exhibit 548 – Investigation Report – North Warrandyte Tanker 1 – 7 February 2009 (CFA.001.027.0235) at 0244–0245

206 Exhibit 548 – Investigation Report V1 – 21 May 2009 (CFA.600.001.0304) at 0306

207 Exhibit 254 – Statement of Farrell, Annexure 11 (DSE.HDD.0012.1044) at 1085–1086; Fitzgerald T16901:3–T16901:15

208 Edgar T16762:1–T16762:28; Williamson T10505:23–T10505:26; Lovick T8392:17–T8393:1

209 Exhibit 811 – Statement of Edgar, Annexure 6 (DSE.HDD.0153.0522)

210 Exhibit 811 – Statement of Edgar (WIT.3024.005.0353) [41], [44]; Exhibit 810 – Statement of Esnouf (WIT.3004.037.0348) [208]; Esnouf T16708:27–T16709:3

211 Exhibit 192 – DSE and CFA – Operational Debrief Report – 2009/08 Fire Season (DSE.HDD.0030.0102); Exhibit 811 – Statement of Edgar, Annexure 4 (DSE.HDD.0153.0363); Exhibit 548 – 2009 Victorian Bushfires Commission – Safety Advisors (CORR.0911.0107_R)

212 Exhibit 871 – Fourth Supplementary Statement of Slijepcevic, Annexure 16 (DSE.HDD.0157.0056)

213 Exhibit 546 – Linton Report (TEN.132.001.0001) at 0078, 0571–0573

214 Esnouf T16695:5–T16696:6; Edgar T16751:25–T16752:24

215 Exhibit 127 – Statement of Paterson, Annexure 3 (WIT.3004.010.0281) at 0771–0772

216 Exhibit 538 – Statement of Grigg, Annexure 4 (WIT.3001.001.0123) at 0128, 0131, Annexure 16 (WIT.3001.001.0304) at 0306

217 Exhibit 535 – McFarlane Report (EXP.007.002.0005) at 0022

218 Exhibit 535 – After the Fires: Looking to the Future Using the Lessons from the Past (EXP.007.001.0082) at 0082

219 Exhibit 857 – Department of Sustainability and Environment – Annual Report 2009 (TEN.201.001.0001) at 0024

220 Exhibit 986 – Volunteer Fire Brigades Victoria – Annual Report 2008–2009 (TEN.304.001.0001) at 0014

221 Exhibit 813 – Statement of Seach (WIT.3004.037.0250) [66]

222 Exhibit 857 – Department of Sustainability and Environment – Annual Report 2009 (TEN.201.001.0001) 0024

223 Exhibit 811 – Statement of Edgar (WIT.3024.005.0353) [130]–[148]

224 McFarlane T11641:7–T11641:14

225 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [25]

226 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0122; Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [72]

227 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [31]; Rees T19:4–T19:16

228 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [47], [53], [55]

229 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [127]; Exhibit 127 – Statement of Paterson, Annexure 3 (WIT.3004.010.0281) at 0707, 0713, 0835, 0857; Paterson T4277:9–T4277:25

230 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [31], [81]

231 Exhibit 923 – Statement of Hawkey (WIT.7554.001.0001_R) [13]–[14]; de Man T19147:6–T19147:13

232 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [62], [68]

233 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [69]

234 Exhibit 912 – Statement of Ackland (WIT.7550.001.0001_R) [22]

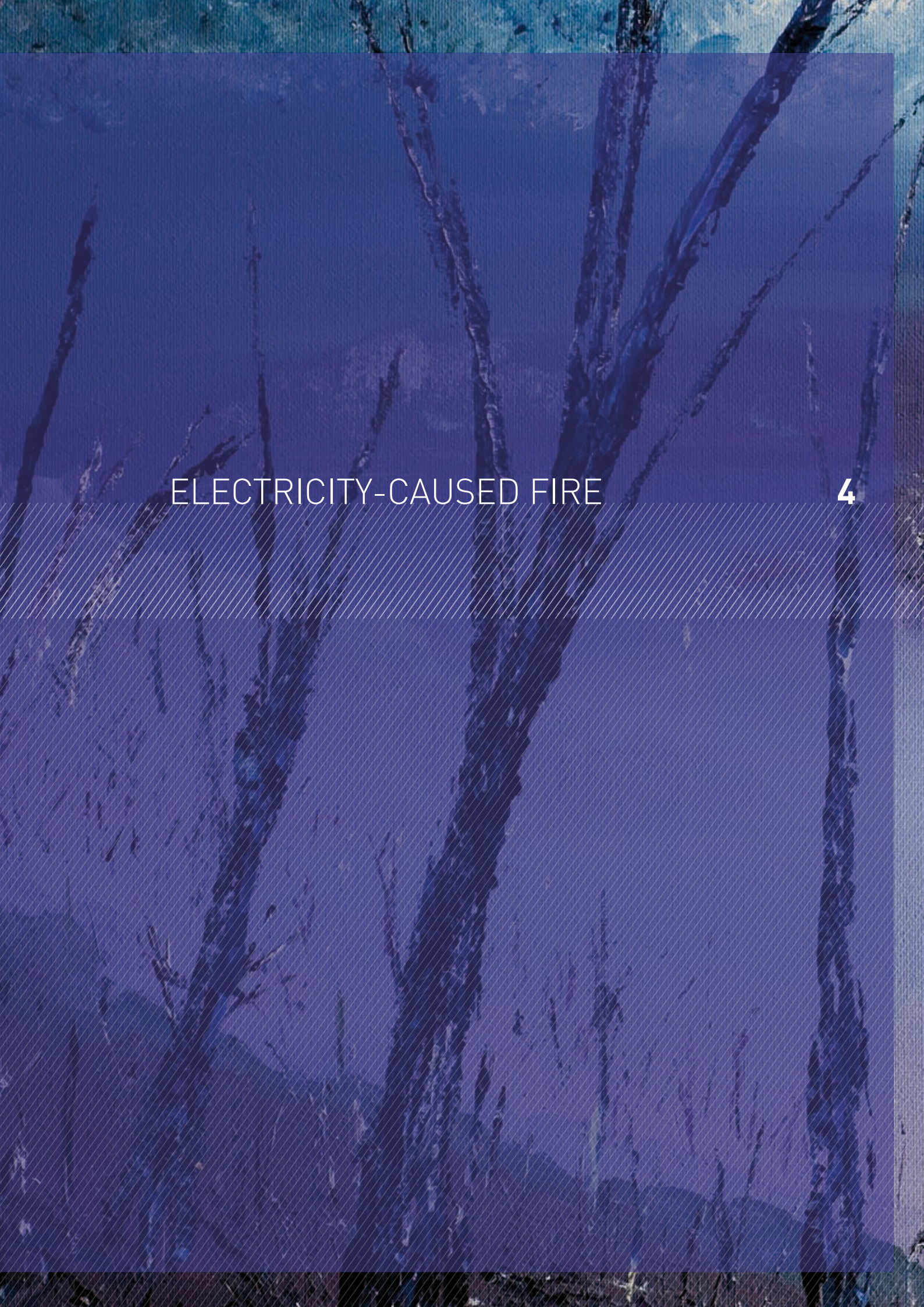
235 Exhibit 914 – Statement of Beer (WIT.7551.001.0001_R) [10]

236 Exhibit 913 – Statement of Jones (WIT.7552.001.0001_R) [11]

237 Exhibit 911 – Statement of Holland (WIT.7553.001.0001_R) [11]

238 Exhibit 910 – Submission of Volunteer Fire Brigade Victoria (VFBV.002.001.0001) [32]

239 Jewell T16776:2–T16776:26
240 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [34]
241 Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [43]
242 Owen T12922:18–T12922:26
243 Exhibit 88 – Statement of Seear (WIT.042.001.0001) [32]
244 Seear T2800:13–T2800:15, T2804:1–T2804:7
245 Wiltshire T5403:7–T5403:18
246 Exhibit 533 – Statement of Barrow (WIT.121.001.0001_R) [109], [117]; Barrow T11558:18–T11558:22
247 McGahy T2256:9–T2256:17



ELECTRICITY-CAUSED FIRE 4

4 ELECTRICITY-CAUSED FIRE

Victoria has a history of electricity assets causing bushfires. In 1969 and 1977 the failure of electricity assets—including the clashing of conductors, conductors contacting trees, and inefficient fuses—caused major bushfires. This history was repeated on 7 February 2009, when five of the 11 major fires that began that day were caused by failed electricity assets; among the fires was that at Kilmore East, as a result of which 119 people died. The Commission investigated the causes of each of those five fires and devoted a considerable amount of time to examining systemic factors associated with the reliability and safety of Victoria's electricity distribution networks.

Against this background the Commission recommends major changes to the state's electricity distribution infrastructure and its operation and management, to make the distribution system safer on days when fire risks are acute. There are two areas of major change: extending Energy Safe Victoria's mandate and resources to require and enable it to play a more active role in reducing the risk of electricity distribution infrastructure causing bushfires through strengthening its regulatory capacity and replacing ageing electricity distribution infrastructure with technology that delivers greatly reduced bushfire risk.

Knowing that these recommendations will take time to implement, the Commission also recommends some interim measures aimed at reducing the risk of electricity assets causing bushfires in the short term. These involve reducing the length of the inspection cycle, improving the efficacy of asset inspection, modifying the operation of automatic circuit reclosers (circuit breakers), retrofitting vibration dampers to longer spans of power line, and fitting spreaders to power lines to minimise clashing.

4.1 HISTORY OF ELECTRICITY-CAUSED IGNITIONS

Nine of the 16 major fires on 12 February 1977 were caused by electrical assets.[1] At the inquiry into those 1977 fires it was claimed that 1.5 per cent of the total annual fire ignitions in 'normal circumstances' were caused by electricity assets then owned by the State Electricity Commission of Victoria. Sir Esler Barber, chairman of the 1977 inquiry, observed, however:

> This overall picture is in sharp contrast to what happens on days of extreme conditions, such as January 8th 1969 or February 12th 1977. On such days, the incidence of SEC fires rises dramatically.
>
> The alarming aspect of these figures is that they tend to occur in widely separated places at approximately the same time and at the time of day when conditions are such that the rate of spread of fire is likely to be at its peak.[2]

The force of Sir Esler's observations was confirmed on Ash Wednesday, 16 February 1983: it appears that four of the eight major fires on that day were caused by electricity assets.[3]

On 7 February 2009 the pattern was repeated. Failed electricity assets caused five of the 11 major fires that began that day—Kilmore East, Beechworth, Coleraine, Horsham and Pomborneit–Weerite. The circumstances of each of these fires are discussed in detail in Chapters 3 to 14 of Volume I.

The importance of Victoria's electricity infrastructure to this Commission's investigations is highlighted by the devastation wrought by the Kilmore East fire: 119 lives were lost as a result of that fire, which was caused by electrical arcing after a conductor—which was probably 43 years old—on the Pentadeen Spur line broke.[4]

Mr Paul Fearon, Director of Energy Safe Victoria, said it was 'probably self-evident' that on days of extreme fire danger the percentage of fires caused by electrical distribution assets rises dramatically above the long-term average.[5]

The history of bushfire in Victoria since widespread introduction of electricity demonstrates that on days of dangerous bushfire conditions the failure of electrical assets can cause fires of great magnitude that result in much destruction and loss. The protection of human life demands a critical analysis of the Victorian electricity industry and recommendations that, when implemented, will lead to a material reduction in the risk of bushfire caused by the failure of electrical assets.

The Commission heard evidence on the state of health of existing infrastructure, on maintenance practices, on inspection regimes, and about a number of technical concerns. The aim was to explore options that would, in time, lead to a safer distribution network that meets the needs of the community while substantially reducing the future risk of bushfire resulting from electrical failure.

The evidence before the Commission supports the conclusion that major changes should be made to Victoria's electricity distribution infrastructure, and its operation and management, if there is to be a substantial reduction in the risk to human life posed by bushfires on catastrophic fire days.

The Commission's recommendations are framed against the view that there is a serious risk that must be dealt with. Implementation of the recommendations will entail considerable cost. Some of that cost is inevitable because of the age and deteriorating state of the distribution network. Replacing much of the network in the short term is unavoidable: it is a question of what it is replaced with. The Commission is not, however, in a position to take into account cost implications and the impact on communities; those are matters for government to determine and assess.

Nevertheless, the seriousness of the risk and the need to protect human life are imperatives the Commission cannot ignore. The number of fire starts involving electricity assets remains unacceptably high—at more than 200 starts recorded each year. Although it is not possible to eradicate the risk posed by electricity assets altogether, the State of Victoria and the distribution businesses should take the opportunity to make changes aimed at substantially removing one of the primary causes of catastrophic fires in Victoria during the past 40 years.

Change such as this necessitates consultation and planning, but the threat of further catastrophic bushfires makes swift action essential. There need to be interim measures designed to ensure that distribution businesses and regulators take all practicable steps to reduce the bushfire risk in the transitional period.

4.2 THE ELECTRICITY DISTRIBUTION NETWORK

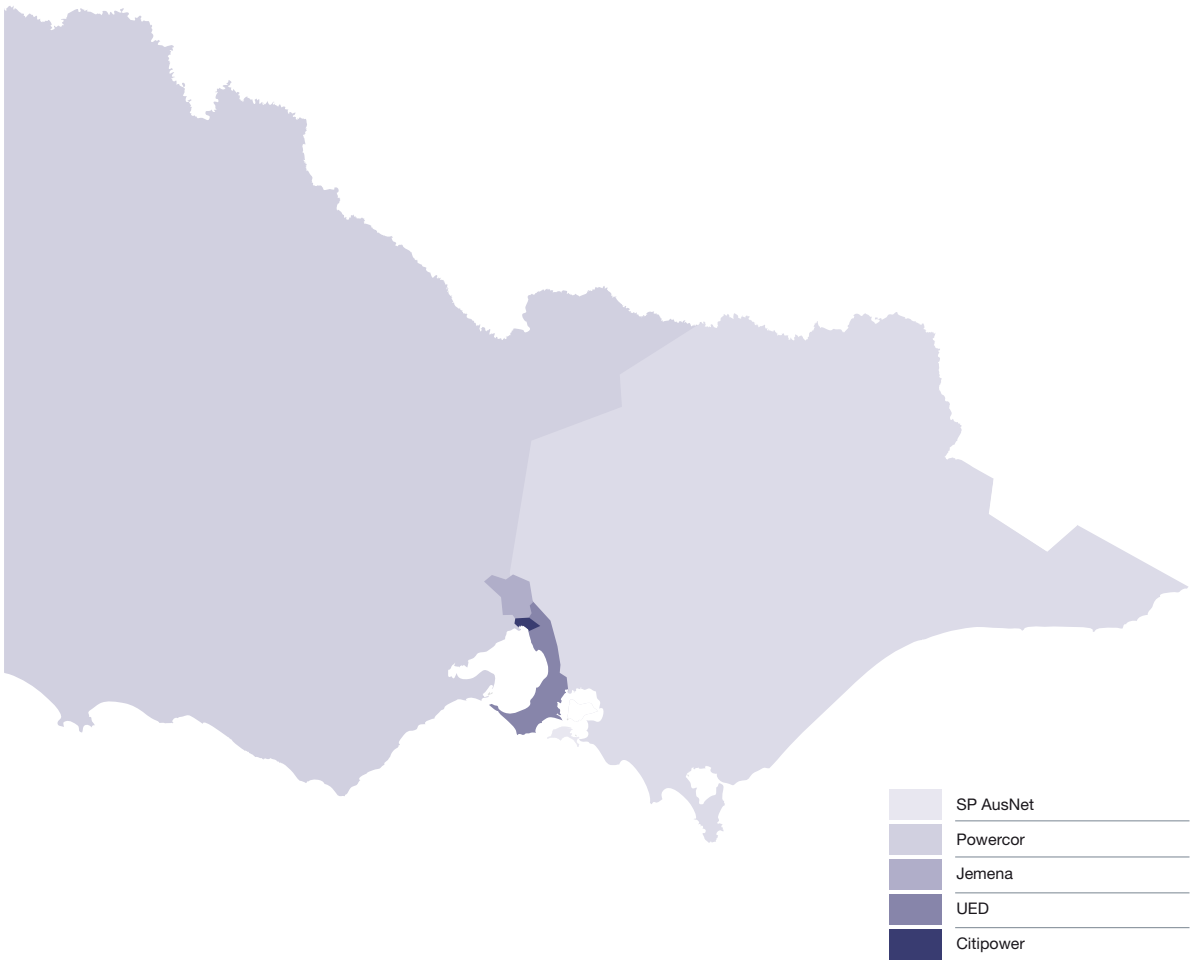
The Victorian electricity distribution network consists of approximately 1.2 million poles and 130,000 kilometres of lines operating at between 240 and 66,000 volts. It is made up primarily of 22,000-volt (or 22-kilovolt) distribution feeders and 12,700-volt SWER (single-wire earth return) lines.[6]

The main distributors of electricity in Victoria are, and were on 7 February 2009, SP AusNet and Powercor (see Figure 4.1).

The Powercor distribution network is about 82,653 circuit-length-kilometres on 528,000 poles of wood, concrete or steel. It includes SWER lines of approximately 21,813 route-length-kilometres. The SP AusNet distribution network is about 41,000 route-kilometres carried on approximately 379,104 poles of wood or concrete. It includes SWER lines of about 6,200 route-length-kilometres.[7]

Over the years the distribution networks have been a notorious cause of bushfires in rural areas. Mr Paul Adams, formerly general manager of SP AusNet's Network Services Group, stated that since 1997 an average of 4,800 fire starts have occurred each year on private property in the SP AusNet distribution area. He noted that, of all these fires, SP AusNet assets had been associated with 52.8 fire starts (1.1 per cent) each year.[8]

Figure 4.1 Victoria's electricity distributors coverage



Source: Exhibit 237 – Statement of Lane.[9]

There appears to be some elasticity in these figures. In its November 2006 evaluation of the SP AusNet Bushfire Mitigation Plan, Energy Safe Victoria expressed concern that the figures represented a gross underestimate. SP AusNet's Five Year Cost Management Plan, dated 1 June 2005, stated that in the previous 10 years the organisation's network had experienced on average 90 fires annually.[10]

Powercor produced a graph of 'Powercor ground fires' up to 30 April 2009, which showed that, as a proportion of CFA fires in the Powercor area of operations, Powercor fires ranged from 1.63 per cent (41 fires) in 2004–05 to 4.53 per cent (113 fires) in 2008–09.[11]

Although the long-term averages SP AusNet and Powercor refer to are similar to those the State Electricity Commission of Victoria claimed at the 1977 inquiry, on catastrophic fire days electrical assets are likely to cause a large proportion of the fires that start.[12]

The distribution businesses have long accepted that their assets have the capacity to start fires and that it is important to take steps to mitigate the risk of such fire starts. A variety of steps are now mandated by Victoria's *Electricity Safety Act 1998* and associated Regulations.

4.3 AGEING INFRASTRUCTURE

The evidence before the Commission suggests that the age of electricity distribution assets contributed to three fires on 7 February 2009:

- the Kilmore East fire—conductor failure caused by fatigue on a SWER line[13]
- the Coleraine fire—fatigue and corrosion leading to a broken tie wire and as a consequence a conductor starting a fire on a SWER line[14]
- the Horsham fire—fallen conductor caused by failed pole cap on a SWER line.[15]

The circumstances of those fires are discussed in detail in Part One of Volume I.

The Commission received from Mr Kim Griffith, who has extensive electricity industry experience with the State Electricity Commission of Victoria and as CEO of Ergon Energy, evidence that distribution businesses' capacity to respond to an ageing network is constrained by the existing regime for the industry's economic regulation. Mr Griffith said the regime favours the status quo and makes it difficult to bring about step change reform.[16]

As components of the distribution network age and approach the end of their engineering life, however, there will probably be an increase in the number of fires resulting from asset failures unless the State Government and the distribution businesses take urgent preventive steps.[17] This poses an unacceptable bushfire risk to the state's residents.

The Commission considers that now is the time for a major change and a start in planning for the replacement of ageing infrastructure. Protection of human life must be the guiding principle for that reform.

4.3.1 CONDUCTORS

SP AusNet provided to the Commission the results of a study of its conductor fleet, which noted, among other things, 'The primary issue facing SP AusNet is the increasing age profile and deteriorating performance (2% p.a.) of steel and copper conductor through failure …' SP AusNet's conductors have a regulatory life of 60 years, and its conductor fleet has an average age of 41 to 45 years. Most of its steel and copper conductors are now more than 50 years old; they account for all conductors of above-average age in its fleet. The failure of steel and copper conductors is the primary type of conductor failure attributed to end-of-life characteristics.[18]

The report of SP AusNet's conductor study also noted that the great majority of conductor failures on the organisation's network involved high-voltage conductors and that this represented a 'considerable risk to the business from a public safety and bushfire perspective'. The report said, 'In the absence of planned conductor replacement programs, failure rates may begin to increase at an exponential rate due to the increasing proportion of [the] conductor fleet approaching current failure age ranges'.[19]

SP AusNet's investigations demonstrated that individual steel and copper conductor sections were in poor condition. Lines were said to be 'annealed', 'corroded' or having 'a history of falling down'.[20]

There is no reason to distinguish the SP AusNet network from the Powercor network when considering the impact of ageing infrastructure.[21] Sinclair Knight Merz's report for Powercor, issued in October 2004, noted that 16 per cent of the overhead line distribution assets in the Powercor network are between 35 and 44 years old, 5 per cent between 45 and 54 years, 1 per cent between 55 and 64 years, and 1 per cent between 65 and 74 years.[22]

The Commission heard evidence from Professor Nicholas Hastings, who has an international reputation in asset management and maintenance engineering, particularly reliability engineering. Professor Hastings noted the increasing proportion of assets in Powercor's network at or beyond regulatory life and told the Commission that in his opinion this would lead to a substantial increase in failure rates for electrical assets. Professor Hastings' opinion is supported by the SKM report, which pointed to a probable gradual trend from random failure to common failure as a consequence of ageing assets.[23] The Commission accepts Professor Hastings' evidence.

4.3.2 INSULATORS

Insulator failure can result in pole fires, cross-arm fires, conductor drops, conductor clashing, and conductor contact with the ground. Such incidents constitute bushfire risks.[24]

The pin-type insulator's engineering life is 40 years. Pin-type insulators installed between 1930 and 1980 account for a considerable proportion (28 per cent) of SP AusNet's 22-kilovolt insulator fleet. In this regard Powercor is apparently in a position similar to that of SP AusNet.[25]

An SP AusNet review of insulators found that between 2002 and 2007 insulator failures increased at a rate of 5 per cent a year and that its pin-type insulators would reach an average age of 40 years between 2011 and 2015. The review concluded that without 'proactive' replacement programs the incidence of pole fires would continue to increase.[26]

4.3.3 POLES

The Energy Safe Victoria audit of SP AusNet's 2008–09 Bushfire Mitigation Plan pointed to age affecting electricity poles. In the auditors' opinion, the high number of pole stakings across the network 'would sometime in the future create a wave of pole replacement' and 'the number of existing staked poles that are now being temporarily supported until replacement indicates that this wave has now commenced'. SP AusNet itself acknowledged this upward trend.[27]

Powercor's October 2004 submission to the Essential Services Commission's electricity distribution price review for 2006 to 2010 recognised that 'age and condition are closely correlated':[28]

> There is a substantial peak in the age of assets, indicated by the example of wood poles … In 2004 there are 37,000 wood poles 50 years and older, however this will increase to approximately 62,000 by 2010 based on average replacement of 1,500 wood poles per year.[29]

Degradation of pole-top attachments with age is also of concern. Energy Safe Victoria's bushfire mitigation audit of SP AusNet in July 2005 noted that five of 11 items found defective had been inspected in the previous two years, leading the auditor to conclude there 'may be an issue with pole top attachments lasting the full five-year inspection cycle'.[30]

4.3.4 TIE WIRES

Metallurgist Dr Jeffrey Gates examined the circumstances of the tie-wire failure that led to the Coleraine fire on 7 February. Dr Gates told the Commission that the typical life span for zinc galvanising on tie wires of that kind is about 40 years and that the Coleraine tie wire was probably more than 40 years old. He noted the galvanising on that tie wire had been consumed by external elements, greatly increasing the corrosion rate and leading to pitting and the initiation of fatigue cracks on the tie wire.[31]

There is every reason to suspect that similarly aged tie wires are in similar condition and thus prone to failure, particularly in severe conditions. The SP AusNet inspection manual recognises zinc loss on a conductor or a tie wire as an end-of-life characteristic and says that from the time zinc is lost a conductor should have only 'a few more years of life' left. Dr Gates said it can be expected that 'a large proportion of tie-wires in the network will … have their zinc layers largely consumed'.[32]

Dr Gates also examined a small sample of Powercor's maintenance records and found they recorded a 'significant' tie-wire failure rate. He told the Commission the tie wires 'need to be replaced soon in order to avoid the risk of a larger number of failures occurring'.[33]

In relation to the broader Powercor network, a spreadsheet prepared by Powercor recorded that on cyclical inspection at least 3 per cent of tie wires across its SWER network require maintenance (meaning they need to be replaced) and for tie wires installed in the 1950s and 1960s the proportion is as high as 10 per cent in some years.[34]

Powercor submitted that the data show its maintenance regime is working because 'deteriorated assets are … detected before they fail'. The Commission heard evidence, however, that in severe weather conditions (in particular, high winds) deteriorated tie wires carry real potential to cause fire and are an example of a 'hidden defect'.[35] As Professor Hastings stated:

> 'Hidden' doesn't mean that you can't see it. It just means that it doesn't become evident to the system operators when it happens.
>
> [A broken tie is] a hidden defect because it is not an in service failure but it is in this degraded state. I think a lot of the issue with distribution networks and their situation in relation to high fire danger days is related to keeping the number of these defects which have not yet progressed to failure under control or to a desirably low level.[36]

The Commission accepts that the combination of high winds and days of high fire danger in Victoria accentuates the importance of detecting hidden defects, because those defects could under such conditions become system failures capable of causing fires.[37]

4.3.5 THE SWER NETWORK

The SWER system is old, having been introduced by the State Electricity Commission of Victoria in the early 1950s to provide a means of electricity distribution to rural areas with low population densities and where small electrical loads need to be widely dispersed. The system could be rolled out relatively cheaply because of its simple design, which consists of a single lightweight, high-tensile conductor mounted on poles. Electricity travels to the customer along the single wire, the current returning through the earth rather than through a second wire.[38]

The SWER design's simplicity offered some bushfire mitigation features because the single line could not clash with other lines and there were fewer poles and less associated infrastructure that could fail.[39]

The SWER design limits a SWER line's maximum current, though, and thus the number of customers the line can service; on the SP AusNet network an average SWER line serves just 45 customers. SP AusNet recognises that the SWER network is reaching thermal capacity and that some SWER lines are already overloaded. This raises questions about the SWER system's capacity to meet present and future demand and maintain supply quality.[40]

Mr Griffith told the Commission there were important limitations on the sensitivity of protection devices that can be used on SWER lines. He said, 'From a protection viewpoint it takes away 90 per cent of your opportunity to provide effective protection by having that return path through the ground'. So, if a fault with the potential to start a fire occurs on a SWER line, the line will remain 'live' for longer than if that fault were to occur on another type of line, increasing the likelihood of a fire starting.[41]

Powercor acknowledged the limitations on the sensitivity of SWER protection equipment in the context of the Coleraine fire. Mr Wayne McDonald, Powercor Senior Protection and Control Engineer, said that when the conductor on the Colfitz North Spur at Coleraine came into contact with tree branches 'the fuse detected the tree as a high resistance earth path and did not operate'. In other words, the tree provided a return earth path that was of slightly lower resistance than the SWER system's ordinary earth return. That meant the fault current was higher—but not much higher than the ordinary current and insufficient to blow the fuse. As this example demonstrates, a SWER conductor that comes off the pole can start a fire without protection equipment ever being engaged.[42]

It is obviously undesirable that current can continue to flow down a power line that is hitting and arcing against a tree. That danger is, however, inherent in the SWER system and can be obviated only if SWER lines are replaced by other, safer technologies.

4.4 REPLACEMENT OPTIONS

The SWER and 22-kilovolt distribution networks constitute a high risk for bushfire ignition, along with other risks posed by the ageing of parts of the networks and the particular limitations of SWER lines.

The Commission agrees with the State of Victoria's submission that an ambitious period of innovation is required. The networks need to be replaced by the available distribution infrastructure technology, which can dramatically reduce the risk that the lines will cause bushfires.

The Commission also notes the high cost of replacement. It stresses, however, the potential for tragic consequences if the Victorian Government and distribution businesses do not take decisive action and explore the full range of alternatives.

Ms Marianne Lourey, Executive Director—Energy Sector Development in the Department of Primary Industries, informed the Commission that the Victorian Government intended to coordinate in April 2010 a national workshop with interested parties, to consider, in particular, options in connection with the ageing SWER lines.[43]

The Commission commends this initiative and suggests that a taskforce be established to investigate the costs and benefits of the full range of replacement options. But this process must not delay real change. The taskforce should be required to present its findings within six months of the date of issue of this report: this will allow the distribution businesses to carry out the replacements within the Commission's recommended time frames.

4.4.1 UNDERGROUND CABLE

The use of underground cable essentially eliminates bushfire risk associated with the provision of electricity. The cabling has a 40- to 80-year lifespan (depending on the voltage) and there are virtually no maintenance or inspection costs. Additionally, in most cases underground cable will survive a firestorm. The result of these features is that the interruptions to electricity supply that often accompany bushfires and can hamper firefighting activities are avoided, as is the need to replace infrastructure following a fire.[44]

Mr Shane Breheny, CEO of Powercor, accepted the existence of the cost savings—such as maintenance, inspection and vegetation clearance costs—but said the savings were not significant when compared with the cost of placing the electricity supply underground.[45]

Underground cabling is not new. For example, the State Electricity Commission of Victoria used it very effectively between Jamieson and Mt Hotham, and 8.29 per cent of the Powercor network is underground cable.[46] State regulations require undergrounding for the following:

- all new housing estates since 1988
- new connections on private land in rural areas
- any private electric lines in need of substantial reconstruction in areas of high bushfire risk.[47]

The current regulations do not impose similar obligations on electricity distribution businesses, even when they are doing reconstruction work in areas of high bushfire risk.[48]

4.4.2 AERIAL BUNDLED CABLE

Aerial bundled cable is superior to bare conductor because it greatly reduces the risk of bushfire caused by distribution infrastructure and overcomes other limitations of the SWER network, as discussed in Section 4.3. It has been very successful in reducing the number of fire starts and has been used in areas of high bushfire risk such as the Dandenong Ranges, the Macedon Ranges, Jan Juc, Daylesford and Woodend.[49]

ABC is, however, much more expensive than bare conductor. It is heavier and needs to be supported by more poles. Specialist skills are often needed to repair it, and the repairs can take longer compared with bare conductors. Additionally, it might be necessary to replace ABC if it is damaged by fire. On the plus side, reduced maintenance is required for ABC, and clashing is eliminated.[50]

4.4.3 AGE-BASED REPLACEMENT WITH EXISTING TECHNOLOGY

At present the distribution businesses manage their networks overwhelmingly on the basis of 'performance', which is determined by condition-based assessment—assets being replaced only when condition monitoring identifies defects or deterioration—rather than by age.[51]

The Commission heard the following evidence:

- Condition-based monitoring through regular, cyclical inspection is a substantial and significant part of prudent asset management, but it has limitations and should be used along with age-related management processes.[52]
- Distribution businesses must have 'a very good system for predicting the end point of failure and the need for replacement' of assets. The alternative is to make arbitrary decisions about an asset's working life and replace it at that time, accepting that many assets will be replaced before they need to be. This must, however, be balanced against the possibility of a fire with enormous consequences.[53]
- It cannot reasonably be concluded that either of the distribution businesses has a very good system for predicting the 'end point of failure'. With the exception of SP AusNet's conductor replacement program, neither SP AusNet nor Powercor conducts regular forensic analysis of the age characteristics of its conductors, tie wires or other assets.
- Assignment of a 'regulated life' is a sound guideline that network owners should follow in the absence of convincing evidence that the end of 'regulated life' should be extended. There is nothing to suggest the judgment in relation to the life of conductors in the distribution networks was wrong. That regulated life has now been, or will shortly be, reached for much of the network.[54]
- Age-based replacement programs are particularly appropriate for network components that are hard to inspect or that have definite ageing characteristics—for example, conductors and tie wires.[55]
- Professor Hastings examined the SP AusNet Conductor Study, in which SP AusNet concluded, 'It is prudent up to the end of 2015 to undertake the replacement of approximately 1,770 route km of steel conductor and 280 route km of copper conductor'. He concluded that the planned replacement was 'a major shortfall' compared with what was needed.[56]
- Professor Hastings recommended that those parts of the network not covered by the Conductor Study or that are hard to inspect or deteriorate with age should be analysed for failure rates against age and other risk factors.[57]
- The Conductor Study also recommended implementation of a forensic analysis process for conductors, improvements to visual assessment criteria for asset inspectors in the *Asset Inspection Manual,* and augmentation of asset management systems to support data capture, management and analysis 'for … enhanced conductor assessment criteria'.[58]

Having considered the current age of the steel conductors in SP AusNet's fleet, Dr Hastings came to the view that there were a significant number of assets in the 61-plus-years group for which there should already be a 'replacement plan in the pipeline, if not already implemented' and that '56 to 60 [years] which is 3,000 circuit-kilometres … is where the plans should be very firmly in place to replace those in the near future'.[59]

The Commission is satisfied that condition-based asset management is inadequate on its own to reduce the risk that latent or hidden defects will lead to fires starting on severe fire days. If distribution networks are not replaced by superior technology, there must be new programs for the replacement of assets on the basis of age and other risk factors. SP AusNet appears to have accepted the idea of such an approach.[60]

4.5 FUNDING THE REPLACEMENT OF THE DISTRIBUTION NETWORK

Victorian electricity distribution businesses are subject to an incentive-based regulatory regime whereby an economic regulator sets the total amount of revenue each distribution business may receive in a specified period. Under the regime the economic regulator makes a revenue determination on the basis of submissions the distribution businesses make in relation to their forecast capital and operating expenditure. If the distribution businesses deliver their services at a cost that is lower than the revenue cap set by the regulator, they are rewarded with an increased return. This gives them an incentive to conduct their business efficiently.[61]

The economic regulator also sets the service standards the distribution businesses should achieve during the regulatory period in question. Those standards form the basis of an incentive scheme that imposes financial penalties on businesses that fail to meet the standards and rewards them financially if they meet the standards. This deters the distribution businesses from reducing expenditure at the expense of service and reliability.[62]

The Essential Services Commission set the price and service levels applicable to Victorian electricity distribution businesses for 2006 to 2010, but this task has since become the province of the Australian Energy Regulator. Victoria's agreement to the transfer of the ESC's functions to the AER was recorded in the Australian Energy Market Agreement, and the transfer was effected by s. 23 of the *National Electricity (Victoria) Amendment Act 2007.*[63]

If a distribution business wants to make a major investment to replace or modify its infrastructure, it must present to the economic regulator a persuasive case for that investment. The regulator's rejection of an application for funds for any particular proposal does not prevent a distribution business from making the investment: the business has discretion to allocate funds as it sees fit, and safety concerns might lead it to use its discretion to invest in projects not approved by the regulator.[64]

If, however, the regulator does not approve a particular investment proposal, the distribution business is unlikely to implement it because it can do so only at the expense of the proposals it was able to persuade the regulator were necessary. For that reason, the fact that distribution businesses do not control their own prices inevitably constrains the extent to which they invest in activities aimed at reducing bushfire risk.

In 2004 and 2005 Powercor presented compelling submissions to the Essential Services Commission, seeking revenue to place power lines in high-risk bushfire areas underground. Powercor referred to the fact that 'undergrounding to protect against bushfire has been identified as an area of concern for customers in rural and semi-rural areas' and noted that its service territory contained some of the most bushfire-prone land in the world. It also pointed out that, even when steps were taken that went beyond the action required by the Line Clearance Code, contact between vegetation and power lines could occur.[65]

Powercor presented evidence suggesting that customers were willing to pay for the placement of power lines underground and that the economic benefits were material. It pointed out, however, that, although it would incur undergrounding costs, it would not capture all the benefits, including those delivered to the entire community. Powercor argued:

> Each year 'disaster-level' bushfires (where the total insurance costs of the event are more than $10 million) cost Australia an average of $77 million … overhead electrical assets can result in the ignition of a number of fires each year due simply to the existence of an energy source exposed to natural elements …
>
> It is difficult to accurately quantify the benefits associated with undergrounding to prevent fire hazards as the value of the benefit will vary depending upon location. Powercor Australia is not aware of any study that has been able to readily value the benefits associated with reducing fire hazard, including those prepared by other regulators. The difficulty in quantifying the benefits does not mean those benefits are not material.
>
> Powercor Australia believes the [Essential Services] Commission has an obligation to investigate the benefits associated with undergrounding to reduce fire danger both from a stand point of ensuring it meets its own objectives, but also from a societal perspective given the benefits from undergrounding largely accrue to the community as a whole.[66]

Mr Ken Gardner was the head of the state safety regulator, Energy Safe Victoria, when Powercor made the submission to the Essential Services Commission. He told the Bushfires Royal Commission that ESV did not make submissions supporting or opposing Powercor's submission. Despite ESV knowing of Powercor's submission, it appears there was no consultation between ESV and the ESC before the ESC's rejection of the submission.[67]

The ESC put forward a number of reasons for rejecting Powercor's submission, among them the following:

- The distribution businesses had failed to quantify the benefit or reveal the amount and network type to be undergrounded.[68]
- The costs of undergrounding should be paid by the customer.[69]
- The regulatory framework's incentive-based nature would ensure undergrounding where the benefits outweigh the costs.[70]
- The Victorian State Government Powerline Relocation Scheme funded up to half the undergrounding cost when a community benefit would result, and this was a more appropriate mechanism for obtaining revenue where there was community benefit.[71]

The ESC's assertion that undergrounding costs should be paid by the customer ignores the fact that many of the benefits of undergrounding—in particular, the reduction in bushfire risk—accrue to the entire community. The ESC's approach also ignores the fact that those benefits, including the saving of lives, are less amenable to measurement in financial terms.

Accordingly, the ESC's argument that distributors would use underground cabling where the overall benefits outweighed the costs is flawed. The Australian Energy Regulator's Mr Chris Pattas, General Manager of the Network Regulation South Branch, agreed that a distribution business might target reliability in high-density areas because if it misses reliability targets in those areas it will be penalised more heavily than it would be for missing targets in low-density areas. The areas of highest risk of bushfire are, however, areas of low-density population, and Mr Pattas could not point to any incentive for a distribution business to focus on reliability in low-density areas. Similarly, Mr Fearon of Energy Safe Victoria stated that the 'current generation' of incentive arrangements go to average performance and that SWER lines are low-priority reliability targets.[72]

Finally, the Commission notes that the ESC's reliance on the Powerline Relocation Scheme was misplaced. The scheme concerns the undergrounding of power lines in areas where there is high pedestrian or vehicular activity or where environmental or cultural factors justify such placement. Most projects under the scheme are for distances of between 100 and 400 metres, and the scheme is expressly not concerned with reducing bushfire risk. The Commission would welcome a scheme that is directed at undergrounding for the purpose of reducing bushfire risk.[73]

Mr Paul Adams, SP AusNet former General Manager Network Services Group, said he believed the ESC's rejection of a similar undergrounding proposal from SP AusNet was based on the regulator applying the 'lowest cost technically acceptable' solution, which was, in the circumstances, overhead power lines. The Commission considers that on this criterion it would be difficult for a distribution business to obtain approval for any proposal to replace distribution assets with safer assets if it has a record of efficient supply in the area in question. In those circumstances 'like-for-like' replacement will be the 'lowest cost technically acceptable solution'.[74]

The Australian Energy Regulator told the Commission it does not approve individual investment proposals, but in determining a distribution business's total allowance for capital expenditure it does consider a cross-section of the more substantial projects proposed against the criteria set out in the National Electricity Rules, which in substance provide that 'A capital expenditure proposal must achieve the capital expenditure objectives of meeting expected demand and a host of regulatory, technical and safety requirements in an "efficient and prudent manner".'[75]

Mr Pattas told the Commission the AER does not take into account costs that are external to the distribution businesses—such as the costs borne by the community when a bushfire is caused by failed electricity assets. In the Australian Energy Regulator's view, whether such 'external' costs should be taken into account is a question for policy makers.[76]

4.5.1 THE ECONOMIC REGULATORY REGIME AND SAFETY

The Australian Energy Regulator's failure to factor in the costs to human life and property arising from bushfire as part of its cost–benefit equation means that real and substantial costs to the community imposed by bushfire are left out of the price determination process.

The AER, and the Regulations under which it operates, should acknowledge that Victoria is one of the most bushfire prone places in the world and that major bushfires on the worst days are often caused by the failure of electricity assets. Protection of human life must become the priority when evaluating distribution businesses' expenditure proposals. The economic regulatory regime must include mechanisms for ensuring that safety-related matters are properly reviewed so as to minimise the risk of bushfire being caused by the failure of electrical assets.

Mr Pattas said the AER 'would be looking to [Energy Safe Victoria] to provide [to AER its] views about any safety issues or any safety aspects associated with the businesses' proposals'. Obviously, ESV has an essential role to play in ensuring that the AER is fully informed of the safety risks and benefits associated with the distribution businesses' investment proposals. Mr Gardner told the Commission ESV acknowledged that role and sought to be involved in the price review process.[77] Section 4.7.1 deals with ESV's role and the relationship between economic regulation and safety regulation.

4.5.2 A 'TRIGGER EVENT' LEADING THE AER TO ADJUST ITS DISTRIBUTION DETERMINATION

It is at the price review every five years that there is the greatest opportunity for 'significant step change in expenditure'.[78]

Considerable expenditure will be required in order to implement the Commission's recommendations in relation to the electricity industry. The necessary revenue is unlikely to be available without an adjustment to the price determination that is now under way. The National Electricity Rules allow for adjustments to a price determination if specific 'trigger events' occur, enabling distribution businesses to seek additional revenue approval from the regulator.[79]

Mr Pattas told the Commission that a serious fire causing death and massive destruction would not be a 'trigger event'; nor would a recommendation from the Commission that distribution businesses substantially increase their expenditure.[80]

The Commonwealth submitted, however, that a 'trigger event' would be constituted by 'material changes, which either reduce or increase the likely costs to be incurred by the [distribution businesses]'—for example, administrative or regulatory change creating new obligations necessitating additional expenditure. The Commission considers the State should take steps to create a trigger event.[81]

4.5.3 A GOVERNMENT CONTRIBUTION TO THE NEW NETWORK

The distribution businesses and the State of Victoria submitted there is a large financial cost associated with any recommendation to replace Victoria's ageing electricity distribution network with technology that delivers a reduced bushfire risk. In the Commission's view, the cost of not renewing the network could be far greater. The costs of major bushfires fall on the entire community, and the Kilmore East fire alone demonstrates, in terms of loss of both life and assets, the potential magnitude of those costs.

The Commission makes its recommendations for the benefit of the entire community. For that reason it considers it inappropriate that electricity consumers bear the entire cost of implementing those recommendations.

The Victorian Government already accepts—through the Powerline Relocation Scheme—that the community should share up to half the power line relocation costs for visual or cultural reasons. Given the Commission's view that protection of human life should be the highest priority, the government should consider adopting a similar scheme to help defray the cost of replacing overhead power lines in order to reduce bushfire risk.

RECOMMENDATION 27

The State amend the Regulations under Victoria's *Electricity Safety Act 1998* and otherwise take such steps as may be required to give effect to the following:

- the progressive replacement of all SWER (single-wire earth return) power lines in Victoria with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk. The replacement program should be completed in the areas of highest bushfire risk within 10 years and should continue in areas of lower bushfire risk as the lines reach the end of their engineering lives
- the progressive replacement of all 22-kilovolt distribution feeders with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk as the feeders reach the end of their engineering lives. Priority should be given to distribution feeders in the areas of highest bushfire risk.

4.6 INTERIM MEASURES

In view of the size of the existing electricity distribution network, any replacement program will take years to complete. It is therefore necessary to consider interim measures aimed at reducing the risk that the current network will lead to further bushfires before its replacement. Among these measures are the following:

- reducing the length of the asset-inspection cycle
- improving the efficacy of asset inspection
- modifying the operation of automatic circuit reclosers
- retrofitting vibration dampers
- fitting spreaders.

4.6.1 ASSET INSPECTION

Improving the efficacy of inspection regimes is crucial to mitigating the bushfire risk created by the failure of electricity assets. Whether network components are repaired or replaced before they fail or are at risk of failing is determined in almost all cases on the basis of inspection results, and there is heavy reliance on cyclical inspections.[82]

The inspection regimes generally

Standards for inspection are not specified by legislation. The inspection regimes of SP AusNet and Powercor do, however, form part of the distribution businesses' bushfire mitigation strategies. Energy Safe Victoria approves the inspection regimes and audits their implementation as part of its oversight of Bushfire Mitigation Plans and Electricity Safety Management Schemes.[83]

With some exceptions, SP AusNet and Powercor generally inspect their distribution assets every five years. During these cyclical inspections, inspectors observe and record defects and allocate priorities for remedial action, in keeping with the business rules of the respective distribution business.[84]

If an asset inspector reports a defect or deterioration, a qualified and experienced tradesperson carries out a technical assessment and might, for deteriorated conductors, assess the line at line height. Each distribution business also implements a limited number of specialised programs directed at particular parts of the network.[85]

The distribution businesses prescribe the scope of and standards for the cyclical inspection program in their asset inspection manuals. Those manuals specify inspection intervals and procedures, priorities for maintenance and replacement, record-keeping standards, and standards for the training of inspectors.[86]

The distribution businesses outsource most of their physical inspection work—SP AusNet to Utility Asset Management and Powercor to Electrix Pty Ltd. SP AusNet's rationale for outsourcing asset inspection is that this role differs considerably from that of its linesmen and that by outsourcing it is able to make use of specialist expertise.[87]

There is some evidence that incorporating the inspection task in the work of linesmen, rather than outsourcing it, could result in better identification of defects since linesmen have often experienced the problems that become visible on inspection. The Commission accepts, however, that there would be difficulties associated with such an arrangement, although it did not hear detailed evidence about the restructuring required for linesmen to perform inspections. This underscores the fundamental importance of providing comprehensive training for inspectors: their role is pivotal to maintaining the safety of the distribution networks.[88]

Both internal auditors and external consultants audit the work of asset inspectors. The purpose of the audits is to ensure that the quality of the work conforms to the requirements of the asset inspection manuals.[89]

The length of the inspection cycle

The State Electricity Commission of Victoria introduced a three-year inspection cycle following the 1977 bushfires. In about 1995 a five-year cycle for areas that were not deemed a fire hazard was introduced. In 1999–2000 both Powercor and SP AusNet moved to a five-year cycle for fire hazard areas, having concluded they could conduct fewer inspections without increasing the level of risk; the rationale for this was the improved reliability of distribution assets and improved inspection processes. In contrast, both expert opinion and the network operators' analyses support a finding that shortening the inspection cycle would appreciably reduce the risk of assets failing in service and consequentially reduce the risk of bushfires starting as a result of failed assets.[90]

International expert Professor Nicholas Hastings explained that an inspection regime's suitability for limiting asset failure should be assessed by reference to the extent to which the regime allows incipient failures to be detected before they proceed to full functional failure—that is, the asset failing while in service. The regime should take into account how the assets fail, how failures can be detected and the effect of failure. Some failure modes lend themselves to early identification by condition monitoring and allow time for remedial action before full functional failure. For other failure modes, however, there might be little or no practical or economic way of identifying potential failures.[91]

The risk that assets will fail during service is substantially determined by the length of the inspection cycle. This is because, assuming inspection effectiveness remains constant, the average number of degradation failures in the system will be proportional to the length of the inspection cycle.[92]

Any reduction in the length of the inspection cycle will reduce risk, even if the effectiveness of inspection does not improve. Increasing the inspection cycle from three years to five years will cause a 66 per cent increase in random failures in the system by the time of inspections. Professor Hastings explained that with time network components degrade and that in the short to medium term it should be assumed that defects accumulate at a constant rate. Over three years, for example, the average number of defects in the system will be three times as high as for a one-year period (assuming no inspections during that time). Those results follow from the mathematical modelling supported by reliability-centered maintenance, or RCM, theory.[93]

The likelihood of detecting degradation failures also increases if the effectiveness of the inspection methodology improves, thereby reducing the risk of in-service failure.[94]

A 1997 RCM study of Powercor's network produced results consistent with Professor Hastings' conclusions. Powercor calculated it could reduce the frequency of inspections and maintain the existing level of 'acceptable risk' of in-service failures by increasing the assumed effectiveness of its inspections from 50 to 65 per cent. The study shows that reducing the number of degradation and in-service failures is demonstrably achievable by shortening the inspection cycle. A return to a three-year inspection cycle (even if inspection effectiveness does not improve) would result in a very substantial—about 70 per cent—reduction in the number of in-service failures.[95]

The 1997 RCM study also showed that a substantial improvement in the effectiveness of asset inspection significantly reduces the risk of in-service asset failure. Powercor's analysis shows that, if the improvements in effectiveness foreshadowed in 1997 had been made without extending the inspection cycle, the projected number of in-service failures each year would have reduced from 500 to 84.[96]

Energy Safe Victoria continued to approve five-year inspection cycles on the basis that there had been 'no obvious increase in failures' and that trends in in-service failures remained relatively consistent and 'at a relatively low level'.[97]

Although either one of these two factors alone will considerably reduce the risk of in-service failure, the distribution businesses made a deliberate choice to offset improvements in one (the inspection effectiveness) with relaxation of the other (the inspection cycle). In practice, they have forgone an opportunity to improve safety in order to reduce costs.

It is not satisfactory that the distribution businesses can decide that a specific level of bushfire risk is 'acceptable' and rely on the benefit of improved processes and technology to maintain that risk level (instead of reducing it) in order to decrease their operating costs or increase their profits. Distribution businesses should take all reasonable opportunities to reduce bushfire risk. In particular, they should not trade improvements achievable by shortening the inspection cycle against those arising from improved inspection methods.

No inspection regime will detect all failures during inspections, and improvements in processes and equipment will always be limited by the effectiveness of inspections. Although it is evident that Powercor did improve the effectiveness of its inspection regime at the time it moved to a longer inspection cycle (as demonstrated by the absence of obvious increases in failure rates), even then it could assume that each inspection was only 65 per cent effective, meaning it assumed that about one-third of defects would still be missed by the improved inspection process. The report of the 1997 study observed, 'The cyclic program intervals are generally too long to be fully effective but significant risk reduction is provided by the reports which should be made'. The very same observation was made in a follow-up study in 2003, after the introduction of the five-year cycle.[98]

Additionally, the rates of failure of some important network components are climbing as those components age. Increasing failure rates warrant increased opportunities for detection.

It is appropriate that the inspection cycle is responsive to differentiated risk. It is also important, however, to avoid complicating the inspection process with too many varying intervals. The Commission considers that a suitable balance would be achieved if a shorter inspection cycle were adopted in all areas of high bushfire risk, in keeping with the previous standard of a three-year interval, while directing specific programs at assets that are at high risk for other reasons.[99] The Commission also considers that the State should press the Australian Energy Regulator to allow distribution businesses an adjustment to their price determination on the basis that a move to a shorter inspection cycle is a material change in obligations and necessitates additional expenditure.

RECOMMENDATION 28

The State (through Energy Safe Victoria) require distribution businesses to change their asset inspection standards and procedures to require that all SWER lines and all 22-kilovolt feeders in areas of high bushfire risk are inspected at least every three years.

Conductors

It is not possible to do more than limited inspection of conductors from the ground. Yet the distribution businesses inspect at line height—by elevated vehicular platforms and other methods—only if a defect or deterioration is first detected from the ground. The capacity to inspect conductors thoroughly is an important part of a 'condition-based' asset management regime. But that capacity is limited because close inspection (for example, by using an elevated vehicular platform) is contingent on detection of a defect when the cyclic inspection occurs.[100]

The report of the SP AusNet 2008 Conductor Study recommended that visual assessments (by asset inspectors in accordance with the *Asset Inspection Manual*) be supported by creating asset condition profiles through forensic analysis of conductors removed from service. SP AusNet considered such analysis would establish an asset's condition relative to a range of environmental and operational conditions—such as service age, geographical location, vibration damage, and mechanical and electrical loading.[101] The Commission considers that network owners should conduct such forensic analyses with a view to developing asset condition profiles, at least by sampling in areas of high bushfire risk.

Improving inspection performance

Those who are charged with the important task of performing cyclical inspections must receive rigorous training and suitable materials and equipment. Additionally, the network owners must carefully monitor the inspectors' performance and the adequacy of their training.

SP AusNet and Powercor each have training and audit programs and detailed asset inspection manuals that are used to guide the inspectors as they work. The Commission considers, however, there is scope for improvement.

Training

The question of training arose during the hearings relating to the Kilmore East fire. The evidence was therefore focused on the training provided by Utility Asset Management on behalf of SP AusNet, whose assets were involved in that fire. The Commission also heard some evidence about the effectiveness of Powercor's training regime.

When UAM asset inspector Mr Jason Leech inspected pole 39 on the Pentadeen Spur line in February 2008 he did not detect a misaligned helical termination. The misaligned helical termination was said to be an uncommon fault and not a defect described in any inspection manual or the subject of specific instruction by UAM. The Commission was told, however, that it will now be specifically taken up in UAM's training.[102]

The evidence about training had two facets: first, to recognise and understand the significance of a misaligned helical termination an inspector would have to be trained and have some understanding of metal fatigue; second, assuming such a defect could be seen, a properly trained inspector would not have missed it. The evidence highlighted the importance of equipping inspectors with sufficient grounding in the design and construction of electricity lines and the ways they can deteriorate.[103]

Mr Kelven Barnbrook, a senior instructor with Gipps TAFE Energy Training Centre who has considerable experience in the electricity distribution industry, explained that inspection used to be done by linesmen with training (as apprentices) in the design and construction of distribution network assets. Mr Barnbrook said linesmen had experienced a range of problems throughout the system, had worked on faults caused by those problems, and were now more aware of the dangers the problems present. Professor Hastings made a similar observation, drawing on his experience.[104]

Mr Maurie Braden, the UAM manager who conducted the organisation's training for asset inspectors, said UAM's inspectors were taught about known faults and mechanisms of failure and to look for 'anything loose, broken, unravelled, deteriorated, rusted or defective'. He agreed that the inspection of tie wires and other pole-top assets can require an asset inspector to make relatively sophisticated judgments about the condition of the infrastructure.[105]

The UAM training course is made up of three days of classroom training, a competency test and 'several weeks' of field work under supervision. The field work includes a requirement to complete an on-the-job training package that is assessed by experienced inspectors. Inspectors receive annual refresher training covering 'some aspect of the asset inspection manual'. Mr Donald Ying, a manager with UAM, said the training was supplemented by half-day meetings, held at three- to six-month intervals, that 'provide an opportunity for issues to be raised by line inspectors'.[106]

External auditors appointed by SP AusNet reported that UAM's Mr Leech had failed audits in December 2006 and December 2008. The audits compared the inspection work with 'first class professional competence' and concluded the work was not completed to the required standard at all sites and did not identify all electrical safety defects. UAM sent Mr Leech a warning letter in December 2008. Nevertheless, despite the failed audits, UAM's opinion was that Mr Leech was a reliable and competent inspector.[107]

Mr Braden said he was satisfied with Mr Leech's training. Mr Braden's own asset inspection training had been limited to a four-day course in 2001, three weeks of field training, and a two-week course in 2002. His line inspection experience was also limited: he had been a labourer and trainee asset inspector 'on and off' for six months, an asset inspector for 18 months, and then an inspector and supervisor for 10 months in Queensland. It was Mr Braden who in 2006 determined the adequacy of the course outline and training materials for UAM's asset inspector course. The course

content was derived from the SP AusNet *Asset Inspection Manual* and was, in Mr Braden's opinion, much the same as that of the courses taught by other distribution businesses and consistent with the training he himself had received in 2001. Mr Braden said he had been told (in preparation for giving evidence at the Commission) the materials had been sent to Mr John Costolloe of SP AusNet for review, but he (Mr Braden) had not communicated with SP AusNet about it before reviewing the course and starting to teach it.[108]

The course outline contained the following instruction for the inspection of conductors:

> Because conductors can deteriorate over the whole span, it is not practical for your work to pick up much in the way of general deterioration … Steel is prone to single strands breaking and unwinding … It usually happens well out in the spans, *so the best you can do is quickly scan along each span when you inspect the pole.*[109] [emphasis added]

Mr Braden of UAM, Mr Denis McCrohan, who was responsible for managing SP AusNet's contract with UAM, and Mr Adams, former General Manager of SP AusNet's Network Services Group, agreed that the instruction in relation to 'quickly scanning' the conductor was inappropriate. It is also inconsistent with the SP AusNet *Asset Inspection Manual*, which requires inspectors to 'regularly and methodically conduct detailed examinations of the distribution … systems'. Mr Leech received the course outline as part of his training. Mr Braden, who said he had never personally given that instruction to trainees and did not distribute the course outline, had no reason to doubt Mr Leech's account. The contract between SP AusNet and UAM required that all training be provided by a registered training organisation unless SP AusNet had agreed otherwise. Mr McCrohan said SP AusNet required its contractor to have RTO status because 'we want the most competent workforce we can get. We want those people that are training inspectors to be registered and to meet national competency standards'.[110]

UAM is not, and was not at the relevant time, an RTO. Mr McCrohan was not aware of that. He was not able to say what steps, if any, SP AusNet took to determine whether UAM had met the contract standards. Mr Braden was not aware of the contractual requirement for an RTO or of any discussions with SP AusNet about UAM's status.[111]

UAM maintained that Mr Leech had received sufficient training to enable him to do his job. It said that, had he seen the helical misalignment, Mr Leech would have reported it. It further argued that the helical misalignment was simply not visible from the ground.[112]

The Commission notes that Victoria Police is continuing to investigate the adequacy of training provided to asset inspectors and of the asset inspection regime. The Commission understands that the outcome of such investigations will probably be referred to the Coroner.

The Commission considers that SP AusNet's training regime suffers from several inadequacies:

- limited experience on the part of UAM personnel responsible for conducting the training and determining the content of the training course
- the limited nature of the theoretical training
- the training organisation not being an RTO, so there was no external audit of the content of its courses and the qualifications of its auditors[113]
- failure of the process for determining and checking course content to detect a serious inadequacy in the instructions relating to the inspection of conductors.[114]

Powercor's training regime was not subject to the same scrutiny in the Commission's hearings. Nevertheless, the Commission considers the Powercor training program to be superior to SP AusNet's in two main ways:

- Competency training in asset inspection is conducted by Gipps TAFE, an RTO. The training starts after two months of in-field training by a mentor who is a qualified asset inspector.

- Gipps TAFE assesses each inspector's competency for each training module and provides the results to Electrix. It also issues to competent trainees a field training module booklet. After the completion of all training modules the trainee returns to the field under the supervision of an experienced asset inspector. During the ensuing months the asset inspector assesses the trainee's ability to perform each of the tasks listed in the booklet. Once satisfied with the trainee's performance, the asset inspector 'signs off' on the training booklet. It is only then that an Electrix employee with training qualifications carries out a final competency assessment, which consists of a practical field test and a theory test. The results are provided to Gipps TAFE with confirmation from Electrix that the trainee has completed the practical elements of the qualification. If satisfied with the documentation it receives, Gipps TAFE issues to the trainee a certificate of competency.[115]

The observations that follow concerning the results of Energy Safe Victoria's audits underscore the need for constant review and improvement of inspection performance, even if the formal system of instruction is of a high standard.

The Commission notes that both SP AusNet and UAM support a review of their asset inspector training and support the creation of an industry group to review inspection processes and training standards. UAM also expressed support for a national standard for asset inspection.

Auditing inspection standards

The Commission is satisfied that SP AusNet's audit program is thorough in that the work of each inspector is subject to audit by UAM and by external auditors and each inspector is audited on average once a month. It considers, however, that there are shortcomings in the way the contractor 'checks' the results of external audits and communicates any disagreement to SP AusNet, which determines what results are valid without any further inspection of the work. This process has the potential to diminish the role and dilute the effectiveness of external audits.[116]

Energy Safe Victoria's audits

Energy Safe Victoria also audits the electricity distribution businesses' compliance with their inspection regimes as part of its compliance audit of bushfire mitigation plans. The audits highlight the importance of continual review of the ways of detecting defective assets and of efforts to improve the training of asset inspectors.

By December 2008 ESV had concluded that in general SP AusNet and Powercor were compliant with the regulatory regime and well prepared for the fire season. After the fires of 7 February, however, ESV began fresh audits of both distribution businesses. It said it was seeking a greater understanding of the two organisations' systems for detecting ageing and potentially defective assets.[117]

The 2008–09 Bushfire Mitigation and Line Clearance Audit, the report of which was presented to ESV in December 2008, concluded that Powercor had excellent policies and procedures for managing bushfire risk. ESV recommended, however, that Powercor strengthen its training and audit procedures for asset inspectors to ensure that all asset defects are identified and recorded during the asset inspection cycle. The recommendation followed a finding that most rusty ties and conductors were not being detected in Powercor's asset inspection process. Mr Gardner of ESV said 'there were instances where the auditor's observations weren't consistent with what was recorded' and that ESV had recommended that 'the way to address the issue of rusting ties is for there to be improved education of the inspectors'.[118]

New methods and technologies

The effectiveness of asset inspection can be further improved by the continual adoption of new inspection processes and technologies.

The Commission commends the distribution companies on their adoption of new technologies to date, among them the following:

- the use of digital cameras in cyclic inspections, which allows the inspection results to be analysed later[119]
- biannual thermal scanning and inspection by corona cameras on the Colac 6 and Colac 8 feeders, which run though the Otway Range[120]

- the use of unmanned aerial vehicles and helicopters to photograph assets, with the intention of overcoming limitations on ground-level inspection of pole-top assets—particularly for detecting cross-arm failure[121]
- reviewing 8,000 randomised samples of conductor spans 'with a view to trying to see whether there are better mechanisms to identify conductor degradation'.[122]

The Commission reiterates, however, that the distribution businesses should translate greater effectiveness in inspection into reduced bushfire risk. In particular, there is no evidence that either SP AusNet or Powercor intends or is in a position to materially change its processes or decrease its reliance on cyclic inspections.

RECOMMENDATION 29

The State (through Energy Safe Victoria) require distribution businesses to review and modify their current practices, standards and procedures for the training and auditing of asset inspectors to ensure that registered training organisations provide adequate theoretical and practical training for asset inspectors.

4.6.2 HAZARD TREES

Distribution businesses generally, and councils, DSE and VicRoads in limited areas, are required by Part 8 of the *Victorian Electricity Safety Act 1998* and corresponding Regulations—the so-called electric line clearance regime—to create and maintain a space free of vegetation in all directions around a power line. The required distance for this clearance space varies, depending on factors such as the type of electric line and the area's bushfire risk rating. One practical requirement of maintaining the regulated clearance space is that vegetation in the 'regrowth space' must also be cleared, to ensure that vegetation does not grow into the regulated clearance space before the next cutting cycle.[123]

Distribution businesses must annually prepare and submit to Energy Safe Victoria management plans for the clearance of electric lines. The plans outline how the businesses propose to discharge their obligation to keep the regulated clearance space free of vegetation.[124]

Some trees, however, can stand outside both the regulated clearance space and the regrowth space yet still pose a risk of causing fires by contacting power lines when they break or fall. These are called 'hazard trees'. There is no express requirement for anyone to remove or otherwise make safe these trees, although the new electric line clearance Regulations do introduce the concept of hazard trees and permit pruning or removal in particular circumstances.[125]

Contact between vegetation and power lines poses a considerable risk for causing fires to start. The Commission heard that, on average, vegetation contact causes about 19 per cent of fire starts associated with SP AusNet's distribution network. This risk increases dramatically in the environmental conditions that prevail on a total fire ban day.[126]

It appears that fire starts caused by contact between vegetation and power lines arise in large part from hazard trees. This is not necessarily because hazard trees pose a greater risk; rather, the current regulatory regime focuses on maintaining the regulated clearance space and fails to squarely deal with hazard trees. In doing so, it encourages distribution businesses to concentrate their activities on the regulated clearance space.[127]

SP AusNet has recognised the risk posed by hazard trees and has implemented two programs aimed at identifying them—despite the absence of an express requirement to do so under the electric line clearance regime. In the case of the first program, SP AusNet's vegetation assessors are required to inspect the hazard space in order 'to evaluate the potential hazards within that space' when performing their standard annual assessments of each span of power line in areas of high bushfire risk (and biennially in areas of low bushfire risk). Once a hazard tree is identified it is subject to a detailed assessment. The assessors are not, however, trained arborists and are responsible only for identifying hazard trees while carrying out their standard assessment tasks. They are not required to approach and check every tree and are instructed to look for 'obvious defects' and to 'take a closer look' when a defect is spotted.[128]

SP AusNet's second program is targeted: it is carried out on selected parts of selected feeders, which are given priority according to the highest number of vegetation-related outages per customer. Qualified arborists thoroughly examine every tree in selected parts of the network that have the potential to affect SP AusNet's assets.[129]

The Commission agrees with the State of Victoria's submission that SP AusNet's hazard tree programs constitute a positive step in management of the risks posed by hazard trees. It considers that all distribution businesses should be required to adopt—and document in their management plans for electric line clearance—measures aimed at reducing the risks created by hazard trees.[130]

The Commission agrees, however, with some of the parties' submissions that this should not amount to prescribing the specific type of vegetation management practices individual distribution businesses should adopt. Nevertheless, if it were a regulatory requirement that distribution businesses adopt and document measures aimed at reducing the risks posed by hazard trees, distribution businesses should be able to obtain funding for such programs.[131]

Including this requirement in management plans for electric line clearance would also give Energy Safe Victoria a role in ensuring that distribution businesses are taking account of the risks posed by hazard trees, which is in keeping with the extended mandate for ESV, as discussed later in this chapter.

Submissions in relation to the Beechworth fire and evidence heard during the hearings dealing with roadside clearing highlighted the complexity of the current vegetation management schemes and the potential for confusion about responsibility for preventing fires caused by hazard trees contacting power lines. In the case of Beechworth, SP AusNet was responsible for maintaining the regulated clearance space around the line, DSE was responsible for Beechworth Historic Park (where the tree probably stood before it fell), and Parks Victoria was responsible for managing the park on DSE's behalf.[132]

Public authorities—councils and VicRoads—have a broad obligation under s. 43 of the *Country Fire Authority Act 1958* to take all practicable steps to prevent and minimise fires, or the spread of fires, on land or roads under their control or management.[133] Yet, despite this obligation and the risks posed by hazard trees, it is apparent from the evidence about roadside clearing (discussed in Chapter 7) that road managers do not systematically check for, nor do they limit the risk of, hazard trees. This is important: many power lines run alongside roads. By virtue of their work, road managers are presented with an opportunity to at least identify potential hazard trees. Information about the trees could then be relayed to the distribution businesses, to help them in their risk-reduction work.

Because of their role in developing municipal fire prevention plans in consultation with their municipal fire prevention committees—which are made up of representatives of local CFA brigades, municipal councils (including the municipal fire prevention officer), DSE, Parks Victoria and VicRoads—councils are in a good position to highlight the need for considering the risks posed by hazard trees.[134]

Councils already identify bushfire risks and take steps to reduce those risks, the risks being documented in their municipal fire prevention plans (or municipal fire management plans, where implemented). But hazard trees do not appear to feature in these plans. Such trees are obviously a bushfire risk and should be identified and assessed through the same framework. This does not increase councils' responsibility for bushfire risk management: councils should be aware of the fire risks posed by hazard trees and should take all practicable steps to help mitigate those risks through their municipal fire prevention committees.[135]

In the Commission's view, if a council has limited resources the most practical action might simply be to inform distribution businesses and other entities responsible for dealing with the risk that it (the council) has identified a hazard tree that requires attention.

RECOMMENDATION 30

The State amend the regulatory framework for electricity safety to require that distribution businesses adopt, as part of their management plans, measures to reduce the risks posed by hazard trees—that is, trees that are outside the clearance zone but that could come into contact with an electric power line having regard to foreseeable local conditions.

RECOMMENDATION 31

Municipal councils include in their municipal fire prevention plans for areas of high bushfire risk provision for the identification of hazard trees and for notifying the responsible entities with a view to having the situation redressed.

4.6.3 SETTINGS AND OPERATION OF PROTECTIVE DEVICES ON TOTAL FIRE BAN DAYS

Automatic circuit reclosers

The purpose of a protection system on an electricity distribution network is to minimise the risk of injury and damage from an electrical fault and to limit the interruption of supply caused by a fault. The protection system generally consists of a number of devices, among them distribution feeder circuit breakers, automatic circuit reclosers, sectionalisers and fuses.

When a fault occurs an ACR opens to break the circuit according to preset fault curves. It then automatically recloses the circuit after a specified amount of 'dead time', when no current is flowing.

Each time an ACR recloses the line is re-energised. If the fault has cleared (that is, is a transient fault) the ACR remains closed and normal current flow continues. If the fault remains (that is, is a permanent fault) the ACR will open again, re-breaking the circuit. That sequence will repeat a set number of times before the ACR 'locks out' and power is shut off until it is manually restored. ACRs are commonly set to reclose up to three times before they lock out.

The ACR fault curve setting determines the time the line remains re-energised on each reclose attempt. Different kinds of fault are governed by different fault curves.

For 'over-current faults' (that is, faults that result in a sharp increase in current), the higher the fault current the faster the ACR will operate to break the circuit. The over-current protection operates only if the fault current exceeds a specified level.

ACRs are often set to operate on two different over-current fault curves—a 'slow curve' and a 'fast curve'. A slow curve allows a line to remain re-energised for longer before the ACR cuts power. This gives time for protection devices such as sectionalisers or fuses to operate to cut power to the network only in the area near the fault. The purpose of this is to reduce the number of customers affected by a fault and help linesmen isolate the fault location and quickly remedy the situation.

In addition to over-current faults, most ACRs used on the 22-kilovolt distribution feeder network (but not on the SWER network) can be set to operate when there is a current flow to earth—referred to as 'sensitive earth protection'. Sensitive earth protection operates at much lower fault currents than over-current protection and cannot be used on SWER lines because a normal characteristic of such lines is that current flows to earth.[136]

The incidence and types of ACR in the distribution network

ACRs are widely used in both the SP AusNet and the Powercor distribution networks in Victoria. They are installed on the great majority of three-phase 22-kilovolt distribution feeders, on about two-thirds of Powercor's more than 1,000 SWER lines, and on 459 of SP AusNet's 515 SWER lines. SP AusNet and Powercor use two kinds of ACRs.[137]

Most ACRs used on the 22-kilovolt distribution feeders are digital electronic devices that have metering and remote supervisory control and data acquisition functions. The majority of ACRs of this type can be controlled remotely from the distribution business's operations centre in Melbourne. It is possible to program the ACRs so as to modify their operation remotely on total fire ban days—for example, by suppressing the reclose function entirely, by reducing the number of reclose attempts, or by setting different fault curves.[138]

Both SP AusNet and Powercor use a type of ACR—oil circuit reclosers—on their SWER networks. OCRs are mechanical hydraulic protection devices that cannot be controlled remotely and operate only according to the fault curves selected at the time of manufacture. SP AusNet's OCRs are generally set to operate with two fast trips followed by two slower trips.[139]

A suitably qualified linesman can manually disable the reclose function on the OCR. If the reclose function is disabled and a fault occurs, the OCR breaks the circuit in accordance with its fastest fault curve. That means the OCR is functionally equivalent to a fuse.[140]

Since there are more than 1,000 OCRs in use in Victoria at present, it is not practicable to suppress the reclose function on all of them on every total fire ban day and then re-activate them. It would, however, be practicable to suppress the reclose function on all OCRs for the crucial period of every fire season—say, for six weeks in January and February, when bushfire risk is greatest—and then re-activate it at the end of this period.[141]

Transient and permanent faults

During the course of a year about 70 to 75 per cent of faults on a distribution network are transient. ACRs can improve the reliability of electricity supply by automatically clearing transient faults within a few seconds, rather than letting the faults interrupt supply for one to three hours while a field crew attends, manually replaces a blown fuse, and then patrols the line before restoring power.[142]

ACRs do not improve the reliability of supply when the fault is a permanent one: the reclose attempts will not clear the fault, resulting in the ACR locking out and cutting power until it is restored manually.

Further, and importantly, in the case of permanent faults the ACR's operation can substantially increase the risk of fire. This is because when a permanent fault occurs—such as a tree falling on a conductor or a conductor breaking or otherwise falling to the ground—the ACR will repeatedly restore high-voltage electricity to the conductor. This multiplies the fault current escaping in circumstances where the conductor might be close to flammable material.

On days when the large majority of faults are likely to be transient faults and the bushfire risk is low, the use of ACRs is justified by the greater reliability of supply.

The evidence suggests, however, that on high-risk bushfire days the proportion of permanent faults is much higher than the long-term average. On 7 February only 32 per cent of the faults (85 of the 264 outages) on SP AusNet's three-phase ACR network were transient faults, in contrast with the long-term average of over 70 per cent. This was about triple the number of transient faults recorded on 1 February 2009, which was also a day of extreme fire risk. This means the majority of faults (68 per cent) on 7 February were permanent faults.[143]

Powercor data for the past five years show that on an ordinary day circuit breakers operate an average of 4.24 times on the 22-kilovolt feeder network; of this number, 2.98, or 70 per cent, result in successful recloses. On total fire ban days, however, circuit breakers operate an average of 4.06 times, but only 2.17, or 53 per cent, result in successful recloses. These figures are consistent with the experience of the State Electricity Commission of Victoria, as detailed in the report of the 1977 inquiry.[144]

If the proportion of permanent faults that occur on a total fire ban day is higher than that for a normal day, it follows that on total fire ban days, as compared with normal days:

- ACRs provide fewer benefits in terms of ensuring reliability of supply.
- ACRs are more likely to operate by restoring high-voltage electricity to a line that has experienced a permanent fault.[145]
- If the ACR restores electricity to a line that has experienced a permanent fault, the conditions are more likely to result in a fault causing a fire to start, and if such a fire does start it might be difficult or impossible to control.

Fault current flows and fire starts

When there is a permanent fault on a high-voltage power line and the ACR or OCR re-energises the line, this substantially multiplies the time that fault current is permitted to flow, which therefore multiplies the amount of fault energy released.

In the case of the Kilmore East fire, the OCR's operation on the Pentadeen Spur line resulted in electrical arcing at the site of the fallen power line for 18 times longer than would have occurred if the reclose function of the OCR had been suppressed. Because of the operation of the OCR, plasma at a temperature of 5,000°C was ejected on four occasions—at the time of the initial fault and then on each of the three recloses—for a total of 3.6 seconds instead of for 0.2 seconds, as would have been the case if the reclose function had been suppressed.[146]

In the case of the Beechworth fire, the ACR's operation on the Myrtleford-7 feeder allowed about 200 amperes of fault current to flow for three times longer than it would have had the reclose function been suppressed. This probably extended the duration of the arcing between the energised conductor and the concrete pole the conductor was resting against. SP AusNet accepted that the operation of the ACR on that day increased the probability of a fire starting.[147]

The contribution of ACRs to bushfire risk should not be treated lightly. The expert evidence before the Commission is that the Kilmore East fire probably would not have started had the reclose function on the OCR on the Pentadeen Spur line been suppressed.[148]

SP AusNet's *Bushfire Mitigation Manual* acknowledges that a statistical survey has linked the potential fault energy with the likelihood of ignition. The amount of fault energy released can be reduced by decreasing the fault current and also by reducing the time the current flows. SP AusNet accepted that it is desirable to limit both the flow time and the level of fault current to reduce the likelihood of fires. The expert evidence before the Commission establishes that time is the most important factor determining whether an electrical fault will start a fire. Although protection engineers often use the formula I2 x T (where 'I' is current and 'T' is time) to determine fault energy for many purposes, the formula does not accurately show the energy dissipated in an electrical arc, for which the correct formula is current multiplied by time (that is, I x T).[149]

Although the latter formula suggests that reductions in fault current and in the time the fault current flows are of equal significance, reducing the time the fault current flows is the more significant factor for two reasons:

- If the arc exists beyond a specific time the plasma is able to drive all water out of the flammable material and bring the material to the temperature at which it will ignite.[150]
- Most protection systems will take longer to operate if current is reduced, which tends to offset the reduction in fault energy that might otherwise have resulted from a reduction in current.[151]

The fact that it is possible for a fire to start even if fault energy flows for only a short time does not constitute a logical argument against ACR suppression. The time for which fault current flows is a major contributor to the probability of a fire starting, and distribution businesses should take steps to reduce that time by adjusting ACRs on total fire ban days.[152]

The electrical distribution industry's practice since at least the 1980s acknowledges that some ACRs should be suppressed on total fire ban days to reduce bushfire risk. As former Energy Safe Victoria head Mr Gardner accepted, it is 'not a contested fact within the industry' that if ACRs are left in operation on high-risk days that will increase the risk of fires. An SP AusNet document went further:

> In the case of an ACR and those distribution feeder circuit breakers where multi-shot auto reclose is available it is possible to compromise by retaining one reclose attempt. Deciding on the net benefit of suppressing auto reclose is difficult especially where requirements for a reliable electricity supply for water pumping, communications, lighting etc are critical during periods of high fire risk. However if a fire were to occur from a permanent fault with auto reclose left in service, defence of the situation would be difficult.[153]

The suppression of ACRs: existing policies

In recognition of the risk that ACRs pose on high-risk fire days, distribution businesses have had policies for ACR suppression on total fire ban days for at least the last 20 to 30 years. The policies recognise that some reduction in reliability of supply is appropriate on high-risk days to reduce the chance that a fault will cause a fire.[154]

The policies of the two main distribution businesses in Victoria are, however, very different.

Powercor

In relation to its 22-kilovolt distribution feeders, Powercor decides whether to suppress ACR reclose functions on feeders in high-risk bushfire areas on total fire ban days on a feeder-by-feeder basis. The policy is set out in the organisation's Operational Contingency Plan, which is attached to its Bushfire Mitigation Plan.[155]

Whether the reclose function is suppressed depends on the maximum fault energy that can flow at that point in the distribution network. Powercor compares the maximum fault current at a particular location with a State Electricity Commission of Victoria table that analyses fire start data and the probability of fire starts at particular levels of fault energy. The table shows that at particular levels of fault energy there is an unacceptable bushfire risk. Powercor has been unable to locate the analysis underpinning the table, and without that analysis it is not possible to evaluate the appropriateness of Powercor's policy—especially given that climatic conditions have changed since the table was created.[156]

Powercor does not suppress the operation of OCRs on its SWER network on total fire ban days because the maximum fault energy that is available on SWER lines is low (typically being equal to 0.1 megajoule or less) and, according to the SECV table, does not warrant the suppression of reclose functions.[157]

Although the maximum fault energy levels on the SWER network are low, experience on 7 February 2009 demonstrates that faults on SWER lines are capable of starting fires. The operation of the OCR on the Pentadeen Spur line obviously contributed to the starting of the Kilmore East fire, even though the fault energy levels were low relative to those that would occur on a 22-kilovolt distribution feeder. The Coleraine and Horsham fires were also started by faults on SWER lines, evidence that the fault current is high enough to start fires on high-risk days, despite the fact that those fires were not associated with the operation of ACRs, which were not installed on either of the relevant SWER lines.

The experience of 7 February suggests that a policy of suppressing reclose functions solely on the basis of maximum fault energy levels might mean that distribution businesses are not taking steps—namely, suppressing reclose functions—that would reduce the risk of the SWER network starting bushfires.

SP AusNet

The SP AusNet Bushfire Strategy Plan provides that the 'Manager of Network Operations shall ensure auto reclose is suppressed on designated feeders supplying rural areas on Total Fire Ban Days'. There are 21 'designated feeders' (those being particularly high risk feeders) that run from six zone substations. But zone substations that have neutral earth resistors no longer require the feeders to be auto-reclose suppressed on total fire ban days. Similarly, feeders with ACRs and NER protection are not auto-reclose suppressed on such days.[158]

SP AusNet suppresses the reclose function on ACRs on three-phrase and SWER lines on total fire ban days only if no NER has been installed and the maximum fault current exceeds 3,500 amperes. If an NER is not functioning SP AusNet will consider suppressing reclose functions on circuit breakers and ACRs on total fire ban days on 22-kilovolt feeders in areas of hazardous fire risk.[159]

Any evaluation of SP AusNet's policy requires an understanding of the operation of an NER.

Current flowing on a conductor increases as resistance decreases. The length of the conductor, which impedes current, is an important source of resistance. Faults close to substations can have extremely high fault current (for example, 3,500 amperes) because the current has travelled only a short distance on the conductor. Such high currents can melt equipment on pole tops, causing particles of molten metal to start fires.[160]

To guard against this, distribution companies can install NERs at the zone substations to increase the resistance by a further 8 ohms and so decrease the current and the risk of damage to distribution equipment (and the potential for fires to start). The impact of an NER on maximum fault current reduces dramatically, however, the further away the fault is from the zone substation, thus limiting the NER's effectiveness. For example, if a fault occurs 24 kilometres from a zone substation, an NER might reduce the total fault current by only about 80 amperes, still leaving a fault current of over 500 amperes. A fault current of that level could easily start a fire.[161]

In the light of this, SP AusNet's blanket policy of not suppressing ACRs on feeders if the zone substation has an NER installed is not justified. The NER does reduce the maximum fault current that can result from a fault, but it does not prevent fault currents of a magnitude sufficient to start a fire.

Considering that the time the fault current flows is the most important factor in determining whether the fault will cause a fire, the time during which that current flows should be reduced (by modifying ACR operation) on total fire ban days to the maximum extent reasonably possible, no matter whether an NER has been installed.

Conclusion: suppression of ACRs

There is no doubt that the operation of automatic circuit reclosers increases the amount of energy released when a fault occurs, with a consequential increase in the risk of that fault starting a fire. Whether the increased risk of fire is acceptable—having regard to ACRs' capacity to prevent transient faults from causing interruptions to the electricity supply—is ultimately a judgment for the community.[162]

Any assessment of the costs and benefits of suppressing the reclose function on ACRs must take account not only of the potential inconvenience resulting from a reduction in the reliability of supply but also of the potentially catastrophic impact and cost of a bushfire if it starts on a high-risk day, when it might be difficult or impossible to control.[163]

The decision to suppress reclose functions on ACRs should not be left solely to the distribution businesses—particularly since they have financial incentives that are determined in part by ensuring the reliability of supply. The Commission notes that, when asked for his opinion about the suppression of ACRs on high-risk days, Mr Adams (formerly of SP AusNet) said, 'With a bushfire mitigation hat on it is an easy decision: you do that. With a customer [hat on] and ramifications, you make the other call'. He went on to say he thought the balance could move in favour of more suppression of reclose functionality and that customers might be prepared to tolerate the inconvenience on days of very high risk.[164]

The need for a policy change in relation to ACR suppression is graphically illustrated by the Kilmore East fire, which started because an ACR reclosed when there was a permanent fault on the line. That ACR was left in service in an effort to improve the reliability of supply on a SWER line that served just 20 customers, yet the resulting fire claimed the lives of 119 people.[165]

The SWER network

Both SP AusNet's and Powercor's SWER networks are almost exclusively in CFA-designated high-risk bushfire areas. Much of the SWER network is now 50 to 60 years old and exhibiting end-of-life characteristics, so it can be expected that failures will occur on the network more regularly in future, particularly on days of extreme weather.[166]

In these circumstances the operation of ACRs on days of high fire risk to improve the reliability of electricity supply to a small number of customers poses an unacceptable risk considering the bushfire risk it presents to those customers and to the broader community.

Because it is not practicable to suppress the operation of ACRs on the SWER network only on total fire ban days (suppression must be done manually), the Commission considers that a suitable balance would be for distribution businesses to suppress ACR reclose functions on SWER networks for the six most crucial weeks of every fire season. This would be an interim measure lasting only until the distribution businesses replace the SWER network with underground cable, aerial bundled cable or other technologies that deliver greatly reduced bushfire risk.

The suppression of oil circuit reclosers during part of the fire season will have some detrimental impact on the reliability of supply on the relevant SWER lines. That effect should not, however, be overstated:[167]

- Even if the reclose function is suppressed for six weeks during the fire season, the reliability of the affected SWER lines during that time will be the same as it is on the 33 per cent of Powercor SWER lines and the 10 per cent of SP AusNet SWER lines that are not fitted with OCRs. Those lines are protected by an ordinary fuse—meaning that if a fault occurs power is lost until the fuse is manually replaced. It appears that reliability on those lines is considered acceptable.[168]
- To the extent that there is a decrease in the reliability of supply to SWER line customers, there is a corresponding benefit to those same customers in that the likelihood of fire starting in their area will be reduced.
- SWER networks serve only about 4 per cent of SP AusNet's customers and 4.6 per cent of Powercor's customers. Any reduction in the reliability of supply to SWER lines will thus affect only a small proportion of the community. In contrast, the reduction in bushfire risk has benefits for the entire community.[169]
- The main arguments against suppression of the reclose function on ACRs do not apply to SWER lines because SWER lines cannot carry sufficient power to service towns, making it unlikely that essential infrastructure such as hospitals, pumping stations and incident control centres would be affected if power were lost from SWER lines. Any customers who are critically dependent on power will have—or should have—alternative sources of power such as generators since power will be lost if there is a permanent fault in any event (regardless of the operation of ACRs).
- SP AusNet agreed that suppression of reclose functions on OCRs during the fire season warranted consideration.[170]

Distribution businesses should tell their SWER customers about the potential for decreased reliability in the electricity supply because a policy to suppress ACRs for the six weeks of greatest risk in the bushfire season is to be introduced. This would allow those customers to ensure that their fire plans are not contingent on the availability of mains electricity. In this regard the Commission notes that there could well be a need for community education, so that customers are informed about any impacts ACR suppression might have on the reliability of their power supply.

If distribution businesses do not want to manually suppress OCRs on SWER networks for six weeks during the bushfire season, they could progressively replace the OCRs with ACRs that can be remotely controlled on total fire ban days (at a cost of about $30,000 to procure and install each one).[171]

Introduction of a policy of suppressing OCRs for six weeks during the bushfire season would substantially reduce the risk that a fault will start a fire. In the Commission's view, had such a policy been in operation on 7 February, it is unlikely that the Kilmore East fire would have occurred.

The three-phase 22-kilovolt network

A different approach is warranted in the case of the 22-kilovolt feeder network because most of the ACRs on that network can have their settings adjusted remotely, making it practicable to change ACR settings only on total fire ban days.

As a transitional measure, until the distribution businesses replace those 22-kilovolt feeders in the areas of highest bushfire risk, as the Commission recommends, the reclose functions on the ACRs should be changed on every total fire ban day to allow only one reclose attempt. This should apply regardless of whether or not a neutral earth resistor has been installed at the zone substation for the relevant feeder.

The single reclose attempt could be set on the 'slow curve' following the initial 'fast curve', to ensure that there is no loss of coordination between protection devices (allowing the location of a fault to be pinpointed), to prevent unnecessary interruptions for customers upstream from the fault, and to improve the reliability of supply on feeders that serve customers with a crucial need for supply—for example, patients on life support, hospitals, incident control centres, and water and sewage pumps.[172]

Such an approach would at least halve the total amount of fault energy liberated during any permanent fault, with no impact on the sequencing of protection devices and with little, if any, impact on the reliability of supply. This low-cost initiative would substantially reduce the risk of a fault on the 22-kilovolt network starting a fire.[173]

The Commission is satisfied that a policy permitting one reclose would have a minimal impact on the reliability of supply because most transient faults would be cleared during the initial reclose.[174] To the extent that there was an impact on the reliability of supply, the Commission notes the following:

- Partial suppression of the reclose function on ACRs is *not* equivalent to cutting off power. Even if reclose functions are partially suppressed, supply will continue as normal in the absence of a fault on a total fire ban day. Further, even if a fault does occur the partial suppression of reclose functions will affect supply only if the fault is a transient one that is not cleared by the first reclose. This would be a rare event: as SP AusNet stated in relation to its overhead 22-kilovolt network, '… on any given day and section of the network, few if any faults would be expected to occur'.[175]
- The suppression of reclose functions would occur only on total fire ban days, so any impact on the reliability of supply would be limited to those days on which a fire is most likely to start and to be particularly difficult to control if it does.
- If, as seems the case, the proportion of permanent faults is higher on days of total fire ban than on ordinary days, ACRs offer less benefit in terms of reliability of supply on total fire ban days than on other days but a higher risk of fire starting.
- In connection with its 22-kilovolt network, Powercor has studied the effect of ACR suppression on the reliability of supply on total fire ban days. The studies do not appear to take account of the fact that for permanent faults power would have been lost regardless of whether the reclose function was suppressed. Nor do they consider the proposal that one reclose be allowed (rather than complete suppression), which would clear the great majority of transient faults and limit adverse impacts on the reliability of supply. Nevertheless, even the impact on supply suggested by Powercor's studies seems to be an acceptable trade-off if a substantial reduction in bushfire risk on total fire ban days is the result.[176]

RECOMMENDATION 32

The State (through Energy Safe Victoria) require distribution businesses to do the following:

- disable the reclose function on the automatic circuit reclosers on all SWER lines for the six weeks of greatest risk in every fire season
- adjust the reclose function on the automatic circuit reclosers on all 22-kilovolt feeders on all total fire ban days to permit only one reclose attempt before lockout.

4.6.4 OTHER DEVICES FOR LIMITING FIRE RISK

Dampers

A damper is a relatively simple device used for minimising the effects of wind-induced vibration on power lines. Sustained vibration can lead to wearing and abrasion of a conductor and the ties near the connection point. It is for this reason that dampers are normally installed within a hand's width of where the conductor finishes at a pole.

Dampers are helically wound around the outside of the conductor and clamped at one end. As the vibrating conductor hits the inside of the damper coil the coil disturbs the build-up of natural frequency, thereby reducing vibration.[177]

Cheap dampers have been available for a long time. In about 1992 the State Electricity Commission of Victoria introduced a requirement that dampers be fitted on all new conductors of a specified tension and on both ends of any span of 300 metres or more. Similarly, in June 2009 SP AusNet proposed that dampers be fitted to all conductors with a span greater than 300 metres.[178]

SP AusNet has, however, no plan to retrofit dampers to old lines with spans exceeding 300 metres, ostensibly because, as Mr Paul Lane, Regional Manager for North Region of SP AusNet, explained, the volume of incidents in which fatigue is implicated does not warrant such a program. Even when the Pentadeen Spur line—the span of which is more than

1 kilometre—was restrung after the Kilmore East fire the linesmen did not fit dampers. Yet Mr Lane acknowledged that an absence of dampers can lead to a big reduction in conductor life as a result of fatigue, as demonstrated in documents prepared by the Energy Networks Association.[179]

The Commission considers it illogical to agree, as Mr Lane did, on one hand that the fitting of dampers to new spans of line greater than 300 metres long is warranted yet not to embark on a retrofitting program for existing spans of that length or more.

As a transitional measure aimed at reducing the risk that the existing network will cause more bushfires before it has been replaced, dampers or other vibration-reducing devices such as shed insulators should be required to be fitted or retrofitted to conductor spans in excess of 300 metres in the areas of greatest bushfire risk.[180]

Spreaders

The problem of clashing conductors and the consequent electrical arcing causing molten particles to start fires is not new. The State Electricity Commission of Victoria considered clashing in detail as early as 1969. Testing showed that clashing conductors could produce incandescent particles that in dry, hot conditions could start a fire.[181]

It was recognised in 1969 that, along with leaning poles and twisted cross-arms, 'slack spans' were a primary cause of clashing. The SECV had installed more than 100 fibreglass spreaders in the Barwon region before April 1969 to limit the risk of clashing where slack spans were suspected of causing faults.[182]

Conductor clashing was also a major cause of fires in 1977, and Sir Esler Barber commented on this in some detail in his report. Among other things, he said, 'There were many places, for example Beeac and Balliang East, where the LV [low-voltage] lines were exposed to high winds and where clashing occurred in consequence and this could have been avoided by the installation of spacers'.[183]

Sir Esler also observed that in many instances spreaders had not been installed when they should have been but that the SECV had given its assurance that steps had 'already been taken and that in future this danger will be eliminated'.[184] Regrettably, the danger has not been eliminated if the Colac–Camperdown line is a representative example. For further discussion of this, see the discussion of the Pomborneit–Weerite fire in Chapter 8 of Volume I.

Mr Vince Power, Powercor manager Network Safety, Environment and Compliance, gave evidence that Powercor intended to fit spreaders on specific spans of the Colac–Camperdown line and that a detailed survey of that line would be carried out in order to identify problems and obviate line clashes. It seems that this work has recently begun, although, considering that the Colac–Camperdown line has a long history of clashing, the work should have been done many years ago.[185]

In relation to clashing and the use of spreaders, the Barber report stated:

> As to such lines as are presently in existence, where any danger of clashing of conductors is possible, consideration should be given as to whether or not the line should be reinstalled. Where this is impracticable, then spreaders to avoid contact between the wires must be installed immediately.[186]

As to the fitting of spreaders, the following recommendation by the Commission is as apt in 2010 as it was in 1977.

RECOMMENDATION 33

The State (through Energy Safe Victoria) require distribution businesses to do the following:

- fit spreaders to any lines with a history of clashing or the potential to do so
- fit or retrofit all spans that are more than 300 metres long with vibration dampers as soon as is reasonably practicable.

4.7 ENERGY SAFE VICTORIA

In the light of the foregoing discussion highlighting the need for major changes to reduce the bushfire risk posed by electricity assets, Energy Safe Victoria must have a more prominent role as safety regulator.

ESV is constituted under s. 4 of Victoria's *Energy Safe Victoria Act 2005*. It was established when the Office of the Chief Electrical Inspector merged with the Office of Gas Safety. Among its functions are those conferred by the State's *Electricity Safety Act 1998*, although most of these are not relevant to bushfires. This is reflected in the fact that, out of ESV's 90 staff, the equivalent of two full-time staff are devoted to matters relating to bushfire mitigation.[187]

Professor Graeme Hodge, Director of the Centre for Regulatory Studies in the Faculty of Law at Monash University, gave evidence that 'the mandate of ESV appears weak and confused'. He said the Electricity Safety Act makes no explicit mention of fires originating from electrical assets and fails to give ESV any clear mandate in relation to things that might be construed as being outside the direct electrical safety area. He considered this to be partly why ESV devotes such limited resources to bushfire mitigation activity.[188]

Among ESV's bushfire-related functions are the following:

- investigating incidents that have implications for electricity safety—CFA investigators contact ESV if they consider a fire might have been caused by electricity, and an ESV inspector attends the fire with the CFA investigator in order to determine whether electricity was the fire's cause[189]
- monitoring and enforcing compliance with the Electricity Safety Act and its Regulations in relation to bushfire mitigation plans, line clearance plans and electricity safety management schemes.

Powers

Three legislative provisions give ESV power to 'approve' how distribution businesses propose to meet their obligation to operate and maintain their networks safely:

- Section 102(2) of the Electricity Safety Act gives ESV a power to 'accept' electricity safety management schemes, and it must do so 'if it is satisfied that the … scheme is appropriate for the supply network to which it applies and complies with this Act and the regulations relating to electricity'.
- Section 83A of the Electricity Safety Act confers on ESV the power to approve bushfire mitigation plans.
- The Code of Practice under the Electricity Safety (Line Clearance) Regulations 2010 (and previously under Electricity Safety (Line Clearance) Regulations 2005) gives ESV the power to approve line clearance plans submitted by distribution businesses.

Approval of electricity safety management schemes

Mr Gardner, former head of ESV, explained to the Commission that ESV 'does not place a large degree of emphasis on the ESMS [Electricity Safety Management Scheme] system when it comes to regulating electricity distribution businesses who have assets in bushfire-prone areas'. It concentrates instead on assessing and auditing bushfire mitigation plans and line clearance plans as a means of regulating those matters.[190]

The Commission notes that in the past ESV chose not to make use of the powerful tool that ESMSs represent, relying instead on statutory provisions that give it less capacity to influence distribution businesses' behaviour. The ESMS regime has, however, undergone important changes. It is now compulsory for the distribution businesses to participate in the ESMS regime and specify how they will meet their obligations under s. 98 of the Electricity Safety Act.

Since December 2009 s. 98 of the Electricity Safety Act has required that each 'major electricity company'—which includes the distribution businesses—design, construct, operate, maintain and decommission its supply network to minimise the following as far as practicable:

- hazards and risks to the safety of any person arising from the supply network
- hazards and risks of damage to the property of any person arising from the supply network.[191]

That obligation reflects the need for distribution businesses to balance the need to augment the safety of people and property against other objectives as far as 'practicable':

> having regard to—
>
> (a) the severity of the hazard or risk in question;
>
> (b) the state of knowledge about the hazard or risk and any ways of removing or mitigating the hazard or risk;
>
> (c) the availability and suitability of ways to remove or mitigate the hazard or risk; and
>
> (d) the cost of removing or mitigating the hazard or risk.

ESV's function in approving a distribution business's ESMS allows it to influence how distribution businesses strike the balance between these competing considerations.

One consequence of the comprehensive ESMS regime is that the Electricity Safety (Management) Regulations 2009 strengthen the distribution businesses' reporting requirements for electricity-related fires. ESV should be armed with data about the specific circumstances of all fires caused by failed distribution infrastructure so that it can identify trends that can be taken into account in the development of bushfire prevention strategies. To that end, it is important that ESV receives information about network failures that had the potential to cause a fire but did not. The Electricity Safety (Management) Regulations will go some way towards ensuring that ESV becomes aware of those 'near misses'. The Regulations provide that, in addition to reporting 'serious electrical incidents' (those causing death, injury, significant property damage or disruption to the community), distribution businesses must now provide a quarterly statistical summary of 'specified electrical incidents' (relevantly, resulting in fire from an operator's network or part of the network becoming dislodged from its supporting structure).[192]

The Commission notes, however, that ESV's ability to effectively detect and analyse trends relating to electricity-related fires depends on the accuracy and detail of the data it receives—whether from the distribution businesses or from other sources such as its joint investigation with the CFA of electrical incidents. The Commission further notes that the quarterly statistical summary of 'specified electrical incidents' the distribution businesses are required to provide to ESV might not furnish sufficient data for ESV to carry out that important analysis. ESV should take an active approach to obtaining the requisite details—be it from the distribution businesses or the fire agencies—about the electricity failures of which it becomes aware.

Approval of bushfire mitigation plans

ESV has a very limited view of its power to refuse approval of bushfire mitigation plans. Mr Gardner explained to the Commission:

> … The office assesses the plans against the criteria that are set out in the Regulations. We obviously discuss the content of the plans with the distribution businesses. Provided on the face of it they look adequate, then we are really obliged under the Regulations to approve the plans. There is no ability for us in terms of dealing with bushfire mitigation plans to go back and say, 'No, we are imposing a different standard'.[193]

4.7.1 A WEAK REGULATOR

Mr Gardner explained that 'ESV regulates electricity infrastructure by focusing on the various systems by which regulated entities operate' on the basis that the organisation that creates the risk should be responsible for managing the risk. He declined to agree that ESV was better placed than the distribution businesses to make an objective judgment about what is an acceptable risk level. He did say, though, that in some circumstances decisions about safety need to involve a wider level of community consultation and that operators in the distribution businesses should not make that judgment.[194] He explained:

> ESV attempts to adopt a co-regulatory approach to the regulation of the energy sector. In the area of electricity this means that the regulated entities will regulate their businesses in accordance with the various systems they have adopted. For its part, ESV seeks to collect information to inform itself on whether the particular regulated entity has adequate systems that are being properly applied and utilised.[195]

The Commission endorses the view of Professor Hodge, who noted that, although co-regulation is a legitimate regulatory style in certain circumstances, as practised by ESV it appears to be nothing more than 'compliance ritualism'.[196] The focus is on ticking boxes rather than substantive matters:

- ESV eschews any role in making substantive judgments, taking the view that 'the whole regulatory system that is in place at the moment is designed to get the distribution businesses to make those decisions'.[197]
- Although ESV will consider a policy's content to satisfy itself 'not only that the issues [have] been covered but at least on the face of it that they looked reasonable and that improvements were occurring', it believes it does have to approve a plan if the distribution business has dealt with all the areas that are covered in the Regulations.[198]
- ESV does not judge how the distribution businesses should achieve the best safety outcomes, only challenging the businesses if their plan contains something that is wrong or 'wildly inconsistent with what everyone else [is] doing'.[199]

Mr Gardner agreed that there would definitely be benefits in having a standard, at least in relation to certain areas.[200]

The Commission notes that ESV's weak position is apparent from the distribution businesses' responses to the criticisms raised by auditors ESV engaged to identify problems with bushfire mitigation plans. For example:

- Powercor simply rejected the auditor's conclusion that the majority of rusty ties and conductors were not being detected in the asset inspection process.[201]
- SP AusNet chose to take no action in response to the shortcomings the auditor identified in relation to rust on conductors and tiewires in its network.[202]

ESV's lack of influence over the distribution businesses was similarly illustrated by the meeting the businesses had with ESV following the 7 February bushfires, at which Mr Gardner raised the possibility of introducing age-based asset replacement. His proposal was rejected by the distribution businesses as being expensive and at odds with the risk-based ESMS regime.[203]

Mr Gardner acknowledged that there were some difficulties in relation to audit compliance but said ESV had little power to sanction the distribution businesses:

> … It may be necessary for ESV to issue a direction that a particular issue be rectified … Whilst this power exists, it is rare for ESV to issue such directions in relation to issues identified by an audit. The reason for this is that the directions powers contained in the Electricity Safety Act are designed to deal with specific issues or failures by a regulated entity. The audits on the other hand are more focused on systemic regulatory considerations. For that reason, the issues identified by an audit will rarely be issues that can be rectified through issuing a direction.[204]

Mr Gardner told the Commission 'there is certainly a case for, as assets get older, inspection frequency [to get] shorter and perhaps the inspection analysis required becomes more stringent'. He added, 'ESV should be requiring their businesses to re-examine the inspection intervals for all of their components and to re-demonstrate what is an appropriate inspection interval, which may vary depending on the age of the asset'.[205]

Notwithstanding those views, there is no evidence before the Commission that ESV has ever tried to use its position as safety regulator to change the existing cycle or perform the necessary analysis to support an argument favouring either a three- or a five-year inspection cycle. ESV has never revisited the Office of the Chief Electrical Inspector's decision in 1999–2000 to permit Powercor to move its standard inspection cycle from every three-to-three-and-a-half years to every five years, which then became the industry standard. ESV has since regularly approved bushfire mitigation plans with five-year inspection cycles, essentially on the basis that 'there is no obvious increase in failures'.[206]

Professor Hodge said the regulator should be expert in relation to all the facts and matters that bear on the policy decisions in the areas it operates, so that there is an independent source of expert knowledge. In his opinion, ESV did not perform that role and nor did it try to. It did not have the 'fierce analytical basis on which regulatory activities proceed' that is characteristic of a strong regulator, operating instead as 'more a bureaucratic regulatory checker'.[207]

That opinion was clearly supported by the evidence of Mr Fearon, Energy Safe Victoria's Director. When asked about the ageing distribution network and its risk to safety, Mr Fearon said, 'We would not see it as our role to assess the complex trade-off of cost, reliability and safety as it pertains to those technology options', and that he did not believe ESV would ever be able to retain the sort of expertise to undertake such assessments.[208] Mr Gardner echoed this sentiment:

> In terms of getting the regulated entity to come up with the solutions, again that's part of this process. They are large organisations. They have the expertise. They have the information. They know the state of their assets better than anyone else. So they are in a better position to make some of these judgments than anyone else as well.[209]

Professor Hodge did not accept that ESV was not able to retain the requisite expertise, noting that the expertise required by the distribution businesses was quite different from that required by the safety regulator but that regulators should never 'have less intelligence' than the entities they regulate. He also said he would expect a safety regulator, in its interactions with government and with the distribution businesses, to promote reforms that would improve safety:

> An appropriate role of a regulator in this context might be to proactively examine technological options that would be available that would decrease risk and to explore the benefits and costs associated with those kinds of technologies and then to make recommendations to the businesses about them.[210]

Even when the distribution businesses have used their expertise and resources to develop safety initiatives, ESV has not always supported their proposals to obtain revenue allowances to implement those initiatives. Earlier in this chapter the Commission notes that ESV did not make submissions in relation to Powercor's 2005 revenue proposal to the economic regulator about underground cabling in areas of high bushfire risk. In that instance ESV was neither co-regulatory nor proactive in its approach: it simply did nothing.

THE FUTURE ROLE OF ESV

The State of Victoria should reform ESV and fund it in such a way as to enable it to provide the analytical base necessary for proposing and evaluating safety reforms and advocating those reforms in submissions to the Australian Energy Regulator. The need for an independent body to perform those functions is strongly supported by the evidence before the Commission.

Since the February 2009 fires ESV has sought to gain a greater understanding of SP AusNet's current asset management system, including by way of additional audit. Mr Gardner said the aim was to revisit the entire system—'to take everyone back to scratch and start again'. The Commission endorses ESV's plan to use the audit results to decide whether changes should be made to existing asset maintenance and bushfire plans.[211]

If ESV acquires a strong analytical basis and sufficient resources, it will have a foundation on which to use its powers to influence distribution businesses in a way that would reduce the risk of bushfires. For example, the Commission considers this would equip ESV to make judgments about the need to adopt other technologies and methodologies, such as the following:

- age-based replacement programs
- inspection programs that vary according to asset age or location
- underground or aerial bundled cables.

This would also enable ESV to determine whether the bushfire mitigation plans put forward by distribution businesses minimise fire risk to the greatest extent practicable.

The Commission is strongly of the view that a strengthening of ESV's regulatory powers is needed, including the ability to apply sanctions in relation to non-performance, so that it can take a more active role in monitoring and regulating the electricity distribution industry in Victoria.

RECOMMENDATION 34

The State amend the regulatory framework for electricity safety to strengthen Energy Safe Victoria's mandate in relation to the prevention and mitigation of electricity-caused bushfires and to require it to fulfil that mandate.

1 Exhibit 151 – Report of the Board of Inquiry Into the Occurrence of Bush and Grass Fires in Victoria (TEN.058.001.0001) at 0133; Exhibit 578 – SP AusNet Bushfire Mitigation Manual – Distribution Network (SPN.002.005.0024) at 0031

2 Exhibit 151 – Report of the Board of Inquiry Into the Occurrence of Bush and Grass Fires in Victoria (TEN.058.001.0001) at 0134–0135

3 Exhibit 544 – BFM Framework 2003–2004 – Bushfire Mitigation Management Framework (PAL.001.002.0326) at 0331. The report of the Ash Wednesday fires provides little evidence as to the causes of the significant fires

4 Exhibit 214 – Statement of Hollowood (WIT.3010.001.0338) [63]; Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [169]; Exhibit 514 – Wildfire Investigation Report into Origin and Cause – Kilmore – Kinglake Fire – Saturday February 7th 2009 (WIT.3004.022.0045) at 0057; Leahy T11006:12–T11006:20

5 Fearon T13224:29–T13225:1

6 Exhibit 225 – Overview of the Technical Regulation of the Electricity Industry, Annexure 7 (Regulatory Impact Statement – Electricity Safety (Electric Line Clearance) Regulations 2005) (SPN.600.001.1403) at 1410; Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [25]–[33]

7 Exhibit 544 – Statement of Breheny (WIT.7000.001.0001) [5]–[6]; Exhibit 558 – Statement of Adams (WIT.5103.001.0001) [46], Attachment 2 (Marked up) (WIT.5103.001.0089) at 0093; Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [23], [72]

8 Exhibit 151 – Report of the Board of Inquiry into the Occurrence of Bush and Grass Fires in Victoria (TEN.058.001.0001), especially at 0077, 0133–0135; Exhibit 558 – Statement of Adams (WIT.5103.001.0001) [33]

9 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) at 0010

10 Exhibit 629 – Bushfire Mitigation Management Plan Evaluation (DOC.ESV.001.0189) at 0192; Exhibit 629 – SP AusNet Electricity Distribution – 5 Year Asset Management Plan 2006–2010 (SPN.010.001.0071_R) at 0124_R

11 Exhibit 544 – BFM Post Season Review 2008–2009 Update – Bushfire Mitigation Post Season Review 2008/2009 (PAL.003.001.0006) at 0018

12 Exhibit 151 – Report of the Board of Inquiry into the Occurrence of Bush and Grass Fires in Victoria (TEN.058.001.0001) at 0134–0135; Fearon T13224:29–T13225:1

13 Exhibit 514 – Wildfire Investigation Report into Origin and Cause – Kilmore – Kinglake Fire – Saturday February 7th 2009 (WIT.3004.022.0045) at 0057; Exhibit 525 – Investigation into the Failure of a 12.7kV SWER Conductor Pentadeen Spur, Kilmore East (VPO.001.039.0016) at 0018, 0051; Jones T11775:15–T11775:17

14 Exhibit 280 – Statement of Power (WIT.7002.002.0001) [22], [25]; Exhibit 539 – Statement of Gates (WIT.123.001.0001_R) [16]–[17], [21]–[23], [109], [146], [149]; Power T7579:25–T7580:16, T7581:20–T7581:24, T12706:24–T12706:29

15 Exhibit 258 – Statement of Power (WIT.7002.001.0001) [17]

16 Exhibit 613 – Outline of Evidence of Griffith (EVI.001.001.0001) [1], Attachment 1 (EVI.001.001.0006) at 0008–0012; Griffith T13185:17–T13185:30, T13190:3–T13190:20, T13198:28–T13199:3, T13216:19–T13216:21

17 Gardner T12260:14–T12260:26

18 Exhibit 558 – Statement of Adams, Attachment 2 (Marked up) (WIT.5103.001.0089) at 0093, 0096–0097, 0101, 0104, Attachment 5 (WIT.5103.001.0363) at 0380. A network component's 'regulatory life' is the age limit set by a network operator at which it will replace the component regardless of whether that component has failed. The term was used interchangeably with 'regulated life' in evidence before the Commission

19 Exhibit 558 – Statement of Adams, Attachment 2 (Marked up) (WIT.5103.001.0089) at 0099, 0105

20 Exhibit 629 – ESMS – Conductor Replacement Program 2007 – 2010 – Scope of Works (SPN.012.004.0168_R) at 0171_R–0174_R

21 For example: Power T12708:29–T12709:14 in relation to pin-type insulators and their failure rate

22 Exhibit 578 – SKM Powercor and Citipower Age Opex Report – Impact of Ageing Assets on Operating Expenses (PAL.017.001.0523) at 0533

23 Exhibit 534 – Expert Report of Hastings (EXP.010.001.0001) at 0019; Exhibit 578 – SKM Powercor Opex Age Relationship Final Report – Impact of Ageing Assets on Powercor Operating Costs (PAL.017.001.0541) at 0546, 0559; Hastings T11594:11–T11595:3, T11578:3–T11578:9, T12647:16–T12648:7

24 Exhibit 629 – AMS – Electricity Distribution Network – Insulators – Line, Medium Voltage (SPN.012.013.0001_R) at 0004_R, 0010_R

25 Exhibit 629 – AMS – Electricity Distribution Network – Insulators – Line, Medium Voltage (SPN.012.013.0001_R) at 0005_R, 0008_R; Power T12708:29–T12709:14

26 Exhibit 629 – AMS – Electricity Distribution Network – Insulators – Line, Medium Voltage (SPN.012.013.0001_R) at 0009_R, 0014_R

27 Exhibit 558 – Statement of Adams, Attachment 21 (WIT.5103.001.0969) at 0971; Exhibit 629 – SP AusNet Electricity Distribution – 5 Year Asset Management Plan 2006–2010 (SPN.010.001.0071_R) at 0105_R. SP AusNet responded to the audit by stating that there had been no significant increase in these numbers in the past five years: Adams T12197:28–T12199:6

28 Exhibit 578 – Powercor Australia – 2006 Electricity Distribution Price Review – Submission to the Essential Services Commission (PAL.019.001.1949) at 2021

29 Exhibit 578 – Powercor Australia – 2006 Electricity Distribution Price Review – Submission to the Essential Services Commission (PAL.019.001.1949) at 2021

30 Exhibit 629 – SP AusNet Distribution BM Audit Report 2005 (DOC.ESV.003.0165) at 0172

31 Gates T11728:10–T11730:5

32 Exhibit 558 – Statement of Adams, Attachment 7 (WIT.5103.001.0472) at 0554; Exhibit 539 – Statement of Gates (WIT.123.001.0001_R) [144]; Gates T11728:10–T11728:31; Power T12707:1–T12707:23

33 Exhibit 539 – Statement of Gates (WIT.123.001.0001_R) [134], [136]; Gates T11744:23–T11745:15

34 Exhibit 579 – Supplementary Statement of Breheny, Attachment 1 (WIT.7005.002.0006); Breheny T12699:22–T12699:31

35 Submissions on Behalf of Powercor – Systemic Issues in the Electricity Industry (RESP.7000.004.0001) [58]; Power T7368:12–T7368:13

36 Hastings T12615:2–T12615:24

37 Exhibit 534 – Expert Report of Hastings (EXP.010.001.0001) at 0009; Hastings T12615:25–T12617:1

38 Exhibit 558 – Statement of Adams, Attachment 2 (WIT.5103.001.0089) at 0097; Exhibit 627 – Statement of Lourey, Attachment 12 (WIT.3019.005.0002) at 0008; Exhibit 714 – SWER Strategy – Strategic Plan for Managing SP AusNet's Single Wire Earth Return (SWER) System (SPN.012.006.0153_R) at 0161_R; Exhibit 237 – Statement of Lane (WIT.5100.001.0001) at 0006

39 Exhibit 544 – Statement of Breheny (WIT.7000.001.0001) [8]–[9]

40 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [32]; Exhibit 714 – Strategic Plan for Managing SP AusNet's Single Wire Earth Return (SWER) System (SPN.012.006.0153_R); Lane T11081:21–T11081:30. Note that 90 per cent of SWER lines in SP AusNet's network cater for less than 100 customers and 53 per cent of those SWER lines serve less than 59 customers: Exhibit 714 – SWER Strategy – Strategic Plan for Managing SP AusNet's Single Wire Earth Return (SWER) System (SPN.012.006.0153_R) at 0164_R

41 Exhibit 627 – Statement of Lourey, Attachment 12 (WIT.3019.005.0002) at 0008; Griffith T13196:10–T13196:17, T13198:13–T13198:23

42 Exhibit 280 – Statement of Power (WIT.7002.002.0001) [26]; Exhibit 266 – Statement of McDonald (WIT.7001.001.0001) [66]; McDonald T7600:7–T7600:17, T7602:2–T7602:6

43 Exhibit 527 – Statement of Lourey (WIT.3019.001.0065) [61]

44 Griffith T13203:6–T13204:1

45 Breheny T11917:11–T11920:2

46 Griffith T13202:19–T13202:24

47 Exhibit 223 – Statement of Gardner, Attachment 38 (WIT.3020.001.1003) at 1013; Exhibit 558 – Statement of Adams, Attachment 4 (WIT.5103.001.0293); Breheny T11916:17–T11917:10. On 8 December 2009 the governing regulations regarding substantial reconstruction of private electric lines changed from r. 403 of the Electricity Safety (Installations) Regulations 1999 to r. 220 of the Electricity Safety (Installations) Regulations 2009, although the requirement remains largely the same. Although the new Regulations still require private electric lines that are to be constructed or substantially reconstructed to be placed underground, they no longer define 'substantially reconstructed'. The 1999 Regulations defined this as reconductoring of more than 30 per cent of the line or replacement of more than 30 per cent of the number of poles in the line. It is unclear whether the new Regulations intended to change this definition by omitting it

48 Adams T12185:13–T12186:17 (in relation to r. 403, see footnote 47 for more details). This is also the case under the new Electricity Safety (Installations) Regulations 2009

49 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [128]; Breheny T11928:4–T11928:10; Griffith T13201:21–T13202:13

50 Exhibit 627 – Statement of Lourey, Attachment 12 (WIT.3019.005.0002) at 0005–0007, 0016–0017, 0021; Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [128]–[129]; Griffith T13201:24–T13201:28

51 Breheny T11874:2–T11874:6, T11934:4–T11934:8, T11870:29–T11871:4, T11867:16–T11869:27

52 Hastings T12640:21–T12642:12

53 Gardner T6885:20–T6886:3

54 'Regulated' or 'regulatory life' refers to the age limit set by a network operator at which the operator will replace a network component regardless of whether that component has failed: Hastings T12652:12–T12652:28, T12643:3–T12643:29

55 Hastings T12640:11–T12640:20

56 Exhibit 558 – Statement of Adams, Attachment 2 (WIT.5103.001.0089) at 0093; Hastings T12645:10–T12646:20

57 Hastings T12648:9–T12648:29

58 Exhibit 558 – Statement of Adams, Attachment 2 (Marked up) (WIT.5103.001.0089) at 0093

59 Hastings T12644:25–T12645:3

60 Submissions of SP AusNet – Systemic Issues within the Electricity Industry (RESP.5100.004.0001) [20]–[22]

61 Exhibit 627 – Statement of Lourey (WIT.3019.001.0065) [20(a)]–[20(b)]

62 Exhibit 627 – Statement of Lourey (WIT.3019.001.0065) [20(d)]

63 *Essential Services Commission Act 2001* s. 8; Exhibit 225 – Economic Regulation of Electricity Distribution (SPN.600.002.0001) at 0020–0021; Exhibit 621 – Statement of Pattas (WIT.6004.001.0001) [13]

64 Exhibit 621 – Statement of Pattas (WIT.6004.001.0001) [17]; Pattas T13430:25–T13431:3; Gardner T12252:13–T12252:18, T6834:9–T6834:30.

65 Exhibit 627 – Statement of Lourey, Attachment 4 (WIT.3019.001.0097) at 0200; Exhibit 578 – Powercor 2006 Electricity Distribution Price Review Submission to Essential Services Commission 21/10/06 (PAL.019.001.0636) at 0949; Exhibit 578 – Powercor Response to Essential Services Commission – Electricity Distribution Price Review 2006–2010 (PAL.019.001.2099) at 2123. Note the submission for capital expenditure on undergrounding was made by other distribution companies as well as Powercor and rejected for the same reasons by the Essential Services Commission

66 Exhibit 578 – Response to Essential Services Commission Electricity Distribution Price Review 2006–2010 Position Paper – Undergrounding (PAL.019.001.2095) at 2097–2098

67 Gardner T12262:5–T12262:10

68 Exhibit 578 – Essential Services Commission Electricity Distribution Price Review 2006–2010 Position Paper (PAL.019.001.1401) at 1470; Exhibit 627 – Statement of Lourey (WIT.3019.001.0065) [24]

69 Exhibit 578 – Essential Services Commission Electricity Distribution Price Review 2006–2010 Position Paper (PAL.019.001.1401) at 1472; Exhibit 627 – Statement of Lourey (WIT.3019.001.0065) [33]

70 Exhibit 627 – Statement of Lourey (WIT.3019.001.0065) [32]; Exhibit 578 – Essential Services Commission Electricity Distribution Price Review 2006–2010 Position Paper (PAL.019.001.1401) at 1472

71 Exhibit 578 – Electricity Distribution Price Review 2006–10 – October 2005 Price Determination as Amended in Accordance with a Decision of the Appeal Panel Dated 17 February 2006 – Final Decision Volume 1 – Statement of Purpose and Reasons (PAL.019.001.0636) at 0964–0965

72 Pattas T13438:6–T13438:19, T13439:4–T13439:11; Fearon T13235:23–T13236:7

73 Exhibit 627 – Statement of Lourey (WIT.3019.001.0065) [14]–[15], Attachment 2 (WIT.3019.001.0081) at 0085, 0091

74 Exhibit 621 – Statement of Pattas (WIT.6004.001.0001) [44]; Adams T12184:22–T12185:12; Breheny T11929:21–T11929:30

75 Exhibit 621 – Statement of Pattas (WIT.6004.001.0001) [29]

76 Pattas T13444:27–T13445:9

77 Pattas T13418:31–T13419:2; Gardner T12252:25–T12253:6

78 Gardner T12252:10–T12252:12

79 National Electricity Rules, Rule 6.6.1; Exhibit 621 – Statement of Pattas (WIT.6004.001.0001) [25], Attachment 2 (WIT.6004.001.0061) at 0085

80 Pattas T13429:5–T13429:29, T13432:19–T13433:6

81 Exhibit 621 – Statement of Pattas (WIT.6004.001.0001) [25]; Pattas T13428:9–T13428:13, T13430:21–T13430:28

82 Exhibit 558 – Statement of Adams (WIT.5103.001.0001) [75]–[76]; Breheny T11874:2–T11874:6, T11870:29–T11871:4

83 Exhibit 558 – Statement of Adams (WIT.5103.001.0001) [67]

84 Exhibit 558 – Statement of Adams (WIT.5103.001.0001) [87], [90]–[92]; Exhibit 544 – Statement of Breheny (WIT.7000.001.0001) [42]–[46]

85 Exhibit 531 – Powercor Network Asset Maintenance Policy for Bare Conductors (PAL.001.007.0318); McCrohan T11493:13–T11493:29

86 Exhibit 558 – Statement of Adams (WIT.5103.001.0001) [80]–[82]; Exhibit 544 – Statement of Breheny (WIT.7000.001.0001) [35]–[41]

87 Exhibit 558 – Statement of Adams (WIT.5103.001.0001) [83]–[84]; Exhibit 544 – Statement of Breheny (WIT.7000.001.0001) [36]–[37]; Submissions of SP AusNet – Kilmore East (RESP.5100.002.0001) [50]; Adams T12233:22–T12234:30

88 Barnbrook T11174:6–T11174:12; Adams T12233:19–T12234:12

89 Exhibit 558 – Statement of Adams (WIT.5103.001.0001) [86]; Exhibit 578 – Powercor Asset Inspection Manual (PAL.001.007.0001) at 0011

90 Exhibit 578 – TXU Asset Inspection 18 August 2000 (SPN.012.005.0049) at 0050; Exhibit 578 – TXU Reliability Centred Maintenance Analysis of Wooden Power Distribution Poles August 2000 (SPN.012.005.0001); Exhibit 578 – Powercor Wooden Cross–arm Task Justification (PAL.016.001.0215); Exhibit 544 – Powercor 1997 RCM Conductor Decision Worksheet (PAL.016.001.0007); Exhibit 625 – OECI Memorandum (EXH.625.0002)

91 Exhibit 534 – Expert Report of Hastings (EXP.010.001.0001) at 0005–0006

92 Exhibit 632 – Figure 1: Failure at Point F (EXP.010.002.0001); Exhibit 632 – Figure 3: Defects in Protective Device (EXP.010.002.0003); Exhibit 632 – Figure 4: Accumulation of Defects (EXP.010.002.0004); Hastings T12617:11–T12621:26

93 Exhibit 534 – Expert Report of Hastings (EXP.010.001.0001) at 0010; Hastings T12667:25–T12669:11, T12617:11–T12621:26, T12636:15–T12637:14; Exhibit 632 – Figure 1: Failure at Point F (EXP.010.002.0001); Exhibit 632 – Figure 3: Defects in Protective Device (EXP.010.002.0003); Exhibit 632 – Figure 4: Accumulation of Defects (EXP.010.002.0004); Adams T12206:1–T12206:19

94 Exhibit 632 – Figure 1: Failure at Point F (EXP.010.002.0001); Exhibit 632 – Figure 3: Defects in Protective Device (EXP.010.002.0003); Exhibit 632 – Figure 4: Accumulation of Defects (EXP.010.002.0004); Hastings T12617:11–T12621:26

95 See, for example, Exhibit 544 – 1997 RCM Conductor Decision Worksheet (PAL.016.001.0007); Exhibit 632 – Figure 2: Risk Calculators for Cross-Arms from Powercor 1997 RCM (EXP.010.002.0002). Dr Hastings said that the methodology for the 1997 study as an analytical tool was correct: Hastings T12627:28–T12629:1; Exhibit 578 – Wooden Cross-arm Task Justification (PAL.016.001.0215) at 0217; Hastings T12629:23–T12629:30. This is consistent with the analysis in Hastings' expert report: Exhibit 534 – Expert Report of Hastings (EXP.010.001.0001) at 0010

96 Exhibit 632 – Figure 2: Risk Calculations for Cross-Arms from Powercor 1997 RCM (EXP.010.002.0002)

97 Exhibit 544 – Statement of Breheny (WIT.7000.001.0001) [42]; Gardner T12265:3–T12265:30, T12284:21–T12285:2

98 Exhibit 544 – 1997 RCM Conductor Decision Worksheet (PAL.016.001.0007) at 0011; Exhibit 578 – Powercor 2003 RCM Conductor Decision Worksheet (PAL.016.001.0036) at 0040

99 Exhibit 534 – Expert Report of Hastings (EXP.010.001.0001) at 0011; Hastings T12637:15–T12637:29

100 Exhibit 558 – Statement of Adams, Attachment 7 (WIT.5103.001.0472) at 0554; Adams T12213:22–T12214:4

101 Exhibit 558 – Statement of Adams, Attachment 2 (Marked up) (WIT.5103.001.0089) at 0106; Powercor's recommendation for a new conductor policy: Exhibit 631 – Powercor 2008 BFM Audit (PAL.001.003.0354) at 0358.

102 Exhibit 528 – Statement of Leech (WIT.7507.002.0001) [53]–[63], Annexure 7 (WIT.7507.002.0071) at 0080; Exhibit 562 – Statement of Braden (WIT.7531.001.0001) [33]; Submissions of Utility Asset Management – Kilmore East (RESP.7504.001.0001) [21(a)(viii)]; Barnbrook T11185:4–T11185:14; Kazenwadel T11045:29–T11046:17; Braden T12321:15–T12321:26

103 McCrohan T11473:13–T11473:15; Barnbrook T11183:5–T11183:7, T11189:31–T11190:10, T11190:27–T11190:30

104 Barnbrook T11174:6–T11174:12; Hastings T12638:28–T12639:24

105 Braden T12312:21–T12312:24, T12318:10–T12318:15, T12321:18–T12321:21

106 Exhibit 528 – Statement of Leech (WIT.7507.002.0001) [14]–[15], Annexure 4 (WIT.7507.002.0034) at 0036; Exhibit 523 – Statement of Ying (WIT.7526.002.0001) [11]–[17]

107 Exhibit 523 – Statement of Ying (WIT.7526.002.0001) [51], [62]–[63], [65], Annexure 5 (WIT.7526.002.0041), Annexure 7 (WIT.7526.002.0078)

108 Exhibit 562 – Statement of Braden (WIT.7531.001.0001) [6]–[15], [23]–[25]; Braden T12298:23–T12298:29, T12300:2–T12300:4, T12302:3–T12302:30, T12304:24–T12305:8

109 Exhibit 528 – Statement of Leech, Annexure 2 (WIT.7507.002.0018) at 0029

110 Exhibit 558 – Statement of Adams, Attachment 7 (WIT.5103.001.0472) at 0479, Attachment 8 (WIT.5103.001.0665) at 0691; Exhibit 528 – Statement of Leech (WIT.7507.002.0001) [10]; Braden T12311:3–T12311:14, T12320:22–T12320:28, T12323:28–T12324:2; McCrohan T11470:1–T11470:15, T11477:21–T11477:30; Adams T12216:23–T12216:30

111 McCrohan T11470:16–T11471:19; Braden T12313:14–T12313:23

112 Submissions of Utility Asset Management – Systemic Issues – Training of Asset Inspectors (RESP.7504.002.0001) [20]

113 Exhibit 558 – Statement of Adams, Attachment 8 (WIT.5103.001.0665) at 0691; McCrohan T11470:1–T11470:15

114 Exhibit 528 – Statement of Leech (WIT.7507.002.0001) [10], Annexure 2 (WIT.7507.002.0018) at 0029; Exhibit 558 – Statement of Adams, Attachment 7 (WIT.5103.001.0472) at 0479; Braden T12311:3–T12311:14, T12320:22–T12320:28, T12323:28–T12324:2; McCrohan T11477:21–T11477:30; Adams T12216:23–T12216:30

115 Exhibit 561 – Statement of Gersh (WIT.7527.001.0001) [5]–[11]. The training qualification is Certificate IV Assessor & Trainer

116 Exhibit 523 – Statement of Ying (WIT.7526.001.0001) [35]–[44]; McCrohan T11480:17–T11481:24, T11501:16–T11501:17

117 Exhibit 223 – Statement of Gardner (WIT.3020.001.0001) [152]–[158], [204]–[211], [218]–[222]

118 Exhibit 223 – Statement of Gardner (WIT.3020.001.0001) [150]–[151], Annexure 35 (WIT.3020.001.0952) at 0969; Gardner T12269:25–T12269:28, T12285:3–T2285:15

119 Breheny T11932:2–T11932:12; McCrohan T11502:3–T11502:16

120 Breheny T11932:13–T11933:10

121 Adams T12213:16–T12214:30

122 Lane T11157:28–T11158:25

123 *Electricity Safety Act 1998*, Part 8, ss. 79–90; Electricity Safety (Electric Line Clearance) Regulations 2010; Code of Practice for Electric Line Clearance (a schedule to the Regulations); Exhibit 243 – Statement of Lane (WIT.5101.001.0001) [32]–[38]

124 Exhibit 243 – Statement of Lane (WIT.5101.001.0001) [31]; Electricity Safety (Electric Line Clearance) Regulations 2010, r. 9

125 Exhibit 223 – Statement of Gardner (WIT.3020.001.0001) [84]; Electricity Safety (Electric Line Clearance) Regulations 2010, r. 7 and Schedule 1, cl. 3

126 Exhibit 223 – Statement of Gardner, Annexure 60 (WIT.3020.001.1574) at 1624–1625; Peters T7153:2–T7153:15

127 Exhibit 243 – Statement of Peters, Annexure 24 (WIT.5101.001.0479) at 0484; Peters T7196:2–T7196:29

128 Exhibit 243 – Statement of Peters (WIT.5101.001.0001) [146]–[153], [161]–[171], Annexure 2 (WIT.5101.001.0085) at 0096

129 Exhibit 243 – Statement of Peters (WIT.5101.001.0001) [172]–[184]

130 Submissions of the State of Victoria – Electric Line Clearance and Hazard Trees (RESP.3000.007.0001) [16]

131 Submissions of the State of Victoria – Electric Line Clearance and Hazard Trees (RESP.3000.007.0001) [17]; Submissions of SP AusNet – Electric Line Clearance and Hazard Trees (RESP.5100.005.0001) [19]–[21]

132 Submissions of SP AusNet – Beechworth Fire (RESP.5100.001.0001) [12]–[13], [93]–[95]

133 *Country Fire Authority Act 1958*, s. 43

134 Exhibit 832 – Statement of Thompson (WIT.3004.040.0263) [32]; Thompson T17168:22–T17169:14

135 Exhibit 248 – Statement of Taylor, Attachment 4 (WIT.4002.001.0162) (Alpine); Exhibit 282 – Statement of Eltringham, Attachment 2 (WIT.4003.001.0274) (Horsham); Exhibit 285 – Statement of Tune, Attachment 5 (WIT.4005.001.0176) (Southern Grampians); Exhibit 377 – Statement of Ellett, Attachment 5 (WIT.4006.001.0262) (Murrindindi); Exhibit 378 – Statement of Jack, Attachment 5 (WIT.4007.001.0367) (Yarra Ranges); Exhibit 427 – Statement of English, Attachment 5 (WIT.4008.001.0121) (Latrobe); Exhibit 428 – Statement of Adams, Attachment 4 (WIT.4009.001.0239) (Wellington); Exhibit 465 – Statement of Malone, Annexure 3 (WIT.4010.001.0172) (Greater Bendigo); Exhibit 594 – Statement of Venville, Attachment 4 (WIT.4022.001.0351) (Baw Baw); Exhibit 650 – Statement of Creedon, Attachment 5 (WIT.4011.001.0218) (Nillumbik); Exhibit 651 – Statement of Hocking, Attachment 3 (WIT.4012.001.0217) (Whittlesea); Exhibit 677 – Statement of Kittel, Attachment 5 (WIT.4004.001.0164) (Corangamite). Statements (and therefore MFPPs) were never provided for the following municipalities: Mount Alexander Shire, Macedon Ranges Shire, Casey City, Indigo Shire, Wangaratta or Mitchell Shire

136 This section does not distinguish between a circuit breaker that is installed at a substation and an automatic circuit recloser. The evidence is that, for the purposes of the Commission, those devices are functionally equivalent: McDonald T11516:12–T11516:19. A reference to an ACR should therefore be taken to include substation circuit breakers: Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [110], [113]–[116], [121]–[122]; Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [54], [75]–[77], [79]–[83], [89], [93]–[108]; Lane T7042:11–T7042:17, T11099:26–T11100:17

137 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [26], [108], [112]; Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [35]; McDonald T11512:30–T11513:4, T11514:20–T11515:3; Lane T11097:27–T11098:4

138 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [111]; Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [35] (stating that 244 of the 276 ACRs on SP AusNet's 3 phase network can be remotely controlled), [42]–[43], [113]–[117], [120]; Exhibit 532 – Supplementary Statement of McDonald (WIT.7001.002.0001) [46], [82]; Lane T11100:25–T11102:4; McDonald T11515:6–T11515:15

139 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [137]; Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [48], [109]–[110]; Exhibit 532 – Supplementary Statement of McDonald (WIT.7001.002.0001) [63]; Lane T11098:21–T11099:21; McDonald T11513:8–T11513:10

140 Lane T11104:3–T11104:12; McDonald T11513:15–T11513:22, T11514:1–T11514:3

141 Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [122]–[146]; Lane T11108:12–T1108:29. There are 459 SWER ACRs on SP AusNet's network: Lane T11097:26–T11098:2; Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [36]. In addition, there are ACRs on two-thirds of Powercor's SWER lines, of which there are over 1,000: McDonald T11512:30–T11513:7

142 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [109]; Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [149]; Gardner T12275:10–T12275:21; Lane T11109:20–T11109:23; McDonald T11517:10–T11517:14, T11527:27–T11528:12

143 Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [149]–[150], [153]; Lane T11109:27–T11111:3; McDonald T11530:1–T11530:22

144 Exhibit 532 – Supplementary Statement of McDonald (WIT.7001.002.0001) [87]; McDonald T11520:21–T11521:6; Exhibit 151 – Report of the Board of Inquiry Into the Occurrence of Bush and Grass Fires in Victoria (TEN.058.001.0001) at 0133–0135

145 McDonald T11521:2–T11521:9. However, the data may be affected by the suppression of reclose devices, which means that some devices would not attempt to reclose

146 Lane T11104:10–T11104:28; Sweeting T11366:6–T11366:29, T11361:4–T11361:18, T11376:28–T11377:10

147 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [193]; Lane T7026:25–T7027:27, T7032:10–T7032:17, T7054:26–T7054:31

148 Sweeting T11377:11–T11377:26, T11385:8–T11385:13

149 Exhibit 578 – SP AusNet Bushfire Mitigation Manual – Distribution Network (SPN.002.005.0024) at 0045; Lane T11111:28–T11112:8; Sweeting T11375:21–T11376:3

150 Sweeting T11376:6–T11376:19; McDonald T11515:21–T11516:3; Lane T11104:29–T11105:9

151 Sweeting T11376:19–T11376:27

152 Compare with the questions put by Counsel for the State of Victoria to Mr Adams: T12242:18–T12243:26

153 Exhibit 532 – Impact on Supply Reliability (Powercor) (PAL.017.001.0763) at 0765; Exhibit 238 – SP AusNet Fault Energy Management on Days of Total Fire Ban (ESV.001.001.0742), in general and at 0746; Lane T7023:19–T7026:1; Gardner T12273:9–T12273:26; McDonald T11521:28–T11522:3

154 Gardner T12273:9–T12273:16

155 Powercor's strategy addressed the circuit breakers of the 208 feeders that enter fire areas (out of 376) and the 275 ACRs on feeders that enter fire areas (out of 334): Exhibit 532 – Supplementary Statement of McDonald (WIT.7001.002.0001) [88]; Exhibit 544 – Powercor Bushfire Mitigation Strategy Plan 2008–2009 (PAL.001.001.0001), Appendix A, Powercor Operational Contingency Plan 2008–2009 (PAL.001.001.0060); McDonald T11512:14–T11512:18, T11520:1–T11520:20

156 Exhibit 532 – Supplementary Statement of McDonald (WIT.7001.002.0001) at 0016, [74]; McDonald T11517:15–T11518:25

157 Exhibit 532 – Supplementary Statement of McDonald (WIT.7001.002.0001) [81]; McDonald T11514:16–T11514:19

158 Exhibit 578 – SP AusNet Bushfire Mitigation Strategy Plan 2008–2009 (SPN.002.005.0002) at 0017; Adams T12211:8–T1211:18, T12212:6–T12212:15

159 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [118]; Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [147]; Exhibit 578 – SP AusNet Bushfire Mitigation Strategy Plan 2008–2009 (SPN.002.005.0002) at 0017; Exhibit 238 – SP AusNet Fault Energy Management on Days of Total Fire Ban (ESV.001.001.0742) at 0744; Lane T7013:29–T7014:8, T11112:23–T11112:29

160 Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [185]–[186]; Exhibit 225 – SP AusNet Materials (SPN.011.003.0001)

161 Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [185]–[187]; Lane T7006:25–T7006:26, T7014:13–T7014:25, T11112:30–T11113:2, T11113:6–T11113:12, T11113:25–T11113:31

162 For example: Exhibit 238 – SP AusNet Fault Energy Management on Days of Total Fire Ban (ESV.001.001.0742) at 0746; Lane T7034:14–T7036:14 (in relation to increased risk); Gardner T6844:8–T6844:22, T12275:10–T12275:31, T12276:4–T12276:29; Shawyer T7067:1–T7067:8

163 Gardner T12274:30–T12275:9. The impact on reliability of supply is detailed extensively in Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [168]–[175]

164 McDonald T11522:10–T11522:18, T11531:11–T11531:21; Gardner T6845:1–T6846:13; Adams T12217:5–T12217:20, T12218:1–T12218:13

165 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [167]

166 Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [124]; Exhibit 544 – Powercor's Bushfire Mitigation Plan 2008–2009 (PAL.001.001.0001) at 0015, 0017; Lane T11106:13–T11106:16, T11106:24–T11106:25; Gardner T12259:24–T12259:30

167 There is little evidence before the Commission concerning the frequency with which OCRs operate. However, the readings on the OCR on the Pentadeen Spur line (which started the Kilmore East fire) showed that OCR had operated only three times in the 12 months preceding December 2008: Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [171]

168 Exhibit 544 – Statement of Breheny (WIT.7000.001.0001) [9]; Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [29]; Lane T11097:26–T11098:4; McDonald T11514:4–T11514:15

169 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [32]; Exhibit 544 – Statement of Breheny (WIT.7000.001.0001) [6]; Lane T11106:17–T11106:23

170 Lane T11107:21–T11108:9

171 Lane T11102:13–T11102:19

172 Exhibit 520 – Supplementary Statement of Lane (WIT.5100.002.0001) [118], [156]–[157], [160]; McDonald T11519:6–T11519:15

173 McDonald T11519:19–T11519:22

174 McDonald T11517:10–T11517:14

175 Exhibit 238 – SP AusNet Fault Energy Management on Days of Total Fire Ban (ESV.001.001.0742) at 0745; Compare with the questions put by Counsel for the State of Victoria to Mr Lane: Judd T7030:10–T7032:6

176 Exhibit 532 – Impact on Supply Reliability (Powercor) (PAL.017.001.0763) at 0765; McDonald T11529:5–T11529:18

177 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [97], [99]; Better T11317:11–T11317:22; Lane T11088:11–T11088:16

178 Exhibit 237 – Statement of Lane (WIT.5100.001.0001) [100]; Exhibit 629 – Steel Conductor Assessment Manual – 1306 Conductor Audit – June 2009 (SPN.012.004.0109) at 0109, 0126; Better T11332:28–T11333:4; Lane T11088:31–T11089:9; Adams T12215:13–T12215:23

179 Kazenwadel T11047:24–T11047:26; Lane T11090:17–T11090:31, T11093:14–T11093:16, T11094:5–T11094:9

180 Adams T12239:1–T12239:8

181 Exhibit 717 – Electricity Supply Department – Conductors Clashing (DOJ.001.001.0127) at 0128

182 Exhibit 717 – Manager Barwon Branch to Chief Distribution Engineer – Conductors Clashing in High Winds (DOJ.001.001.0125)

183 Exhibit 151 – Report of the Board of Inquiry Into the Occurrence of Bush and Grass Fires in Victoria (TEN.058.001.0001) at 0144

184 Exhibit 151 – Report of the Board of Inquiry Into the Occurrence of Bush and Grass Fires in Victoria (TEN.058.001.0001) at 0144

185 Power T9891:15–T9891:19, T9892:3–T9892:9

186 Exhibit 151 – Report of the Board of Inquiry Into the Occurrence of Bush and Grass Fires in Victoria (TEN.058.001.0001) at 0192

187 Gardner T6829:22–T6829:25, T6829:29–T6830:2, T6830:16–T6830:21; Fearon T13236:9–T13236:14

188 Exhibit 622 – Hodge Report (EXP.011.001.0001) at 0004; Hodge T13455:3–T13455:24

189 Gardner T6835:4–T6835:28

190 Exhibit 223 – Statement of Gardner (WIT.3020.001.0001) [59]–[60]

191 On the commencement of the *Electricity Safety Amendment Act 2007*, No. 61/2007 (as amended by No's 25/2008, 57/2009)

192 Electricity Safety (Management) Regulations 2009, rr. 27, 28

193 Gardner T6841:7–T6841:15, T6852:6–T6852:12

194 Exhibit 223 – Statement of Gardner (WIT.3020.001.0001) [46]; Gardner T6836:13–T6836:15, T6843:25–T6844:7, T6845:1–T6845:13, T6849:15–T6849:21

195 Exhibit 223 – Statement of Gardner (WIT.3020.001.0001) [100]

196 Exhibit 622 – Hodge Report (EXP.011.001.0001) at 0003; Hodge T13452:2–T13452:16, T13453:2–T13453:10

197 Gardner T6851:29–T6851:31

198 Gardner T12249:7–T12249:15

199 Gardner T12251:22–T12251:29, T6839:5–T6839:9; Fearon T13225:28–T13225:30; Compare with Hodge T13459:2–T13459:5

200 Gardner T12250:13–T12250:17

201 Exhibit 223 – Statement of Gardner, Annexure 35 (WIT.3020.001.0952) at 0969; Breheny T11940:1–T11940:30

202 Exhibit 223 – Statement of Gardner, Annexure 57 (WIT.3020.001.1568); Gardner T12269:11–T12269:24

203 Exhibit 223 – Statement of Gardner, Annexure 16 (WIT.3020.001.0379) at 0391–0393; Gardner T6885:12–T6885:16

204 Exhibit 223 – Statement of Gardner (WIT.3020.001.0001) [95]–[96]

205 Gardner T6888:26–T6888:29, T12268:9–T12268:24

206 Exhibit 625 – Bushfire Mitigation Program 1998/99 (EXH.625.0001); Exhibit 257 – Statement of Knop (WIT.3020.002.0133_R) [22]; Knop T7557:12–T7557:18; Gardner T12265:3–T12265:14, T12265:28–T12265:30, T12267:13–T12267:17. The State of Victoria questioned whether the five-year cycle is an 'industry standard': Hodge T13479:26–T13480:16

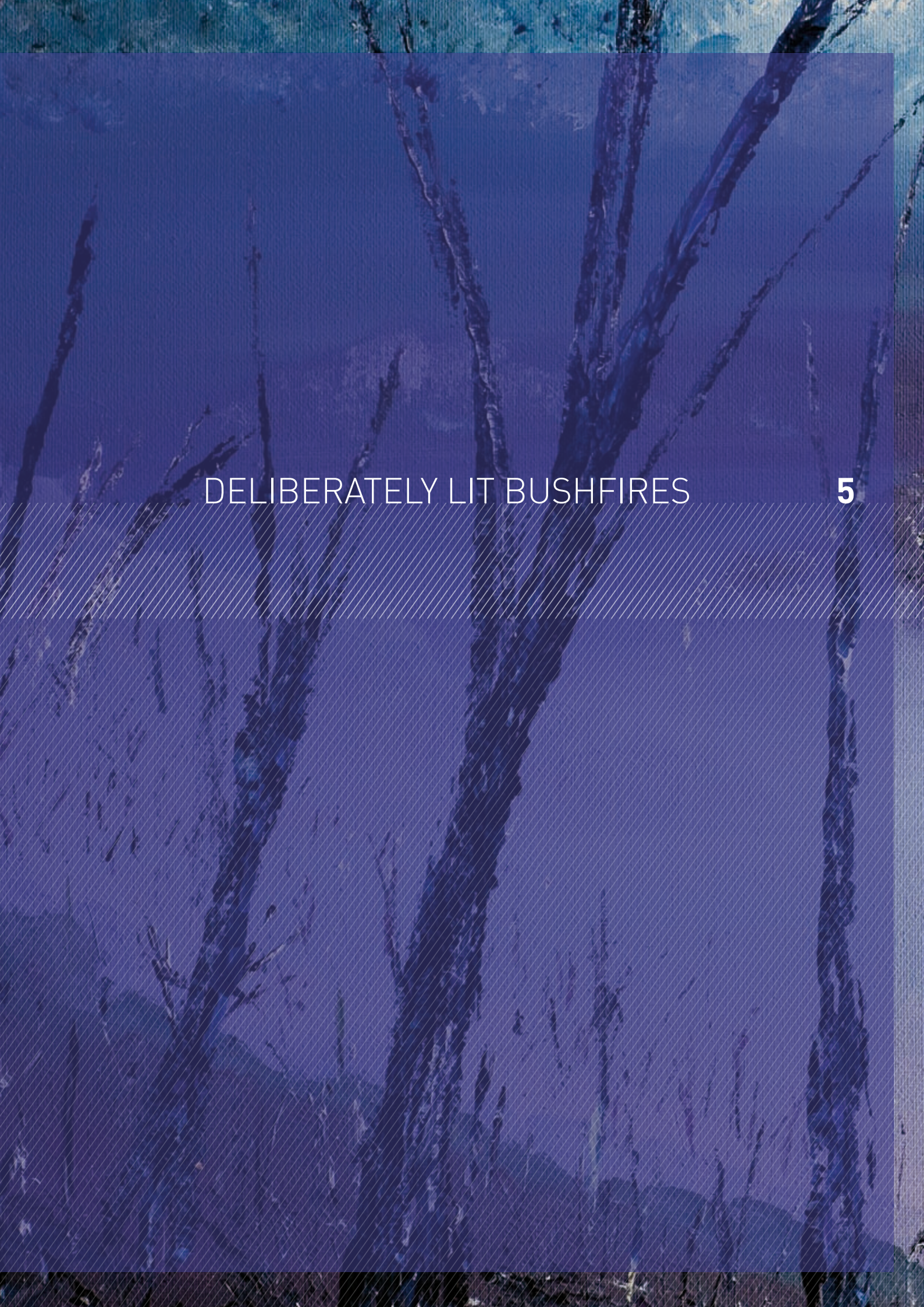
207 Exhibit 622 – Hodge Report (EXP.011.001.0001) at 0006; Hodge T13458:1–T13458:13, T13460:25–T13461:13

208 Fearon T13231:9–T13231:13, T13237:26–T13237:29

209 Gardner T6839:30–T6840:5

210 Hodge T13461:15–T13461:20, T13462:17–T13462:26, T13462:31–T13463:2, T13456:9–T13456:16

211 Exhibit 223 – Statement of Gardner, Annexure 37 (WIT.3020.001.1001), Annexure 57 (WIT.3020.001.1568); Gardner T12270:22–T12270:24, T12271:22–T12271:25



DELIBERATELY LIT BUSHFIRES 5

5 DELIBERATELY LIT BUSHFIRES

The cause of four of the fires the Commission investigated was determined to be 'suspicious'.[1] Although it is not appropriate to comment on matters that are subject to continuing police investigation, the Commission does acknowledge the potentially devastating impact of all fires, including deliberately lit fires.

Deliberate fire-setters constitute only a small proportion of the population, yet their actions can cause enormous damage to individuals, communities and the environment. The Commission considered what is known about deliberate fire-setting and arson as well as current and proposed measures aimed at reducing the risk of deliberately lit fires. The evidence before the Commission suggests that there is a great deal of preventive activity under way at the local, state and national levels. There remains, however, considerable scope for improving the evidence base associated with deliberate fire-setting and arson in order to facilitate policy and program development.

5.1 DEFINING AND RECORDING DELIBERATE FIRE-SETTING

In its legal sense 'arson' refers to an indictable offence that involves deliberate fire-setting resulting in criminal damage to property—which might be a structure, a house, a vehicle or vegetation—and having the requisite intention to cause damage or having no regard for the damage that might result. Sometimes the term 'arson' is used loosely to refer to any deliberate, or even negligent, fire-setting, describing a wide range of behaviours that might not meet the legal definition of the crime of arson. The preferred clinical descriptor for this behaviour is 'deliberate fire-setting' because this term does not imply 'motive, criminal responsibility or pathology'.[2]

Fire agencies and police services differ in the way they treat and categorise deliberately lit fires. Additionally, there is no nationally consistent approach to the recording of statistics on arson. Some jurisdictions adopt a broad definition, deeming all suspicious fires to be arson; others might limit the term to those fires for which there is a prima facie, or even a proven, case of arson. Traditionally, bushfire prevention campaigns in Australia have been 'concerned more with protecting against a fire than with preventing fires from starting'. Because of the difficulties inherent in investigating and prosecuting arson offences, the rate of conviction is extremely low compared with the rates for some other serious offences. As a result, many people who deliberately light fires are not identified or dealt with by the criminal justice system.[3]

The Commission heard evidence about opportunities for dealing with arson and deliberate fire-setting through crime prevention techniques directed at people and places at greater risk of deliberate fire-setting. Dr Damon Muller, criminologist and post-doctoral fellow with the Australian Research Council Centre of Excellence in Policing and Security at the Australian National University, noted:

> A lot of the discussion around the issue ignores the fact that most of the people who light fires won't end up in the criminal justice system. So focusing on community crime prevention isn't a soft option. In a lot of cases it is the only sensible other way of accessing this population of offenders that are not caught.[4]

5.2 THE EXTENT AND NATURE OF THE PROBLEM

The extent of deliberately lit bushfires and arson and the causes of these behaviours are not well understood: as noted, there is no uniform national approach to data collection, and little research specifically into bushfire-setting, especially in the Australian context, has been done. Further, most of the research in this area pertains to arson or deliberate fire-setting generally, without distinguishing between structural fires—for example, deliberately lit fires that damage houses, vehicles and buildings—and bushfires.[5]

Using the available data, the Australian Institute of Criminology recently analysed about 280,000 vegetation fires recorded by Australian fire agencies. It found that the most common reasons for bushfires in Australia are suspicious (37 per cent), accidental (35 per cent) and deliberately or maliciously lit (13 per cent) causes, followed by natural causes (6 per cent), re-ignition or spot fire (5 per cent) and other causes (4 per cent). The institute also analysed vegetation fires recorded by fire agencies in each state and territory. In the case of Victoria, data collected from the Metropolitan Fire and Emergency Services Board, the Country Fire Authority and the Department of Sustainability

and Environment show that between 23 and 33 per cent of fires in the state are recorded as being deliberately lit. This means that about one-third of bushfires in Victoria could possibly be lit by people acting with mischievous or criminal intent.[6]

The lack of reliable and comparable data constitutes a serious impediment to research and evaluation efforts that would assist in determining what works in the prevention of deliberate fire-setting and arson and facilitating policy and program development. The Commission notes there is strong support for a nationally consistent approach to terminology, data collection and information-sharing measures to assist future research and the development of evidence-based prevention measures; it urges the relevant jurisdictions and interested parties to promptly work together to resolve the remaining impediments.[7]

5.2.1 HOT SPOTS AND PEAK TIMES

Bushfires occur more frequently in areas close to human habitation. The rural–urban interface—'where human habitation sits alongside areas of vegetation'—is an area at particularly high risk of bushfires caused by humans, including fires that are deliberately lit. Dr Muller noted that this might be simply because these areas, where the urban area is expanding into the bush, contain a relatively high proportion of both people and burnable vegetation.

Fires are more often deliberately lit on weekends than they are on weekdays. On weekends deliberate fire-setting is more likely to occur between 1.00 pm and 4.00 pm, but on weekdays the number of deliberate lightings peaks in the late afternoon and remains high during the night. This highlights links between patterns of fire-setting and the nature of human behaviour. For example, the weekday pattern may be associated with the fact that children often commute unsupervised during the afternoon.

Although there is some anecdotal evidence that the publicity surrounding days of high fire danger might perversely excite or motivate arsonists, there are no empirical data to support this contention. Dr Muller noted that a fire started on a day of high fire danger has a greater chance of catching and spreading, so fires deliberately lit at such a time can do more damage and attract great attention after the event.[8]

5.2.2 WHO DELIBERATELY LIGHTS FIRES?

Background, personality and indicators

It is difficult to compile a profile of a typical deliberate fire-setter or arsonist. There is no single typology, profile or mindset of a fire-setter, and it has been suggested that 'it is likely that there is actually no such thing as a typical arsonist, as arson is a complex and multifaceted behaviour'. Studies overwhelmingly show that arson offenders have features similar to those of many other types of offenders.[9]

In addition, the profiling work done on arsonists so far has limitations because it has tended to focus on arson generally and has not been specific to bushfire. The sample group is also necessarily skewed, since studies generally rely on people who have been charged or sentenced for arson or people who come to the attention of the mental health system either voluntarily or as forensic clients.[10]

Nevertheless, the existing research does help with developing a picture of the people who could be more likely to deliberately light fires, and this might help with developing and refining preventive strategies and community education programs. For example, a recent New South Wales study of bushfire arson found that the 'average' offender was male and had an average age of 26.6 years, although 31 per cent were aged less than 18 at the time of the offence. Despite there being no typical profile of a deliberate fire-setter, there is some evidence that particular features are more commonly seen among fire-setters than among other offenders. Most international studies have found that fire-setters tend to be young men with interpersonal difficulties, drug or alcohol dependence, evidence of an unstable childhood, and some form of mental health problem. Among other typical characteristics were being racially 'white', low socio-economic status, a poor academic and employment record, and an extensive criminal history, with many crimes that were not identified or prosecuted. As noted, however, these characteristics are similar to those applying to many other offenders, and predictors for arson offenders re-offending tend to be similar to those for other offenders. As a result, these factors offer only limited predictive assistance.[11]

Some figures show that up to 50 per cent of malicious fires and 20 per cent of deliberately lit bushfires are lit by children. In juveniles, the risk factors are largely similar to those seen in adults, and fire-setting is often part of a broad array of antisocial behaviours.[12]

Mental illness

Study results suggest that a disproportionate number of fire-setters have a mental illness or disorder, the most common of these being schizophrenia and alcohol and drug abuse. Personality disorders and depression have also been associated with fire-setting. Care must, however, be taken when relying on statistics in this area: the studies draw from samples of 'convenience', such as people referred to mental health services.[13]

Contrary to popular perception, arsonists who are compulsive offenders, including those with the condition of pyromania, constitute a small and reasonably rare group, and these people are not responsible for the majority of deliberately lit fires.[14]

Criminal history

A criminal history, including previous convictions for arson, is one of the strongest predictors for people who deliberately light fires or commit arson. Research shows that most arsonists are not exclusively arsonists and that a general history of offending is a reliable indicator of a predilection for deliberately lighting fires. Professor James Ogloff, Foundation Professor of Clinical Forensic Psychology and Director of the Centre for Forensic Behavioural Science at Monash University and Director of Psychological Services for the Victorian Institute of Forensic Mental Health (Forensicare), noted, 'very few offenders are particularly narrowly interested, so they are what we call criminally versatile'. Further, Dr Muller noted that many arsonists 'have a diverse offending background' and 'it is likely that many fire-setters are general offenders who happen to light fires, rather than dedicated arsonists'.[15]

These statements are supported by recent Australian Institute of Criminology research on arson defendants in New South Wales, which examined the offending history of fire-setters in the seven years before their court appearance for arson or bushfire arson. The study found that slightly more than half of all arson defendants and one-third of bushfire arson defendants had a prior conviction.[16]

Motives

The motives for bushfire arson can differ from the motives for typical 'structural' arson. Mr Matthew Willis, Research Analyst from the Australian Institute of Criminology, has proposed the following typology to describe the diverse motives for lighting bushfires:

- to relieve boredom or create excitement—motives include vandalism, stimulation and inciting activity (for example, by firefighters)
- for recognition and attention—prompted by a desire to be seen as a hero or to improve self-esteem, or it might constitute a cry for help
- for a specific purpose or gain—prompted by anger (to secure revenge or as an expression of protest), a pragmatic purpose (for example, land management), material gain or an altruistic motive
- no motive—fires lit without malicious intent by, for example, a child (this would also include a small group who act on psychiatric impulses derived from mental disability)
- mixed motives—fires lit on the basis of a number of the foregoing motives or lit with malicious intent but not expected or predicted to spread.[17]

The motives underlying the deliberate lighting of fires are likely to be diverse, even for a single offender. For example, an offender might be motivated by a combination of revenge, excitement and pathology.[18]

5.2.3 FIREFIGHTERS

Deliberate fire-setting by firefighters is relatively uncommon, and 'the overwhelming majority of firefighters do not have fire setting propensities'. As Professor Ogloff noted, however, with any instance of firefighter arson 'the effect on the community perception of and trust in emergency response personnel can be significant' and the impact on the morale of other firefighters can be devastating.[19]

In New South Wales Strike Force Tronto investigated 1,600 suspicious fires, and 11 volunteers from the New South Wales Rural Fire Service were charged as a result. This is less than 0.02 per cent of the 69,000-odd other volunteers in the Rural Fire Service who apparently did not offend. Firefighters made up a significant proportion of the people charged as a consequence of the strike force investigation (11 out of 50). The situation highlights the need for the development of effective screening of prospective firefighters.

Research suggests that fire-setting firefighters could be a distinct group of offenders because they tend to be higher functioning and of greater intelligence than other offenders. Among their motives are relieving boredom and stimulating activity, material gain (such as overtime payments) and achieving hero status in the eyes of the community or their colleagues.

Professor Ogloff cited several 'red flags' that could help with identifying firefighters who are attracted to deliberate fire-setting. For example, a firefighter who is an arsonist might seem to always be the first at the scene of a fire, even when they have not been called to the job; they might seem to have an uncanny ability to locate a fire's point of origin; or they might locate and report fires that are not easily visible.

As with the general population, the most useful predictor of a potential arsonist is a history of criminal offending. In Victoria all potential MFB and CFA employees and CFA volunteers undergo a criminal history check at the time of their application. DSE intends to introduce this requirement for all firefighting staff from 1 July 2010.

Each of the fire agencies uses some form of screening or psychological testing appropriate to the role of the prospective applicant. Such measures can be useful in identifying a range of potential psychological and behavioural variables relevant to the position, and among these might be a propensity for fire-setting. The State of Victoria submitted that the MFB and the CFA are continuing to review their screening processes and will participate in future work by AFAC (the Australasian Fire and Emergency Service Authorities Council) to develop a national position on screening processes.[20]

The Commission considers that criminal history checking of all firefighters is a reasonable way of screening for potential arsonists. It supports Victoria's policy of requiring criminal history checks for all applicants for firefighting-related roles and encourages the continued review of screening processes.

5.3 APPLYING CRIME PREVENTION TECHNIQUES TO DELIBERATELY LIT BUSHFIRES

The literature suggests that a range of interventions are available to reduce deliberate bushfire-setting and arson. As Box 5.1 shows, these include broad strategies for preventing the behaviour before it happens (primary prevention), specific programs aimed at people who are at risk of offending (secondary prevention) and interventions that focus on reducing re-offending once someone has come to the attention of the criminal justice system (tertiary prevention).

Box 5.1 Crime prevention techniques

Primary crime prevention

Primary crime prevention—sometimes referred to as 'situational crime prevention' or 'crime prevention through environmental design'—aims to prevent crime before it happens. Strategies are aimed at the environment or the community in which the crime might occur and can include the following:

- *Surveillance.* By maximising the visibility of monitoring devices and other people in an area, the behaviour of individuals can be observed and monitored. Examples are increasing the perceived risk of detection by installing surveillance cameras or increasing the visible police presence at hot spots.
- *Territorial reinforcement.* A sense of community ownership of an area tends to increase people's feelings of safety and willingness to use the area. This in turn discourages crime.
- *Access control.* Physical or symbolic barriers help to make clear the divisions between private and public land. An example is limiting or controlling access to arson hot spots or closing areas such as national parks on days of very high bushfire risk (see Chapter 1).

This approach increases the effort required to commit a crime (called 'target hardening') or reduces the rewards for the fire-setter. For example, reducing fuel loads or constructing more firebreaks might make arson less 'rewarding' because it might be more difficult to light a fire that is likely to cause substantial damage.

Secondary crime prevention

Secondary crime prevention focuses on individuals who are at higher risk of engaging in a crime. This includes intervention programs aimed at people who have displayed warning signs or problematic behaviour. Research suggests that a significant proportion of arsonists are recidivists, so techniques aimed at intervening with known offenders could reduce recidivism.

Tertiary crime prevention

Tertiary crime prevention focuses on preventing re-offending by individuals who come into contact with the criminal justice system, either by direct intervention or by deterrence through sentencing.

Arson is an indictable offence in all Australian states and territories, but the sentencing regime differs between jurisdictions. Typically, the maximum sentence is 15 years' imprisonment, although life imprisonment is available in some jurisdictions. Most jurisdictions also have specific offences for deliberately lighting bushfires, with sentences of up to 15 to 20 years.[21]

Expert witnesses Dr Muller and Professor Ogloff agreed that prevention strategies—particularly primary prevention programs—are very important in dealing with deliberate fire-setting and arson. Dr Muller noted:

> Preventing the fire before it actually occurs should be the preferred option where possible, avoiding the potential damage that the fire would have caused and freeing up the resources of the fire services for suppression of other fires. Prevention is neither incompatible with criminal justice sanctions for bushfire arson, nor a 'soft option' alternative to punishment, but rather another valuable tool to reduce deliberate bushfires in Australia.[22]

This is consistent with other information available to the Commission. Primary crime prevention approaches focus on when and where fires are most likely to be deliberately lit, rather than on known offenders, and are therefore most likely to reach the widest possible audience. Such approaches can be supplemented with an understanding of the characteristics of someone who is more likely to deliberately light fires, but they do not rely on an arsonist 'profile' since this has been demonstrated to be fairly non-specific. Dr Muller stated:

> Given that many arson offenders go undetected, and that it is difficult to prosecute those who are detected, primary prevention strategies whereby potential offenders are prevented from lighting fires by some characteristics of the environment seem to be the most promising. Secondary and tertiary prevention strategies, which target potential and repeat offenders, are effective only when the offenders are known.[23]

Although primary prevention was the focus of the Commission's attention, other measures should not be ignored. The Commission heard some evidence about promising secondary and tertiary prevention measures. The following are examples:

- Some psycho-education programs have shown 'encouraging trends toward decreasing recidivism', and cognitive behavioural therapy (particularly that focusing on self-control, problem solving, coping skills and pro-social behaviour) has been shown to assist in reducing fire interest.
- All Australian jurisdictions operate treatment programs for juvenile fire-setters, targeting young people who are at risk of more serious offending. The programs generally seek to educate individuals about the dangers of fire and can provide links to other services to deal with a person's wider social and psychological problems. With the exception of the Victorian program—the Juvenile Fire Awareness and Intervention Program—these initiatives have not been evaluated. The evaluation of the Victorian program showed that it was somewhat successful in reducing arson re-offending but was limited by a short follow-up period. The Commission heard only limited evidence about these programs. It considers that further evaluation of such secondary prevention measures would be beneficial.
- Although the data on arson-related sentencing are limited, it appears that few of those charged with arson are found guilty and sentenced and, of those who are, the percentage receiving a custodial sentence or the maximum sentence is low. The Commonwealth informed the Commission that it is taking steps to develop a nationally consistent approach to arson offences through the National Work Plan to Reduce Bushfire Arson in Australia (see Section 5.5) and to promote awareness of sentencing as an aspect of crime prevention aimed at reducing deliberate fire-setting through the National Judicial College of Australia. The Commission did not turn its attention to tertiary prevention measures—sentencing is a broad and complex legal policy question beyond the scope of the Commission—but it welcomes these initiatives aimed at national consistency.[24]

5.3.1 A MULTI-FACETED APPROACH

Overall, the evidence before the Commission suggests that prevention and reduction of deliberate fire-setting will be most effective when a multi-faceted approach is adopted. For example, Professor Ogloff recommended an approach involving situational principles, psycho-educational programs, criminal justice sanctions, and the involvement of police and emergency response personnel. Such an approach could combine community education, initiatives directed at known fire-setters, and target hardening. Examples of this type of approach are Operation Hussar in Victoria, Operation NOMAD in South Australia, and a joint program implemented in Western Australia.

Operation Hussar, conducted in 2007 by Victoria Police, the CFA, DSE and Parks Victoria, targeted resources in particular police service areas to patrol problem locations (which had been identified from crime statistics) in order to deter offending, gather intelligence and respond rapidly to fire events.

In Western Australia the Fire and Emergency Services Authority, in conjunction with the Department of Education and Training and Western Australia Police, implemented a program that provided education for school children, community education, and doorknocks encouraging the community to report suspicious behaviour in identified fire-prone areas. The outcome was a reduced incidence of deliberately lit fires and successful engagement and empowerment of a broad sector of the community, giving them a role in reducing arson.[25]

Operation NOMAD is a high-profile, proactive approach adopted by South Australia Police. Its objectives are to prevent bushfires that are started deliberately or are caused by reckless or indifferent human activity; to improve the operational policing response to bushfires (through rapid responses to incidents and coordination with fire agencies); and to educate operational police. The approach has not been formally evaluated, but Chief Superintendent Silvio Amoroso,

Operations Commander for Operation NOMAD, told the Commission that community feedback has been positive and South Australia Police considers the number of scrub, vegetation and grass fires is decreasing. The following are central elements of Operation NOMAD:

- a high level of support at senior levels of South Australia Police
- activation of police patrols on days of extreme fire danger to prevent and respond to outbreaks of fire
- intelligence-based covert and overt surveillance in high-risk areas
- a high level of resourcing, including the capacity to 'back-fill' using resources from outside the local area
- comprehensive training that covers fire behaviour, personal safety, incident management for police during fires, traffic management, evacuation procedures and policy, bushfire investigation, bushfire laws and basic bushfire mapping
- a combination of central coordination, local planning and resource commitment and effective partnerships between law enforcement and the local community, whereby the community is made aware of dangers and asked to be vigilant.[26]

Integrated approaches should also harness local knowledge and involve collaboration between police, fire agencies and the local community. Dr Muller highlighted the importance of tapping into local knowledge, noting that the 'local fire service personnel know the spots that are lit up and they know the times that they are most busy'. A local forum to facilitate the bringing together of such information might be a useful approach.[27]

Dr Muller suggested a number of elements to consider when designing community-based arson reduction programs.[28] On the basis of these elements and evidence before the Commission about Operation Hussar, the Western Australian program and Operation NOMAD, the Commission concluded that the main components of a successful community-based program for dealing with deliberate fire-setting and arson are likely to be as follows:

- high-level commitment and direction
- an awareness of arson 'hot spots' in order to tailor interventions, reduce costs and potentially increase effectiveness
- use of intelligence to help guide prevention and detection activities
- high levels of cooperation with the community—including delivering a consistent message in a range of ways that is tailored to the particular audience
- a coordinated response between the fire service and the police
- comprehensive training
- adequate resourcing
- an evaluation framework.

5.4 THE VICTORIA POLICE APPROACH TO ARSON

Traditionally, Victoria Police's approach to arson has focused on criminal investigation and emergency management, rather than crime prevention. This appears to be changing, though. Detective Superintendent Paul Hollowood, Senior Investigative Officer for the Phoenix Task Force, within the Crime Department, acknowledged that it is necessary to understand arsonists and their behaviour and motivations if one is to develop improved prevention and control initiatives.[29]

The Commission was advised that Victoria Police relies heavily on local initiatives to harness community expertise and knowledge, to enable operations to be tailored to local needs and to foster relationships between local police and emergency services agencies. Some centralised support is provided, particularly in the form of expert advice in identifying strategies, intelligence and risk analysis, and training provided in conjunction with the CFA.[30]

Prevention and detection initiatives—such as the use of overt police patrols to deter arsonists, as well as intelligence gathering and target hardening—are in operation in all bushfire-prone police service areas. The Commission heard evidence about a number of local initiatives, among them Operation Matchless in the Macedon Ranges, proactive mobile patrols in the shires of Casey, Cardinia and Greater Dandenong, and Operation Hussar in the Yarra Ranges. Until recently, however, these local initiatives have not been part of a structured approach to arson prevention on the part of Victoria Police.[31]

Since 7 February 2009 Victoria Police appears to have greatly increased the attention it pays to arson prevention. It advised the Commission of the following initiatives:

- a statewide arson prevention and detection strategy, introduced in December 2009, to augment local approaches and strategies for controlling bushfire arson
- a statewide Operations Response Unit, which began operations in March 2010 with an initial staffing level of 140 personnel, to be increased to 229 by the end of August 2010. The unit is directed at crime, traffic and public order, rather than specifically focusing on arson but 'will be available to be deployed during periods of extreme bushfire risk to increase visible police patrol activity at times of high fire risk and in high-risk locations to help deter and detect bushfire arson offending'.[32]

The Commission was advised that Victoria Police's arson prevention and detection strategy is an ongoing activity that will evolve with time and is based on five streams of activity:

- *Delivering a statewide coordinated approach.* This will be based on analysis of data on suspicious bushfires for each police service area (to aid deployment of additional resources and help local police direct high-visibility patrols), target hardening and other preventive measures; introduction of a live intranet site to monitor suspicious bushfires and identify serial offending; and identifying and creating profiles of 'persons of interest' and distributing these to regional police.
- *Local action informed by predictive risk assessment.* This will occur through the development of anti-bushfire strategies in all bushfire-prone areas, a focus on highly visible police patrols, identification of 'people of interest', improved protocols between Victoria Police and fire agencies, and an increased emphasis on targeted investigations.
- *Developing a better understanding of bushfire arson.* This will be done through collaborative research with three universities and other Victorian government agencies, including Forensicare. The focus of the research incorporates bushfire arsonist behaviour and motivation; independent evaluation of Victoria Police's anti-bushfire arson strategies; assessment of the effectiveness of bushfire preparation efforts by individuals and the behaviour of bushfire victims; criminal profiling of suspected bushfire arsonists in order to develop more effective investigation and interview techniques; and monitoring and assessment of international developments.
- *Building effective cooperative partnerships.* This will come about through improved information sharing between agencies (including establishing a state Bushfire Arson Prevention Group), a new Crime Stoppers arson campaign, and an awareness campaign focusing on rural communities and volunteer firefighters.
- *Creating increased organisational capacity.* This will be done through the development of improved guidelines, training, and the availability of specialist resources for arson investigation.[33]

Mr Hollowood advised the Commission that local arson control strategies for each high-risk police service area would incorporate the following:

- geospatial analysis and intelligence to help define bushfire arson hot spots—periods and locations
- increased visible police patrols to deter and detect bushfire arson activity—including additional deployment of police officers on days of high fire risk
- target hardening in high-risk areas by restricting vehicular and pedestrian traffic
- targeted police investigations of people suspected of bushfire arson or serial arson activity

- promotion of local community awareness about bushfire arson through the news media and education programs
- use of specialist resources such as helicopters to monitor areas that are inaccessible to police patrols
- use of 'Vehicle Observed in a Fire Area' stickers—to be affixed to vehicles found unattended in high-risk areas—to encourage the community to provide information about suspicious activity.[34]

The Commission notes that since February 2009 Victoria Police has proposed, and begun to implement, changes to its approach to arson prevention. The statewide arson prevention and detection strategy entails many of the elements of good practice outlined in Section 5.3.1. The Commission welcomes the focus on research to determine best practice, as it does ongoing evaluation of current and proposed strategies. It also supports a consistent approach to arson control strategies in high-risk areas, with a suitable level of central coordination and a focus on dissemination of information about best-practice approaches.

The Commission notes the proposal to use the Operations Response Unit to provide additional resources for arson prevention patrols. It urges Victoria Police to evaluate this approach after the first fire season in which it operates in order to determine whether it provides sufficient support.

RECOMMENDATION 35

Victoria Police continue to pursue a coordinated statewide approach to arson prevention and regularly review its approach to ensure that it contains the following elements:

- high-level commitment from senior police
- a research program aimed at refining arson prevention and detection strategies
- centralised coordination that includes comprehensive training, periodic evaluation of arson prevention strategies and programs, and promotion of best-practice prevention approaches
- a requirement that all fire-prone police service areas have arson prevention plans and programs, according to their level of risk.

5.5 NATIONAL INITIATIVES

Since Black Saturday there has been much work done on developing a national approach to arson prevention. A national forum initiated by the Commonwealth Attorney-General in March 2009 brought together experts 'to look at examples of bushfire arson prevention initiatives from around the country, and identify national priorities for action'.[35] Among those who attended the forum were representatives of AFAC, the Bushfire Cooperative Research Centre, the Australian Institute of Criminology, the Commonwealth, and the states and territories.

On 20 November 2009 the Ministerial Council for Police and Emergency Management, which includes Commonwealth, state and territory police and emergency management ministers, adopted and endorsed a National Work Plan to Reduce Bushfire Arson in Australia. The work plan details 10 actions:

- developing a national strategy to reduce bushfire arson, to provide direction to individual jurisdictions and agencies
- using prevention and community education programs in high-risk fire and arson areas at the urban–rural interface
- promoting nationally consistent arson and bushfire offences
- producing a best-practice bushfire arson prevention manual
- developing programs aimed at known arsonists and recidivist arsonists
- updating nationally accredited training programs for fire agency and police personnel, to include strategies for preventing bushfire arson
- raising community awareness of bushfire arson and incorporating arson prevention messages in existing community awareness programs

- supporting a nationally consistent framework for collecting data on bushfire arson
- researching socio-economic and demographic factors suggestive of a propensity for bushfire arson
- promoting a two-way information flow on arson prevention between practitioners, researchers and policy makers.[36]

The Commission was informed of progress in relation to several of these actions. A working group jointly chaired by the Commonwealth and Victoria was established to develop a national strategy based on the National Work Plan; the strategy is due to be completed in August 2010. On 3 May 2010, at the second annual national forum, the Commonwealth launched a bushfire arson prevention manual developed by the Australian Institute of Criminology. It also announced its intention to develop a bushfire arson investigation course, to be finalised and ready for delivery by June 2011, and a proposal to establish a national database of convicted and suspected arsonists. The Commission notes the Commonwealth's advice that the proposal to establish the national database is subject to further agreement from all jurisdictions.[37]

The Commission welcomes this action and encourages the Commonwealth and the states and territories to ensure that the National Work Plan has a suitable focus on evaluating current and proposed programs for developing and sharing best-practice approaches. In particular, it encourages the development of a national approach to data collection that includes uniform terminology and classification schemes; the recording of specific information about deliberately lit bushfires (for example, their type and size and the extent of damage), their causes and location; conviction and sentencing outcomes where matters are pursued through the criminal justice system; and de-identified information about convicted arsonists (for example, gender, age, place of residence and criminal history) that could be used for evaluation and research rather than the tracking of individuals.

RECOMMENDATION 36

The Commonwealth, states and territories continue to pursue the National Action Plan to Reduce Bushfire Arson in Australia, giving priority to producing a nationally consistent framework for data collection and evaluating current and proposed programs in order to identify and share best-practice approaches.

5.6 EVALUATION

Witnesses before the Commission agreed that formal evaluation should be part of any crime prevention program in order to assist with gaining an understanding of what aspects of the program are successful. The State of Victoria and the Commonwealth also supported this. There has, however, been little evaluation of the success of crime prevention strategies for deliberate fire-setting and arson. Dr Muller thought this might be because programs are often initiated at the 'grass-roots' level and have limited resources and no funding for evaluation. Professor Ogloff also noted the importance of evaluating individual elements of crime prevention approaches to assess their effectiveness since overall programs can be labour and resource intensive.[38]

Evaluation of crime prevention programs should be encouraged and funded. The Commission notes that Victoria intends to have its strategies and those of other jurisdictions independently evaluated. It also notes that the National Work Plan includes actions to improve data collection and the sharing of research and evaluation results nationally. It encourages the Commonwealth and the states and territories to make these actions a priority when implementing the National Work Plan.

1 Exhibit 214 – Statement of Hollowood (WIT.3010.001.0338) [26], [64]–[65], [69]; Exhibit 611 – Statement of Owen (WIT.3004.031.0173) [42], Annexure 15 (WIT.3004.031.0462) at 0467; Owen T13150:17–T13150:21

2 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0014; Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [15]; Ogloff T9051:3–T9051:29

3 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0015, 0018, Attachment 3 (WIT.077.001.0062) at 0068; Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [3]; Muller T9093:16–T9093:31, T9095:15–T9095:22; Ogloff T9085:14–T9085:31

4 Muller T9117:13–T9117:25

5 Ogloff T9050:21–T9051:2

6 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0015–0016; Exhibit 381 – Deliberately Lit Vegetation Fires in Australia (TEN.088.001.0001) at 0002

7 Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [3], [6], [11]; Submissions of the Commonwealth – Arson and Deliberately Lit Bushfires (RESP.6002.001.0001) [12]; Muller T9094:1–T9095:14; Amoroso T9137:20–T9137:24

8 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0020–0022; Exhibit 381 – Deliberately Lit Vegetation Fires in Australia (TEN.088.001.0001) at 0003–0004; Muller T9098:1–T9100:11; Ogloff T9069:28–T9070:29, T9081:12–T9082:7

9 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0025–0026; Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [36]; Muller T9102:3–T9102:29; Ogloff T9052:3–T9052:17

10 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0026; Muller T9104:2–T9104:14; Ogloff T9055:6–T9055:22

11 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [18], [27]–[29], [36]; Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0026, Attachment 5 (WIT.077.001.0078) at 0081; Ogloff T9052:17–T9052:29, T9055:6–T9056:5

12 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [35]; Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0025

13 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [21(c)]; Ogloff T9055:6–T9055:22

14 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [21(d)]; Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0029; Ogloff T9057:5–T9057:10

15 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0028–0029; Ogloff T9061:27–T9061:29, T9062:21–T9063:1

16 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0028 (see in particular Figure 8)

17 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [23]; Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0029, Attachment 3 (WIT.077.001.0062) at 0065; Ogloff T9058:29–T9060:14

18 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [20]

19 Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [70]; Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [66]

20 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [65], [67]–[69], [71]–[72]; Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [71]–[75], [80]–[88]; Ogloff T9077:10–T9078:27, T9079:15–T9080:2

21 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0031–0034, 0048, 0050; Ogloff T9067:21–T9068:7

22 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0056

23 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0035; Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [38]

24 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0049–0050; Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [55]–[56], [59]–[60]; Submissions of the Commonwealth – Arson and Deliberately Lit Bushfires (RESP.6002.001.0001) [4]–[5]; Ogloff T9074:10–T9074:19

25 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [47], [62]–[64], [79]; Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0041; Ogloff T9068:30–T9069:27

26 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [48]; Exhibit 384 – Statement of Amoroso (WIT.087.001.0001_R) [8], [10], [12]–[14], [16], [21]–[25], [29]–[30], [32], [37]–[38]; Exhibit 384 – Nomad Type Fires are Decreasing in SA (WIT.087.002.0001); Amoroso T9122:14–T9122:18, T9125:2–T9125:8, T9126:9–T9127:20, T9127:25–T9128:2, T9130:25–T9131:25, T9132:1–T9132:26, T9134:8–T9134:15

27 Exhibit 384 – Statement of Amoroso (WIT.087.001.0001_R) [39]–[42]; Muller T9109:8–T9109:28, T9119:1–T9119:20

28 Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0034, 0041–0042

29 Exhibit 442 – Statement of Hollowood (WIT.3010.009.0279) [38]

30 Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [35]–[36], [38]–[40], [46]; Exhibit 442 – Statement of Hollowood (WIT.3010.009.0279) [16], [21]–[22], [28]–[31], [41]–[42]

31 Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [44], [50], [54]; Exhibit 442 – Statement of Hollowood (WIT.3010.009.0279) [23]–[24]; Hollowood T9998:14–T9999:19

32 Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [44], [59]; Exhibit 442 – Statement of Hollowood (WIT.3010.009.0279) [47]–[48], [50]; Hollowood T10001:24–T10001:25, T10008:31–T10009:4; Exhibit 964 – Arson Chapter of the Final Report – Updates (CORR.1005.0018) at 0021

33 Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [26]; Exhibit 715 – Letter from Victorian Government Solicitor's Office, Dated 24 December 2009 (CORR.1001.0033); Exhibit 715 – Victoria Police Bushfire Arson Prevention and Detection Strategy – Powerpoint (INF.028.001.0055)

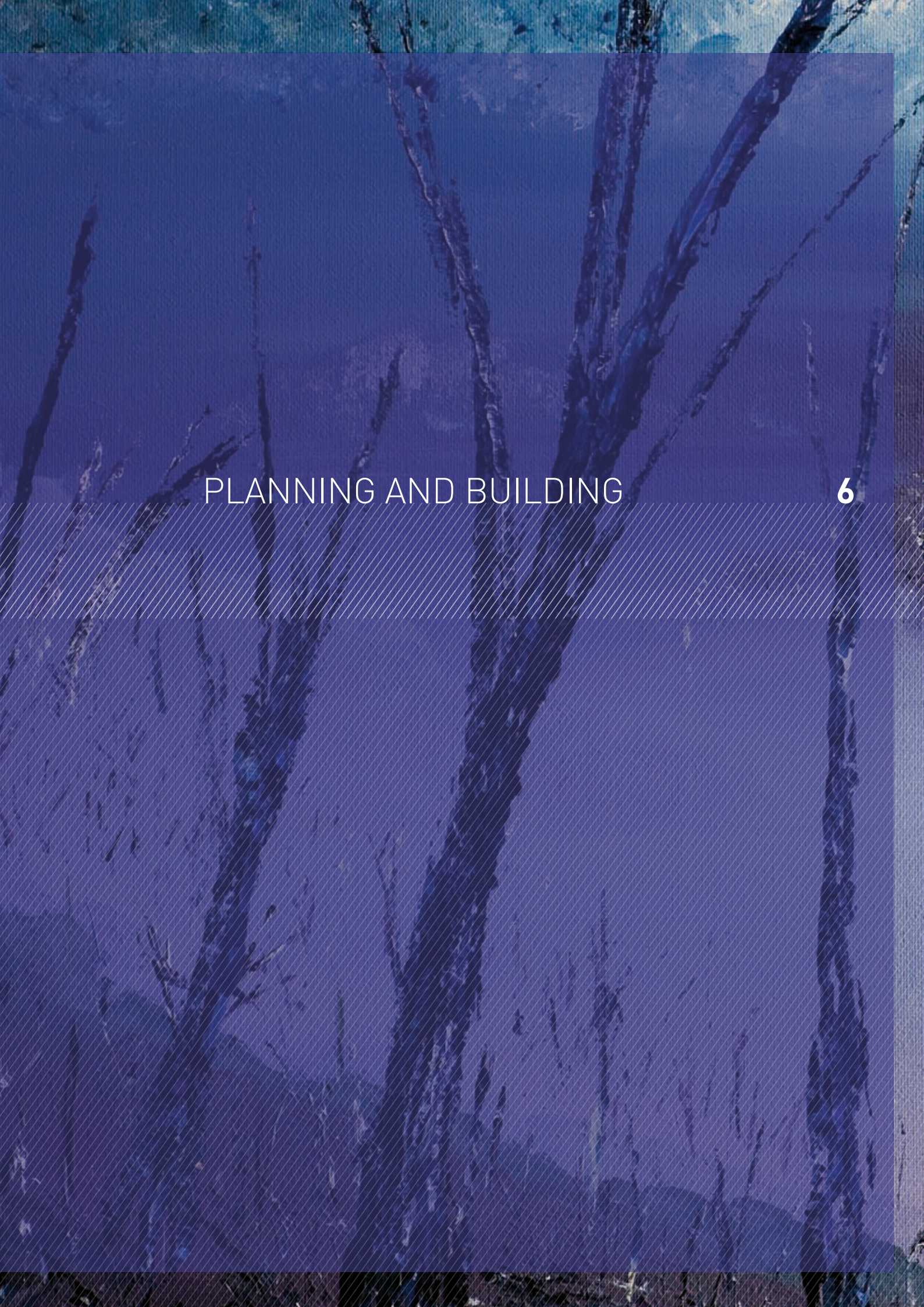
34 Exhibit 442 – Statement of Hollowood (WIT.3010.009.0279) [49.7]

35 Exhibit 381 – Australian Government Attorney General's Department Report Titled 'National Forum to Reduce Deliberate Bushfires in Australia 25 March 2009' (TEN.088.001.0007) at 0009

36 Submissions of the Commonwealth – Arson and Deliberately Lit Bushfires (RESP.6002.001.0001) [3], [7]; Exhibit 559 – National Work Plan to Reduce Bushfire Arson in Australia (AGD.914.0001)

37 Submissions of the Commonwealth – Arson and Deliberately Lit Bushfires (RESP.6002.001.0001) [9]; Exhibit 964 – Update to Submissions of the Commonwealth – Arson and Deliberately Lit Bushfires (RESP.6012.001.0001) [3]–[8]; Exhibit 992 – Additional Response of the Commonwealth of Australia – Arson and Deliberately Lit Bushfires (CORR.1005.0175_R) [7], [12]; Exhibit 964 – Arson Chapter of the Final Report – Updates (CORR.1005.0018) at 0019, 0021

38 Submissions of the Commonwealth – Arson and Deliberately Lit Bushfires (RESP.6002.001.0001) [13]; Submissions of the State of Victoria – Arson and Deliberately Lit Bushfires (RESP.3001.008.0173) [41]; Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0042; Exhibit 442 – Statement of Hollowood (WIT.3010.009.0279) [39]; Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [47], [50], [60]; Ogloff T9072:4–T9072:19; Amoroso T9127:13–T9127:29; Muller T9096:22–T9096:31



PLANNING AND BUILDING 6

6 PLANNING AND BUILDING

Where people live, the standard of the buildings in which they live and how those standards are maintained are crucial factors affecting people's exposure to bushfire risk. The Commission considered the complex and multi-layered planning and building regimes, including how they could be used to prevent or deter people from living in areas of unacceptably high bushfire risk. Protection of human life is the overriding objective in implementing bushfire prevention measures through improved planning and building regulation. The Commission considers there is much scope to substantially restrict development in areas thought to pose an unacceptably high bushfire risk by ensuring that strategic policies and the Victoria Planning Provisions give more emphasis to human safety. Where development is approved, risk-mitigation measures and construction standards should be related to the degree of risk.

Victoria's planning and building provisions are embedded in detailed and comprehensive regulation. By necessity, this chapter extends to a commensurate level of specificity to enable consideration of the development, adoption and implementation of the regulations by all levels of government. To avoid weighting the report with an undue number of detailed recommendations, the Commission puts many of its conclusions and views in tables and the text and adopts recommendations that are broad, as in other chapters. The reader is encouraged to note the Commission's positions in tables and the text, as well as its recommendations.

In all, 2,133 houses were destroyed as a result of the late January–February 2009 bushfires in Victoria. Research conducted by the Bushfire Cooperative Research Centre shows that many of the 173 people who died during that time had been trying to defend their home. A number of these homes had been well prepared, in accordance with Country Fire Authority advice, but the Commission nevertheless heard many accounts of people who tried to defend a well-prepared house and failed (see Chapter 1 in this volume and Part One in Volume I).[1]

The unpredictable nature of fire and extreme weather conditions means it is not possible to guarantee that any building will survive a bushfire. Nevertheless, the construction of buildings and their siting relative to surrounding fuel loads are central to their defendability. Maximising a house's ability to withstand bushfire is important, both for people who choose to stay and defend and for those unexpectedly caught in their home during a fire. It can also help minimise the personal, social and economic costs of the widespread destruction of homes.[2]

Land-use planning and regulation of building standards in bushfire-prone areas are two of several measures available for improving people's chances of surviving a bushfire. Individual planning and response are also essential. As lay witness Mr Rainier Verlaan of Callignee noted, 'Building regulations and bushfire plans need to go hand-in-hand together. There is no point in having these bushfire building regulations without the need for some form of bushfire survival plan as well'. Applying land-use planning and building controls to minimise or reduce bushfire risk does, however, present challenges. In particular, the planning and building systems, which seek to reduce risk to communities in the long term, operate prospectively and have little capacity to deal with past decisions in relation to existing settlements or buildings in bushfire-prone areas.[3]

Many have argued that planning regulation is crucial; for example, the 2004 report of the National Inquiry on Bushfire Mitigation and Management cited land-use planning as 'the single most important mitigation measure in preventing future disaster losses in areas of new development'. Good planning offers the potential to help people who choose to leave their property in the face of a fire by allowing for the development of evacuation routes. It can also make it easier for firefighters to gain access to and defend a property by imposing entry, exit and water supply requirements. Additionally, planning decisions in relation to settlement matters, land use and development, and the location of individual buildings on a property can potentially reduce bushfire risk by, among other things, restricting development in the areas of highest risk, where people's lives may be gravely endangered in the event of extreme bushfire.[4]

The Commission also studied what can be done to maximise buildings' capacity to provide sanctuary during a bushfire. This is in large part the preserve of building regulation—specifically, the regulation of building in bushfire-prone areas.

After reviewing the existing planning and building regimes in Victoria, the Commission explored the following themes:

- There are deficiencies in the mapping of bushfire risk throughout Victoria. Mapping is the starting point for all decisions on planning and building in bushfire-prone areas. It identifies bushfire hazard and provides the information base that gives rise to the requirement for bushfire-specific planning and building controls in areas of high risk. A well-informed, holistic and strategic approach to mapping is essential for planning and building decisions.
- The current approach to planning does not take account of the fact that there are some areas in which the risk to life from bushfire is so high that new settlements should not be established in these locations. People should be prevented or discouraged from building new houses in such areas and those already living there should be helped to move.
- The planning framework and subsequent planning decisions, as currently applied, do not attach sufficient importance to the risk of bushfire and the potential threat to people's lives in bushfire-prone areas. The strategic policy framework should provide more clarity and guidelines for giving greater recognition to bushfire risk in planning decisions without imposing unacceptable biodiversity costs.
- The provisions in the planning framework pertaining to bushfire safety include a number of exemptions that allow clearing of native vegetation for fire protection. The provisions are unduly complex. They need to be consolidated and simplified so as to help planning professionals and the public more effectively reduce bushfire risk.
- Residential development of bush blocks scattered across the landscape has the potential to greatly increase bushfire risk, especially if the blocks are too small to create defendable space around dwellings. Grouping development in areas that can be adequately protected is preferable.
- Clearing and maintaining a defendable space around buildings is crucial to facilitating active defence and can increase the chances of a building surviving a bushfire—particularly by reducing the risk of radiant heat and direct flame contact. The planning system should prevent, or strongly discourage, people from living in areas where it is not possible to have the minimum defendable space without excessive costs for biodiversity.
- The Building Code of Australia and most bushfire-related standards are not readily available at low cost, and this can inhibit compliance.
- The standard for construction in bushfire-prone areas does not adequately cover all the important components of bushfire risk.
- Building regulations do not adequately cover the construction of non-residential buildings used by vulnerable groups—for example, schools, hospitals and aged care facilities.
- It is difficult to ensure that the standards and conditions that apply at the time of planning and building approval are upheld for the life of a development. Specific mechanisms are required to improve compliance and maintenance in order to ensure that bushfire safety continues to be a focus.

The Commission also heard that bushfire risk management was not well integrated into the Victorian planning and building systems. This was emphasised by the panel of experts the Commission brought together to consider planning matters (see Box 6.1); the panel concluded that 'responsibility for the development and implementation of planning policy is fragmented, both horizontally and vertically, which raises the question of who should ultimately be responsible for the integration of bushfire risk management into planning processes'.[5] This chapter cites examples of such fragmentation, among them the range of participants in the planning and building regimes—including the Department of Planning and Community Development, the Department of Sustainability and Environment, the Country Fire Authority and local councils.

The Commission considers that coordination and integration of bushfire risk–management responses for planning and building could be improved, and the Commission's recommendations better implemented, if the State were to assign to an appropriate government entity responsibility for promoting and overseeing bushfire management—including bushfire hazard mapping, land-use planning, and supporting local government in the implementation of bushfire risk management strategies.

The approach proposed by the Commission recognises the complexity of the planning system and the need to strengthen the consideration of bushfire at different stages of the planning process. The Commission views this as the most effective way of maintaining the capacity to assess each development on its merits, while ensuring that such assessment gives sufficient weight to the risk of bushfire. The independent audit of implementation recommended in Chapter 12 should look at the outcomes of this approach and consider the need for more prescriptive controls if the construction of new houses in high-risk areas continues to occur.

Box 6.1 The expert panel on planning

The Commission engaged six experts from a variety of fields and jurisdictions to provide evidence relating to land-use planning:

- Dr Michael Buxton, Associate Professor, Environment and Planning, School of Global Studies, Social Science and Planning, RMIT University
- Mr Mark Chladil, Fire Management Planning Officer, Tasmania Fire Service
- Professor Roz Hansen, Managing Director, Hansen Partners, and Adjunct Professor, Faculty of Arts and Education, Deakin University
- Mr Brett Lane, Director, Brett Lane & Associates
- Ms Debbie Pinfold, Town Planner, Sutherland Shire Council, New South Wales
- Mr Athol Yates, Executive Director, Australian Security Research Centre.

At the request of the Commission, the experts prepared individual reports on a series of land-use planning questions. The reports were tendered in evidence. The experts also attended a private facilitated conference on 5 February 2010 to discuss the matters raised in their reports and identify areas of agreement and disagreement. The conference was conducted in accordance with Practice Note No. 5. No third parties—including media, external parties and parties with leave to appear—attended the conference. Nor were the Commissioners present. Counsel assisting and solicitors instructing attended as observers. At the conclusion of the conference the experts prepared a written statement of the discussion and that, too, was tendered in evidence.

On 15 and 16 February 2010 the experts appeared together as a panel before the Commission. They responded to a range of questions asked by counsel assisting, counsel for the parties with leave to appear and the Commissioners.

Use of a panel proved effective and efficient, allowing a range of views to be explored within a short period and facilitating a method of instantaneous peer review.

6.1 BUILDING SURVIVAL IN THE 2009 VICTORIAN BUSHFIRES

In considering how planning and building regulation could improve people's safety in the event of a bushfire, it is important to understand what fire does to buildings and what causes the greatest risk. In the report he prepared for the Commission Mr Justin Leonard, a research scientist with CSIRO Sustainable Ecosystems, described the current understanding of building performance in bushfires; his description is based on research involving post-bushfire surveys, experimental work and risk modelling and is detailed in Section 6.9. In brief, the report indicates that most houses are damaged or destroyed by embers, rather than by direct flame contact or radiant heat; that a house is more likely to survive if people actively defend it; and in the absence of human intervention a house is likely to burn to the ground once ignited, rather than just be damaged.[6]

In the weeks after 7 February the Bushfire Cooperative Research Centre surveyed 1,065 houses in the areas affected by the Bunyip, Churchill, Kilmore East, Bendigo and Murrindindi fires. The survey results were supplemented by remote-sensing data for a number of fire-affected regions. A further survey was later conducted, incorporating houses in areas affected by the Beechworth–Mudgegonga, Horsham and Narre Warren fires.

The Bushfire CRC found that, in comparison with other recent major fires, a much lower proportion of houses were damaged by embers only and a higher proportion of houses were damaged by direct flame contact—20 per cent destroyed by embers only and 13 per cent by flame contact. It also found that wind was an important factor: 13 per cent of houses damaged were damaged by both fire and wind.[7]

Among the findings relating to house design and materials were the following:

- Brick structures performed significantly better than cellulose cement, timber or mud-brick structures.
- There was a strong correlation between overhanging trees and house destruction and between house destruction and lack of active water defence.
- There was a higher rate of house survival where water was available on the property and was gravity fed because both mains water and water pumps often fail.
- Concrete water tanks performed best, followed by steel tanks. Polyethylene and fibreglass tanks performed poorly.
- The raw data revealed that a much lower proportion of houses fitted with sprinkler systems were destroyed. The data do not, however, show whether the sprinklers were activated.[8]

The following are findings of particular importance for the Commission's consideration of planning:

- Of all damaged or destroyed structures that were surveyed, 59 per cent were not in an area that had been identified as an area of high bushfire risk for the purposes of planning regulation; that is, they were not covered by the planning regime's primary tool for managing bushfire risk, the Wildfire Management Overlay. This raises serious questions about the effectiveness of this planning instrument—see Section 6.4.3.
- The distance between a structure and a forested area is a good indicator of the likelihood of damage by fire—although not of the extent of damage.
- In the largest sample region, houses were destroyed up to 150 metres away from forest, and over 20 per cent of houses more than 100 metres from forest were destroyed, suggesting a need to review the currently accepted 100-metre buffer between houses and vegetation. This finding was supported by research recently conducted for the Commission by the Bushfire CRC—see Section 6.2.4.[9]

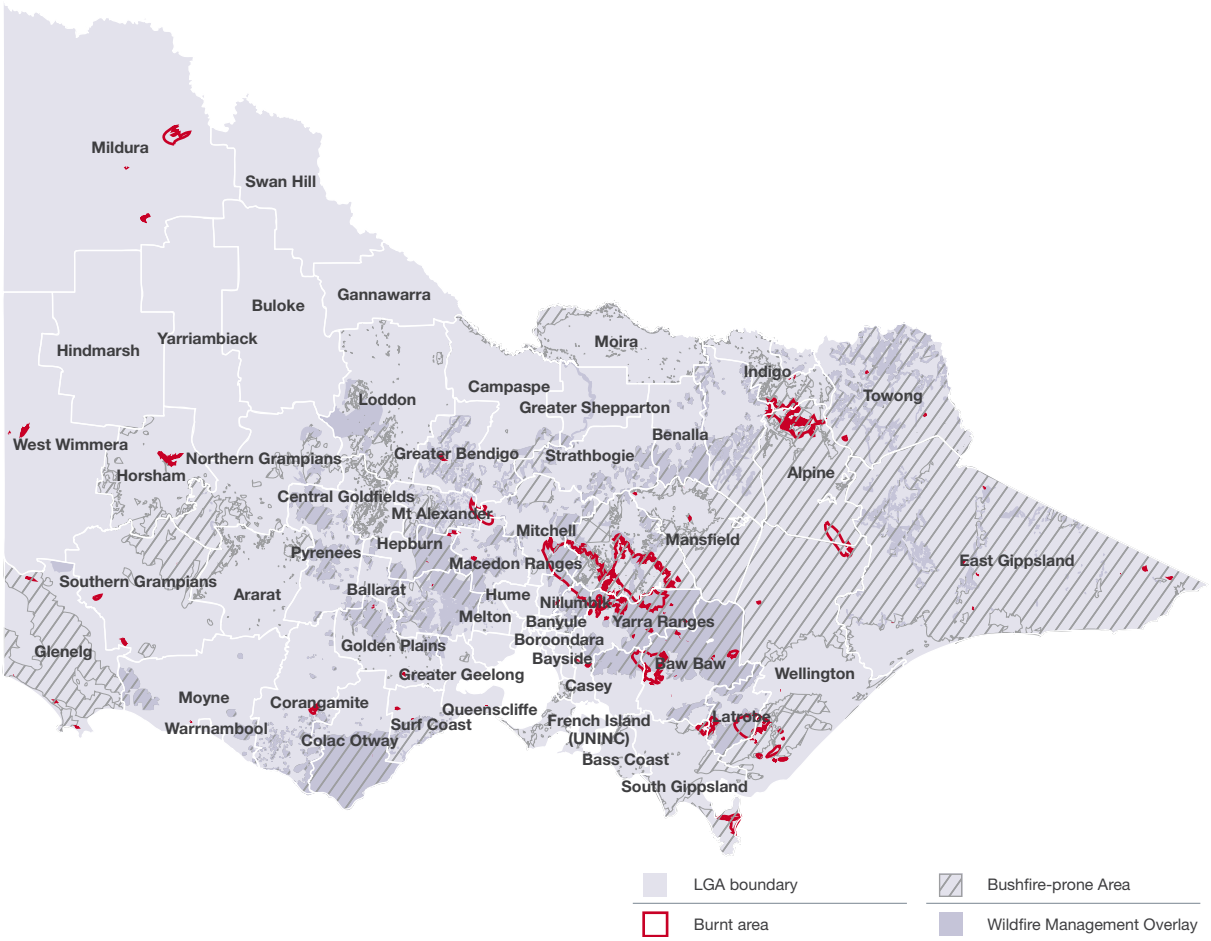
The Building Commission analysed data on 2,131 buildings destroyed by the fires that burned in late January and February 2009. Its interim analysis of the data shows that only 177 of those buildings had been required to be built in accordance with the Australian Standard for Construction of Buildings in Bushfire-prone Areas. In the absence of other pertinent data—such as data on the houses that survived and on whether houses had adequate defendable space and were actively defended—the Building Commission was unable to draw any conclusions about the effectiveness of construction standards in preventing house destruction.[10]

6.2 MAPPING BUSHFIRE RISK

Bushfire-specific planning and building controls are applied only in areas that have been identified as being at high bushfire risk through bushfire hazard mapping. Building controls apply in areas designated 'Bushfire-prone Areas', or BPAs, in accordance with the Building Regulations 2006. Planning measures apply only in areas where the Wildfire Management Overlay has been used through a local planning scheme. Bushfire risk assessment is then carried out on individual sites, so that specific risk treatments can be developed. The mapping and designation processes differ between the building and planning systems. The Commission heard evidence that both systems are flawed and in need of review, that mapping for both systems should be integrated and centralised, and that there is scope to strengthen the mapping criteria used to determine bushfire hazard.

In 2002 Victorian government agencies embarked on a statewide project to align WMO mapping with mapping of designated BPAs. Progress was very slow, as demonstrated by Figure 6.1, which shows the status of the project at February 2009. The map also reveals that the 2009 fires burned across large areas that were not designated BPAs and where the WMO had not been applied.[11]

Figure 6.1 Areas burnt within the Wildfire Management Overlay or Bushfire-prone Areas



Source: Exhibit 679 – Statement of Gilmore, Attachment 63.[12]

6.2.1 BUSHFIRE-PRONE AREAS

The bushfire safety provisions of the Building Code of Australia, which are detailed in Appendix B, apply only to new buildings in designated BPAs. Until 11 March 2009 mapping and designation of BPAs was a matter for municipal councils. This system had a number of shortcomings, primarily the lack of clear criteria for designating BPAs. Additionally, the Building Commission and the CFA had limited power to advocate for and monitor the designation of BPAs, which hindered statewide coordination of bushfire risk assessment.[13]

The result was inconsistency. For example, some councils included public land in designated BPAs, while others did not. Other instances resulted in land on one side of a municipal boundary being designated bushfire prone, while land on the other side was not. It is telling that councils' designation of BPAs was a poor predictor of where bushfires burned on 7 February; most starkly, neither Kinglake nor Marysville was in a BPA.[14]

Since 11 March 2009 all of Victoria has been designated a BPA, an interim arrangement that will terminate on 9 September 2011. Victoria's Building Commissioner, Mr Tony Arnel, put the view that requiring a site assessment for all sites would result in a more consistent, safer outcome for Victoria. He did not consider it imposed an unnecessary regulatory burden since up to 80 per cent of the 40,000 new houses built every year in Victoria would not require any bushfire-specific construction standards.[15]

No witness who appeared before the Commission called for responsibility for designating BPAs to revert to councils after the interim arrangement expires, but a number of witnesses were critical of the interim measure and did not want it to continue. Mr Stuart McLennan, a registered building surveyor, suggested the interim arrangement is simplistic, expensive and counter-productive because it misrepresents actual risk, potentially undermines the effectiveness of the designation process and adds to the cost of building works. Mr Mike Harding of the Housing Industry Association and Mr Geoff Woolcock of MBA Building Services criticised the additional regulatory burden imposed by the interim arrangement.[16]

6.2.2 THE WILDFIRE MANAGEMENT OVERLAY

The WMO is applied to 'areas where the intensity of wildfire is significant and likely to pose a threat to life and property'. Mapping of the WMO has, however, changed with time, leading to inconsistent application across Victoria:

- For areas mapped before 2002 the WMO was applied more restrictively than BPAs and was applied only to areas where controlling a high-intensity fire would be difficult, rather than to all areas where bushfire was likely to pose a threat to life and property.
- Since July 2002 the criteria for mapping the WMO have been the same as those used for BPAs, but there has been no systematic re-examination of the WMO mapping completed before that time.
- DSE initially opposed applying the WMO to public land—a matter that was not resolved for some time. In December 2005 the Minister for Planning approved application of the WMO to public land, but DSE notified only councils that were in the process of amending their planning schemes at the time, so this criterion was not applied to all planning schemes.[17]

The practical consequences of the tardy development of and unevenness in the criteria for mapping the WMO and its application to public land can be seen in the case of Murrindindi (see Box 6.2), which shows how lack of clarity about mapping criteria has led to inconsistent, and in some cases sparse, application of the WMO across Victoria.

Box 6.2 Mapping the Wildfire Management Overlay: Murrindindi

The WMO did not apply to some areas of Murrindindi Shire that were devastated by fire on 7 February 2009—notably Marysville, Kinglake and Kinglake West. It is obvious from aerial photographs taken before the fire that these were 'areas where the intensity of wildfire is significant and likely to pose a threat to life and property'.

Several factors—for which the CFA, DSE, the Minister for Planning and Murrindindi Shire Council share responsibility—contributed to the failure to apply the WMO to these areas:

- The CFA prepared the WMO maps for Murrindindi in 2001, when public land was not included. The maps did not identify private land adjacent to vegetated public land for inclusion in the WMO, although there were in fact areas of private land within 100 metres of public land that should have been included.
- The Murrindindi Municipal Fire Prevention Committee reviewed the maps prepared by the CFA and did not query their accuracy.
- When the mapping criteria were expanded in 2002, the CFA did not re-examine the WMO mapping it had already completed for Murrindindi Shire.
- DSE did not advise Murrindindi Shire of the Minister's December 2005 decision to include public land in the WMO.
- Murrindindi Shire Council has not reviewed the application of the WMO since it was introduced in July 2004.

The Commission heard that 24 houses that were destroyed by fire on 7 February had been built in Marysville, Pine Ridge Road and Grandview Crescent after the introduction of the WMO in 2004. The evidence before the Commission does not permit the drawing of a conclusion about whether a more thorough and extensive application of the WMO and the resultant planning and construction–related bushfire protection measures would have affected the survival rate for these houses. The evidence does, however, demonstrate the need for a serious look at the current mapping criteria and a more systematic and cohesive approach to mapping.[18]

Figure 6.2 Marysville before the fire

Source: Exhibit 678 – Marysville – Pre-fire Aerial Photography.[19] (Showing property boundaries.)

Figure 6.3 Marysville after the fire

Source: Exhibit 678 – Marysville – Post-fire Aerial Photography.[20] (Showing property boundaries.)

6.2.3 INTEGRATED, CENTRALISED MAPPING

There is widespread agreement that there needs to be a more strategic, holistic approach to mapping the state's bushfire risk and designating levels of risk for planning and building purposes.[21] Such an approach requires the following:

- that mapping be assigned higher priority
- that the approach to mapping be applied consistently by skilled officers
- that the criteria used be justifiable on the basis of the best available science and cover all aspects of bushfire risk
- adoption of a tiered approach that better identifies risk and more effectively targets responses.

One of the best means of achieving this would be to have a single agency responsible for bushfire mapping. Mr Jeffrey Gilmore, Executive Director, Planning Policy and Reform, Department of Planning and Community Development, agreed with such an approach:

> … using a single mapping method for hazard identification and a single approach to risk assessment across the state is going to deliver significant benefits, and having that mapping controlled by a single agency is an important part of that so that you do get consistency and timeliness …[22]

The panel of planning experts the Commission convened supported this proposition, concluding, 'There must be a common underlying methodology for the mapping of bushfire-prone areas and the overlay. This methodology must apply a clear and transparent process that can be applied consistently across the state'.[23]

In South Australia and New South Wales, both bushfire-prone states, consistency is achieved by designating BPAs centrally:

- In South Australia the State Government designated 'bushfire protection areas' following a two-staged bushfire mapping exercise (a strategic assessment and a more detailed hazard assessment) carried out in consultation with councils, the Country Fire Service and the public. Three levels of bushfire risk—general, medium and high—determine what, if any, planning and construction requirements apply.
- In New South Wales bushfire-prone land is designated by the Commissioner of the Rural Fire Service at the request of a council. This then triggers the application of bushfire-specific building and planning controls. The Rural Fire Service provides strict mapping guidelines and has the legislative power to certify bushfire-prone land maps.[24]

The Commission considers that centralised mapping and designation of BPAs for the purposes of planning and building controls would achieve more thorough and consistent outcomes, enable risk assessment beyond the individual site, and promote holistic management of bushfire risk. The CFA already has mapping expertise and is one agency that might take up this role. There might be other government agencies that could perform the task.[25] As this mapping is done, designation of BPAs under the Building Regulations should be re-introduced. This is preferable to the current situation, in which all of Victoria is effectively designated a BPA, and it will remove the regulatory burden involved in requiring a site assessment for building work where there is obviously no bushfire risk.

The State should identify a central point of responsibility within government, and this entity should do the following:

- immediately start comprehensively mapping Victoria's bushfire risk, beginning with an initial strategic assessment and proceeding to a detailed hazard assessment of each region, giving priority to the regions of highest risk
- progressively designate BPAs for the purpose of applying the bushfire-specific planning and building controls
- identify different levels of bushfire risk
- consider how the various risk levels could best be used to align building and planning 'triggers' and to apply different treatments based on risk
- publish maps and make them widely available, to further community education and other community or business purposes
- review the mapping and designation of BPAs regularly.

6.2.4 MAPPING CRITERIA

The criteria the CFA currently uses to map the Wildfire Management Overlay for planning purposes are the same as those used for Bushfire-prone Areas that are used for building. Both remain limited in several ways:

- They focus exclusively on forest fire, excluding grassland and scrub fires, even though grass and scrub fires can be of great intensity and can threaten life and property.
- Evidence before the Commission suggests that the criterion requiring a minimum patch size of 5 hectares is too generous.
- The boundary of the WMO is determined by applying a 100-metre buffer around the areas of mapped risk and should be reviewed.[26]

The distance of 100 metres appears to have been chosen initially as a convenient margin and was retained when a 1999 study by Ahern and Chladil found that 85 per cent of houses were destroyed within 100 metres of vegetation. It is not known whether any agency has ever considered whether 85 per cent is an acceptable level of risk. Analysis of more recent fires, including those on 7 February, shows that 85 per cent of houses are destroyed within 108 metres of bush and 90 per cent within 145 metres. These data, and the CFA's practice in relation to 'neighbourhood safer places' (see Chapter 1), suggest that something beyond 100 metres would be a more conservative choice from the perspective of safety. The Commission supports the view that the 100-metre margin should be reviewed.[27]

The CFA applies different criteria for designating neighbourhood safer places (or bushfire shelters)—using a methodology based on assessment of radiant heat levels, rather than determining the acceptable risk of loss—and includes either a separation distance of 140 metres between the building and the vegetation or a maximum potential radiant heat impact of no more than 10 kilowatts per square metre. Although there might be good reasons why bushfire shelters should be subject to more stringent criteria than residences, there is scope to review the mapping criteria for planning and building in light of this different approach. Ms Lisa Sturzenegger, the CFA's Director of Community Safety, agreed with this proposition.[28]

Finally, consideration should be given to the increasing risk exposure arising from climate change projections of more frequent occurrence of catastrophic fire weather.[29]

There is a clear need for a wholesale review of the criteria used for mapping bushfire-prone areas for the purposes of applying planning and building controls. The criteria should specify that bushfire risk is to be mapped regardless of land tenure and the review should consider the following:

- the inclusion of all vegetation types that carry a risk of bushfire that could pose a risk to life and property—in particular, grasslands, scrub and heath
- the identification of low, medium and high levels of bushfire risk
- the 100-metre margin applied to vegetation boundaries, with specific reference to the recent work of Risk Frontiers and to the proportion of house destruction that represents an acceptable level of risk
- the 5-hectare minimum patch size
- the methodology used in developing criteria for bushfire shelters (neighbourhood safer places)
- the impact of climate change projections of more frequent occurrence of catastrophic fire weather.

6.2.5 A SINGLE SITE-ASSESSMENT METHODOLOGY

Increased consistency and stronger links between planning and building controls are already state government policy. A project control group was established in September 2009 with representatives of the CFA, the Building Commission and the Department of Planning and Community Development 'to discuss the way building controls and land use planning can interact in order to be able to provide the best possible risk management solutions to building in BPAs'. This group is progressing a number of projects to achieve this.[30]

One way to achieve greater integration is to enable a single site assessment to be carried out for planning and building permit applications. At present there are some technical differences between the site assessments used for planning and building. The Building Regulations, however, allow a single site assessment to be carried out in order to determine the construction requirements and for the planning permit application.[31]

The Department of Planning and Community Development, the CFA and the Building Commission are working on a joint project to align the site assessment methods for planning and building purposes. This includes liaising with Standards Australia and the Australian Building Codes Board to discuss changes to the site assessment methodology used nationally for building in bushfire-prone areas.

The Commission welcomes the State's commitment to increasing consistency and strengthening links between planning and building controls, including the work being done by the project control group as well as the specific project to align the site-assessment methods. In all of this work the State should explicitly consider the risk of bushfires to human safety as well as property. The Commission encourages the State to bring the work to finalisation as soon as possible.[32]

RECOMMENDATION 37

The State identify a central point of responsibility for and expertise in mapping bushfire risk to:

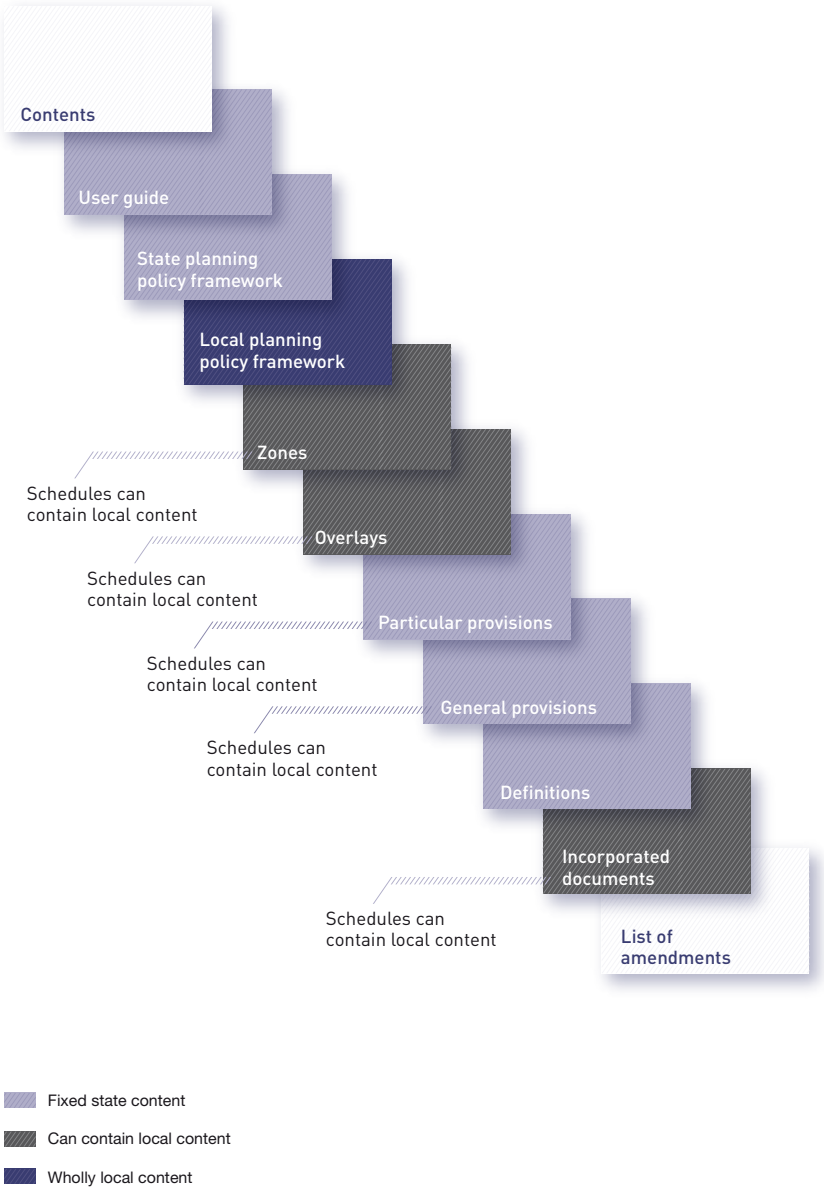
- review urgently the mapping criteria at present used by the Country Fire Authority to map the Wildfire Management Overlay, to ensure that the mapping used to determine building and planning controls is based on the best available science and takes account of all relevant aspects of bushfire risk
- map and designate Bushfire-prone Areas for the purposes of planning and building controls, in consultation with municipal councils and fire agencies
- finalise the alignment of site-assessment methods for planning and building purposes, taking into account bushfire risk to human safety as well as to property.

6.3 REGULATION OF LAND-USE PLANNING

Land-use planning in Victoria is regulated by the *Planning and Environment Act 1987*, which establishes 'a framework for planning the use, development and protection of land in Victoria in the present and long-term interests of all Victorians'. The planning framework established under the Act aims to ensure sound strategic planning and coordinated action at the state, regional and municipal levels and enable easy integration of land-use planning and policy with environmental, social, economic, conservation and resource management policies.[33]

The Act is administered by the Minister for Planning, who is advised by the Department of Planning and Community Development. The State sets the strategic planning framework through a set of standard statewide planning provisions called the Victoria Planning Provisions. Councils then use the VPPs to create local planning schemes, which must include standard provisions selected from the VPPs—the State Planning Policy Framework, zones, overlays, and particular and general provisions—and local provisions developed by the council, primarily through its Local Planning Policy Framework and local schedules to zones and overlays and other provisions.[34] Appendix B provides further information about the VPPs and planning schemes.

Figure 6.4 Elements of a local planning scheme



Source: Exhibit 679 – Composition of a Planning Scheme.[35]

Decisions about specific proposals for the use and development of land are made by responsible authorities (usually councils), in accordance with the permit application process set out in the Act and the strategic policies and planning scheme controls in the local planning scheme. If a planning scheme specifies a person or body to be a 'referral authority' for specific permit applications, those applications must be directed to the referral authority for its consideration. A permit must be refused if the referral authority objects, or it must include any conditions that are required by the referral authority. The two main referral authorities relevant to bushfire provisions are the CFA (for permits in the Wildfire Management Overlay) and DSE (for some permits to remove native vegetation).[36]

Planning has limited capacity to mitigate bushfire risk for existing developments, including townships, in high-risk areas. The main area in which it can do so is in rationalising controls on the removal of vegetation for bushfire risk (as discussed in Section 6.5) and ensuring that sites subject to existing permits that impose bushfire risk–management conditions are maintained to particular standards.

In many areas, however, planning (as well as building regulation) needs to be accompanied by other measures, so that a 'package' of measures is used to improve people's safety in the face of bushfires.

Planning can lead to increased safety of new buildings and developments in most areas of bushfire risk by setting conditions that substantially improve people's safety. The expert panel put the view that in some areas the bushfire risk is so high that new development, including new subdivision of existing areas, should not be permitted. The panel proposed that the criteria for identifying where new development should not be permitted should include the physical characteristics of the area—the type, the density and extent of vegetation, the topography and the weather patterns for the area—as well as potential effects of climate change on the bushfire hazard in the area. The panel also proposed that a number of social framework criteria—such as the quality and availability of infrastructure, social and demographic considerations in the area, the changing nature of hazards, and the level of confidence that mitigation measures will remain in place over time—should also be taken into account.[37]

This creates particular difficulties in areas of extremely high risk where people have already established homes. Even a combination of protective measures might not be enough to reduce the risk to an acceptable level. In such areas the government should consider options outside the planning system, as discussed in Section 6.8.

The vast majority of settled land has already been deemed suitable for development, but much of this occurred before the possible impacts of climate change were known and before the devastating impact of deadly fires on particular localities on days such as Black Saturday were investigated. The Commission is of the view that there is considerable scope to substantially restrict development in areas that are known to pose an unacceptably high bushfire risk. Overall, the planning framework and subsequent planning decisions should give more explicit consideration to, and attach greater importance to, the risk of bushfire and the potential risk to people's safety in bushfire-prone areas.

Much of what follows deals with planning policies and controls in detail and how they can be modified to ensure that a more suitable emphasis is given to bushfire risk.

6.3.1 URBAN GROWTH

Bushfire risk management should start at the highest strategic level—when the state and local governments are planning and zoning new settlements in Melbourne's urban growth boundary or around regional centres.

There is a well-defined process for taking into account bushfire risk when new settlements in Melbourne's urban growth boundary are being planned and when expansion of that boundary is being investigated. A proposal for a new development in the Urban Growth Zone must be in accordance with a precinct structure plan that includes a bushfire risk–management plan that has been developed in consultation with the CFA. The investigation of areas for expansion of Melbourne's urban growth boundary, published in June 2009, included a land capability report that considered bushfire risk as one of the possible constraints on development.[38]

There is currently no equivalent of this process for Victoria's regional cities. Beyond Melbourne's urban growth boundary, individual councils decide whether and how they deal with bushfire risk when planning for urban growth.[39]

Mr Gilmore from the Department of Planning and Community Development told the Commission that the State Government was developing a regional settlement policy, called the Regional Blueprint.[40] It is vital that this blueprint deals with bushfire risk management—in particular, in the context of small undeveloped rural lots and the urban growth of Victoria's regional cities.

6.3.2 SETTLEMENT PATTERNS

Professor Hansen told the Commission about the need for good planning and the risks inherent in allowing residential development and population growth in bushfire-prone areas without adequately considering bushfire risk:

> In my opinion seeking to protect communities living in dwellings scattered across rural landscapes from the ravages of bushfire, often with one access road in and out, is tantamount to 'death trap' planning. Unfortunately there are areas within Victoria where rural living and rural residential development is characterized by this pattern of settlement and yet, in my opinion, it is this very type of settlement pattern that makes it very difficult for planning and building provisions to avoid and manage bushfire risk.[41]

This question of land fragmentation was also nominated by Mr Greg Johnson of Friends of Nillumbik as one of the challenges facing Nillumbik Shire Council in land-use planning to reduce bushfire risk.[42]

Professor Hansen considered that bushfire risk was best managed by concentrating urban and semi-rural settlements in defined areas with adequate buffers, good road access, emergency services and fire refuges. First and foremost the experts thought this should be dealt with in a regional settlement policy. They concluded:

> There are a large number of small lot subdivisions outside urban areas in rural Victoria which present a bushfire risk. Settlement policies which discourage fragmented development on rural lots should be developed and implemented, for example, through alternative and innovative development options such as rural clusters, restructures, buy-backs, consolidated titles, tenement controls and transfer [of] development rights.[43]

One means of discouraging development in some areas and encouraging it in others is for government to purchase land that it does not want developed, in order that the owner can settle in a more suitable area. Another means is for government to swap land in the former area for land in an area that it does want to see developed. These approaches are fairer to individual landowners than simply restricting use and development of their land through tenement controls or a restructure overlay, but they would involve a considerable amount of public money.

Dr Buxton and Professor Hansen both supported buybacks and the transfer of development rights.[44] The Commission does not consider this is warranted for broad-scale rural lots. It is, however, a suitable strategy for existing developments in areas where bushfire risk is unacceptably high. This is discussed in Section 6.8.

6.3.3 SMALL RURAL LOTS

A more specific question within the broader subject of fragmented settlements in rural areas is that of small rural lots. The experts, particularly Dr Buxton and Professor Hansen, noted that, because of poor planning and decisions in the past, there are thousands of small, undeveloped lots in rural zones in Victoria that pose particular problems for taking account of bushfire risk in the planning system. Residential development on these lots would increase the number of people living in areas of bushfire risk. Further, acute problems can arise on lots where there is no reticulated water, where road access is poor, and where it is not possible to achieve the minimum recommended defendable space because the lot is too small.

Rural zones have controls on the size of lots that may be created by subdivision.[45] There are, however, a large number of existing lots that are smaller than the minimum lot size for subdivisions. Dr Buxton cited many examples of this. His research in local government areas in peri-urban parts of Melbourne revealed the following, for example:

- Across those municipalities, more than 60 per cent of housing approvals in the Farming Zone were on properties of less than 20 hectares, despite the majority of planning schemes generally nominating larger minimum lot sizes for subdivision.
- In Murrindindi Shire 27 per cent of lots (2,185 lots) in the Farming Zone are less than 2 hectares.
- Most local government areas in the peri-urban region have a high proportion of lots of less than 2 hectares in the Rural Conservation Zone.
- Seventy-five per cent of housing approvals within rural zones were on properties of less than 20 hectares and almost 60 per cent were on properties less than 8 hectares.[46]

There is in the Victoria Planning Provisions a control that could be used to restrict residential development on existing small lots: a council can apply the Restructure Overlay to an existing subdivision to consolidate the lots as a precondition to their development. Nillumbik Shire Council has used this overlay to good effect to restructure an old mining subdivision where the lots were in common ownership. In contrast, an attempt by Murrindindi Shire Council to use the Restructure Overlay to consolidate small lots with different owners in a subdivision at Flowerdale was an unhappy experience, one the council would not care to repeat. This evidence suggests that the Restructure Overlay can be used effectively to consolidate small rural lots, especially where they are in common ownership, but that community support is otherwise required.[47]

As noted, particular safety risks arise when residential development is permitted on small blocks in areas of high bushfire risk. The Commission supports the expert panel's view that additional measures are needed to deal with the problem of residential development on small rural lots and that this could be achieved by more effective use of some types of zones. Although zones are often used to prescribe minimum lot sizes for subdivisions, they are infrequently used to prescribe minimum lot sizes for new residential developments. Dr Buxton suggested that councils should be able to introduce 'tenement controls' by specifying a minimum lot size for use of land as a dwelling or binding together groups of jointly owned lots. Professor Hansen agreed with this, but emphasised the importance of councils tailoring the use of zones to local circumstances in areas of high bushfire risk.[48]

The Commission considers that councils need to be able to specify a minimum lot size for the use of land for a dwelling, not just for subdivision. Although this can already be done—to a certain extent through application of the schedules to the Rural Living Zone and the Farming Zone on land where no permit is required to construct a dwelling—the ability to specify a minimum lot size must also apply to dwellings that do require a permit in those areas and to other rural zones, both with and without a permit.

The rural zones in the Victoria Planning Provisions should be amended to allow councils to use schedules to the zones to specify minimum lot sizes for the use of land for residential development in areas of high bushfire risk.

RECOMMENDATION 38

The State implement a regional settlement policy that:

- takes account of the management of bushfire risk, including that associated with small, undeveloped rural lots
- includes a process for responding to bushfire risk at the planning stage for new urban developments in regional cities, the process being similar to that used for new developments in Melbourne's Urban Growth Zone.

6.3.4 A BUSHFIRE-PRONE ZONE?

At present there is in the Victoria Planning Provisions no zone that relates to bushfire risk. This is unlike the situation with flood risk, for which there is an Urban Floodway Zone plus three overlay controls. The zone is, however, not widely used since it prohibits most land uses, including dwellings.[49] Mr Gilmore explained why there is no equivalent zone for bushfire risk:

> In floods that's relatively straightforward. The level of water in a 100-year flood is a known, quantifiable and discretely defined area and that can be easily mapped and put into the planning scheme. The challenge of mapping a much more dynamic response to a hazard in a bushfire sense is much harder, and the challenge has always been to not only work out what levels of hazard identification are associated with what levels of risk, but also to map them and to map them in a way that can be useful in the time frame over which the planning system works.[50]

The expert panel recognised the difficulties of defining and applying a bushfire risk zone, particularly in being able to map the risk accurately considering the ubiquitous nature of bushfire risk in the landscape. Professor Hansen urged caution in using a zone of this type because of its potential to limit appropriate and legitimate development. Zoning land so as to prohibit certain uses, including use as a dwelling, 'sterilises' that land for future development, and this has harsh consequences for the landowners concerned. The only concrete step that can be taken to mitigate those harsh consequences is government buying the land.[51]

The Commission agrees with the expert panel that there should not be a specific 'bushfire-prone zone' that would prohibit residential and other development in areas of high bushfire risk. A variety of other measures could be taken within the Victorian planning system to better manage bushfire risk.

One such measure is to strengthen existing zones to influence the use and development of land in areas of bushfire risk. For example, uses by vulnerable groups such as a child care centre, school or hospital are prohibited uses in areas at greatest risk of bushfires and require a permit in others. The rural zones also have specific requirements for land used for a dwelling—for example, road access and water supply requirements. These could, however, be strengthened by adding some prescriptions for small rural lots.[52]

6.4 THE VICTORIA PLANNING PROVISIONS: BUSHFIRE RISK MANAGEMENT

Management of bushfire risk is dealt with in the state planning policy Protection from Wildfire, which constitutes clause 15.07 of the Victoria Planning Provisions and forms part of the State Planning Policy Framework, and in a specific overlay, clause 44.06, Wildfire Management Overlay. The requirements of these clauses are discussed in detail in Sections 6.4.1 and 6.4.3 respectively. Some shire councils complement the state planning policy by including a bushfire policy in their Local Planning Policy Framework, as illustrated by the case studies in Box 6.4.

There is also a general provision that requires responsible authorities to consider for all permit applications 'the degree of flood, erosion or fire hazard associated with the location of the land and the use, development or management of the land so as to minimise any such hazard' (clause 65.01). Additionally, for subdivisions consideration must be given to the 'design and siting of buildings having regard to safety and the risk of spread of fire' (clause 65.02). A number of general controls that are also relevant to bushfire risk management deal with matters such as provision of fire hydrants and fire plugs, water supply, and safe access for emergency vehicles (clauses 56.06 and 56.09).[53]

6.4.1 CLAUSE 15.07: PROTECTION FROM WILDFIRE

The objective of clause 15.07, Protection from Wildfire, is 'to assist the minimisation of risk to life, property, the natural environment and community infrastructure from wildfire'. The clause requires that risk be identified, that fire hazards be considered in planning decisions to 'avoid intensifying the risk through inappropriately located or designed uses or developments', that authorities have regard to a number of cited documents, and that further advice be sought from fire authorities where necessary.[54]

On the basis of the evidence before it, including the views of the planning expert panel, the Commission considers that the wildfire policy outlined in clause 15.07 of the State Planning Policy Framework inadequately sets the strategic policy foundation for considering bushfire risk in all planning decisions: the clause lacks the detail, clarity and guidance that would help councils discharge their obligation to minimise bushfire risk when making planning decisions; and it compares unfavourably with other, more detailed policies in the SPPF that deal with coastal areas and conservation of native flora and fauna.[55]

The panel of planning experts concluded there was considerable scope for improving the policy and that this might mean amending the policy to include some prescriptive elements.[56]

The Commission agrees that the state planning policy for bushfire risk management does not give clear guidance to decision makers and does not include all the elements that would promote protection of human life as the highest priority. The policy should be rewritten to take into account the shortcomings and solutions highlighted in the evidence before the Commission, as outlined in Table 6.1. The intent is that the proposed amendments to the Victoria Planning Provisions take account of the matters detailed in this table.

Table 6.1 The state planning policy for bushfire: shortcomings and solutions

Shortcoming	Solution
Protection of human life should be the ultimate objective of the policy. The policy's focus needs to be comprehensively recast to achieve this.	The revised policy should assign priority to policy objectives. In particular, it should clearly state that the protection of human life overrides all other policy objectives.
The policy does not give adequate attention to management of native vegetation; nor does it provide guidance about how that element should be balanced with objectives to do with protection from fire. It does not recognise that in areas where the bushfire risk is very high it is not possible to allow people to live safely without clearing land around dwellings and beyond.[57] In the Commission's view, if the native vegetation in these areas has high ecological value new development should not be allowed.	The revised policy should do the following: ■ strongly discourage new development of sites in bushfire-prone areas that are also of high biodiversity conservation value ■ state that in bushfire-prone areas new developments should proceed only where bushfire risk can be reduced to an acceptable level on a continuing basis—without unacceptable biodiversity costs ■ for existing developments in bushfire-prone areas, introduce a policy that explicitly enables landowners to take reasonable steps to reduce bushfire risk to an acceptable level.
Although the policy directs readers to reference documents, it provides no specific guidance on how to assess bushfire risk.	For existing and new developments, the revised policy should do the following: ■ provide guidance on what is an acceptable level of bushfire risk ■ identify policy elements that are necessary in order to achieve development with an acceptable level of risk—such as adequate defendable space and vegetation management.
The policy is not based on up-to-date, relevant documents and policies. Some documents cited are not current, have not been reviewed for many years, or are not readily available to authorities or the public.[58]	The revised policy should refer to current documentation such as AS 3959-2009, Construction of Buildings in Bushfire-prone Areas, and HB 330-2009, Living in Bushfire-prone Areas.
The policy does not take account of climate change projections of a greater frequency of catastrophic fire weather.[59]	The revised policy should take account of climate change projections as they relate to bushfire risk and incorporate the precautionary principle by recognising that the absence of absolute certainty about bushfire risk is not a reason for postponing action that might diminish risk.
The policy is not linked to related policies to help the reader understand how the policy was formed and what additional sources of information should be consulted.[60]	The revised policy should show links with other important state policies—for example, Living with Fire, Melbourne 2030 and the regional settlement policy—and relevant Commonwealth policies.
The evidence before the Commission suggests that councils do not consistently include in their Local Planning Policy Framework local bushfire policies to supplement the high-level strategic policy in the State Framework.	The revised policy should include a requirement that the LPPF of each planning scheme where the Bushfire-prone Overlay is applied include a bushfire policy that broadly outlines how to incorporate risk management in land-use planning, including the policy's links with the council's municipal fire prevention plan and municipal emergency management plan. The situation with local policies and the State Framework could be improved if municipal councils received better support to develop local bushfire strategies and if the bushfire provisions of the state and local frameworks were more closely linked.
'Wildfire' is an American term that is not widely used by the Victorian community. Further, its use in the Victoria Planning Provisions is inconsistent with the terminology used in the building regulatory system.[61]	The revised policy should use the term 'bushfire' instead of 'wildfire'.

One of the main challenges for Victoria in revising the state planning policy relating to bushfire will be determining the variables for 'acceptable levels of risk' for existing and new developments. The State advised the Commission that this is a complex task that will require consideration of many variables—the location of the land, proximity to vegetation and slope being examples.[62]

6.4.2 LOCAL PLANNING POLICIES

The requirement for all councils in areas of bushfire risk to have a bushfire policy in their Local Planning Policy Framework will mean substantial work for many councils. The Commission is strongly of the view that the State should provide material assistance by developing a model local bushfire policy that can be adopted or adapted by councils to suit their own circumstances. The model policy should give priority to the protection of human life, clearly reflect the objective of substantially restricting development in the areas of highest bushfire risk, give due consideration to biodiversity conservation, and contain guidance on making decisions at the strategic and statutory planning stages. Although local policy must not be inconsistent with state policy, and should not simply repeat state policy, the model should help councils focus on local application of the elements of a revised state planning policy, as outlined in Table 6.1.

The content and complexity of local bushfire planning policies will vary according to the level of bushfire risk in a municipality and the location of bushfire hazards. For example, in a municipality where the bushfire hazard is primarily on public land on which little or no development is likely to occur, a much less detailed policy would be required than for a municipality in which entire towns are deemed to be at high risk of bushfire. The model local bushfire policy should be flexible enough to accommodate a range of local circumstances.

6.4.3 CLAUSE 44.06: WILDFIRE MANAGEMENT OVERLAY

The Wildfire Management Overlay is the primary tool in the Victoria Planning Provisions for managing bushfire risk. It is an additional layer of control in a planning scheme, and the purpose of having it is to ensure that when a development proceeds fire protection objectives are achieved.[63]

On land covered by a WMO a permit is required to construct a building or to carry out works associated with the following uses of accommodation (which includes residential land use): child care centre, education centre, hospital, industry, place of assembly, retail premises or timber production. Developments in the WMO must demonstrate that the following fire protection objectives have been considered and incorporated:

- *Water supply.* Water is available to landholders and emergency services, to enable life and property to be defended against bushfire.
- *Access.* Safe access is provided for emergency and other vehicles at all times.
- *Buildings and works.* The design and siting of buildings and works increases the potential to protect life and minimises the level of fire impact.
- *Vegetation.* Ground fuel and shrubs are managed in such a way as to reduce potential fire intensity in the vicinity of buildings.[64]

A permit is also required to subdivide land in a WMO. An applicant must demonstrate that the following fire protection objectives have been met:

- *Protective features.* The level of fire risk and potential loss of life is reduced by the design, siting and layout of the subdivision.
- *Access.* Both public access and private access are designed to be safe for emergency and other vehicles at all times.
- *Water requirements.* Adequate quantities of water are available to landholders or emergency services to enable life and property to be defended against fire.
- *Public open space.* A fuel-managed buffer lies between a potential or existing fire hazard and a subdivision.
- *Vegetation.* The subdivision is designed to take account of the effect of vegetation on the level of fire intensity.[65]

One of the central elements of the WMO requirements concerns the establishment of a building protection zone that is 'landscaped to reduce fuel load, distribution and continuity … to inhibit the spread of fire and minimise the fire risk to life and property'. The CFA has developed a method for determining appropriate vegetation management zones on a site in order to create around a building defendable space that provides 'an area of protection from radiant heat, direct flame contact and ember attack'.[66]

In discussing defendable space, policy makers need to be aware that, as discussed in Chapter 1, one of the lessons from the late January–February fires is that an assessment of whether a house is defendable should cover more than the immediate property. Defendability is also affected by the surrounding environment, such as proximity to a heavily forested area. These broader factors affect the ferocity of an approaching fire and whether the house could be subject to very heavy ember attack.

Permit applications under the WMO must be referred to the relevant fire authority—invariably the CFA. Because a council must accept the CFA's assessment of a permit, including any conditions it (the CFA) imposes, the CFA's guidelines for assessing permit applications are crucial and provide much detail about the decision-making tools for assessing bushfire risk on a site. These guidelines are discussed in Section 6.4.4.[67]

As well as the CFA's advice, the council must consider the State Planning Policy Framework, the Local Planning Policy Framework and any adopted municipal fire prevention plan before deciding on an application for a site in the WMO. Permit applications under the WMO are exempt from the usual requirement to give notice to third parties.[68]

Application of the Wildfire Management Overlay

The WMO was first introduced into the Victoria Planning Provisions in October 1997. It was progressively applied by councils and, by 7 February 2009, 35 of Victoria's 82 planning schemes applied it. Of the 20 municipalities affected by the fires the Commission investigated, 13 had applied the WMO and the remaining seven—Southern Grampians, Horsham, Alpine, Indigo, Casey, South Gippsland and Wellington—had not.[69]

A council wanting to apply the WMO in its planning scheme must do so through the standard planning scheme amendment process, as outlined in Appendix B. This can be time consuming: it generally involves mapping, ground truthing, public consultation, a panel hearing to respond to any objections, approval to proceed, a council decision and ministerial approval. It has taken an average of 4.8 years for councils to implement the WMO in their planning schemes.[70]

The Commission agrees with the submission of the Municipal Association of Victoria (and the 77 councils it represented) that the process for councils to introduce or amend the WMO is 'slow, costly, labour-intensive and unpredictable'. Although some measures—such as alternative notice procedures and exemptions or waivers for some costs—have been introduced to alleviate this problem, the WMO amendment process still takes an unreasonably long time.[71]

The Commission is of the view that councils have implemented the WMO slowly and inconsistently, at least partly, for several reasons:

- The planning scheme amendment process has been costly and complex.
- Before the late January–February 2009 fires, the Department of Planning and Community Development had not systematically monitored the application of the WMO, despite the CFA's attempts to apprise the department of concerns through its regional managers.
- No government agency was responsible for the process. The CFA, in its role as advocate, could do nothing more than monitor, encourage and advise. Councils have limited resources for dealing with a large number of competing priorities, one of which is the management of bushfire risk, including applying the WMO. The person who could, and should, have led the process was the Minister for Planning, acting on the advice of the Department of Planning and Community Development.[72]

Since February 2009 the department, with the CFA's assistance, has identified areas in 26 municipalities where the WMO should be applied and has begun fast-tracking their applications through a process whereby the minister prepares and approves amendments without advance public notice. By February 2010 a number of planning schemes had been amended to apply the WMO through this process of ministerial amendment.[73]

Although the Commission welcomes this development, it considers that the standard process for amending the scheme is not suitable for mapping bushfire risk and applying the WMO. The State should replace this process with a simplified system that allows the Bushfire-prone Overlay to be automatically applied without delay once the mapping has been done, as proposed in recommendation 37.

The centralised, comprehensive mapping process the Commission recommends will result in more accurate, consistent and robust identification of bushfire risk, obviating the need for the lengthy process of amending the planning scheme to introduce a Bushfire-prone Overlay. Automatic application of this overlay would, however, eliminate the opportunities for community consultation and education that exist as part of the standard planning scheme amendment process. The State should consider how such opportunities could otherwise be provided.[74]

The effectiveness of the Wildfire Management Overlay on 7 February 2009

Because adoption of the WMO has been slow and because it applies only to new developments, there has been little opportunity to assess its effectiveness. CFA internal research into houses destroyed in the Kilmore East, Murrindindi, Churchill, Delburn, Beechworth–Mudgegonga and Bunyip fires looked at the number of dwellings destroyed in the fire areas and the proportion of those dwellings that had been formally referred to the CFA to assess their compliance with WMO requirements. The draft results provided to the Commission constituted a preliminary analysis only, using a very small sample of houses, and did not take account of important factors such as whether a house was actively defended. Nevertheless, the data did suggest that houses that had been referred to the CFA were less likely to be destroyed.[75]

Box 6.3 Rebuilding in Wildfire Management Overlay areas

In March 2009 an amendment to the Victoria Planning Provisions was introduced to enable rebuilding without a permit in areas affected by the February 2009 fires if a dwelling was in a WMO and was to be rebuilt in the same location and provided construction began before 31 March 2011. The amendment allowed dwellings in a WMO that had been destroyed in the 2009 bushfires to be rebuilt in the same place, without any attention to the fire protection objectives set out in the WMO—namely, water supply, access, design and siting of buildings, and management of vegetation to achieve defendable space.[76]

The rationale was 'to streamline the planning process so that bushfire survivors can commence rebuilding their homes as soon as practicable'. It was thought that early rebuilding would offer important environmental, social and economic benefits and reduce the time, cost and administrative burden for bushfire survivors and councils.[77] Mr Gilmore explained:

> The government was clearly aware of its role in providing leadership for the community in a very difficult time and didn't want to be seen to make the rebuilding for the community any more difficult than it already was. There was a requirement to provide the sort of leadership to the community and respond to those people whose lives had been so badly affected by the fires.[78]

The evidence before the Commission suggests that this amendment did not streamline the rebuilding process and that further amendments were needed to achieve this. The Commission considers it was an ill-conceived and ineffective gesture that allowed homes that had just been destroyed by fire to be rebuilt without any requirement to manage vegetation so as to create or maintain defendable space around the new homes. The standard WMO requirements for water supply and access were subsequently imposed by means of an amendment to the Building Regulations, but this did not come into effect until 1 September 2009.[79]

Figure 6.5 Bald Spur Road before the fire

Source: Exhibit 678 – Bald Spur Road – Pre-fire Aerial Photography.[80] (Showing property boundaries.)

Figure 6.6 Bald Spur Road after the fire

Source: Exhibit 678 – Bald Spur Road – Post-fire Aerial Photography.[81] (Showing property boundaries.)

Revision of the Wildfire Management Overlay

Members of the expert panel agreed on the need for some revision of the WMO, noting that it 'is generally a useful risk management tool, but it has shortcomings which need to be addressed in terms of how it works from a top down approach'. They also said the WMO cannot work effectively alone as a risk management tool and cannot treat existing risk.

In the Commission's view the WMO has serious limitations and should be revised and strengthened. Like the bushfire policy in the State Planning Policy Framework, the WMO does not provide strong and unequivocal guidance about the relative weight that should be given to bushfire risk when balancing complex and competing objectives, including native vegetation management. More comprehensive mapping of bushfire risk would enable better directed application of risk treatments through the WMO. Changes to the permit requirements and giving councils the opportunity to include local content would also help meet the overlay's fire protection objectives.

The Commission urges that the Wildfire Management Overlay be renamed the Bushfire-prone Overlay and that it be comprehensively reviewed in order to redress the shortcomings detailed in Table 6.2. The intent is that the proposed amendments to the WMO take account of the matters detailed in this table, and the revised CFA guidelines for permit applications take account of these matters.

Table 6.2 The Wildfire Management Overlay: shortcomings and solutions

Shortcomings	Solution
The WMO does not provide strong, clear direction for decision makers about the relative priority that should be given to bushfire objectives vis-a-vis other priorities, particularly the management of native vegetation. Like the state planning policy for bushfire, the WMO fails to explicitly acknowledge that in some areas where the bushfire risk is very high it is not possible for people to live safely without clearing land around dwellings. Contrary to community expectations, there is no connection between application of the WMO and the ability to clear vegetation, without a permit, for fire-protection purposes.[82]	The revised overlay should do the following: ■ provide that new developments in the areas of highest risk in the Bushfire-prone Overlay are strongly discouraged ■ provide that new developments be approved only if minimum defendable space can be created and continually maintained on the property, without unacceptable biodiversity costs, unless the permit applicant can demonstrate that exceptional circumstances justify approving the development with less than minimum defendable space ■ for existing developments, provide that minimum defendable space may be created on the lot without a requirement for a permit to remove vegetation ■ allow councils to use a schedule to the overlay to identify areas of particular environmental or landscape importance and for which a permit is required to remove vegetation to create defendable space around existing developments.
The WMO does not provide enough flexibility to allow for tailored risk treatments. Further, it does not recognise that different levels of bushfire risk can exist in an area and does not provide any means for councils to include local content in a schedule to the overlay or to adapt it to local circumstances.[83]	The revised overlay should do the following: ■ recognise the different levels of bushfire risk identified in the mapping of bushfire-prone areas ■ allow councils to use schedules to adapt the application of the overlay to different risk levels and to local conditions—including to identify areas of particular environmental or landscape importance for which a permit is needed to remove vegetation to create defendable space around existing developments.

Shortcomings	Solution
The WMO specifies water supply requirements for subdivisions in reticulated and non-reticulated areas. The CFA takes reticulated and static water supply into account when assessing applications for a permit to develop dwellings in the WMO. Evidence before the Commission showing that reticulated water supplies failed on 7 February 2009—particularly in Marysville—suggests these requirements should be reviewed. People in areas at risk of bushfire should have a static water supply because they cannot rely solely on a reticulated water supply in the event of bushfire.[84]	The CFA should review the requirements for the supply of water for firefighting purposes in areas with reticulated water, and any amendments deemed necessary should be included in the revised overlay.
Professor Hansen and Ms Pinfold suggested that there is a need to review the permit 'triggers' and exemptions in the WMO, specifically in relation to whether the current uses that require a permit (accommodation, child care centre, education centre, hospital, industry, place of assembly, retail premises and timber production) are appropriate and whether small-scale alterations (less than 50 per cent of the floor area) to existing buildings should require a permit.[85]	The State should review the uses for which a permit is required under the WMO and the exemption from the permit requirement for small-scale alterations, to ensure that they adequately take account of developments with increased bushfire risk exposure.
A planning permit is not at present required for constructing or carrying out works associated with a 'private bushfire shelter' (bushfire bunker). There are, however, several very important planning considerations for bunkers—among them siting, access and egress, and defendable space.	A planning permit should be required for constructing or carrying out works associated with a bushfire bunker.
The WMO-referenced documents are dated, in need of revision and, in the case of one, have not been readily available.[86]	The revised overlay should refer to the following: ■ the revised CFA guidelines for assessing permit applications for dwellings, non-dwellings and subdivisions ■ AS 3959-2009, Construction of Buildings in Bushfire-prone Areas, and HB 330-2009, Living in Bushfire-prone Areas.

6.4.4 THE CFA AS A REFERRAL AUTHORITY

Mr James Fox, the CFA's Manager Community Safety for the Outer Metro Norwest Area, told the Commission that the CFA did not consider the WMO was aimed at preventing development but that it was instead about 'addressing the issues to do with fire risk so that development can happen, development that meets the objectives of the WMO'. The CFA rarely objects to a permit application referred to it under the WMO: in the past three years 2,866 permit applications were referred to the CFA; it objected to 24, required permit conditions for 2,754, and did not object to 88.[87]

The CFA's view that development can usually be accommodated is puzzling. It should be recognised that some places are too dangerous for people to live there, and development should be strongly discouraged in these areas in the first instance. In high-risk areas safety needs to be paramount, and minimum defendable space considerations should therefore not be compromised.

The Victorian Civil and Administrative Tribunal dealt with the approach taken by the CFA in assessing permit applications in a decision it handed down in May 2010 in relation to an application for the subdivision and development of land at St Andrews. The decision was delivered after the Commission had concluded its hearings and receipt of submissions. The parties have not therefore had the opportunity to comment on the decision. The Commission notes that VCAT found the CFA's assessment in that matter as 'somewhat surprising' and concluded that the proposal was unacceptable. This may give some indication of the approach to be taken in such matters in the future.[88]

In the WMO Applicant's Kit the CFA sets out the way it assesses permit applications for dwellings in the Wildfire Management Overlay. It also has guidelines for assessing applications for developments other than dwellings and for subdivisions, which are not as widely available. These documents are very important because councils must take the CFA's advice, as informed by these documents, when determining whether to approve a planning permit.

Dwellings

The WMO Applicant's Kit does not have any formal status in the Victoria Planning Provisions, but councils may refer to it in their planning schemes, as Nillumbik has done. The kit describes a method for assessing the wildfire, or bushfire, risk on a site, as well as three permit options, each with standard permit conditions—for water supply, access and vegetation management.

- Option One applies to a site with low-risk vegetation within 100 metres. The site must have either reticulated water or a static water supply of at least 10,000 litres maintained solely for firefighting, and it must meet minimum design requirements for emergency vehicle access. Vegetation must be managed within 30 metres of the dwelling.
- Option Two applies to a site with higher risk vegetation within 100 metres. The 10,000-litre static water supply requirement is a standard condition, as are minimum design requirements for emergency vehicle access. The vegetation management requirements are more extensive and include management in an area of up to 85 metres around a dwelling.
- Option Three is available where the standard permit conditions for Option One or Option Two are not achievable or are not accepted by the applicant—for example, if the block is too small to achieve the minimum defendable space requirements or if there are major environmental concerns. The applicant must propose an alternative solution (detailing it in a Wildfire Management Statement) that satisfies the fire protection objectives and outcomes of the WMO. Applicants are encouraged to seek expert advice for difficult sites.[89]

Three specific concerns arise from the Commission's examination of the assessment guidelines for dwellings: the need for a stronger stance on defendable space; the need for a review of how defendable space is determined; and inclusion of assessment guidelines for bunkers.

Because of its focus on defendable space as an integral part of preserving human life, the Commission considers that the CFA should not approve a development in the absence of being assured that defendable space exists or can be created and maintained on the site without excessive damage to conservation values. The Applicant's Kit should be revised to eliminate Option Three. Instead, the kit should state that the CFA will approve new developments only if minimum defendable space exists or can be created and maintained on a continuing basis. The sole exception to this is if the permit applicant can demonstrate to the CFA's satisfaction that exceptional circumstances justify approving the development with less than the minimum defendable space. In providing guidance about what could constitute exceptional circumstances, the CFA might wish to consider the role of alternative safety measures such as bunkers.

Expert panel member Mr Chladil expressed some reservations about the WMO Applicant's Kit parameters for defendable space, which are also used in the Household Bushfire Self-Assessment Tool and in the fire protection exemption in clause 52.17, Native Vegetation. In particular, he suggested that these parameters be reviewed in order to incorporate the modelling used in AS 3959-2009. The Commission encourages the CFA to include this modelling as part of its current revision of the Applicant's Kit to take account of the major changes resulting from the adoption of AS 3959-2009.[90]

The Applicant's Kit does not provide guidance on bunkers, or 'private bushfire shelters', since these are a relatively new addition to Victoria's building regime. In addition to the construction requirements for bunkers that have recently been developed nationally and adopted by Victoria, there are several very important planning considerations for bunkers, among them siting, access and egress, the availability of water for firefighting, and defendable space. The revised Applicant's Kit should also set out the CFA's guidelines for assessing planning permit applications for bushfire bunkers.

Use by vulnerable groups

The CFA also assesses applications for non-dwellings in a WMO, including buildings used by 'vulnerable' groups—such as schools, child care centres, hospitals and places of assembly. It assesses the applications against the following 'critical variables' to ensure that appropriate treatments and mechanisms are considered:

- the capacity of the occupants to be involved in active defence
- whether the building will always be occupied and the capacity of occupants to evacuate early
- the likelihood of fire service attendance
- the suitability of AS 3959 for defining construction levels
- whether the development is made up of multiple occupied structures and the practicality of making all of the occupied structures defendable
- the expected population.[91]

Emergency management planning is considered at the planning approval stage. Specifically, consideration is given to two factors:

- including high-risk new developments on the local risk register or wildfire risk plan and the municipal emergency management plan
- including a permit condition that requires an emergency management plan or fire risk management plan that covers, among other things, communication with occupants, equipment, occupant and firefighter safety, and 'triggers' for activating the plan.[92]

Unlike the WMO Applicant's Kit, the CFA practice note for assessing non-dwellings does not appear to be publicly available. It also makes reference to a site assessment tool developed by a private company that is available only through a restricted-access website.[93]

The CFA should review its guidelines for non-dwellings but should continue to give particular attention to emergency management planning and the fire protection measures required for vulnerable uses such as schools, child care centres, hospitals and aged care facilities. The Commission encourages the CFA to take into account the New South Wales provisions for special fire protection–purpose buildings as part of this review.[94]

Subdivisions

In assessing applications for subdivisions in the WMO, the CFA relies on two documents: its 1991 document *Planning Conditions and Guidelines for Subdivisions* and a more recent internal practice note.[95]

The 1991 subdivision guidelines set out requirements for emergency vehicle access and water supply and include specific requirements relating to building protection zones, buffer zones and the setback of buildings within the building envelope that do not appear in the practice note. But the guidelines are not readily available, even within the CFA.[96]

The practice note contains very little beyond the general fire protection objectives and outcomes set out in the WMO. It refers to the 1991 subdivision guidelines but does not otherwise draw on their contents. In particular, it does not set out the specific minimum distances required for building protection zones and fuel-modified buffer zones. It does, however, spell out the importance of ensuring that defendable space is achievable on each lot in the subdivision and that future development of the subdivision should be possible, consistent with the WMO. The note specifically cautions against subdivisions that might create 'Option 3' permit applications in the future, citing the cost and complexity of designing responses that meet the required level of fire protection.[97]

Again, this practice note is not publicly available and, like the practice note for assessing non-dwelling applications, refers to an online site assessment tool access to which is restricted to 'wildfire practitioners'.[98]

The focus on defendable space in the CFA documents for assessing subdivisions is welcome, but it should be made explicit that a subdivision without defined building envelopes around which minimum defendable space can be created will be approved only if exceptional circumstances can be demonstrated. The two main documents the CFA uses to assess permit applications also need to be updated, made consistent and made widely available.

RECOMMENDATION 39

The State amend the Victoria Planning Provisions relating to bushfire to ensure that the provisions give priority to the protection of human life, adopt a clear objective of substantially restricting development in the areas of highest bushfire risk—giving due consideration to biodiversity conservation—and provide clear guidance for decision makers. The amendments should take account of the conclusions reached by the Commission and do the following:

- outline the State's objectives for managing bushfire risk through land-use planning in an amended state planning policy for bushfire, as set out in clause 15.07 of the Victoria Planning Provisions
- allow municipal councils to include a minimum lot size for use of land for a dwelling, both with and without a permit, in a schedule to each of the Rural Living Zone, Green Wedge Zone, Green Wedge A Zone, Rural Conservation Zone, Farming Zone and Rural Activity Zone
- amend clause 44.06 of the Victoria Planning Provisions to provide a comprehensive Bushfire-prone Overlay provision.

RECOMMENDATION 40

The Country Fire Authority amend its guidelines for assessing permit applications for dwellings, non-dwellings and subdivisions in the Bushfire-prone Overlay in order to accommodate the amendments to the Wildfire Management Overlay that are implemented as a result of recommendation 39 and make the guidelines available to municipal councils and the public. The revised guidelines should do the following:

- substantially restrict new developments and subdivisions in those areas of highest risk in the Bushfire-prone Overlay
- set out the CFA's guidelines for assessing permit applications for dwellings, non-dwellings and subdivisions—including the minimum defendable space requirements for different risk levels
- clarify that the CFA will approve new developments and subdivisions only if the recommended bushfire protection measures—including the minimum defendable space—can be created and maintained on a continuing basis
- emphasise the need for enduring permit conditions—in particular, conditions for the creation and maintenance of minimum defendable space to be maintained for the life of the development.

6.5 VEGETATION CONSERVATION

Management of native vegetation is relevant to the Commission's consideration of planning because much of Victoria's native vegetation is highly flammable and managing bushfire risk often involves the removal or modification of native vegetation around dwellings.[99]

The conservation of native vegetation is subject to planning controls—primarily clauses 15.09 and 52.17 of the Victoria Planning Provisions, which are discussed in detail in the following sections. A council can also apply additional vegetation protection controls through one or more of the three environmental and landscape overlays in its planning scheme.

As a consequence of these two objectives—modifying native vegetation around dwellings and conserving native vegetation—the bushfire risk-management measures often intersect and conflict with the Victorian Native Vegetation Management Framework.

The Commission was told by a number of witnesses—among them lay witness Mr Ray Maino—that native vegetation controls were unduly complex, leading to confusion and frustration when trying to interpret and follow the various provisions and exemptions. During the Commission's community consultations in fire-affected areas many residents also expressed concern about regulations governing the removal and retention of vegetation.[100]

6.5.1 CLAUSE 15.09: CONSERVATION OF NATIVE FLORA AND FAUNA

The objective of clause 15.09 of the Victoria Planning Provisions, Conservation of Native Flora and Fauna, is 'To assist the protection and conservation of biodiversity, including native vegetation retention and provision of habitats for native plants and animals and control of pest plants and animals'.[101]

In implementing that objective, councils must have regard to Victoria's Native Vegetation Management Framework. It reflects the National Framework for the Management and Monitoring of Australia's Native Vegetation, in which all Australian governments commit to reversing the long-term decline in the quality and extent of Australia's native vegetation cover. The Department of Sustainability and Environment implements the Victorian framework.[102]

By 2002, when the framework was adopted in Victoria, an estimated 66 per cent of Victoria's 22.7 million hectares of native vegetation had been cleared. Of the remainder, about 7.4 million hectares was on public land and about 1.1 million on private land. At that time an estimated 2,500 hectares of native vegetation was being permanently lost each year.[103] The framework identified two major legacies of this widespread clearing of native vegetation:

> Ecosystems upon which our presence and productivity depend are now beyond the point of sustainability. Evidence of this is in the continuing problems of salinity, soil structure decline, reduced water quality and quantity and increased rates of severe flooding. The biodiversity that built and maintains these ecosystems is also in decline.[104]

To redress the situation, the framework seeks 'reversal across the entire landscape of the long-term decline in the extent and quality of native vegetation, leading to a Net Gain', to maintain biodiversity, increase the viability of threatened species and ecological communities, improve land and water quality, and increase carbon sinks in Victoria.[105]

A net gain is achieved by reducing losses of existing native vegetation and the quality of that vegetation and achieving gains in the extent and quality of native vegetation through rehabilitation and revegetation. The framework establishes a three-step approach for this:

- Avoid adverse impacts, particularly through vegetation clearance.
- If impacts cannot be avoided, minimise them through planning processes and project design or management.
- Identify suitable offset options—that is, actions taken to achieve commensurate gains.[106]

Any clearance of native vegetation must be offset by like-for-like gains that are commensurate with the loss. The conservation significance of the cleared vegetation will determine the stringency of the offset required, there being more emphasis on protecting and improving vegetation of high conservation significance and a more flexible approach to offsetting the clearance of vegetation of lower conservation significance. In practice, native vegetation offsets can result in existing vegetation being protected and managed, an area being revegetated and protected, or an area being set aside for regeneration or restoration. For those who cannot achieve offsets on their own land, DSE runs a service called BushBroker, which accredits providers of offsets available in Victoria. A similar scheme is run by the Trust for Nature, established under the *Victorian Conservation Trust Act 1972.*[107]

6.5.2 CLAUSE 52.17: NATIVE VEGETATION

Clause 52.17 of the Victoria Planning Provisions, Native Vegetation, applies across planning schemes and is instrumental in implementing the framework through the planning system. The purpose of the clause is 'to protect and conserve native vegetation to reduce the impact of land and water degradation and provide habitat for plants and animals' by taking the following action:

- avoiding the removal of native vegetation
- minimising native vegetation removal through planning and design
- offsetting the loss of native vegetation if removal cannot be avoided
- removing native vegetation in accordance with a property vegetation plan
- managing vegetation near buildings to reduce the threat to life and property from wildfire.[108]

Central to the operation of clause 52.17 is the requirement for a permit to 'remove, destroy or lop native vegetation, including dead native vegetation'. 'Native vegetation' is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'.[109]

A council must refer an application for a permit to remove native vegetation to DSE if particular referral 'triggers' exist. The triggers include removing more than 15 immature trees or more than five mature trees and removing more than 0.5 hectares of endangered, vulnerable or rare vegetation or more than 1 hectare of depleted or 'least-concern' vegetation.[110]

Clause 65 of the Victoria Planning Provisions requires a council to have regard to the degree of fire hazard associated with the land, but there is apparently no requirement for DSE to have regard to fire hazard, and fire risk is not included in DSE's guide to assessing permit applications.[111]

A number of exemptions enable clearing of vegetation without a permit for a range of purposes, among them to remove native vegetation for a fire protection purpose. The parts of the exemption that are most relevant to creating and maintaining defendable space around a home allow for removal or modification of the following for fire protection:

- a tree overhanging the roof of a building used for accommodation
- native vegetation within 30 metres of a building used for accommodation—except for trees and provided that at least 50 per cent of native shrubs are retained and native grasses are kept to at least a height of 100 millimetres
- native vegetation within up to 100 metres of a building used for accommodation, provided the conditions just noted are met and a plan is submitted to DSE.[112]

The exemption allowing creation of defendable space within 30 metres of a home is relatively straightforward and has been simplified with the introduction of clause 52.43, Interim Measures for Bushfire Protection, which is discussed in the next section.

Compliance with the exemption that allows clearing up to 100 metres from a house is more onerous because a person wanting to apply the exemption must calculate the exact distances that apply on the basis of the vegetation category, the slope, and whether the vegetation is in the north-western or eastern zone of the property. The method for calculating defendable space is consistent with the WMO Applicant's Kit and the CFA's Household Bushfire Self-Assessment Tool. The exemption also requires that the applicant submit a plan to DSE. DSE's approval of the plan is not required, but the department can take action if the plan does not comply with clause 52.17. Although this exemption has been in operation since September 2006, DSE has not received any plans under it. The State should reconsider whether the exemption is still required in the light of the Commission's recommendation that people be able to create defendable space around existing properties in the Bushfire-prone Overlay without a permit.[113]

6.5.3 CLAUSE 52.43: THE 10/30 RULE

Clause 52.43—widely known as the '10/30 right' or the '10/30 rule'—is in effect from 10 September 2009 until 31 August 2010. It allows the removal without a permit of some vegetation for bushfire protection purposes. This includes the following:

- any vegetation within 10 metres of a building used for accommodation
- any vegetation, except for trees, within 30 metres of a building used for accommodation
- any vegetation for a combined maximum width of 4 metres either side of a fence on a boundary between properties in different ownership
- fuel-reduction burning on the roadside of an existing public road
- removing fallen wood for personal use from the roadside of an existing public road.[114]

The clause applies only to the planning schemes of non-metropolitan councils and only to existing developments constructed or approved before 10 September 2009. It applies in addition to any other exemption in a planning scheme and overrides any requirement in an overlay for a permit to remove vegetation. The main differences between this new clause and the existing exemptions to clause 52.17 are that there is no requirement to retain 50 per cent of shrubs within the area between 10 and 30 metres from the building and there is no requirement to maintain native grasses at a height of 100 millimetres. The main virtue of the new provision is that it simplifies and clarifies what was already permitted.[115]

There is, however, concern that, in an effort to achieve simplicity, clause 52.43 might permit the destruction of vegetation to the overall detriment of the community and the environment because it overrides any environmental and landscape overlay that has been applied in a planning scheme.[116] This is discussed in Section 6.6.1.

6.5.4 ENVIRONMENTAL AND LANDSCAPE OVERLAYS

The Victoria Planning Provisions contain three environmental and landscape overlays that can be applied in a planning scheme:

- The Environmental Significance Overlay identifies areas where the development of land can be affected by environmental constraints and ensures that development is compatible with identified environmental values.
- The Vegetation Protection Overlay protects areas of significant vegetation, including ensuring that development minimises loss of vegetation.
- The Significant Landscape Overlay identifies significant landscapes and conserves and improves the character of significant landscapes.[117]

Where any of these overlays applies, the requirements of the overlay are in addition to clause 52.17, Native Vegetation. A permit is required to remove, destroy or lop vegetation that is protected by an overlay. There are fire protection exemptions to the requirement for a permit in the overlays, but they are more restrictive than the conditions contained in clause 52.17. As with clause 52.17, there appears to be no requirement for DSE to consider fire hazard or fire protection when assessing a referred application.[118]

6.6 BALANCING THE CONSERVATION OF NATIVE VEGETATION AND THE MANAGEMENT OF BUSHFIRE RISK

Many of the witnesses before the Commission raised the question of balancing measures designed to mitigate bushfire risk with the conservation of native vegetation. Striking such a balance is a challenge at all levels, but the Commission was especially concerned to hear about the difficulties it causes councils when they are deciding on permit applications because there is a lack of strategic direction about how to balance competing objectives. Individuals also encounter problems when they want to clear land for fire protection purposes around their existing homes.

The expert panel accepted that considerable weight should be given to biodiversity conservation—not only for native vegetation but for all flora and fauna and particularly threatened species—in planning. They thought the balance between biodiversity conservation and protection against bushfire was best struck at the strategic level, using high-quality information, so that development could be concentrated in areas of lower biodiversity value. Panel members also stressed that this high-level policy should be reflected in decision making at the permit application stage, to enable an assessment of the biodiversity costs of an application by, for example, considering the amount of vegetation clearing required to create the defendable space necessary for new developments and subdivisions.[119]

In his report Mr Chladil noted that native vegetation measures were technically complex and were highly weighted in the planning system. He observed, 'To me (an outsider) it appears that the Native Vegetation Management policy in Victoria is positioned to be a "must have" while relegating bushfire safety to a "nice to have"'.[120]

There was widespread agreement with this observation among panel members, although Dr Buxton did not accept the characterisation of the framework as 'must have'. He suggested that, despite the complex regulatory arrangements, the first two elements of the framework—avoiding and minimising removal of native vegetation—were not widely adopted and that there is 'still extensive, continuing clearing' in Victoria.[121]

The Commission proposes in recommendations 39 and 40, that the State provide strategic leadership by amending key clauses of the Victoria Planning Provisions to clarify how bushfire risk management and biodiversity conservation should be balanced. The Commission also considered the following related matters:

- biodiversity concerns arising from the 10/30 rule
- DSE's consideration of bushfire risk in its role as a referral agency for permits to clear land around existing properties
- the difficulty of securing offsets where removal of native vegetation has been allowed
- biodiversity mapping
- fire-resistant vegetation.

6.6.1 THE 10/30 RULE: BIODIVERSITY CONCERNS

The 10/30 rule was introduced as an interim measure for simplifying vegetation controls for fire protection purposes around existing buildings. It is a welcome measure, but there are some difficulties associated with it:

- It does not permit clearing beyond 30 metres from a house or other building used for accommodation, and a permit might still be required to create the minimum defendable space recommended by the CFA if an exemption under clause 52.17 does not apply.
- There is no link between the 10/30 rule and the Wildfire Management Overlay. This is understandable considering the imperfect application of the WMO to date.
- It is a one-size-fits-all solution, and there is concern about whether the rule could be used to permit widespread clearing to the detriment of important environmental or landscape values.[122]

Implementation of recommendation 39 should alleviate these problems because it would include a general provision that no permit will be necessary for removing vegetation to create minimum defendable space on existing developments in the Bushfire-prone Overlay, but that councils will be able to identify areas where this provision should not apply and a permit is required. Exceptions to the general provision should be included in a schedule

to the Bushfire-prone Overlay so that the rules applying to vegetation clearing for defendable space remain in just one place in a planning scheme.

Implementation of recommendation 39 would also allow the extent of clearing permitted for fire protection to be linked to an applicable risk level, based on more accurate bushfire hazard mapping and application of the Bushfire-prone Overlay, rather than the arbitrary measures in the 10/30 rule. This might not be as simple as the 10/30 rule, but it would be a more evidence-based and robust approach, and the CFA could provide detailed guidelines to help people understand the rationale and approach to assessing permit applications for dwellings, non-dwellings and subdivisions.

Although the Commission considers the 10/30 rule has been a useful interim measure, the rule should not continue to be used once clause 44.06 and the CFA's assessment guidelines are revised and comprehensive bushfire-prone area mapping is completed. The State agreed with this proposition in its submissions.[123]

6.6.2 CONSIDERATION OF BUSHFIRE HAZARD BY THE DEPARTMENT OF SUSTAINABILITY AND ENVIRONMENT

The intent of the changes proposed in recommendation 41 is to make it easier for people to create and maintain defendable space around homes located in the Bushfire-prone Overlay, but a permit will still be required for removing native vegetation in some circumstances and the permit application might be referred to DSE for advice if the relevant triggers, discussed in Section 6.5.2, exist. At present there is no requirement for DSE to consider bushfire hazard or fire protection purposes when assessing a referred application for a permit to remove native vegetation around an existing development. There is no evidence before the Commission that this has led to DSE rejecting such an application, but minimising fire hazard should be an explicit consideration both for DSE, as the referral authority, and for responsible authorities, such as councils. DSE should also consult with the CFA in the development and publishing of guidelines for assessing an acceptable level of native vegetation removal for bushfire risk mitigation, to ensure that the approaches taken by the two agencies are not in conflict.[124]

RECOMMENDATION 41

The State:

- amend the Victoria Planning Provisions to require that, when assessing a permit to remove native vegetation around an existing dwelling, the responsible authority and the Department of Sustainability and Environment, as referral authority, take into account fire hazard and give weight to fire protection purposes
- develop guidelines for determining the maximum level of native vegetation removal for bushfire risk mitigation, beyond which level the application would be rejected.

6.6.3 NATIVE VEGETATION OFFSETS

Allowing people in the Bushfire-prone Overlay to clear defendable space around their homes without a permit should reduce the requirement for native vegetation around homes to be offset. Offsets might still be required for clearing in those areas of particular environmental or landscape importance where councils already require a permit to remove vegetation around existing properties. For new developments, the Native Vegetation Management Framework's net gain requirements will apply, so offsets will be required where a permit is granted to remove vegetation.

Expert panel member Mr Brett Lane, a specialist ecological consultant, outlined the difficulties individual landholders face in finding offsets for the removal of small amounts of vegetation and the questionable benefit of the offsets achieved:[125]

> It is my view that in a situation where you have multiple individual separate landholders wanting to remove small bits of vegetation in order to protect their property from fire … it is not practical to expect each of them to go out and find an offset. Even if they did, you would end up with a series of random tiny little offset sites spread across the countryside with absolutely no strategic view as to how they work together to actually achieve a biodiversity conservation outcome.[126]

The time and effort required for individual landholders to achieve offsets was illustrated by the evidence of Ms Eva Matthews of Steels Creek, who told the Commission of long and costly delays in obtaining permission to clear native vegetation to build a home at that location.[127]

The Commission also heard evidence that at present the demand for offset sites exceeds the number of sites registered with schemes such as BushBroker and the offset scheme run by the Trust for Nature and that it is difficult to arrange an off-site offset relatively quickly. The State informed the Commission that DSE operates a limited program whereby landholders can buy offsets for trees over the counter and is working with a number of councils to establish local offset schemes that allow councils to accept payment in exchange for obtaining offsets on behalf of landowners. The Commission encourages this work and urges the State to expand the BushBroker scheme so as to increase the number of sites registered.[128]

The Commission agrees, however, with Mr Lane's suggestion that DSE develop a collective offset solution. Such a scheme would differ from the BushBroker scheme, which brokers individual offsets, in that it would pool funds contributed by individual landholders seeking to offset small removals in order to create a larger scale offset with greater biodiversity value.

RECOMMENDATION 42

The Department of Sustainability and Environment develop and administer a collective offset solution for individual landholders who are permitted to remove native vegetation for the purpose of fire protection.

6.6.4 BIODIVERSITY MAPPING

A recurrent theme in the panel of experts' written statement and in their panel discussion concerned the need for thorough biodiversity mapping that identified flora, fauna and any protected, vulnerable or threatened species. As noted in Chapter 7, this subject was also raised by the expert panel for land and fuel management. Such mapping would greatly help councils and the wider community in their efforts to accommodate biodiversity considerations when aiming to manage bushfire risk. DSE is already doing high-resolution biodiversity mapping as part of the process of precinct structure planning for Melbourne's growth areas. This mapping should be done across the state. It would be useful in more areas than planning and would be of particular value in relation to fuel-reduction burning on public land and roadside management.[129]

RECOMMENDATION 43

The Department of Sustainability and Environment conduct biodiversity mapping identifying flora, fauna and any threatened species throughout Victoria and make the results publicly available. The format used should be compatible with that used for Bushfire-prone Area mapping.

6.6.5 FIRE-RESISTANT VEGETATION

A final consideration in connection with balancing native vegetation conservation and the management of bushfire risk is the use of fire-resistant vegetation as a risk-mitigation measure. Much of Victoria's native vegetation is fire dependent and highly flammable. In the 1980s and 1990s the CFA advised the community about the use of fire-resistant vegetation in landscaping and, among other things, provided a list of species that burn less readily than others. Its current advice, however, is that 'There is no such thing as a "fire retardant" or "hard to burn" plant' since 'all plants will burn given the right fire conditions'. The advice notes that different plants burn differently, according to factors such as age, environment, season and water availability. This advice is so general as to be quite unhelpful.

Of course, all plants will burn in the right conditions, but it is equally the case that some plants burn far more readily than others. The Tasmania Fire Service, the South Australian Country Fire Service, the ACT Planning and Land Authority and CSIRO all provide more specific advice about choosing and planting less flammable plants. Ms Sturzenegger had no difficulty with the idea of the CFA providing this kind of information to the community.[130]

RECOMMENDATION 44

The Country Fire Authority produce for community guidance material on fire-resistant landscape and garden design, including a list of fire-resistant species.

In the light of the information other states and the ACT provide about fire-resistant vegetation as a bushfire risk–mitigation measure, the Commission was concerned to hear from lay witness Ms Eva Matthews of Steels Creek that a condition on her planning permit required that 85 per cent of new plantings in the 10-acre (4-hectare) development zone where her house was to be built be native vegetation. This condition was imposed at the same time as a WMO permit condition requiring the creation and maintenance of defendable space around the home was imposed.[131]

Although there is no evidence before the Commission that administration of the framework has required landowners to plant flammable native vegetation in preference to fire-resistant vegetation within their defendable space, it is conceivable that this could occur under the current arrangements.[132] The Commission strongly discourages DSE and councils from implementing clause 52.17 of the Victoria Planning Provisions or 'Native Vegetation Management—a framework for action' so as to limit the ability of landowners to plant fire-resistant vegetation in their minimum defendable space or to require them to plant native vegetation within that space.

6.7 LOCAL PLANNING SCHEMES

The Commission looked at how the planning schemes of Nillumbik, Murrindindi and Latrobe Councils deal with bushfire risk management and vegetation conservation. All three schemes make use of some of the main provisions of the Victoria Planning Provisions, such as clause 52.17, and apply the Wildfire Management Overlay to some extent. Their case studies demonstrate that balancing the objectives of bushfire protection and maintaining biodiversity at the local level varies considerably.

Box 6.4 Bushfire risk management and vegetation conservation: Nillumbik, Murrindindi and Latrobe Councils

Nillumbik

The Shire of Nillumbik, north-east of metropolitan Melbourne, covers 430 square kilometres and has a population of about 62,000. About 90 per cent of the shire's population lives in urban areas, the main townships being Eltham, Diamond Creek, Hurstbridge and Greensborough.

Nillumbik's planning scheme allows for a comprehensive approach to both bushfire risk and native vegetation management. It identifies high fire risk as an important environmental concern, gives prominence to conservation of native flora and fauna, and highlights the possible tension between managing bushfire risk and biodiversity conservation. The shire's Local Planning Policy Framework specifically deals with bushfire hazard and includes a comprehensive, well-constructed wildfire management policy. The Wildfire Management Overlay has applied in Nillumbik since December 2005 and applies to 64 per cent of the municipality.

The Local Planning Policy Framework has a strong emphasis on biodiversity conservation, which is implemented in part by use of the Environmental Significance Overlay and the Significant Landscape Overlay, but the overlays also recognise bushfire risk. Although the ESO restricts the removal of vegetation on significant sites, it does include a fire protection exemption. The SLO implements Nillumbik's neighbourhood character policy, which involves retaining and planting native vegetation but also requires that buildings and landscaping be designed and sited to minimise bushfire risk and stipulates that defendable space should be maintained around dwellings.

Nillumbik Shire Council has adopted its own native vegetation offsets management policy, which provides that where on-site offsets are not practical the council considers making public land available for this purpose or accepting a payment to fund planting and maintenance on private or council land in lieu of an offset.[133]

Murrindindi

Murrindindi Shire, north-east of Nillumbik, covers 3,889 square kilometres and has a population of about 14,000 people. The main population centres are Alexandra, Yea and the Kinglake Ranges. The shire is very hilly, and about 46 per cent of the land area is forest and public land.

There is no clear planning response to bushfire risk in the Murrindindi planning scheme. The Local Planning Policy Framework does not specifically address bushfire risk management and, although it mentions bushfire risk—most notably in relation to the lack of reticulated water in some townships—no coherent approach to managing the risk is described. Application of the Vegetation Protection Overlay means a permit is required to remove any vegetation in Marysville. This is subject to exemptions in the VPO and in VPO Schedule 1, but the exemptions are more restrictive than those in clause 52.17 of the Victoria Planning Provisions.

The Wildfire Management Overlay has applied in Murrindindi since July 2004, but many areas in the shire that were burnt in February 2009 were not covered by the WMO, among them Marysville, Kinglake and Pine Ridge Road in Kinglake West.[134]

In January 2010 the council amended its Local Planning Policy Framework to include a policy and strategies for rebuilding Marysville and policies for the Marysville business and residential areas. One aspect of the rebuilding policy involves the intention to ensure that 'Marysville is rebuilt as a scenic mountain village located in an attractive setting in the Steavenson River valley enclosed by vegetated forest and hills'. There is no mention of the known bushfire risk or how it is to be taken into account in rebuilding the town.

Latrobe

The City of Latrobe is based in the Latrobe Valley, about 140 kilometres east of Melbourne. It covers an area of 1,400 square kilometres and has a population of about 73,500. The four main urban areas are Traralgon, Morwell, Moe–Newborough and Churchill.

In January 2010 Latrobe City Council adopted a new Municipal Strategic Statement (see Appendix C), which now constitutes the Latrobe Local Planning Policy Framework. The MSS contains high-level objectives and strategies for identifying bushfire risk and ensuring that new developments do not increase risk and do include adequate fire protection measures. The main way these objectives and strategies are implemented is through application of the Wildfire Management Overlay, which has applied since April 2007. The MSS also covers native vegetation and biodiversity objectives and strategies. Latrobe makes limited use of the Environmental Significance Overlay to provide a buffer between urban areas and coal-mining and electricity-generating areas and to protect water catchments. It does not apply either the Vegetation Protection Overlay or the Significant Landscape Overlay.[135]

Nillumbik, Murrindindi and Latrobe Shires exemplify the fact that, despite high levels of bushfire risk, councils do not always pay sufficient attention to mitigation measures by adopting planning controls in their planning schemes. The Commission's proposed changes to the Victoria Planning Provisions, requiring a specific bushfire policy in the Local Planning Policy Framework of every council where the Bushfire-prone Overlay is applied, would ensure that bushfire risk management is given more appropriate consideration in future. The model policy recommended by the Commission would also ensure a higher level of consistency among councils.

The Commission is alarmed, however, that Murrindindi Shire Council recently amended its Local Planning Policy Framework to include policies for rebuilding Marysville without reference to the mitigation of bushfire risk. The council should urgently incorporate bushfire risk management in its planning activities, starting with adopting a bushfire policy in its Local Planning Policy Framework. This should not wait for changes to the Victoria Planning Provisions.

RECOMMENDATION 45

The State press municipal councils—in particular, Murrindindi Shire Council—to urgently adopt a bushfire policy in their Local Planning Policy Framework and incorporate bushfire risk management in their planning policies and strategies for rebuilding communities such as Marysville, Kinglake and others affected by the January–February 2009 fires.

6.8 HIGH-RISK AREAS

Planning policies and controls such as the Wildfire Management Overlay are designed to apply to decision making about whether new development should proceed and, if so, what bushfire measures should be applied. They are not designed to mitigate bushfire risk for existing developments, including townships, in high-risk areas.

Planning's limited capacity to treat existing risk highlights the need for a rethinking and redesign of settlements and towns that were destroyed by fire on 7 February 2009, but the opportunity was lost with the early commitment to rebuilding these communities 'brick by brick'.

The Commission understands the imperative to rebuild, but to rebuild without any real thought being given to the future management of bushfire risk is to fail to learn from experience. The Commission notes the State's efforts to quickly rebuild homes and communities in order to help people heal and to deal with practical problems such as homelessness. It considers, however, that this has put short-term social welfare considerations above the longer term safety of the community.[136] Murrindindi Shire Council's Local Planning Policy Framework illustrates this wish to rebuild without considering how to accommodate future bushfire risk.

The new Bushfire-prone Overlay the Commission proposes would allow for vegetation clearing for fire protection purposes around existing dwellings, but there could be circumstances when this would not be enough. In these cases communities might need to rely on other mechanisms for dealing with bushfire risk. Many of the alternatives—for example, fuel management on public land, the construction of refuges and shelters, and options such as evacuation planning—are discussed elsewhere in this report. They will be most effective when they are taken as part of an integrated fire management plan.[137]

In its hearings dealing with the fire-related deaths the Commission examined particular localities, all of them close to bush and posing an unacceptably high threat to human safety. For example, Pine Ridge Road in Kinglake West remains an extraordinarily high risk location: it consists of a number of small lots on top of a ridge surrounded by national park. Every house in the street was destroyed by fire on Black Saturday. Landowners there have little option but to rebuild if they cannot sell and move on.[138] But if they rebuild the risk to life and property returns; if they sell their land to someone else who then rebuilds the risk is merely transferred to someone else. Were they able to sell their land to the State, that land could be used to create a buffer for Kinglake West, they could resettle elsewhere, and the problem of the risk would be redressed. The Commission notes the State's concern about this proposal, including in connection with the short- to medium-term risk for those who choose to remain in such a high-risk location. The Commission has, however, set its sights on long-term solutions.

Figure 6.7 Pine Ridge Road before the fire

Source: Exhibit 681 – Pine Ridge Road – Pre-fire Aerial Photography.[139] (Showing property boundaries.)

Figure 6.8 Pine Ridge Road after the fire

Source: Exhibit 681 – Pine Ridge Road – Post-fire Aerial Photography.[140] (Showing property boundaries.)

In view of the extent of existing development in rural areas, the commitment to rebuild following 7 February, and the slow progress in establishing shelters and refuges, it might be necessary to help people move out of areas where the bushfire risk is greatest. One option for existing developments in areas of unacceptably high risk is a retreat-and-resettlement strategy that encourages people living in those areas to move somewhere safer. An aspect of such a strategy should be the non-compulsory acquisition by the State of land from people who want to sell and resettle. If they cannot sell their land many landowners in areas of extreme risk will be financially unable to move to a safer location. This proposal is not without precedent. The Commission heard evidence from Dr Buxton that over 30 years successive Victorian governments created a fire buffer zone in the Dandenong Ranges through extensive compulsory acquisition and restructuring of often inappropriately subdivided residential lots, with the objective of separating residential development from areas of high fire risk. Dr Buxton estimated that this policy prevented tens of thousands of people from building properties in what was historically identified as an area of extremely high bushfire risk.[141]

In developing the retreat and resettlement strategy the State should consider a number of factors:

- focusing on land that is near to or adjoining public land
- giving priority to acquiring land that is in an area of unacceptably high bushfire risk and on which dwellings were damaged or destroyed by the 2009 bushfires
- determining criteria for 'unacceptably high risk', with particular reference to the availability of other risk-mitigation measures such as shelters and refuges
- using non-compulsory land acquisition as a last resort only, when other options—such as creating defendable space around a dwelling and installing a bunker—are not feasible
- allowing an application for acquisition to be initiated by a landowner or recommended by the State
- the duration of the strategy and the available funds.

RECOMMENDATION 46

The State develop and implement a retreat and resettlement strategy for existing developments in areas of unacceptably high bushfire risk, including a scheme for non-compulsory acquisition by the State of land in these areas.

6.9 BUILDING REGULATION

Building in bushfire-prone areas of Victoria is regulated in three ways:

- by Victorian legislation—the *Building Act 1993* and the Building Regulations 2006
- by a national building code—the Building Code of Australia, which includes specific bushfire provisions and is adopted in the State's Building Regulations
- by an Australian standard adopted in the Building Code of Australia—AS 3959, Construction of Buildings in Bushfire-prone Areas.

The Building Act and Regulations, which are administered by the Building Commission, regulate building standards and building work in Victoria. The Regulations establish building standards, primarily by adopting the Building Code of Australia and the standards referred to in it. Operation of the BCA and the relevant standards is detailed in Appendix B. Bushfire construction provisions contained in the BCA are one element of the building standards. The provisions apply only to building work in designated Bushfire-prone Areas, which are determined by each state and territory. Building work must be carried out in accordance with the Building Act and Regulations, including the building standards. Municipal and private building surveyors are responsible for issuing building and occupancy permits and ensuring that a building meets all the relevant requirements.[142]

National standards for building in bushfire-prone areas are based on research about how houses burn in bushfires. Post-bushfire surveys—including those conducted in Beaumaris after the 1944 fires, in Macedon and the Otway Range after the 1983 Ash Wednesday fires, around Sydney after the January 1994 fires, and in Duffy after the 2003 Canberra fires—have highlighted two major themes:

- Most houses damaged or destroyed were ignited by wind-borne embers, rather than by direct flame contact or radiant heat.
- The presence of people able to put out spot fires greatly increased the likelihood of a building surviving.[143]

There is a clear relationship between the severity of weather conditions and building losses from bushfires. A recent study found that most building losses occurred under very intense weather conditions, when the Forest Fire Danger Index exceeded 100. The FFDI is calculated using data on wind speed, temperature, humidity and drought conditions. Each of these factors influences the severity of a bushfire, as well as buildings' vulnerability to ignition.[144]

The insights provided by post-bushfire surveys have been added to by experimental studies, which typically focus on the performance of specific building components—for example, timber, windows and window shutters, and water tanks. The results of these two forms of empirical research have been used to develop risk and vulnerability models, including the Wilson House Survival Meter, the House Ignition Likelihood Index and the CFA's Household Self-Assessment Preparedness Tool.[145]

Mr Leonard from CSIRO outlined the ways buildings are damaged or destroyed during bushfires. All of them have implications for the standards of building construction:

- *Ember attack.* Ember attack can occur before, during and after a firefront has passed and is more intense in hot, dry and windy conditions. It persists for the longest time and affects areas that are not reached by the main firefront. Recent studies show that houses were destroyed at around 700 metres from continuous vegetation in the 2003 Canberra bushfires and in Kinglake during the 7 February fires. Embers can ignite a building through direct contact, igniting combustible gases, entering through a small gap in the building structure (for example, a vent), or igniting something near the building.[146]
- *Radiant heat.* This can come from the firefront or from combustible elements on or near a building. Such heat can cause structural failure (melting or cracking), heat a building component to the point that gases ignite (either from embers or spontaneously) or dry the surface of the material, increasing its flammability.[147]
- *Flame contact.* Flame contact occurs across shorter distances than ember attack and radiant heat and can come from the firefront or other sources. Risk of direct flame contact is influenced by the siting of the building and the amount of fine fuels close to the building or heavier fuel sources such as fences and decks close by. The combustibility of external building elements is crucial to a building's vulnerability to ignition from direct flame contact.[148]
- *Convective heat.* This is the effect hot gases, such as hot air from a bushfire, have on a building's predisposition to ignition by another source. Hot winds that heat and dry a building and surrounding structures before a firefront arrives increase the risk of ignition and can also shrink timber, creating gaps in the building's facade.[149]
- *Strong winds.* These are a defining feature of extreme fire weather. Wind can dislodge building components and thus expose areas inside the building to fire, create an air pressure difference between the inside and outside of the building that drives flames through small gaps in the building, and increase the rate of moisture loss from building components. The effects of wind can be reduced by designing and constructing a building to withstand high wind loads and through siting and surrounding vegetation.[150]

Of course, a building will often be subjected to more than one attack mechanism, and the combination can be what causes ignition and burning. For example, high winds can lift roof tiles, allowing embers to enter the roof cavity, or radiant heat can cause windows to break, allowing embers and flames to enter the building and ignite its contents.[151]

In bushfires, and in the absence of human intervention, once a building catches fire it is most likely that it will burn to the ground. Buildings that are only partially damaged by bushfire are rare and this usually occurs only where part of the building is saved by occupants or fire brigades fighting the fire. For this reason research into building performance in bushfires and building standards in bushfire-prone areas has focused on factors that contribute to the initial ignition of the building.[152]

The Commission notes that building standards do not and cannot guarantee a home will not burn down. They are, at present, designed to reduce the risk of ignition during the passage of the firefront. In the case of ferocious fires, such as those experienced on 7 February, this passage took much longer than under more usual fire conditions. Under such extreme conditions the protection offered by even well-constructed buildings is diminished.[153]

Box 6.5 Explosion

A number of witnesses reported seeing buildings explode during the fires of 7 February. These observations do not accord with the accepted scientific understanding of how buildings ignite and burn in a bushfire. Mr Leonard noted that the explosion of things such as gas bottles, paint tins and aerosol cans is sometimes mistaken for a building explosion once a building is on fire. He added, 'It may be technically possible for a building to explode, however it must first be filled with combustible gases and later detonated, meaning that the building or an isolated region of the building would be untenable prior to the explosion'. He concluded:

> Apart from the possibility of the building filling with combustible gas from an unusual failure of gas supply infrastructure, CSIRO is not aware of any plausible theory being discussed by scientists that would explain how a building may explode during the passage of a firefront due to the fire effects that the main firefront imposes.

Researchers have investigated a number of instances in which houses were reported to have 'just exploded' and in each case have found that the house ignited some time before the actual explosion and subsequently detonated a substance such as fuel, gas or paint that was inside the burning house. No studies have confirmed a case of a house exploding as a result of external exposure to a bushfire.

Mr Leonard also confirmed that researchers had found evidence of 'catastrophic rupture' of gas bottles when dislocation of the bottles had prevented the venting valve from working effectively. It seems probable that a number of observations of houses exploding are associated with the venting of gas bottles in or near those houses.[154]

6.9.1 AS 3959: CONSTRUCTION OF BUILDINGS IN BUSHFIRE-PRONE AREAS

AS 3959 was first published in 1991 and has evolved over three editions—AS 3959-1991, AS 3959-1999 and AS 3959-2009. It provides rules and guidelines for the construction of elements of buildings, such as floors, walls, windows, doors, roofs, verandas and decks, and water and gas supply pipes. Despite this standard being crucial to providing effective guidance on construction of buildings in bushfire-prone areas, the process for revising, producing and publishing this guidance has been fraught with difficulty. It has not delivered timely regulation.[155]

6.9.2 REVISION OF AS 3959-1999

The full revision of AS 3959-1999 began in late 2001. Following the Canberra bushfires in January 2003, the Australian Building Codes Board stressed the importance of revising the standard in a timely manner to the committee undertaking the review. Even though it was expected that the new edition would be published in September 2003, the revised standard was not put to a final ballot of the committee until 27 February 2009, despite requests from the ABCB and a recommendation by COAG's 2004 National Inquiry on Bushfire Mitigation and Management that it be finalised as a matter of priority. There were several reasons for the long delay:

- The committee responsible for the standard—the FP-020 Committee—had to review over 490 comments received on the original public consultation draft and more than 1,100 comments on a further draft issued in February 2005.
- Four subcommittees were established to consider specific matters in depth.
- Standards Australia was concurrently developing and publishing two important standards for testing the performance of building materials subjected to simulated bushfire attack (AS 1530.8.1 and AS 1530.8.2) that were to be extensively cited in the revised edition of AS 3959.
- Committee members disagreed about the flame temperature for the site assessment methodology and whether to include deemed-to-satisfy provisions for the Extreme and Flame Zone categories.[156]

The question of flame temperature was finally resolved in April 2007, when the ABCB agreed that regulators would make the decision on the basis of policy considerations and the level of stringency required. The ABCB also determined that if a category of Flame Zone was to be included in the new edition of AS 3959, a deemed-to-satisfy construction solution for that category would be necessary.[157]

6.9.3 PUBLICATION AND ADOPTION OF AS 3959-2009

In the aftermath of the 7 February 2009 fires considerable pressure was brought to bear on Standards Australia to publish the revised standard quickly, and the ABCB and Standards Australia moved to finalise the standard with much more urgency than had previously been evident. Standards Australia initially proposed to publish an interim standard that could be adopted in Victoria but ultimately, at the request of the Victorian Government, proceeded to finalise the fully revised edition for publication.[158]

A special meeting of the FP-020 Committee was held on 25 February 2009 to finalise the pre-ballot draft. Some, but not all, of the points of disagreement were resolved at the meeting. The main questions that remained unresolved concerned the inclusion of the Bushfire Attack Level for the Flame Zone, or BAL-FZ, and prescription of deemed-to-satisfy construction solutions for that level.[159]

At the close of the ballot, on 4 March, five of the 20 votes received were negative. The representatives of the Australasian Fire and Emergency Service Authorities Council, CSIRO and the Fire Protection Association Australia voted against publication; they were concerned about the inclusion of deemed-to-satisfy solutions for BAL-FZ (see Section 6.9.5). The ballot had not achieved consensus. Although the FPAA subsequently agreed to publication of the standard on the condition that it include comments noting the association's reservations, the continued opposition of CSIRO and AFAC had to be considered by the Standards Development Committee. It met on 5 March 2009 and resolved to publish the standard, notwithstanding the opposition of these two major interests. It was, however, agreed to include the following notation in the preface to AS 3959-2009:

> **Construction in Flame Zone**
>
> Whilst the majority of the Committee support the full Standard, unanimity was not reached on aspects related to BAL-FZ Flame Zone. The Committee will be asked to review this Standard, including Flame Zone construction, in light of relevant outcomes of the Victorian Royal Commission into the February 2009 bushfires.[160]

AS 3959-2009 was finally published on 10 March 2009. It was adopted in Victoria the following day with the making of the Interim Building Regulations, and was cited in the 2010 edition of the Building Code of Australia.[161]

The lengthy history of the revision of AS 3959-1999 and the eventual publication of AS 3959-2009 reflect poorly on both Standards Australia and building regulators, in particular the ABCB. It is unfortunate that regulation of a matter of public safety should have been allowed to drift for nearly eight years—and for five years after the 2004 COAG Inquiry recommended that it be completed as a matter of priority. Resolution of difficult and important policy matters such as the level of stringency required of the standard and whether deemed-to-satisfy solutions should be prescribed for the Flame Zone should not be left to a technical committee consisting of volunteers who must try to reach consensus and are not accountable for the timeliness of their decision making. While there has been some recognition of these problems, there is currently no clear commitment to adopting a more efficient process.

Box 6.6 Standards Australia's development pathways

Although consensus-based standards development offers advantages for the legitimacy and implementation of the resulting standards, an outcome within a given time frame cannot be guaranteed.

The Standards Australia business model offers a choice of development pathways, including development led by committees, development in collaboration with interested parties, and development led and resourced by Standards Australia.

To date AS 3959 has been developed under the Standards Australia–led pathway. The Chief Executive Officer of Standards Australia, Mr John Tucker, told the Commission that future development and revision of the standard were likely to occur under the collaborative pathway. This would involve interested parties (such as the Australian Building Codes Board) and Standards Australia jointly leading and resourcing the project through a negotiated sharing of responsibility.

On 4 November 2009 Standards Australia announced it would introduce revised governance and budgeting arrangements for the Standards Australia–led pathway to ensure that it can make progress with priority projects that deliver safety, community or economic benefits and cannot be financially resourced by stakeholders.

The Commonwealth prefers that AS 3959 continue to be developed using the Standards Australia–led pathway. The Commission considers, however, that a different approach, with agreed resource allocation and greater flexibility to achieve more timely outcomes, is required. It sees the collaborative pathway as a better option for future work on AS 3959 because the pathway is designed to maintain collaboration while ensuring timely progress. The State and Standards Australia support this.[162]

Responsibility for this failure of regulation is broadly spread. In part, it rests with Standards Australia for its failure to actively manage the revision of the standard. On the basis of Mr Tucker's evidence, the Commission is satisfied that this failing has been redressed by Standards Australia's adoption of its new business model.

Responsibility also rests in part with Australia's building regulators, who come together as the ABCB. It left the technical content of the Building Code of Australia's performance requirements for bushfire-prone areas entirely up to a non-government body without contributing substantial resources to the revision of the standard or defining the scope of the standard. When, belatedly in April 2007, the ABCB advised the FP-020 Committee that the final decision on flame temperature was a policy matter that would be decided by the regulators, the committee was able to produce a near-to-final draft of the standard relatively quickly. It is regrettable that the regulators did not also take responsibility earlier for resolving the question of deemed-to-satisfy solutions for the Flame Zone.[163]

Some responsibility also rests with the allocation of modest resources to the ABCB by its government members. Mr Ivan Donaldson, General Manager, Australian Building Codes Board, acknowledged that a greater commitment of resources and people earlier in the process would have been helpful. He did not say the ABCB did not have the necessary resources, but the evidence suggests that this has been a problem for the ABCB and, if the current funding model continues, will continue to be so in the future.[164]

The Commission is of the view that a greater commitment of public resources to the continuing review and development of AS 3959 and other bushfire-related standards is required, and that future project proposals for revision and development of bushfire-related standards by Standards Australia should specify the scope of the project—including matters of regulatory policy that are beyond the project's scope—and provide clear project management specifications.

6.9.4 ACCESS TO THE BUILDING CODE OF AUSTRALIA AND AUSTRALIAN STANDARDS

With the exception of municipal councils and public libraries, which receive free copies, the Australian Building Codes Board charges for online and hard copies of the Building Code of Australia. About two-thirds of the ABCB's operating budget is funded by sales of the code. Although successive reviews of the ABCB have recommended

that it be funded to enable a minimum level of free access to the code, including free online access, Australian governments have not revised the ABCB's funding model.[165]

As with the Building Code of Australia, standards developed by Standards Australia are available at a cost. In the report of its 2006 Review of Standard Setting and Laboratory Accreditation, the Productivity Commission recommended that the Australian Government and other governments fund free or low-cost access to standards made mandatory by regulation. The Commission agrees.[166]

Standards Australia owns the copyright in the standards it develops. It receives royalties under an agreement with its publisher, SAI Global Ltd, but otherwise has no involvement in the pricing or sale of standards by SAI Global. The cost of access to AS 3959 is of concern: evidence before the Commission shows that the cost of access reduces compliance.[167]

The Commission considers that bushfire-related standards mandated by legislation should be freely available and that any cost associated with this should be borne by the Commonwealth and state and territory government members of the Australian Building Codes Board. The Commission notes that the performance standard for private bushfire shelters, released by the ABCB on 30 April 2010, is available free of charge on the ABCB website. It welcomes this development.[168]

6.9.5 AS 3959-2009

The 2009 edition of AS 3959 contained many important improvements on the 1999 edition. Among other things, the 2009 edition does the following:

- specifies six Bushfire Attack Levels, or BALs, as opposed to the previous four levels
- contains five levels of construction corresponding to the highest BALs, as opposed to the previous three levels
- contains two scientifically based methodologies for assessing bushfire attack—a simplified method and a detailed method—in contrast with the observation-based approach in the 1999 edition
- recognises the variations in bushfire risk across Australia, specifying different Fire Danger Index values for each state and territory and for distinct regions in Victoria and New South Wales
- refers to two new testing standards—AS 1530.8.1 and AS 1530.8.2—designed to test the ability of materials to withstand specified levels of radiant heat over time in simulated bushfire conditions
- has a structure that is easier to follow compared with that of the earlier edition.[169]

A central element of AS 3959-2009 is the requirement that each site in a bushfire-prone area undergo a site assessment to determine its BAL. The six BAL levels—BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 AND BAL-FZ—are named according to radiant heat flux thresholds but are based on the predicted bushfire attack for ember attack, heat flux and flame exposure. Ember attack is predicted for all BALs other than BAL-LOW.[170]

By far the most controversial aspect of AS 3959-2009 was the inclusion of deemed-to-satisfy construction solutions for BAL-FZ (the Flame Zone).[171] Two elements of the deemed-to-satisfy solutions are particularly significant:

- The deemed-to-satisfy solutions rely heavily on testing standard AS 1530.8.2.[172] Several witnesses before the Commission expressed concern about the testing standards referenced in AS 3959-2009.
- AS 3959-2009 specifies a minimum setback distance of 10 metres from the classified vegetation, but it also allows that 'in circumstances where the 10 m setback distance cannot be achieved, those elements of the building that are less than 10 m from the classified vegetation shall comply with AS 1530.8.2'.[173] This effectively prescribes a construction solution for a building surrounded by vegetation that is very close or even adjacent to the building.

Overall, the Commission is satisfied that the 2009 edition of AS 3959 improves the protection of buildings in bushfire-prone areas compared with AS 3959-1999.[174] There is, however, evidence before the Commission of some serious reservations about the following aspects of AS 3959-2009 and its application through the Building Code of Australia:

- the deemed-to-satisfy solutions for the Flame Zone
- lack of application to buildings used by vulnerable groups
- the importance of ember attack
- reliance on the testing standards AS 1530.8.1 and AS 1530.8.2.

Deemed-to-satisfy solutions for the flame zone

There was a sharp divergence of views about whether building regulations for bushfire-prone areas should prescribe deemed-to-satisfy construction solutions for the Flame Zone. A site assessed as BAL-FZ is predicted to be exposed to direct flame contact from a bushfire, as well as radiant heat flux greater than 40 kilowatts per square metre and ember attack. It is the highest risk category of bushfire attack. At present, the deemed-to-satisfy solutions set out in AS 3959-2009 are prescribed for BAL-FZ in Victoria.

Citing AS 3959 as the deemed-to-satisfy solution is highly significant because most domestic construction (not just in bushfire-prone areas) is done in accordance with a deemed-to-satisfy solution rather than an alternative solution. Alternative solutions that comply with the performance requirement for bushfire-prone areas are always possible, but they are not the norm in domestic construction.[175]

Mr Ivan Donaldson, General Manager, Australian Building Codes Board, Mr Tony Arnel, Building Commissioner, Victoria, witnesses from the Housing Industry Association and the Master Builders Association of Victoria, and two experienced building surveyors, Mr Stuart McLennan and Mr Geoff Woolcock, supported the inclusion of deemed-to-satisfy solutions for the Flame Zone. They told the Commission that prescribing deemed-to-satisfy solutions establishes a greater level of certainty for designers, builders and property owners—they can be quantified and costed and result in more consistent, certain and timely outcomes for clients. The absence of any guidance potentially creates uncertainty and higher compliance and construction costs. As noted by Mr Mike Harding, the HIA's National Manager Codes and Standards, there is a concern that 'the potential construction requirements provided by a fire authority on an ad hoc basis would not provide a level of consistency in application across jurisdictions nor be subject to regulatory scrutiny, and it could be argued would not pass the test of delivering a net cost benefit, as building regulations are required to do'. The State also noted that provision of deemed-to-satisfy solutions drives investment in product research and development, which in turn increases the safety of houses built in the Flame Zone.[176]

In summary, the arguments for prescription of deemed-to-satisfy provisions for the Flame Zone are certainty, consistency, reduced compliance and construction costs, and provision of a clear indication of acceptable minimum levels of construction as well as a benchmark for alternative solutions. It should be noted, however, that certainty and consistency are not possible at present since there are very few deemed-to-satisfy construction solutions that have met the requirements of testing standard AS 1530.8.2 available for some parts of a building, such as roofing and window systems. This appears to pose difficulties for people who are rebuilding in fire-affected areas, as highlighted by lay witness Mr Andrew Berry of Kinglake, who said, 'Many people are uncertain what to do regarding [the] roof structure of homes in the fire zone because there is no roofing material that has been tested to withstand a fire in that scenario'.[177]

Fire agencies and the Fire Protection Association Australia oppose the prescription of deemed-to-satisfy solutions for the Flame Zone. Two of their concerns are as follows:

- Deemed-to-satisfy solutions, and indeed building homes in the Flame Zone at all, normalise the placement of people in extreme hazard.

- Deemed-to-satisfy solutions are useful as a benchmark only in situations in which it is possible to set a benchmark, which is not the case in the Flame Zone. The Flame Zone is an inherently dangerous area where adequate defendable space is not possible. Any home built in such an area should be individually designed to the specific fire risks of the site. Providing deemed-to-satisfy solutions implies the resultant safety level is equivalent to that of lower hazard areas.[178]

Mr Chladil, one of AFAC's representatives on the FP-020 Committee, characterised the Australian Building Codes Board's position that there should be deemed-to-satisfy solutions for any place where a built solution was possible as 'more ideological than practical or safe'.[179]

The Commission considered the competing perspectives of building regulators, industry bodies and fire agencies and fire safety interests. It considers that the policy imperatives of certainty, consistency, reduced costs of compliance and construction, and benchmarking alternative solutions are important and are consistent with the national approach under the Building Code of Australia. But they do not outweigh the compelling safety arguments against prescribing deemed-to-satisfy building solutions in the Flame Zone. The Commission is particularly concerned that the aims of certainty, consistency, and reduced costs are unlikely to be achieved in the short-term because of the limited availability of tested roofing and window products in the marketplace. Benchmarking alternative solutions is not appropriate or even readily achievable in the circumstances of high risk that apply when building in the Flame Zone.

The nature of the risk, and the appropriate ways of mitigating that risk, differ according to site-specific characteristics. If building is to be permitted on a site assessed to have the highest level of bushfire risk, then the building should be designed specifically for the particular risks on the site. This is the approach taken in New South Wales, and it should also be the approach in Victoria. Consistent with the commitment to national building standards, consideration should be given to adopting this position in all jurisdictions through the Building Code of Australia.[180]

The Commission notes that requiring an alternative solution for building in the Flame Zone is likely to cost more than a deemed-to-satisfy solution and could take longer to achieve. It will require specialist technical advice and possibly testing of specific building components and a higher construction cost. Since alternative solutions are not the norm for domestic building, consideration also needs to be given to ensuring that suitably qualified people are available to provide the necessary design services. But reducing the potential loss of life is the most important consideration, and in the Flame Zone this requires the development of performance-based building solutions for each particular site.[181]

Non-residential buildings

The Building Code of Australia currently applies AS 3959-2009 only to Class 1, 2, 3 and associated class 10a buildings—in essence, dwellings and nearby outbuildings—except where jurisdictions have modified their application of the BCA. In Victoria there are no bushfire-related construction requirements for buildings in Classes 4 to 9 (such as schools, early childhood centres, hospitals, aged care facilities, shops, restaurants and offices) constructed in bushfire-prone areas. Many buildings of this kind were destroyed in the 7 February fires.[182]

Mr Arnel told the Commission that extending the bushfire safety provisions of the Building Code of Australia to all non-residential buildings should be considered and that the Building Commission was looking at the way the New South Wales Rural Fire Service does this. In New South Wales application of the Building Code of Australia is varied to apply the bushfire safety provisions to specific Class 4 and 9 buildings, known as 'special fire protection purpose buildings', whose occupants might be more vulnerable to bushfire attack for reasons of age, illness or limited mobility and who present organisational difficulties for evacuation and management. This includes schools, child care centres, hospitals and retirement villages.[183]

As noted in Section 6.4.3, the Victoria Planning Provisions already require additional bushfire safety measures for 'vulnerable use' developments such as schools, child care centres, hospitals and places of assembly. The Commission is of the view that extending the application of bushfire safety construction provisions to non-residential buildings, particularly those for vulnerable use, warrants further consideration by both the Australian Building Codes Board and the State.

Ember attack

In its second interim report the Commission recommended immediate revision of AS 3959-2009 to deal with the following:

- inclusion of unmanaged grassland in the vegetation types and classifications
- use of sarking as a secondary ember protection measure
- increased ember protection measures at lower bushfire attack levels—in particular, in relation to sub-floor requirements and materials prescribed for doors, windows and wall barriers.[184]

Standards Australia advised the Commission that a revised edition of AS 3959–2009 is due for public comment and committee ballot consideration from June to August 2010. Assuming that consensus is reached, the amendment is expected to be published in October 2010. The amendment will incorporate unmanaged grassland in its vegetation types and classifications and take account of the use of sarking as a secondary ember protection measure. Amending AS 3959–2009 to increase ember protection measures at lower Bushfire Attack Levels will, however, not be considered by Standards Australia until further information supporting an amendment becomes available. These developments are welcomed, but the Commission urges that ember protection measures at lower Bushfire Attack Levels also need to be pursued as a priority.[185]

As discussed, ember attack is the predominant bushfire attack mechanism, and measures to protect buildings from the risk of ignition by embers are essential. The significance of protecting a building against ignition by embers is not, however, specifically reflected in the objective of AS 3959-2009. Similarly, the performance requirement in the bushfire safety provisions of the Building Code of Australia is that a building constructed in a designated Bushfire-prone Area must be 'designed and constructed to reduce the risk of ignition from a bushfire while the fire front passes'. As noted, the evidence before the Commission suggests that most houses that are burnt in bushfires are burnt because of ember attack. Although buildings' resistance to radiant heat and direct flame contact is important in the areas of highest risk, resistance to ignition by embers is crucial to the survival of all buildings in bushfire-prone areas.[186]

The relevant performance requirements in the Building Code of Australia and the objective of AS 3959-2009 should be amended to incorporate resistance to ember attack. This will assist in ensuring that ember protection measures remain a focus of future work on development of appropriate standards and regulatory measures.

The Commission is also of the view that new houses and extensions in bushfire-prone areas should have some level of ember protection. It proposes that all new buildings and extensions in bushfire-prone areas have a minimum AS 3959-2009 construction level of BAL-12.5. This would ensure that new developments and extensions of existing developments in areas of bushfire risk incorporate basic ember-protection measures. This requirement could be waived in exceptional circumstances. Higher construction levels would be required as determined by the site assessment.[187]

Testing standards AS 1530.8.1 and AS 1530.8.2

Another area of concern in relation to AS 3959-2009 is its reliance on the testing standards AS 1530.8.1 (in the Flame Zone) and AS 1530.8.2 (for construction on sites assessed as BAL-29 or BAL-40). CSIRO, AFAC and the Fire Protection Association Australia are all concerned about using AS 1530.8.1 or AS1530.8.2, or both, to determine the performance of building components under bushfire conditions. They argue that the testing standards do not effectively simulate bushfire conditions because they do not sufficiently consider wind effects, moisture content relevant to bushfire conditions, and effective requirements for gaps to hamper ember entry.[188]

The limitations of AS 1530.8.1 and AS 1530.8.2 are acknowledged in the standards themselves. Witnesses before the Commission confirmed that the conditions specified in AS 1530.8.1 and AS 1530.8.2 do not simulate bushfire conditions and are not designed to do so. Rather, the tests are designed to be repeatable and to provide a reliable mechanism for comparing the performance of building elements at a very high level of fire intensity. Because the test methods are designed to achieve consistent ranking of the performance of building systems subjected to heat and flame, it has been necessary to make some simplifications and to balance these with other criteria.[189]

On the evidence before the Commission, testing standards AS 1530.8.1 and AS 1530.8.2 do allow for repeatable tests for comparing and ranking the performance of building components subjected to radiant heat and direct flame contact in a bushfire. This is necessary. But, because AS 3959-2009 prescribes compliance with these tests as deemed-to-satisfy solutions for construction at higher bushfire attack levels, it is vital that the testing standards also be reliable predictors of the performance of building components under bushfire conditions. The Commission therefore considers that a review of both testing standards is warranted.

RECOMMENDATION 47

Standards Australia do the following:

- amend the objective of AS 3959-2009, Construction of Buildings in Bushfire-prone Areas, to ensure that it incorporates reducing the risk of ignition from ember attack
- review, and amend as appropriate, the testing methods prescribed in its standards for Tests on Elements of Construction for Buildings Exposed to Simulated Bushfire Attack (AS 1530.8.1 and AS 1530.8.2) to ensure that, so far as is possible, the methods provide a reliable predictor of the performance of construction elements under bushfire conditions.

RECOMMENDATION 48

The Australian Building Codes Board do the following:

- amend the performance requirements in the Building Code of Australia to ensure that they incorporate reducing the risk of ignition from ember attack
- work with Standards Australia to effect expeditious continuing review and development of AS 3959, Construction of Buildings in Bushfire-prone Areas, and other bushfire-related standards referred to in the Building Code of Australia
- negotiate with Standards Australia and SAI Global Ltd an arrangement for free online access to AS 3959-2009, Construction of Buildings in Bushfire-prone Areas, the other Australian standards referred to in AS 3959-2009, and any other bushfire-related Australian standards referred to in the Building Code of Australia
- amend the Building Code of Australia to remove deemed-to-satisfy provisions for the construction of buildings in BAL-FZ (the Flame Zone)
- include in the Building Code of Australia bushfire construction provisions for non-residential buildings that will be occupied by people who are particularly vulnerable to bushfire attack, such as schools, child care centres, hospitals and aged care facilities.

RECOMMENDATION 49

The State modify its adoption of the Building Code of Australia for the following purposes:

- to remove deemed-to-satisfy provisions for the construction of buildings in BAL-FZ (the Flame Zone)
- to apply bushfire construction provisions to non-residential buildings that will be occupied by people who are particularly vulnerable to bushfire attack, such as schools, child care centres, hospitals and aged care facilities
- other than in exceptional circumstances, to apply a minimum AS 3959-2009 construction level of BAL-12.5 to all new buildings and extensions in bushfire-prone areas.

6.10 BUSHFIRE BUNKERS

In its second interim report the Commission expressed its concern about the lack of regulation for bunkers, the risks of misplaced reliance on bunkers, the demand for bunkers, and the widespread availability of bunker products. It tackled the clear and pressing need for a minimum standard to regulate the design, siting and construction of bunkers by recommending that the Australian Building Codes Board develop a standard as a matter of priority.

The Commission also made recommendations designed to ensure that, in Victoria and nationally, bunkers are regulated under building legislation and the standard developed by the ABCB is referenced as the minimum standard for construction of bunkers.

On 30 April 2010 the ABCB released a performance standard for private bushfire shelters; the standard is available free on the ABCB website. The ABCB advised the Commission that the 2011 edition of the Building Code of Australia will include bunkers and will reference the standard. In the meantime, the Commonwealth and the ABCB will continue to encourage all jurisdictions to adopt the bunker standard by means of interim regulations. On 28 May 2010 the Victorian Government adopted the standard through an amendment to the Building Regulations. The Commission commends this swift action to finalise and adopt the standard.[190]

6.11 BUSHFIRE SPRINKLERS

An important finding in the Bushfire Cooperative Research Centre's research after Black Saturday concerned the strong influence of the presence of sprinkler systems for house survival. The Commission heard a number of lay witnesses' accounts of the role sprinklers played in successfully defending a house. Mr Andrew Berry of Kinglake told the Commission, 'If we didn't have the sprinkler system, I believe we would have been incinerated in the house in less than two minutes. The sprinkler system bought us time and absorbed the "hit" of the firefront'.[191]

The CFA advised the Commission that sprinkler systems might help to protect a house. But sprinkler systems can fail during a fire, as several lay witnesses attested, and the presence of such a system is no guarantee that a house or its occupants will survive a fire. For example, the Commission was told about sprinkler systems that ceased to work once the power failed. It also heard of instances of people using regular garden sprinklers that were not designed to withstand extreme fire conditions.[192]

There is no standard to guide people in designing and installing a workable sprinkler system. Some lay witnesses told the Commission about sprinkler systems they had designed and built, sometimes at great expense. For example, Ms Judy Frazer-Jans of Marysville described the 'water curtain' she designed:

> I devised a unique solution involving 132 linear metres of copper piping installed on the fascia boards under all of the guttering around the house. Approximately 130 fine copper tubes were inserted into this copper piping, each about 1 metre apart and facing downwards. Very small brass sprinkler heads were inserted into the ends of each tube, and aligned so that the water jets intersected to create a water curtain around the house. I designed this myself from scratch. Copper was selected because it is a more fire resistant material.[193]

Mr Barry Eadie, chair of the FP-020 Committee, told the Commission that bushfire sprinklers and sprayers were not within the scope of AS 3959 and were most likely to be dealt with by technical sub-committee FP-004-02 as a separate and specific standard-development project. He estimated that it would take two years to develop the standard.[194]

Standards Australia advised the Commission that it received a proposal for this project on 1 October 2009 and, following stakeholder consultation, broad but not unanimous support was received for a bushfire sprinkler standard. It also noted that a net benefit analysis for the project would be essential given the potentially high cost of such systems. Standards Australia has not been approached by any party willing to fund the development of a standard, although a proposal to have the standard treated as a Standards Australia–resourced standards-development project is currently being assessed, with an outcome expected in August 2010.[195]

The Commission welcomes this. Although it does not envisage that sprinklers would be mandated in bushfire-prone areas, the standard would add to the options available to people in high-risk areas. It is highly desirable that this standard be developed and ready for publication as soon as possible—ideally, within 12 months. Effective project management under Standards Australia's new business model will be needed to bring the project to a prompt conclusion.

The Commission also notes that there were examples of people who had installed sprinklers who died while sheltering in their homes during the 2009 fires. It therefore cautions that sprinklers should be seen as a supplement to other measures and, in particular, are not a substitute for active external defence of a property. Reliance on a mechanical system alone does not appear to be sufficient to provide a satisfactory level of protection.

RECOMMENDATION 50

Standards Australia move expeditiously to develop a standard for bushfire sprinklers and sprayers.

6.12 RETROFITTING OF BUILDINGS

The requirement to build homes that comply with AS 3959 applies only to new buildings and extensions. Compliance with AS 3959 has been a requirement in Victoria only since 2004, and many existing buildings in areas of high bushfire risk do not comply. The Building Commission's analysis of 2,131 homes destroyed by the fires on 7 February 2009 found that 87 per cent of those homes had not been required to be built to any bushfire standard.

AFAC's tentative position on this subject, set out in its draft discussion paper *Habitable Buildings in Bushfire-prone Areas,* is that fire agencies should work with other interested parties to raise awareness and encourage the owners of properties to upgrade and improve the bushfire preparedness of existing buildings.[196]

The CFA publication *Preparing Your Property: make your home bushfire ready* suggests modifications that can be made to roofs, windows, doors and decks in existing homes to make them better able to withstand ember attack and the passage of a bushfire. Each suggested modification is accompanied by a brief explanation of why it will make the building more bushfire resistant. The useful work done by the CFA in this regard would be reinforced if similar information were also published by the Building Commission, targeted at both the community and the building industry.[197]

The pace and extent of voluntary retrofitting are likely to be inhibited by the shortage of Victorian building practitioners qualified in bushfire planning and design who could assess existing houses for the purposes of recommending modifications consistent with AS 3959-2009.[198]

The Commission considered whether there should be a legal requirement to modify existing houses and other buildings in bushfire-prone areas to make them compliant with AS 3959-2009. Mr Arnel acknowledged that there is some precedent for applying new regulations to existing buildings in relation to pool and spa fencing and some smoke alarms and fire sprinklers. In light of the substantial cost involved in modifying existing houses to meet AS 3959-2009, however, he expressed caution about making such retrofitting mandatory in the absence of a cost–benefit analysis.[199] The Commission agrees with this assessment. It does not recommend mandatory retrofitting of houses in bushfire-prone areas. It does, however, encourage individuals to consider voluntary modifications to their homes as part of their bushfire planning. This should be aided by wide access to publicly available information on options. The Commission takes this view in light of its other recommendations aimed at improving individual and community safety.

RECOMMENDATION 51

The Victorian Building Commission, in conjunction with the Country Fire Authority, develop, publish and provide to the community and industry information about ways in which existing buildings in bushfire-prone areas can be modified to incorporate bushfire safety measures.

6.13 ENFORCEMENT AND MAINTENANCE OF PLANNING AND BUILDING CONDITIONS

It is imperative that the conditions that exist at the time of a planning or building approval, such as the required defendable space or the bushfire attack level of the site, are maintained to provide for continued bushfire risk management. Ensuring that this occurs is, however, a challenge in both the planning and the building regimes. The Commission considered a number of ways to achieve this over the life of a building, even after the building changes hands. It also looked at how municipal fire prevention arrangements could better complement enforcement and maintenance of planning and building measures.

6.13.1 PLANNING PERMIT CONDITIONS

A planning permit for a development in a Wildfire Management Overlay will generally contain detailed conditions for water supply, access and vegetation management for achieving and maintaining defendable space. Compliance with these permit conditions is the responsibility of the owner and the occupier of the land. The WMO Applicant's Kit reminds applicants of this responsibility and that the obligation to comply with permit conditions is ongoing.[200]

The responsible authority—the local council—is responsible for enforcement of permit conditions. There is, however, no requirement in the *Planning and Environment Act 1987* for a council to check whether permit conditions have been fulfilled at any stage of a development. This contrasts with the position under the *Building Act 1995*, which requires an occupancy permit before the building may be occupied.[201]

It is an offence to use or develop land in contravention of a planning scheme or a permit or to fail to comply with a planning scheme or permit. Councils have several mechanisms under the Act for enforcing permit conditions and planning schemes more broadly:

- An authorised officer of a council may serve a planning infringement notice on any person the officer believes has committed an offence.
- A council (or any other person) may apply to the Victorian Civil and Administrative Tribunal for an enforcement order against an owner or occupier of land if a use or development of land contravenes a planning scheme or a permit condition.
- A council may prosecute for the offence and the penalty must be paid to it.[202]

There are, of course, measures short of formal enforcement that may be taken by a council to ensure compliance with a planning permit—for example, a letter inquiring as to whether the permit conditions have been fulfilled, a telephone call from a council officer or a site visit.

Murrindindi Shire Council has a proactive system for checking compliance with permit conditions. Three months before each permit expires the computer system flags that a letter should be sent to the permit applicant asking about the progress of compliance with the permit conditions. Generally applicants respond with information about how they are achieving compliance or with a request for further time. Applicants who do not respond to the letter are contacted by council staff.[203]

Enforcement action is a last resort for Nillumbik, Murrindindi and Latrobe councils. On the rare occasion when enforcement action is taken, it is prompted by a complaint to the council rather than the result of the council's monitoring of compliance. None of the council witnesses was aware of enforcement action ever having been taken in relation to WMO permit conditions. Enforcement action had, however, been taken by Nillumbik and Murrindindi for removal of vegetation without a permit. In both instances the action was prompted by complaints to the council.[204]

The Commission acknowledges that councils are constrained by the resources available to them and that this necessarily focuses attention on resource-efficient means of achieving compliance with permit conditions.[205] It is, however, of the view that councils should do more to enforce the bushfire protection measures in their planning schemes, including permits issued by them. The obligation of a permit holder to comply with permit conditions is not the same as, and does not discharge, a council's responsibility to enforce permit conditions imposed by it in the administration of its planning scheme. Requirements for a minimum supply of water for firefighting purposes and

for vegetation management for defendable space are ongoing and need attention every fire season. It cannot be assumed that this will occur without active enforcement.

One way of improving continued compliance with conditions is to apply only those conditions that are likely to be complied with during the term of the development.[206] As proposed in recommendation 40, the CFA's guidelines for assessing permit applications should emphasise that permits will be issued subject to conditions only if the assessing officer considers the conditions can be maintained in the long term. This is not to dilute the requirements imposed through permit conditions; rather, if the officer's opinion is that it is unlikely that minimum defendable space can be readily created or maintained on the site, the development should not be approved in the first place.

Councils should also be required to check that Bushfire-prone Overlay permit conditions for new developments have been complied with before the development may be occupied—in the same way that compliance with building permit conditions is checked through the requirement for certificates of occupancy under the Building Act. More regular assessment of compliance with Bushfire-prone Overlay permit conditions over the full term of the development is also essential. A mechanism to follow up non-compliance and escalate responses, including any additional enforcement powers, would be necessary.

RECOMMENDATION 52

The State develop and implement, in consultation with local government, a mechanism for sign-off by municipal councils of any permit conditions imposed under the Bushfire-prone Overlay and the regular assessment of landowners' compliance with conditions.

6.13.2 BUILDING MAINTENANCE

AFAC is concerned that AS 3959-2009 does not cover the continued maintenance of a building's bushfire safety features.[207] The benefit of constructing a house in a bushfire-prone area to a specified standard may be eroded or lost in the following circumstances:

- The house is poorly maintained—for example, holes in window screens or loose roof tiles.
- The house is modified in a way that is inconsistent with the standard—for example, through the addition of a non-compliant deck or pergola.
- Vegetation around the house increases the bushfire attack level for the site.

The subject of maintenance has been raised in previous inquiries, most recently by COAG in its 2004 National Inquiry on Bushfire Mitigation and Management. COAG noted that a shortcoming of AS 3959-1999 was 'the absence of any requirement or mechanism for ensuring continuing building maintenance'. It supported AFAC's work to develop a national position that included incorporating building maintenance in AS 3959.[208]

Before this, in October 2003 the House of Representatives Select Committee into the Recent Australian Bushfires delivered its report, *A Nation Charred: report on the inquiry into bushfires,* which looked at, among other things, building maintenance measures to protect a building from bushfire and other measures to maintain a defendable space around the home, such as removing vegetation and hazardous material. The committee concluded that often buildings are not adequately maintained and this could be attributed to regulations that focus specifically on construction. It recommended that Standards Australia incorporate building maintenance in AS 3959.[209]

The committee's recommendation was never implemented. The Australian Building Codes Board did not respond to the recommendation because the recommendation was directed to Standards Australia. Standards Australia did not act on or respond to the recommendation, perhaps because it regarded maintenance as outside the scope of a construction standard referred to in the Building Code of Australia.[210]

The evidence before the Commission suggests that expanding AS 3959 to incorporate maintenance of buildings is impractical. The Commission agrees with Mr Eadie's view that maintenance is beyond the scope of a construction standard referred to in the BCA.[211]

There is considerable difficulty associated with regulating the ongoing maintenance of a house and its surrounds. Mr Chladil suggested a maintenance regime such as that found in the BCA for fire protection features in commercial buildings, where there is a requirement for an annual statement of compliance. Another possibility would be if the building surveyor were to attach maintenance conditions to occupancy permits for houses constructed in bushfire-prone areas and for these to be enforced by an inspection regime. These suggestions were rejected as impractical by two of the building surveyors who gave evidence, largely because of problems with enforcement.[212]

Although maintenance of a house's bushfire safety features, or the bushfire attack level for the site, might be the subject of a note on the occupancy permit, it would appear that making these matters conditions of the permit is not supported by the Act or the Regulations in their current form. The Building Commission advised this Royal Commission that vegetation management cannot be enforced as a condition of an occupancy permit issued under the Act because it is not 'building work' and is therefore beyond the scope of the Act. Even if the legislation were to be amended, the difficulty of enforcing conditions of this nature would potentially render the amendments ineffective.[213]

Both Mr Chladil and Mr Arnel spoke of the important role of community information and education. The CFA already provides community information about maintaining houses and defendable space, as exemplified by its publication *Preparing Your Property—make your home bushfire ready.* In addition, maintenance is covered in Standards Australia Handbook 330, *Living in Bushfire-prone Areas,* which was released on 31 December 2009 following a recommendation by the Commission in its second interim report.[214] The Commission considers that information could be complemented by information about maintaining the bushfire safety measures and bushfire attack level assessments of buildings in bushfire-prone areas published by the Building Commission, with accompanying community education.

The Commission is also of the view that measures beyond community information and education are required to ensure the effectiveness of building controls in bushfire-prone areas throughout the life of a building.

6.13.3 CHECKS AT THE POINT OF SALE

Because a house often changes hands a number of times during its life, the point of sale is a logical time to provide prospective purchasers with information about the bushfire safety of the site and building they propose to purchase.

The Commission proposes that s. 32 of Victoria's *Sale of Land Act 1962* be amended to require that, for land in a designated Bushfire-prone Area, a vendor's statement under that section must contain a statement about the standard (if any) to which the dwelling was constructed and the assessment (if any) of the bushfire attack level at the time of construction. This would tell potential purchasers whether the house is in a Bushfire-prone Area and the risk level and standard for which the house was constructed (if these were a requirement at the time the house was built).

It is also proposed that the vendor be required to provide a current BAL assessment of the site and that that BAL rating be included on the vendor's statement. If the house was built after AS 3959-2009 was introduced, a prospective buyer will be able to determine whether the expected level of bushfire attack had changed over time, for example, as a result of lack of maintenance. Any increase in risk is likely to have an adverse impact on price, thus providing an incentive for owners to maintain the original BAL for the site or to take steps to improve that level before selling. If the house was built after AS 3959-2009 was introduced, the current BAL assessment will provide an indication of the level of risk of the site and might encourage prospective buyers to undertake additional checks to determine how the property could be made safer.

RECOMMENDATION 53

The State amend s. 32 of the *Sale of Land Act 1962* to require that a vendor's statement include whether the land is in a designated Bushfire-prone Area, a statement about the standard (if any) to which the dwelling was constructed, the bushfire attack level assessment at the time of construction (where relevant) and a current bushfire attack level assessment of the site of the dwelling.

6.14 MUNICIPAL FIRE PREVENTION

Although limited resources constrain councils in their enforcement of WMO permit conditions, every council has some resources dedicated to fire prevention activities under the *Country Fire Authority Act 1958*, which requires every council to appoint a municipal fire prevention officer. Councils may also appoint any number of assistant MFPOs, to whom the MFPO may delegate powers.[215]

One of the main responsibilities of the MFPO is to serve fire prevention notices on the owner or occupier of land where there is deemed to be 'a danger to life or property from the threat of fire'. A fire prevention notice may require the owner or occupier to take the steps specified in the notice to remove or minimise the threat of fire, within the time specified in the notice. Fire prevention notices are generally aimed at removing fine fuels, particularly around dwellings, but also on other parts of a property where they pose a risk. The Commission heard evidence of a great deal of work done by MFPOs to issue and follow up fire prevention notices each fire season. A large number of notices are issued each year, and compliance is generally high.[216]

Fire prevention notices are not specific to areas in the WMO and are not specifically directed to achieving defendable space around dwellings; nor are they a replacement for proper enforcement of WMO planning conditions. There may be, however, scope for better integration of the fire prevention and planning permit enforcement roles of councils. For example, the State told the Commission that some of the matters dealt with by a fire prevention notice might overlap with certain planning permit conditions, such as a requirement to manage vegetation around a dwelling. In implementing recommendation 39, the State should consider whether MFPOs could play a role in complementing the enforcement of planning permit conditions.[217]

The Chief Officer of the CFA may also issue and enforce a fire prevention notice if the relevant MFPO refuses or fails to issue one. This is, in effect, a fallback measure available where an MFPO has failed to act. Curiously, the Chief Officer is precluded from delegating the power to issue fire prevention notices. This would be a much more workable fallback measure if the power to issue fire prevention notices could be delegated by the Chief Officer to other CFA personnel.[218]

RECOMMENDATION 54

The State amend the *Country Fire Authority Act 1958* to enable the Chief Officer to delegate the power to issue fire prevention notices.

6.15 EDUCATION AND TRAINING

The Commission heard evidence that education and training for planning and building professionals could be improved by provision of better practical training and materials and more formal education in bushfire planning and design.

There is a demonstrated need for council planners to have access to CFA training about bushfire risk management through planning. The CFA does run a WMO site assessment training course, but this is a five-day intensive course. The Commission considers that such a course is probably more detailed than most council planners need and probably takes more time than their employers can afford. It sees benefit in the CFA regularly offering shorter training sessions to council planners, as it has done in the past, when the sessions were well attended.[219]

There is evidence before the Commission that building practitioners have had difficulty interpreting and applying the bushfire attack level site-assessment methodology in AS 3959-2009. Since such an assessment must be conducted in order to obtain a permit to build a dwelling in a designated Bushfire-prone Area, this results in inconsistent BAL assessments and poor-quality supporting information. At present training in the site-assessment methodology provided for in AS 3959-2009, which is offered by the Building Commission and professional associations, is occasional and informal. The Building Commission previously held 22 technical seminars for the building industry about AS 3959-2009 and the CFA also developed a one-day course to train the Building Commission's BAL assessment volunteers. Mr Arnel foreshadowed developing the CFA's one-day course into

an accredited TAFE short course. The Building Commission should continue to provide education opportunities on AS 3959-2009, including the site-assessment process, at regular intervals. The Commission expects that, at least initially, this would occur every six months.[220]

Other forms of information and guidance are also important for building and planning practitioners. For example, in August 2009 the Building Commission issued an interim practice note on the interpretation and application of the site-assessment methodology for AS 3959-2009. The practice note should be further developed and refined, using worked examples and case studies, and provide information about the interaction between bushfire planning and building controls that was included in earlier versions of the practice note.[221]

The take-up of more general bushfire training in the building industry is, however, still limited. Mr McLennan of the Australian Institute of Building Surveyors surveyed people who attended the Building Commission seminars on AS 3959-2009 and estimated that less than 1 per cent had done any bushfire-specific training. A reason for this might be the absence of any training course in bushfire design in Victoria.[222]

Victoria University offers a graduate certificate and a graduate diploma in fire safety through its Centre for Fire Safety, but these courses focus on fire safety in buildings rather than bushfire safety. The University of Western Sydney offers the only graduate diploma course in bushfire planning and design in Australia. Mr Christopher Orr, National President, Fire Protection Association Australia, who has completed this course, informed the Commission that it covers fire behaviour, bushfire fighting and emergency management, planning, defendable space and construction. A practitioner who has completed the course would be well placed to take a holistic approach to planning and building in a bushfire-prone area. The course focuses, however, on legislation and practice in New South Wales, particularly in relation to planning.[223]

The expert panel also highlighted the need for education and training on bushfire risk management in planning:

> It is acknowledged that due to the level of technical detail in the CFA Permit Applicant's Kit, the involvement of qualified fire experts should be strongly encouraged in undertaking site assessments for building and planning applications.
>
> State government should help relevant educational institutions to develop courses with relevant institutions to provide training and retraining for bushfire and planning professionals. Training should include technical bushfire risk assessment training, and also communication and negotiation skills training.[224]

There is obvious potential to develop a course in bushfire planning and design specific to Victorian conditions, legislation and practice at a Victorian university or TAFE institute. The evidence before the Commission suggests a need for such a course. The Commission expects that such a course would make provision for recognition of prior learning, recognition of current competency and access for rural students.

AFAC advised the Commission that it had begun discussions with the Fire Protection Association Australia and the University of Western Sydney with a view to developing a national graduate diploma in bushfire planning and design. The Commission also heard evidence about the Fire Protection Association Australia's bushfire planning and design certification scheme, which is currently the only scheme in Australia that benchmarks practitioners and businesses providing bushfire planning and design services. Completion of the University of Western Sydney course is a criterion for accreditation, with the result that the scheme operates mainly in New South Wales. Establishment of an equivalent course in Victoria would enable the association, or another suitable industry organisation, to operate such a scheme in Victoria.[225]

RECOMMENDATION 55

The State initiate the development of education and training options to improve understanding of bushfire risk management in the building and planning regimes by:

- providing regular training and guidance material to planning and building practitioners
- helping a suitable tertiary institution design and implement a course on bushfire planning and design in Victoria.

1 Exhibit 980 – Victorian Bushfires Royal Commission 2009 – Houses Destroyed in Bushfires (CORR.1002.0330_R); Exhibit 980 – Victorian Bushfires Royal Commission 2009 – Houses Destroyed in the Bushfires – Breakdown of Houses Destroyed by Fire Areas (CORR.1003.0048_R); Exhibit 894 – Review of Fatalities in the February 7, 2009, Bushfires – Final Report (Amended version without mark up) (EXP.029.003.0001) at 0020, 0026–0027; Exhibit 108 – Statement of Brown (WIT.053.001.0001_R) [6]–[7], [11], [14], [25]–[32], [43]–[44]; Exhibit 173 – Statement of Wiltshire (WIT.075.001.0001_R) [9]–[13], [18]–[22], [28]; Exhibit 181 – Statement of Wasley (WIT.073.001.0001_R) [4]–[18], [21], [26], [33]–[45], [51]–[56]; Exhibit 49 – Statement of O'Halloran, Attachment 1 (WIT.3010.001.0007_R); Brown T3501:7–T3501:22, T3504:1–T3504:28, T3506:9–T3507:16, T3513:16–T3519:19; Wiltshire T5406:6–T5407:25, T5408:13–T5413:11; Wasley T5707:6–T5707:20, T5709:2–T5715:11, T5717:20–T5721:18, T5722:29–T5724:1

2 Exhibit 9 – Building in a Fire-Prone Environment: Research on Building Survival in Two Major Bushfires (TEN.001.001.0102) at 0106, 0108; Exhibit 9 – Living in the Bush (TEN.001.001.0004) at 0035–0038; Exhibit 172 – Statement of Eadie, Attachment 6 (WIT.7502.001.0098) at 0107; Pinfold T14437:1–T14437:7

3 Exhibit 416 – Statement of Verlaan (WIT.095.001.0001_R) [62]; Exhibit 706 – Yates Report (EXP.020.001.0001) at 0001–0002; Further Submissions of the State of Victoria – Land Use Planning (RESP.3000.006.0110) [5]

4 Exhibit 45 – 2002 COAG Report (TEN.004.002.0037) at 0067; Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0126–0128; Submissions of Counsel Assisting – Land Use Planning (SUBM.600.001.0001) [1.3]–[1.4]; Exhibit 710 – Buxton Report (EXP.023.001.0001) at 0007; Yates T14430:20–T14431:9

5 Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0001; Hansen T14428:4–T14428:12

6 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0011

7 Exhibit 672 – Building and Land-use Planning Research After the 7th February 2009 Victorian Bushfires Preliminary Findings (CRC.300.007.0135) at 0185–0189; Exhibit 602 – Bushfire CRC Supplementary Report (CRC.301.001.0001) at 0004, 0039, 0040, 0077

8 Exhibit 672 – Building and Land-use Planning Research After the 7th February 2009 Victorian Bushfires Preliminary Findings (CRC.300.007.0135) at 0197–0215; Exhibit 602 – Bushfire CRC Supplementary Report (CRC.301.001.0001) at 0041–0044, 0078–0081

9 Exhibit 672 – Building and Land-use Planning Research After the 7th February 2009 Victorian Bushfires Preliminary Findings (CRC.300.007.0135) at 0218–0231

10 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [264]–[279]; Exhibit 980 – Victorian Bushfires Royal Commission 2009 – Houses Destroyed in Bushfires (CORR.1002.0330_R); Exhibit 980 – Victorian Bushfires Royal Commission 2009 – Houses Destroyed in the Bushfires – Breakdown of Houses Destroyed by Fire Areas (CORR.1003.0048_R); Arnel T5220:28–T5221:23, T5223:20–T5224:16

11 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [6.14]–[6.15], [7.5], Attachment 63 (WIT.3018.001.0758); Exhibit 684 – Statement of Fox, Annexure 3 (WIT.3004.028.0235), Annexure 4 (WIT.3004.028.0246); Submissions of Counsel Assisting – Building in Bushfire Prone Areas (SUBM.201.001.0001) [4.3]–[4.7]

12 Exhibit 679 – Statement of Gilmore, Attachment 63 (WIT.3018.001.0758)

13 Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [95], [104]–[110], Annexure G (WIT.3000.002.0072) at 0101; Exhibit 190 – Statement of Spring (WIT.3004.011.0228) [28]–[31]; Exhibit 207 – Statement of Andreou (WIT.3004.012.0065) [34], [36]–[39]; Exhibit 291 – CFA, Land Use Planning – Wildfire Management Overlay Mapping Process (CFA.001.026.0007); Andreou T6427:4–T6429:3

14 Exhibit 484 – Map of the City of Greater Bendigo Showing Bushfire-prone Areas, Wildfire Management Overlay Areas and Fire Affected Areas (MAV.001.001.0022); Exhibit 484 – Map of Nillumbik Shire Showing Bushfire-prone Areas, Wildfire Management Overlay Areas and Fire Affected Areas (MAV.001.001.0039); Exhibit 484 – Map of Murrindindi Shire Showing Bushfire-prone Areas, Wildfire Management Overlay Areas and Fire Affected Areas (MAV.001.001.0037)

15 Building Amendment (Bushfire Construction – Short-term Requirements) Regulations 2010; Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [222]–[223]; Arnel T5187:19–T5188:30

16 Exhibit 180 – Statement of McLennan (WIT.068.001.0001_R) [47]–[51]; Exhibit 179 – Statement of Harding (WIT.7503.001.0001_R) [98]; Exhibit 185 – Statement of Woolcock (WIT.7505.001.0001_R) [52]–[55]; McLennan T5678:27–T5679:29; Woolcock T5790:16–T5791:23

17 Exhibit 693 – Statement of Parsons (WIT.4021.001.0001) [91]; Exhibit 678 – VPP Practice Note – Planning for Wildfire Protection (SUMM.020.019.0172) at 0175; Exhibit 678 – Nillumbik Planning Scheme Amendment C11 Panel Report (DOC.NMC.001.0658) at 0684–0688; Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [9.2], [9.5], Attachment 63 (WIT.3018.001.0760) at 0761, Attachment 65 (WIT.3018.001.0763); Exhibit 689 – Statement of Abbey (WIT.4016.001.0001) [169]; Sturzenegger T13988:23–T13989:8; Abbey T14168:28–T14169:8, T14172:1–T14172:18; Gilmore T13881:5–T13881:23

18 Exhibit 678 – Murrindindi Shire – Bushfire Extent and WMO (TEN.196.001.0001); Exhibit 678 – Marysville – Pre Fire Aerial Photography (EXH.678.0005); Exhibit 678 – Bald Spur Road – Pre Fire Aerial Photography (TEN.196.001.0004); Exhibit 678 – Pine Ridge Road – Pre Fire Aerial Photography (TEN.196.001.0007); Exhibit 678 – Marysville – Parcels with Destroyed Buildings (EXH.678.0003); Exhibit 678 – Pine Ridge Road – Destroyed Buildings (TEN.196.001.0006); Exhibit 678 – Bald Spur Road Area – Destroyed Buildings (TEN.196.001.0003); Exhibit 678 – Marysville Township – Building Permit Analysis (EXH.678.0002); Exhibit 679 – Statement of Gilmore, Attachment 64 (WIT.3018.001.0763); Exhibit 693 – Statement of Parsons (WIT.4021.001.0001) [92]–[95], [112]; Sturzenegger T13987:11–T13988:19; Parsons T14257:18–T14258:12, T14261:9–T14261:25, T14262:10–T14262:24, T14266:10–T14266:18, T14292:23–T14296:5

19 Exhibit 678 – Marysville – Pre Fire Aerial Photography (EXH.678.0005)

20 Exhibit 678 – Marysville – Post Fire Aerial Photography (EXH.678.0004)

21 Exhibit 185 – Statement of Woolcock (WIT.7505.001.0001_R) [52]–[56]; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004; Exhibit 709 – Lane Report (EXP.022.001.0001) [38], [40]; Exhibit 705 – Pinfold Report (EXP.019.001.0001) at 0035, 0038–0040; Exhibit 708 – Hansen Report (EXP.021.001.0001) [7.23]–[7.36]; Hansen T14671:19–T14671:21; Woolcock T5790:16–T5792:16

22 Gilmore T13878:21–T13879:8

23 Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004; Hansen T14671:16–T14674:13

24 Exhibit 167 – BRC Research – Building and Planning in Bushfire-prone Areas, Appendix 4 (TEN.065.001.0080) at 0081–0088; Exhibit 167 – A Fresh Approach to Development Assessment in Bushfire Protection Areas (TEN.063.001.0018); Exhibit 167 – BRC Research – Building and Planning in Bushfire-prone Areas – Regulation and Policy in Other States and Territories, Appendix 1 (TEN.065.001.0038) at 0038–0042; Exhibit 167 – Bush Fire Prone Land Mapping (TEN.063.001.0024)

25 Exhibit 183 – Statement of Watson (WIT.4001.001.0001_R) [22]; Exhibit 207 – Statement of Andreou (WIT.3004.012.0065) [35]; Andreou T6420:19–T6421:8; Watson T5832:8–T5834:2

26 Exhibit 684 – Statement of Fox, Annexure 2 (WIT.3004.028.0227) at 0227, 0230; Exhibit 687 – Bushfire Penetration Into Urban Areas in Australia: A Spatial Analysis (CRC.304.001.0001) at 0024, 0028; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004; Chladil T14602:27–T14603:28, T14674:30–T14675:20, T14676:24–T14676:30

27 Exhibit 684 – Statement of Fox, Annexure 2 (WIT.3004.028.0227) at 0230; Exhibit 687 – Bushfire Penetration Into Urban Areas in Australia: A Spatial Analysis (CRC.304.001.0001) at 0024; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004; Sturzenegger T13978:1–T13978:4, T13990:11–T13991:17; McAneney T14111:18–T14111:27; Chladil T14601:2–T14601:27, T14602:27–T14603:28

28 Exhibit 614 – Statement of Hayes (WIT.3004.032.0147) [16]–[23]; Sturzenegger T13994:11–T13994:28

29 Exhibit 222 – Hennessy Report (EXP.006.001.0001) at 0034; Hennessy T6771:9–T6773:22; Chladil T14532:6–T14534:5; Pinfold T14534:6–T14536:3

30 Exhibit 207 – Statement of Andreou (WIT.3004.012.0065) [32]–[33]; Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [13.28], Attachment 89 (WIT.3018.001.1559) at 1589; Andreou T6418:27–T6420:10

31 Building Amendment (Bushfire Construction – Short-term Requirements) Regulations 2010 (Vic), r. 6

32 Submissions of the State of Victoria – Land Use Planning (RESP.3000.006.0001) [199]; Gilmore T13872:17–T13874:3

33 *Planning and Environment Act 1987,* ss. 1, 4(2)(a), 4(2)(c)

34 *Planning and Environment Act 1987,* s. 7

35 Exhibit 679 – Composition of a Planning Scheme (WIT.3018.001.0106)

36 *Planning and Environment Act 1987,* ss. 55–56, 61(2), 62(1)(a)

37 Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0002; Exhibit 706 – Yates Report (EXP.020.001.0001) at 0002–0003; Exhibit 708 – Hansen Report (EXP.021.001.0001) [3.18]–[3.24]; Chladil T14455:20–T14457:28

38 Exhibit 678 – Precinct Structure Planning Guidelines – Preparing the Precinct Structure Plan (TEN.173.002.0001) at 0009, 0042; Exhibit 678 – Delivering Melbourne's Newest Sustainable Communities – Background Technical Report 1: Land Capability (PCD.001.101.0001) at 0019–0020, 0044; Gilmore T13892:21–T13894:4, T13894:14–T13894:26; Fox T14037:15–T14038:29

39 Gilmore T13894:27–T13895:26

40 Gilmore T13895:27–T13895:30

41 Exhibit 708 – Hansen Report (EXP.021.001.0001) [2.15]

42 Exhibit 696 – Statement of Johnson (WIT.136.001.0001_R) [41]; Johnson T14340:17–T14341:4

43 Exhibit 708 – Hansen Report (EXP.021.001.0001) [2.16], [3.9]; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0003; Hansen T14561:27–T14562:8, T14565:23–T14569:6; Lane T14562:9–T14562:22; Buxton T14562:23–T14565:23; Yates T14569:14–T14570:1

44 Buxton T14573:11–T14574:6, T14574:26–T14575:4; Hansen T14574:9–T14574:25

45 Exhibit 678 – VPP Clause 35.04 – Green Wedge Zone (TEN.114.001.0047) at 0051–0052; Exhibit 678 – VPP Clause 35.06 – Rural Conservation Zone (TEN.114.001.0055) at 0058–0059; Exhibit 678 – VPP Clause 35.07 – Farming Zone (TEN.114.001.0062) at 0065–0066; Exhibit 678 – VPP Clause 35.03 – Rural Living Zone (TEN.114.001.0041) at 0044; Exhibit 679 – Statement of Gilmore, Attachment 16 (WIT.3018.001.0273), (WIT.3018.001.0303) at 0307, (WIT.3018.001.0281) at 0285

46 Exhibit 710 – Buxton Report (EXP.023.001.0001) at 0018

47 Exhibit 678 – Murrindindi Shire Council Restructure Overlay (TEN.203.001.0001); Exhibit 696 – Statement of Johnson (WIT.136.001.0001_R) [13]–[20]; Gilmore T13846:29–T13847:28; Abbey T14183:16–T14184:14; Johnson T14333:22–T14337:17; Parsons T14250:3–T14252:20

48 Buxton T14570:20–T14571:21; Hansen T14571:22–T14572:28

49 Exhibit 678 – Clause 37.03 – Urban Floodway Zone (TEN.114.001.0069); Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [12.8]–[12.16]; Gilmore T13883:24–T13884:21, T13890:26–T13891:7

50 Gilmore T13884:24–T13885:4

51 Hansen T14460:26–T14461:9, T14472:3–T14472:23, T14480:6–T14480:17; Buxton T14463:22–T14463:26, T14469:25–T14472:2; Chladil T14456:5–T14456:12, T14464:2–T14465:29, T14472:24–T14473:4; Pinfold T14478:5–T14478:13

52 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [11.7]; Gilmore T13882:16–T13883:9; Buxton T14462:20–T14463:22, T14479:6–T14479:22; Pinfold T14467:11–T14468:8; Chladil T14481:8–T14481:21

53 Exhibit 678 – VPP Clause 65 – Decision Guidelines (TEN.111.001.0062) at 0062–0063; Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [3.1(4)], Attachment 14 (WIT.3018.001.0262), Attachment 16 (WIT.3018.001.0267), (WIT.3018.001.0273), (WIT.3018.001.0281), (WIT.3018.001.0289), (WIT.3018.001.0296), (WIT.3018.001.0303), Attachment 22 (WIT.3018.001.0335), Attachment 23 (WIT.3018.001.0337)

54 Exhibit 678 – VPP Clause 15 – Environment (TEN.115.001.0001) at 0005

55 Exhibit 678 – VPP Clause 15 – Environment (TEN.115.001.0001) at 0006–0010; Exhibit 708 – Hansen Report (EXP.021.001.0001) [2.7]; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004; Hansen T14419:22–T14420:3; Buxton T14441:29–T14442:14

56 Exhibit 708 – Hansen Report (EXP.021.001.0001) [2.7], [8.22]–[8.24]; Exhibit 710 – Buxton Report (EXP.023.001.0001) at 0038; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004; Buxton T14692:31–T14695:24; Lane T14695:25–T14696:22; Hansen T14696:23–T14697:25; Chladil T14697:26–T14698:21; Yates T14698:24–T14699:4; Pinfold T14699:5–T14702:5

57 Exhibit 708 – Hansen Report (EXP.021.001.0001) [2.7], [8.22]–[8.24]; Exhibit 710 – Buxton Report (EXP.023.001.0001) at 0038; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004; Buxton T14692:31–T14695:24; Lane T14695:25–T14696:22; Hansen T14696:23–T14697:25; Chladil T14697:26–T14698:21; Yates T14698:24–T14699:4; Pinfold T14699:5–T14702:5

58 Exhibit 678 – Building in Bushfire-prone Areas – Information and Advice, CSIRO & Standards Australia (SAA HB36–1993) (SUMM.045.002.0003); Exhibit 678 – Planning Conditions and Guidelines for Subdivisions (CFA.001.026.0232); Exhibit 678 – Standards Australia HB 330–2009 Living in Bushfire-prone Areas (TEN.174.001.0001); Gilmore T13856:4–T13856:19, T13858:28–T13859:14; Sturzenegger T13999:3–T13999:31

59 Exhibit 222 – Hennessy Report (EXP.006.001.0001) at 0034; Hennessy T6771:9–T6773:22; Planning Expert Panel Discussion T14532:6–T14536:3

60 Exhibit 708 – Hansen Report (EXP.021.001.0001) [2.7], [8.22]–[8.24]; Exhibit 710 – Buxton Report (EXP.023.001.0001) at 0038; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004; Buxton T14692:31–T14695:24; Lane T14695:25–T14696:22; Hansen T14696:23–T14697:25; Chladil T14697:26–T14698:21; Yates T14698:24–T14699:4; Pinfold T14699:5–T14702:5

61 Sturzenegger T13983:13–T13984:4; Rogers T14368:5–T14368:13

62 Submissions of the State of Victoria – Land Use Planning (RESP.3000.006.0001) [54]

63 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [3.9], [3.32]; Gilmore T13860:6–T13860:26

64 Exhibit 678 – VPP Clause 44.06 – Wildfire Management Overlay (TEN.111.001.0036) at 0036–0038

65 Exhibit 678 – VPP Clause 44.06 – Wildfire Management Overlay (TEN.111.001.0036) at 0038–0040

66 Exhibit 678 – VPP Clause 44.06 – Wildfire Management Overlay (TEN.111.001.0036) at 0038; Exhibit 678 – Building in a Wildfire Management Overlay: Applicant's Kit 2007 (TEN.008.001.0007) at 0022, 0029

67 Exhibit 678 – VPP Clause 44.06 – Wildfire Management Overlay (TEN.111.001.0036) at 0040; *Planning and Environment Act 1987*, ss. 55–56

68 Exhibit 678 – VPP Clause 44.06 – Wildfire Management Overlay (TEN.111.001.0036) at 0040

69 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [3.20], [7.9]–[7.10], [7.12], [7.16]; Gilmore T13874:27–T13875:20

70 Sturzenegger T13984:24–T13984:31, T13989:12–T13989:14

71 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [7.8]; Exhibit 688 – Key Introductory Propositions of MAV and 77 Councils (EXH.688.0001) [5]

72 Exhibit 682 – Statement of Sturzenegger (WIT.3004.028.0166) [18.b]; Gilmore T13877:26–T13878:11; Sturzenegger T13981:31–T13982:8, T13984:15–T13984:31, T13985:29–T13986:22; Fox T14026:18–T14027:8

73 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [7.11], [7.13], Attachment 61 (WIT.3018.001.0753) at 0754; Gilmore T13875:21–T13875:30, T13878:13–T13878:20; Sturzenegger T13985:17–T13985:28

74 Fox T14024:26–T14025:30

75 Exhibit 678 – Land Use Planning and Bushfire Risk: CFA Referrals and the February 2009 Victorian Fire Area (CFA.600.003.0001)

76 Exhibit 678 – Amendment VC54 and Explanatory Report (TEN.061.001.0010), (TEN.061.001.0012), (TEN.061.001.0013)

77 Exhibit 678 – Amendment VC54 and Explanatory Report (TEN.061.001.0010) at 0010

78 Gilmore T13865:15–T13865:21

79 Exhibit 678 – Amendment VC57, Explanatory Report and Advisory Note Dated May 2009 (TEN.061.001.0018), (TEN.061.001.0020), (TEN.061.001.0021), (TEN.061.001.0024); Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [5.13]–[5.25]; Submissions of Counsel Assisting – Building in Bushfire-prone Areas (SUBM.201.001.0001) [3.12]; Gilmore T13864:30–T13865:13, T13867:22–T13868:4

80 Exhibit 678 – Bald Spur Road Post Fire Aerial Photography (TEN.196.001.0005)

81 Exhibit 678 – Pine Ridge Road Post Fire Aerial Photography (TEN.196.001.0008)

82 Exhibit 689 – Statement of Abbey (WIT.4016.001.0001) [190]–[191]; Abbey T14174:23–T14175:19; Murray T14330:21–T14331:11

83 Exhibit 708 – Hansen Report (EXP.021.001.0001) [3.25]–[3.32]; Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004–0005; Abbey T14175:25–T14176:2

84 Exhibit 678 – VPP Clause 44.06 – Wildfire Management Overlay (TEN.111.001.0036) at 0039; Exhibit 678 – Building in a Wildfire Management Overlay: Applicant's Kit 2007 (TEN.008.001.0007) at 0018; Submissions of Counsel Assisting – Murrindindi Fire (SUBM.202.009.0001) [10.1]–[10.15], [13.19]; Submissions of the State for the Murrindindi Mill Fire (RESP.3000.005.0112) [230]

85 Exhibit 705 – Pinfold Report (EXP.019.001.0001) at 0038–0045; Exhibit 708 – Hansen Report (EXP.021.001.0001) [8.2]–[8.21]; Exhibit 678 – VPP Clause 44.06 – Wildfire Management Overlay (TEN.111.001.0036) at 0036

86 Exhibit 678 – Design and Siting Guidelines, Bushfire Protection for Rural Houses (CFA.001.026.0208)

87 Exhibit 684 – Statement of Fox (WIT.3004.028.0202) [38]–[39]; Fox T14027:26–T14028:5, T14030:1–T14030:11

88 *Masten Bennett & Associates v Nillumbik Shire Council* [2010] VCAT 21 May 2010

89 Exhibit 678 – Building in a Wildfire Management Overlay: Applicant's Kit 2007 (TEN.008.001.0007) at 0012–0021, 0026–0027; Exhibit 684 – Statement of Fox (WIT.3004.028.0202) [30], [32(c)]; Exhibit 684 – Site Plan – Wildfire & Vegetation Management (DOC.CFA.003.0056_R); Exhibit 684 – Map – Jan 21 09"56:45 EST 2009 (DOC.CFA.003.0051_R); Exhibit 684 – Planning Permit (DOC.CFA.003.0065_R); Exhibit 684 – Conditional Consent to the Grant of a Permit (DOC.CFA.004.0003_R); Exhibit 689 – Statement of Abbey (WIT.4016.001.0001) [172]–[176]; Exhibit 693 – Statement of Parsons (WIT.4021.001.0001) [107]–[108]; Exhibit 694 – Statement of Morland (WIT.4023.001.0001) [33], [74]–[76]; Fox T14029:5–T14029:22, T14030:12–T14035:31

90 Exhibit 707 – Chladil Report (EXP.024.001.0001) [7.2]–[7.9]; Sturzenegger T13999:18–T13999:29

91 Exhibit 678 – PN LUP 0004 Land Use Planning – Assessing Applications for Non Dwellings Within a Wildfire Management Overlay (CFA.600.003.0225) at 0228

92 Exhibit 678 – PN LUP 0004 Land Use Planning – Assessing Applications for Non Dwellings Within a Wildfire Management Overlay (CFA.600.003.0225) at 0232

93 Exhibit 678 – PN LUP 0004 Land Use Planning – Assessing Applications for Non Dwellings Within a Wildfire Management Overlay (CFA.600.003.0225) at 0238; Fox T14037:5–T14037:14

94 Exhibit 167 – Planning for Bushfire Protection (TEN.063.001.0048) at 0085–0092; Pinfold T14709:28–T14712:13

95 Exhibit 678 – Planning Conditions and Guidelines for Subdivisions (CFA.001.026.0232); Exhibit 678 – PN LUP 0002 Land Use Planning – Assessing Subdivision Referrals Within a Wildfire Management Overlay (CFA.600.003.0217)

96 Exhibit 678 – Planning Conditions and Guidelines for Subdivisions (CFA.001.026.0232) at 0239, 0241, 0243–0249

97 Exhibit 678 – PN LUP 0002 Land Use Planning – Assessing Subdivision Referrals Within a Wildfire Management Overlay (CFA.600.003.0217) at 0219–0220; Fox T14036:17–T14036:26

98 Exhibit 678 – PN LUP 0002 Land Use Planning – Assessing Subdivision Referrals Within a Wildfire Management Overlay (CFA.600.003.0217) at 0224; Fox T14036:6–T14036:14

99 Exhibit 684 – Statement of Fox, Annexure 2 (WIT.3004.028.0227) at 0227, 0230; Exhibit 697 – Statement of Francis (WIT.133.001.0001_R) [28]–[34]; Exhibit 709 – Lane Report (EXP.022.001.0001) at 0009–0010; Dripps T14073:2–T14073:12; Lane T14560:20–T14561:24

100 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 at 92, 94; Exhibit 724 – Statement of Maino (WIT.138.001.0001_R) [3]–[6], [10]–[12]; Maino T14956:1–T14957:8, T14958:1–T14958:29, T14959:9–T14960:31

101 Exhibit 678 – VPP Clause 15 – Environment (TEN.115.001.0001) at 0009

102 Exhibit 678 – VPP Clause 15 – Environment (TEN.115.001.0001) at 0009–0010; Exhibit 678 – Victoria's Native Vegetation Management – A Framework for Action (SUMM.020.038.4204) at 4214; Exhibit 685 – Statement of Dripps (WIT.3024.005.0081) [12]; Exhibit 744 – National Framework for the Management and Monitoring of Australia's Native Vegetation (DEWH.001.001.0246). A revised draft National Framework was released in February 2010 for public comment which, once finalised, is intended to replace the existing National Framework: Exhibit 744 – Australia's Native Vegetation Framework – Consultation Draft (DEWH.001.001.0320); Dripps T14041:17–T14041:20, T14090:21–T14091:24

103 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [26]; Exhibit 678 – Victoria's Native Vegetation Management – A Framework for Action (SUMM.020.038.4204) at 4211

104 Exhibit 678 – Victoria's Native Vegetation Management – A Framework for Action (SUMM.020.038.4204) at 4211

105 Exhibit 678 – Victoria's Native Vegetation Management – A Framework for Action (SUMM.020.038.4204) at 4218–4219

106 Exhibit 678 – Victoria's Native Vegetation Management – A Framework for Action (SUMM.020.038.4204) at 4222, 4227

107 Exhibit 678 – Victoria's Native Vegetation Management – A Framework for Action (SUMM.020.038.4204) at 4227–4229, 4258–4259; Exhibit 685 – Statement of Dripps (WIT.3024.005.0081) [97]–[98], Attachment 5 (DSE.HDD.0052.1822) at 1836; Dripps T14049:18–T14050:15

108 Exhibit 678 – VPP Clause 52.17 – Native Vegetation (TEN.111.001.0041) at 0041

109 Exhibit 678 – VPP Clause 52.17 – Native Vegetation (TEN.111.001.0041) at 0041; Exhibit 678 – VPP Clause 72 – General Terms (TEN.114.001.0085) at 0087

110 Exhibit 678 – VPP Clause 66 – Referral and Notice Provisions (TEN.111.001.0064) at 0066; Exhibit 685 – Statement of Dripps (WIT.3024.005.0081) [20]; Dripps T14053:16–T14054:16

111 Exhibit 678 – VPP Clause 65 – Decision Guidelines (TEN.111.001.0062) at 0062; Exhibit 685 – Statement of Dripps (WIT.3024.005.0081) [26], Annexure 5 (DSE.HDD.0052.1822); Dripps T14056:12–T14058:25

112 Exhibit 678 – VPP Clause 52.17 – Native Vegetation (TEN.111.001.0041) at 0043–0050

113 Exhibit 678 – Building in a Wildfire Management Overlay: Applicant's Kit 2007 (TEN.008.001.0007) at 0022–0025; Exhibit 678 – VPP Clause 52.17 – Native Vegetation (TEN.111.001.0041) at 0046; Sturzenegger T13977:22–T13978:14; Dripps T14076:12–T14077:5

114 Exhibit 678 – Amendment VC61 Explanatory Report (TEN.077.001.0001); Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [5.26]–[5.36]; Exhibit 695 – Statement of Murray (WIT.134.001.0001_R) [34]; Gilmore T13868:5–T13869:31

115 Dripps T14083:8–T14083:27, T14083:30–T14084:17; Gilmore T13868:14–T13869:10, T13869:20–T13869:31, T13871:7–T13871:16

116 Exhibit 696 – Statement of Johnson (WIT.136.001.0001_R) [35]; Johnson T14339:20–T14340:16; Buxton T14655:2–T14658:14

117 Exhibit 678 – VPP Clause 42.01 – Environmental Significance Overlay (TEN.111.001.0002); Exhibit 678 – VPP Clause 42.02 – Vegetation Protection Overlay (TEN.111.001.0006); Exhibit 678 – VPP Clause 42.03 – Significant Landscape Overlay (TEN.111.001.0011)

118 Exhibit 678 – VPP Clause 42.01 – Environmental Significance Overlay (TEN.111.001.0002) at 0002–0004; Exhibit 678 – VPP Clause 42.02 – Vegetation Protection Overlay (TEN.111.001.0006) at 0006-0008; Exhibit 678 – Clause 42.03 – Significant Landscape Overlay (TEN.111.001.0011) at 0011–0013; Exhibit 678 – VPP Clause 65 – Decision Guidelines (TEN.111.001.0062); Dripps T14077:6–T14077:26

119 Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0003; Lane T14621:14–T14629:6

120 Exhibit 707 – Chladil Report (EXP.024.001.0001) [5.10]–[5.11]

121 Planning Expert Panel Discussion T14629:7–T14635:10

122 Hansen T14637:7–T14637:17, T14659:3–T14659:12; Pinfold T14638:8–T14639:5, T14661:22–T14662:4; Buxton T14655:12–T14656:29

123 Submissions of the State of Victoria – Land Use Planning (RESP.3000.006.0001) [171]

124 Submissions of the State of Victoria – Land Use Planning (RESP.3000.006.0001) [178(c)]

125 Lane T14649:27–T14654:27

126 Lane T14652:28–T14653:5

127 Exhibit 731 – Statement of Matthews (WIT.137.001.0001_R) [5]–[6], [28]–[45]; Matthews T15115:10–T15121:10

128 Submissions of the State of Victoria – Land Use Planning (RESP.3000.006.0001) [188]–[189]; Lane T14653:16–T14653:28

129 Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0003; Planning Expert Panel Discussion T14680:16–T14681:16; Dripps T14080:5–T14081:13, T14093:13–T14093:23

130 Exhibit 831 – Preparing Your Property – Make Your Home Bushfire Ready (RESP.3001.001.0047) at 0056; Exhibit 831 – Design and Siting Guidelines, Bushfire Protection for Rural Houses (CFA.001.026.0208) at 0224–0226; Exhibit 831 – Tasmania Fire Service, Fire Retardant Garden Plants for the Urban Fringe and Rural Areas (TEN.180.001.0007); Exhibit 831 – South Australian Country Fire Service Wildfire Fact Sheet No 15 (TEN.180.001.0003); Exhibit 831 – South Australian Country Fire Service Wildfire Fact Sheet No 16 (TEN.180.001.0005); Exhibit 831 – ACT Planning and Land Authority, FireWise Home Gardens (TEN.180.001.0001); Exhibit 831 – CSIRO, Landscape and Building Design for Bushfire Areas (extracts) (TEN.182.001.0001); Exhibit 697 – Statement of Francis, Attachment 3 (SUBM.002.017.0407_R) at 0437_R–0441_R; Sturzenegger T14001:5–T14002:1

131 Exhibit 731 – Statement of Matthews (WIT.137.001.0001_R) [30], [34]; Matthews T15119:21–T15120:22

132 Submissions of the State of Victoria – Land Use Planning (RESP.3000.006.0001) [196]

133 Exhibit 689 – Statement of Abbey (WIT.4016.001.0001) [7]–[10], [22]–[69], [87], [91], [103]–[144], [154]–[165], Attachment 2 (WIT.4016.001.0064) at 0092, 0120, 0170–0182, 0186–0187, Attachment 5 (WIT.4016.001.0409) at 0417–0421, Attachment 8 (WIT.4016.001.0456), Attachment 9 (WIT.4016.001.0466), Attachment 10 (WIT.4016.001.0468) at 0469, Attachment 11 (WIT.4016.001.0470); Exhibit 166 – Wildfire Map Management Overlay Map – Nillumbik (SUMM.020.035.0014); Abbey T14129:19–T14130:11, T14140:1–T14140:16, T14138:22–T14139:9, T14171:30–T14172:3, T14194:21

134 Exhibit 678 – Murrindindi Shire Council LPPF (TEN.202.001.0001) at 0009, 0016–0018, 0021–0022, 0029–0033, 0053–0055, 0057–0059; Exhibit 678 – Planning Map – WMO Marysville Region (TEN.191.001.0004); Exhibit 678 – Planning Map – WMO in Kinglake Region (TEN.191.001.0001); Exhibit 678 – Planning Map – WMO Bald Spur Road, Kinglake (TEN.191.001.0002); Exhibit 678 – Planning Map – WMO Pine Ridge Road, Kinglake West (TEN.191.001.0003); Exhibit 377 – Statement of Ellett (WIT.4006.001.0001) [29]; Exhibit 166 – Wildfire Map Management Overlay Map – Murrindindi (SUMM.020.035.0013); Exhibit 679 – Statement of Gilmore, Attachment 60 (WIT.3018.001.0748) at 0750; Exhibit 693 – Statement of Parsons (WIT.4021.001.0001) [11]–[14], [38]–[41], [43]–[60], [92]–[97]; Parsons T14242:5–T14242:25, T14244:7–T14244:11, T14248:16–T14249:8, T14249:22–T14249:29, T14259:2–T14260:17, T14266:19–T14267:24

135 Exhibit 166 – Wildfire Map Management Overlay Map – Latrobe (SUMM.020.035.0009); Exhibit 678 – Latrobe City Council LPFF – Current (TEN.194.001.0001) at 0005, 0010–0011, 0014; Exhibit 678 – Latrobe City Council LPPF – Superseded (TEN.195.001.0001); Exhibit 679 – Statement of Gilmore, Attachment 60 (WIT.3018.001.0748) at 0749; Exhibit 694 – Statement of Morland (WIT.4023.001.0001) [7]–[31], [41]–[50], [61]–[67]; Morland T14302:12–T14302:30, T14303:11–T14303:21, T14304:24–T14304:25, T14306:11–T14307:8

136 Exhibit 708 – Hansen Report (EXP.021.001.0001) [2.19]; Planning Expert Panel Discussion T14451:23–T14455:4

137 Planning Expert Panel Discussion T14579:2–T14588:18; Parsons T14289:22–T14289:26

138 Exhibit 678 – Pine Ridge Road Post Fire Aerial Photography (TEN.196.001.0008); Exhibit 680 – Statement of Cook (WIT.131.001.0001_R) [27], [32]–[34]; Hainsworth T4545:6–T4545:13; Cook T13902:25–T13902:27, T13920:5–T13921:13

139 Exhibit 678 – Pine Ridge Road – Pre Fire Aerial Photography (TEN.196.001.0007)

140 Exhibit 678 – Pine Ridge Road – Post Fire Aerial Photography (TEN.196.001.0008)

141 Exhibit 706 – Yates Report (EXP.020.001.0001) at 0003; Exhibit 710 – Buxton Report (EXP.023.001.0001) at 0017; Planning Expert Panel Discussion T14431:24–T14453:31, T14573:11–T14575:4; Hansen T14581:16–T14582:3; Buxton T14470:2–T14470:22

142 Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [25], Annexure 4 (WIT.6001.002.0229) at 0233–0234; Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [96], [99], [269]; Building Regulations 2006, rr. 109, 807; *Building Act 1993*, ss. 1, 3, 7, 9, 196, Parts 3 and 5; Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [11]–[16]

143 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0011–0015

144 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0038–0040, and in particular Figure 6, citing Blanchi R, Lucas C, Leonard J & Finkele K (forthcoming), *Meteorological Conditions and Wildfire Related House Loss in Australia (review International Journal of Wildland Fire)*; Exhibit 3 – Statement of Rees (WIT.004.001.0001) [237]

145 Exhibit 135 – Tolhurst Report (EXP.003.005.0001); Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0015–0018

146 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0020, 0029; Exhibit 687 – Bushfire Penetration into Urban Areas in Australia: A Spatial Analysis (CRC.304.001.0001) at 0020

147 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0022

148 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0025, 0035–0036

149 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0026–0027

150 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0025, 0036–0037

151 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0019–0020, 0027

152 Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0019

153 Exhibit 165 – Building Commission & Standards Australia Seminars Series – Delegates Information Pack – AS 3959–2009 (TEN.064.001.0001) at 0005, 0011

154 Exhibit 17 – Statement of Spooner (WIT.011.001.0001_R) [26]; Exhibit 224 – Statement of Cowdery (WIT.081.001.0001_R) [33]; Exhibit 357 – Statement of Malcolm (WIT.3004.017.0251) [44], [50]; Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0027; Spooner T485:1–T485:21; Cowdery T6865:20–T6865:24; Barber T3351:20–T3351:29; Malcolm T8707:3–T8707:5; Leonard T5520:25–T5522:30; Tolhurst T1076:3–T1076:23

155 Exhibit 172 – Statement of Eadie (WIT.7502.001.0001_R) [20]–[38], Attachment 2 (WIT.7502.001.0038), Attachment 3 (WIT.7502.001.0053), Attachment 6 (WIT.7502.001.0097), Attachment 7 (WIT.7502.001.0211) at 0211–0216, Attachment 13 (WIT.7502.001.0261); Eadie T5379:7–T5379:18

156 Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0025; Exhibit 172 – Statement of Eadie (WIT.7502.001.0001_R) [45]–[46], [54]–[55], [60], [64], [66], [81], [85], [90]–[92], [94], [97], [100], [106]–[107], [144]–[146], Attachment 18 (WIT.7502.001.0304), Attachment 23 (WIT.7502.002.0169) at 0177–0178, Attachment 37 (WIT.7502.003.0062), Attachment 62 (WIT.7502.004.0155), Attachment 63 (WIT.7502.004.0166), Attachment 87 (WIT.7502.006.0151); Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [55(a)], [55](f)], [55(n)], Annexure 22 (WIT.6001.002.0515), Annexure 24 (WIT.6001.002.0550), Annexure 36 (WIT.6001.002.0813), Annexure 37 (WIT.6001.002.0863); Eadie T5383:31–T5384:9, T5385:2–T5386:11

157 Exhibit 172 – Statement of Eadie (WIT.7502.001.0001_R) [110], [112], Attachment 66 (WIT.7502.004.0174), Attachment 67 (WIT.7502.004.0182); Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [55(t)], Annexure 25 (WIT.6001.002.0553); Eadie T5386:20–T5386:26

158 Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [55(cc)], Annexure 31 (WIT.6001.002.0697); Exhibit 171 – Statement of Tucker (WIT.7501.001.0001) [101]–[106]; Tucker T5309:10–T5311:12

159 Exhibit 171 – Statement of Tucker (WIT.7501.001.0001) [107], Attachment 87 (WIT.7501.005.0121)

160 Exhibit 171 – Statement of Tucker (WIT.7501.001.0001) [111]–[119], Attachment 88 (WIT.7501.005.0131), Attachment 89 (WIT.7501.005.0134), Attachment 90 (WIT.7501.005.0139), Attachment 91 (WIT.7501.005.0142), Attachment 92 (WIT.7501.005.0145); Exhibit 188 – Statement of Orr (WIT.060.001.0001_R) [30]–[32], Attachment 2 (WIT.060.001.0019); Tucker T5314:26–T5317:10; Donaldson T5624:20–T5626:24

161 Exhibit 171 – Statement of Tucker (WIT.7501.001.0001) [123]; Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [79], Annexure 33 (WIT.6001.002.0802), Annexure 34 (WIT.6001.002.0809); Exhibit 481 – Minutes of ABCB Meeting Held 5 March 2009 (TEN.126.001.0008)

162 Exhibit 171 – Statement of Tucker (WIT.7501.001.0001) [31]–[35], Attachment 27 (WIT.7501.002.0078), Attachment 28 (WIT.7501.002.0082); Submissions of the Commonwealth – Building in Bushfire-prone Areas (RESP.6003.001.0001) [20]–[23]; Submissions of the State of Victoria – Building in Bushfire-prone Areas (RESP.3001.011.0062) [7]; Submissions of Standards Australia – Building in Bushfire-prone Areas (RESP.7501.002.0001) [5]; Tucker T5272:30–T5273:27, T5358:13–T5358:27

163 Donaldson T5610:23–T5612:2, T5618:12–T5619:15; Chladil T5437:24–T5437:30

164 Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [14]; Donaldson T5586:14–T5587:17, T5617:31–T5618:4

165 Exhibit 161 – Reform of Building Regulation, Productivity Commission Research Report (TEN.062.001.0001); Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [14], Annexure 5 (WIT.6001.002.0250), Annexure 6 (WIT.6001.002.0353); Donaldson T5586:14–T5587:17, T5594:4–T5594:31, T5595:1–T5596:14

166 Exhibit 171 – Statement of Tucker, Attachment 26 (WIT.7501.002.0038) at 0071

167 Exhibit 180 – Statement of McLennan (WIT.068.001.0001_R) [59]–[67]; Tucker T5289:16–T5290:25

168 Exhibit 930 – National Standard for Private Bushfire Shelters (TEN.285.001.0001)

169 Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [137]–[140]; Exhibit 172 – Statement of Eadie (WIT.7502.001.0001_R) [135]–[139], Attachment 84 (WIT.7502.006.0076); Eadie T5371:15–T5373:21

170 Exhibit 172 – Statement of Eadie, Attachment 6 (WIT.7502.001.0098) at 0132

171 Exhibit 172 – Statement of Eadie, Attachment 6 (WIT.7502.001.0098) at 0173–0179

172 Exhibit 177 – Statement of Donaldson, Annexure 37 (WIT.6001.002.0863)

173 Exhibit 172 – Statement of Eadie, Attachment 6 (WIT.7502.001.0098) at 0173

174 Exhibit 169 – Supplementary Statement of Arnel, Annexure Q (WIT.3000.002.0375); Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0051–0053; Exhibit 177 – Statement of Donaldson, Annexure 39 (WIT.6001.002.0900)

175 Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [27]; McLennan T5697:30–T5698:14

176 Exhibit 169 – Supplementary Statement of Arnel, Annexure Q (WIT.3000.002.0375) at 0385–0390; Exhibit 179 – Statement of Harding (WIT.7503.001.0001_R) [91]–[95]; Exhibit 180 – Statement of McLennan (WIT.068.001.0001_R) [69]–[71]; Submissions of the State of Victoria – Building in Bushfire-prone Areas (RESP.3001.011.0062) [14c], [19]; Arnel T5198:27–T5199:1, T5199:23–T5200:2; Harding T5658:11–T5659:1; McLennan T5683:1–T5685:26; Donaldson T5628:22–T5628:28, T5629:3–T5629:11; Welch T5772:23–T5773:4; Woolcock T5782:7–T5782:20

177 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [212]–[216]; Exhibit 180 – Statement of McLennan (WIT.068.001.0001_R) [85]–[90]; Exhibit 185 – Statement of Woolcock (WIT.7505.001.0001_R) [20]; Exhibit 195 – Statement of Berry (WIT.071.001.0001_R) [111]; Arnel T5194:23–T5195:27, T5197:20–T5198:8; McLennan T5684:15–T5684:22, T5699:2–T5699:18; Woolcock T5777:20–T5779:9

178 Exhibit 171 – Statement of Tucker, Attachment 89 (WIT.7501.005.0134) at 0135; Exhibit 174 – Statement of Chladil (WIT.7506.001.0001_R) [30]–[34]; Exhibit 188 – Statement of Orr (WIT.060.001.0001_R) [57]; Exhibit 190 – Statement of Spring (WIT.3004.011.0228) [17]–[18], [25]–[26]; Exhibit 207 – Statement of Andreou (WIT.3004.012.0065) [28]; Exhibit 207 – Letter from CFA and MFB to T Arnel (CFA.001.023.0229); Chladil T5443:4–T5445:22; Orr T5892:4–T5893:26; Spring T6002:6–T6002:9, T6003:9–T6003:19; Andreou T6412:7–T6413:25

179 Exhibit 174 – Statement of Chladil (WIT.7506.001.0001_R) [30]–[34]; Chladil T5443:4–T5445:22

180 Exhibit 167 – BRC Research – Building and Planning in Bushfire-prone Areas, Appendix 1 (TEN.065.001.0038) at 0056–0058; Orr T5914:27–T5915:27

181 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report,* Parliament of Victoria, Melbourne, August 2009 [7.104]

182 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [241]

183 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [246], [250]–[252]; Exhibit 167 – BRC Research – Building and Planning in Bushfire-prone Areas (TEN.065.001.0001) at 0030–0031, Appendix 1 (TEN.065.001.0038) at 0050–0060, Appendix 3 (TEN.063.001.0112) at 0114; Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [43]–[47]; *Rural Fires Act 1997* (NSW), s. 100B; Orr T5914:10–T5916:27

184 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report 2,* Parliament of Victoria, Melbourne, November 2009 [42]–[54]

185 Exhibit 997 – Letter to Fiona Bustos-McNeil of Standards Australia from Gary Morgan of Bushfire CRC (CORR.1006.0017_R)

186 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report 2,* Parliament of Victoria, Melbourne, November 2009 [51]–[54]

187 Chladil T14686:31–T14687:7; Pinfold T14687:8–T14687:25

188 Exhibit 171 – Statement of Tucker, Attachment 88 (WIT.7501.005.0131), Attachment 89 (WIT.7501.005.0134) at 0135; Exhibit 174 – Statement of Chladil (WIT.7506.001.0001_R) [44]–[46]; Exhibit 175 – Leonard Report (TEN.066.001.0001) at 0052–0053; Exhibit 177 – Statement of Donaldson, Annexure 36 (WIT.6001.002.0813), Annexure 37 (WIT.6001.002.0863); Exhibit 188 – Statement of Orr, Attachment 2 (WIT.060.001.0019); Chladil T5449:21–T5451:5

189 Exhibit 169 – Supplementary Statement of Arnel, Annexure Q (WIT.3000.002.0375) at 0390–0392; Exhibit 177 – Statement of Donaldson, Annexure 36 (WIT.6001.002.0813) at 0821–0822, Annexure 37 (WIT.6001.002.0863) at 0870; Eadie T5380:10–T5381:27

190 Building Amendment (Private Bushfire Shelter Construction) Interim Regulations 2010, rr. 3(1), 6; Building Amendment (Bushfire Construction – Short Term Requirements) Regulations 2010 (Vic), rr. 3(1), 6

191 Exhibit 13 – Statement of Newman (WIT.009.001.0001_R) [6], [11], [16], [22]; Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [13]–[15], [19]–[20], [42]–[44], [72]; Exhibit 182 – Statement of Moore (WIT.076.001.0001_R) [5], [9]–[10], [25]–[26], [43]–[44]; Exhibit 195 – Statement of Berry (WIT.071.001.0001_R) [9]–[18], [53], [58]–[68], [83]–[84]; Exhibit 672 – Building and Land-use Planning Research After the 7th February 2009 Victorian Bushfires Preliminary Findings (CRC.300.007.0135) at 0215; Newman T334:20–T334:30, T338:17–T338:28, T347:22–T347:24; Frazer-Jans T5239:28–T5242:6, T5242:30–T5243:10; Moore T5727:22–T5727:27, T5731:1–T5731:4, T5731:19–T5731:30, T5735:23–T5735:28; Berry T6112:22–T6113:25, T6118:18–T6120:14, T6123:23–T6123:29; Leonard T5956:28–T5957:16

192 Exhibit 831 – Preparing Your Property – Make Your Home Bushfire Ready (RESP.3001.001.0047) at 0058–0059; Exhibit 108 – Statement of Brown (WIT.053.001.0001_R) [6], [25]–[26]; Exhibit 416 – Statement of Verlaan (WIT.095.001.0001_R) [8], [13], [30]–[31]; Brown T3515:16–T3515:23, T3516:6–T3516:15, T3539:1–T3539:7; Easterbrook T7163:25–T7164:10, T7171:5–T7171:13; Verlaan T9640:1–T9640:12, T9646:15–T9646:25; Davey T776:19–T776:28; Hollowood T10649:25–T10650:25, T15986:16–T15986:18, T15993:15–T15993:21, T15994:3–T15994:7, T15995:14–T15995:16, T16014:23–T16014:28, T16015:22–T16015:29, T16016:30–T16017:6

193 Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [13]–[14]

194 Exhibit 172 – Statement of Eadie (WIT.7502.001.0001_R) [8], [21], [138]; Eadie T5391:23–T5392:12

195 Submissions of Standards Australia – Building in Bushfire-prone Areas (RESP.7501.002.0001) [19]–[20]; Exhibit 981 – Letter from Fiona Bustos-McNeil of Standards Australia Ltd (CORR.1003.0288_R) at 0291_R; Exhibit 997 – Letter to Fiona Bustos-McNeil of Standards Australia Ltd from Gary Morgan of Bushfire CRC (CORR.1006.0017_R)

196 Exhibit 174 – Statement of Chladil, Attachment 2 (WIT.7506.001.0024) at 0034

197 Exhibit 831 – Preparing Your Property – Make Your Home Bushfire Ready (RESP.3001.001.0047) at 0057–0059

198 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [261]

199 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [256], [259]–[260]

200 Exhibit 678 – Building in a Wildfire Management Overlay: Applicant's Kit 2007 (TEN.008.001.0007) at 0018–0021

201 *Planning and Environment Act 1987,* s. 14(a); *Building Act 1993,* ss. 9, 16

202 *Planning and Environment Act 1987,* ss. 114, 126, 129, 130(1)

203 Exhibit 693 – Statement of Parsons (WIT.4021.001.0001) [120]–[121]; Parsons T14272:30–T14273:21

204 Exhibit 689 – Statement of Abbey (WIT.4016.001.0001) [208]; Exhibit 693 – Statement of Parsons (WIT.4021.001.0001) [119]; Exhibit 694 – Statement of Morland (WIT.4023.001.0001) [89]; Abbey T14177:8–T14179:30; Parsons T14272:24–T14272:29, T14273:30–T14274:15

205 Abbey T14179:31–T14180:9, T14181:2–T14181:6; Hansen T14518:17–T14518:23

206 Exhibit 705 – Pinfold Report, Appendix 3 (EXP.019.001.0092); Pinfold T14480:27–T14481:7, T14490:4–T14491:19

207 Exhibit 174 – Statement of Chladil (WIT.7506.001.0001_R) [47]

208 Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0130–0131

209 Exhibit 160 – A Nation Charred (EXH.160.0001) at 0294, 0305–0306

210 Exhibit 171 – Statement of Tucker (WIT.7501.001.0001) [129]–[130], Attachment 100 (WIT.7501.005.0277); Exhibit 172 – Statement of Eadie (WIT.7502.001.0001_R) [21], [142]; Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [56]–[58]; Eadie T5392:23–T5392:30

211 Exhibit 172 – Statement of Eadie (WIT.7502.001.0001_R) [21]; Eadie T5392:23–T5392:30

212 Building Regulations 2006, Part 12; Chladil T5451:18–T5452:17; Woolcock T5792:17–T5793:5; Watson T5839:1–T5845:2

213 Exhibit 206 – Memorandum of Advice (TEN.074.001.0002)

214 B Teague, R McLeod, S Pascoe, *2009 Victorian Bushfires Royal Commission: Interim Report 2,* Parliament of Victoria, Melbourne, November 2009 at 13; Exhibit 831 – Preparing Your Property – Make Your Home Bushfire Ready (RESP.3001.001.0047); Exhibit 678 – Standards Australia HB 330-2009 Living in Bushfire-prone Areas (TEN.174.001.0001) at 0055–0057; Arnel T5208:17–T5208:23; Chladil T5452:18–T5452:25

215 *Country Fire Authority Act 1958,* ss. 96A(1)(b), 96(A)(2)

216 Exhibit 692 – Statement of Creedon (WIT.4017.001.0001) [19], [21]–[24]; Exhibit 692 – Municipal Fire Prevention Officer Learning Manual (EXH.692.0001) at 0003–0004; Exhibit 693 – Statement of Parsons (WIT.4021.001.0001) [145], [150]; Exhibit 694 – Statement of Morland (WIT.4023.001.0001) [99]–[101]; *Country Fire Authority Act 1958*, ss. 41(2), 41(3); Creedon T14231:24–T14232:6, T14234:28–T14235:11; Parsons T14280:24–T14282:22; Morland T14310:21–T14311:29

217 Further Submissions of the State of Victoria – Land Use Planning (RESP.3000.006.0110) [6]–[8]; Creedon T14234:24–T14236:3; Parsons T14282:29–T14283:10

218 *Country Fire Authority Act 1958*, ss. 28(1), 41F; Sturzenegger T14002:27–T14003:10

219 Exhibit 684 – Statement of Fox (WIT.3004.028.0202) [42], Annexure 6 (WIT.3004.028.0262); Exhibit 689 – Statement of Abbey (WIT.4016.001.0001) [170]–[171]; Exhibit 693 – Statement of Parsons (WIT.4021.001.0001) [105]–[106]; Exhibit 694 – Statement of Morland (WIT.4023.001.0001) [70]–[73]

220 Exhibit 165 – Building Commission & Standards Australia Seminars Series – Delegates Information Pack – AS 3959–2009 (TEN.064.001.0001); Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [153]; Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [204]–[209]; Exhibit 180 – Statement of McLennan (WIT.068.001.0001_R) [11], [55]–[58]; Exhibit 183 – Statement of Watson (WIT.4001.001.0001_R) [33]; Exhibit 185 – Statement of Woolcock (WIT.7505.001.0001_R) [54]–[66]; Arnel T5192:20–T5192:26, T5193:14–T5193:19, T5194:8–T5194:18; McLennan T5668:13–T5668:23, T5677:27–T5678:16

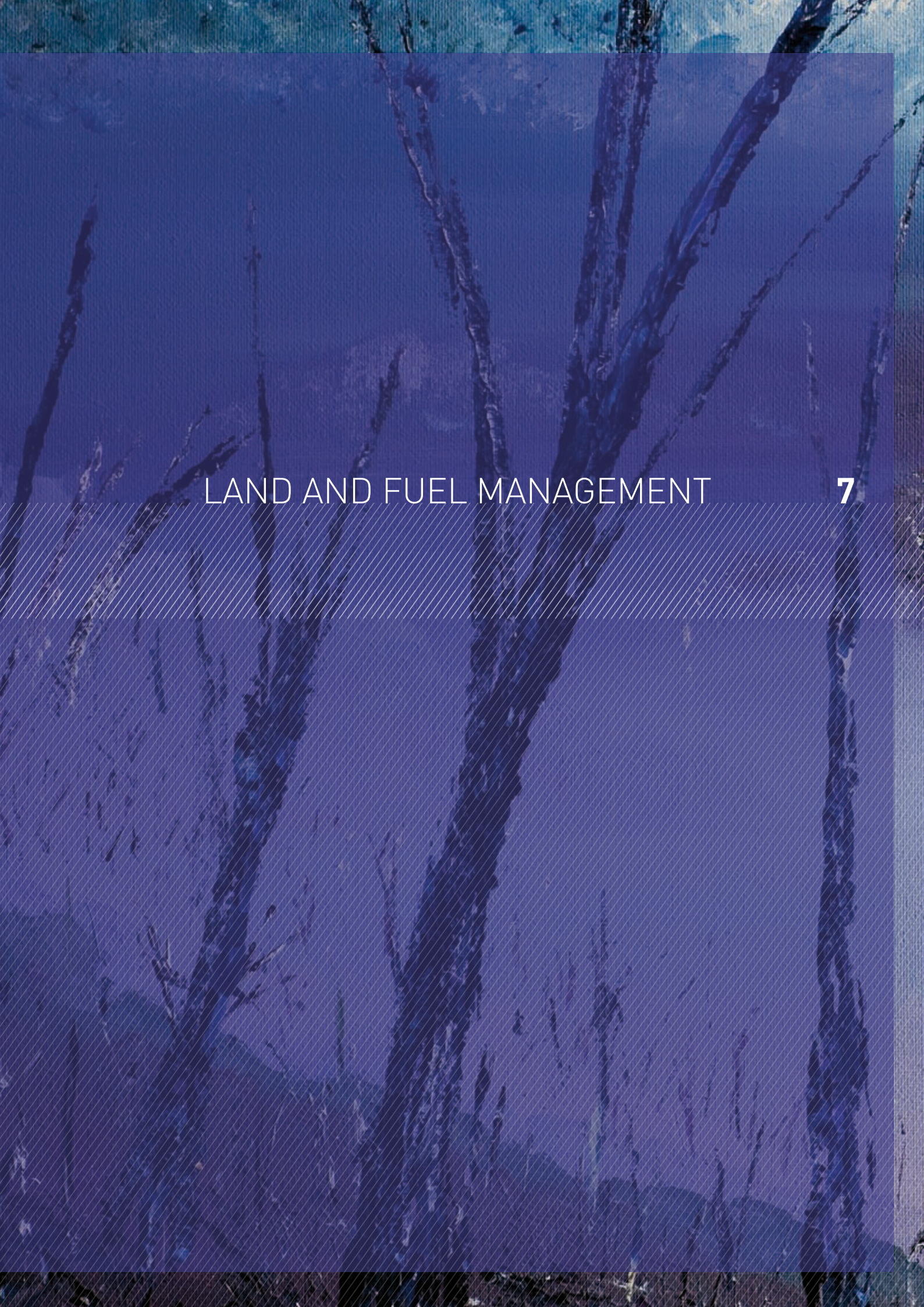
221 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) [210], Annexure M (WIT.3000.002.0361), Annexure O (WIT.3000.002.0368), Annexure R (WIT.3000.002.0396); Exhibit 185 – Statement of Woolcock (WIT.7505.001.0001_R) [59]; Woolcock T5788:22–T5788:31

222 Exhibit 180 – Statement of McLennan (WIT.068.001.0001_R) [55], [109]–[112]; McLennan T5677:4–T5677:19, T5677:27–T5678:16

223 Exhibit 188 – Statement of Orr (WIT.060.001.0001_R) [62]; Orr T5898:22–T5899:30

224 Exhibit 711 – Planning Topic – Facilitated Expert Conference, Written Statement (EXP.027.001.0001) at 0004

225 Exhibit 188 – Statement of Orr (WIT.060.001.0001_R) [59]–[66]; Submissions of AFAC – Building in Bushfire-prone Areas (RESP.7500.004.0001) [15]; Orr T5896:16–T5903:1



LAND AND FUEL MANAGEMENT 7

7 LAND AND FUEL MANAGEMENT

Bushfires occur naturally throughout many Victorian landscapes. The harm they cause to people and the environment has created the need for effective land management for prevention and mitigation of fire. One of the primary tools for fire management on public land is prescribed burning. The main purpose of prescribed burning is to make people and communities safer by reducing combustible fuel, and hence the risks associated with fire. A secondary purpose is protecting flora and fauna from the consequences of destructive bushfire by preferentially applying prescribed burning in the environment. The amount of prescribed burning occurring in Victoria has been insufficient to significantly reduce the risk of bushfires and the Commission is recommending that the State introduce a long-term, robust prescribed burning program.

The existence and maintenance of fuel breaks are important for giving firefighters access to forests for more effective bushfire suppression and prescribed burning purposes. Roads also act as fuel breaks and, importantly, allow access and egress during bushfires both for the authorities and for private individuals. It is therefore important to manage the vegetation along roadsides so that it does not impinge on these essential functions.

Roadsides may contain the only remnant native vegetation in some areas. Consequently, a balance must be struck between the competing objectives of maintaining biodiversity and reducing bushfire risk. The differing objectives of the regulatory framework with respect to road safety, biodiversity protection and bushfire prevention can be difficult to reconcile for road managers. The Commission's recommendations are aimed at making reducing bushfire risk a priority.

Properly carried out, prescribed burning reduces the spread and severity of bushfire. It makes a valuable contribution to reducing the risks to communities and firefighters by complementing effective suppression and is one of the essential protective strategies associated with making it safer for people to live and work in bushfire-prone areas in the state. Prescribed burning does not prevent bushfire: it is used in conjunction with building design, defendable space, community education and fire suppression to provide a comprehensive strategy for fire management to protect life and property.[1]

Prescribed burning can also contribute to other land management purposes, which may be reflected in the way it is implemented. It is, however, a high-risk activity to conduct, is resource intensive, is available only in limited time frames, and can have some adverse consequences for local communities.

The main focus of attention for prescribed burning is public land managed by the Department of Sustainability and Environment, comprising about 7.7 million hectares. These areas include national parks, state forests and reserves. A significant portion of public land is forested. It has a variety of uses or values, such as biodiversity conservation, recreation, water and carbon cycle maintenance, and timber production.[2] Australian forests are among the most fire dependent, fire adapted and fire prone forests in the world. The dry eucalypt forests in Victoria adjoin the majority of the economic assets at greatest risk from bushfire and in which the greatest reductions in risk to life and property might be obtained.[3]

The Commission is concerned that the State has maintained a minimalist approach to prescribed burning despite a number of recent official or independent reports and inquiries, all of which have recommended increasing the prescribed burning program. The State has allowed the forests to continue accumulating excessive fuel loads. Not dealing with this problem on a long-term and programmed basis means that fuel levels continue to increase, adding to the intensity of bushfires that inevitably eventuate and placing firefighters and communities at greater future risk.

The Commission did not review fire management on private lands in depth, although it recognises the importance of fuel management across the landscape. The level of hazard reduction on private land can influence fire behaviour and could either complement or detract from the effectiveness of the burning regimes on public land.

Since 2007 DSE and partner agencies have increased fuel break construction on public land, mainly around Melbourne Water catchments. Fuel breaks allow more rapid response and safer access for firefighters during bushfire suppression and for fire management during prescribed burning. Local councils and private landholders also construct and use fuel breaks as part of fire protection.

Roads and roadsides can be important fuel breaks, so fuels may need to be reduced during fire seasons by road managers. This occurs by mowing, slashing, pruning and, to a more limited extent, prescribed burning.[4] Roadsides offer wildlife corridors and shelter and contain remnant native vegetation.[5] Community consultations held by the Commission identified concerns that roadside vegetation had acted as a 'fuse' during the January–February 2009 bushfires and that dead vegetation and logs on roadsides had contributed to the fires. Fire experts investigated the effects of roadside vegetation during the January–February 2009 bushfires.[6]

Roads are also essential for members of the community seeking to escape fires and for emergency services attempting to access fires. Since the 2009 fires land and road managers and the Country Fire Authority have identified high-risk roads and are undertaking fuel-reduction works to reduce future bushfire risks.[7]

Local councils are responsible for bushfire prevention and mitigation activities and biodiversity management of roadsides, together with management of some local and arterial roads. VicRoads has similar responsibilities for rural freeways and arterial roads. There is legislative complexity around these competing objectives, and councils find compliance difficult and onerous.[8]

The Commission identified a number of important areas that require attention in relation to land and fuel management:

- The current prescribed burning regime in Victoria inadequately reduces the risks associated with bushfires.
- Accountability for achieving publicly recognised targets and effective implementation of prescribed burning is not evident or supported by transparent resourcing.
- There is a poor understanding of biodiversity and the effects of different fire regimes on biodiversity.
- There are unresolved tensions between bushfire risk mitigation and environmental conservation reflected in fuel management activities and roadside clearing.
- The legislative complexities associated with road safety, biodiversity and bushfire risk mitigation affect roadside management activities.

The Commission's recommendations in this chapter are designed to redress the land and fuel management areas of concern arising from prescribed burning, fuel breaks and roadside clearing. Protection of human life is considered the highest priority, although the Commission is also mindful of the importance of environmental protection. Prescribed burning must more effectively reduce the risk of bushfire, particularly in forested areas close to population centres. Wider use of fuel breaks will complement prescribed burning and assist fire-suppression activities. Attending to the level of regulatory complexity will reduce the burden on road managers of managing roadside clearing to reduce bushfire risk.

7.1 THE EXPERT PANEL

The Commission heard from experts who, as a panel, gave evidence about fire behaviour, forest fires and ecology. Before giving evidence, the experts participated in a joint conference at which they prepared a summary.[9] The conference provided a base for examining the complexities associated with prescribed burning. The members of the expert panel were as follows:

- Professor Mark Adams, fire and forest ecologist, Professor and Dean, Faculty of Agriculture, Food and Natural Resources, University of Sydney
- Professor Ross Bradstock, fire ecologist, Director of the Centre of Environmental Risk Management of Bushfires, University of Wollongong, and Visiting Fellow, Fenner School, Australian National University
- Mr Phil Cheney, fire behaviouralist, Honorary Research Fellow, CSIRO
- Dr Michael Clarke, ecologist, Associate Professor and Head of the Department of Zoology, La Trobe University
- Dr Malcolm Gill, fire ecologist, Visiting Fellow, Fenner School, Australian National University
- Dr Kevin Tolhurst, forest scientist and fire behaviouralist, Senior Lecturer, Department of Forest and Ecosystem Science, University of Melbourne
- Mr Jerry Williams, former director, Fire and Aviation Management, United States Forest Service

7.2 THE IMPACT OF PRESCRIBED BURNING ON BUSHFIRE

Bushfires obtain their energy from fuel and their speed and direction from the weather, topography and the fire itself. These factors affect fire behaviour, including the rate of spread, flame height and angle, persistence in the area, and the way firebrands travel.[10] The only element that can be controlled by humans is the management of fuel. Prescribed burning—'the controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity and rate of spread required to attain planned resource management objectives'—is the most effective mechanism for managing fuel.[11]

The terms 'controlled burning', 'planned burning' and 'prescribed burning' tend to be used interchangeably. In their broadest sense, these phrases simply refer to all circumstances in which burning is done in a manner that is planned, deliberate and lawful. In this chapter the term 'prescribed burning' is used as it is used in the *Australian Emergency Management Manual.*[12]

Prescribed burning encompasses burning for fuel reduction to reduce bushfire risk, for regeneration following timber harvesting, and for maintenance of indigenous ecosystems. These are quite different objectives, and the characteristics of prescribed burning may reflect these differences.[13] In practice, prescribed burns may be conducted to meet multiple objectives simultaneously.

Land management objectives, and practicability, determine the purpose for undertaking prescribed burning in particular environments. The purpose of the prescribed burn should inform the characteristics of the implementation of the burns, such as:

- location in the landscape—in terms of the actual site and in the context of past fires and future prescribed burns
- size of the burn area—referring to the number of hectares to be treated. According to the expert panel, size *does* matter
- amount of area burnt within the burn area—typically expressed as a percentage. To effectively reduce bushfire risk a significant portion of the total area must be burnt
- intensity of the burn—the rate at which heat is released as the fire moves across the landscape. For hazard or fuel-reduction burns a 'low'-intensity burn is typically preferred. The fire intensity determines whether burn objectives are met and whether the prescribed burn can be controlled
- frequency of the burning regime—should take into consideration fuel accumulation and the fire tolerance of the biota in the area under consideration.[14]

Dr Clarke observed that some plants and animals require fire to perpetuate their populations and that flora and fauna have evolved to cope with fire of particular frequency, intensity and scale. This ecological requirement for fire is tempered by the understanding that uniformity in fire history across the landscape should be avoided.[15] Dr Tolhurst identified the need to maintain fire in the landscape and pointed in particular to the strong link between seed germination and smoke for a significant proportion of Australian flora. He said, 'The question for conservation land managers then is not whether to use fire but how'.[16]

7.2.1 EFFECTIVENESS OF PRESCRIBED BURNING

The effectiveness of prescribed burning for reducing the risks of bushfire is determined by the ability of past prescribed burns to stop or reduce the spread of bushfire, reduce fire intensity, and assist fire-suppression efforts. A range of approaches have been applied to determine the effectiveness of prescribed burning: empirical observations, applied research and case studies of prescribed fires and bushfires have all been used, as has simulated fire behaviour modelling.

The effectiveness of prescribed burning to mitigate the effects of bushfire has been the focus of applied research in Australia and internationally for some decades. It is difficult to quantify and measure the effectiveness of prescribed burning because of the variable characteristics of the prescribed burning applied, including the size and placement of the burnt area and the interactions between fuel amount and type, landscape features and weather.[17]

However, the research has established that fuel reduction through prescribed burning mitigates the intensity and effect of bushfires by reducing the extent and severity of fires and increasing the ability to suppress fires, hence reducing their potential size and impact.[18]

There are many case studies that draw on extensive data demonstrating the effectiveness of prescribed burning to mitigate the extent and severity of bushfires. The use of a case study approach allows systematic investigation of a single event collecting and analysing data for creating and testing hypotheses. Case studies can demonstrate the effect of past use of prescribed burning in a particular place at a particular time.[19]

This is illustrated by Tolhurst and McCarthy's case study following the Victorian alpine fires of 2003. They analysed a total burnt area of about 1.1 million hectares, within which there had been 152 fires greater than 100 hectares over the previous 33 years, most of which were prescribed burns. For each of the fire areas they selected a statistical 'pair' based on size, vegetation type and topography. These were burnt at the same time and under the same fire conditions. The results showed that the most significant factor determining fire severity was the weather, where fire severity was most strongly correlated with Forest Fire Danger Index. The second most important factor associated with fire severity was the time since the last fire, assumed to be associated with fuel levels. There was a significant trend showing increasing severity with time since the area was last burnt. There was a statistically significant difference between the fire severity in long-unburnt areas and the prescribed-burnt area for up to seven years before the 2003 bushfire. These findings are consistent with their earlier studies and with overseas studies.[20]

McCarthy and Tolhurst also assessed the effectiveness of fuel-reduction burning on public land across Victoria. They found that the fuel hazard level (time since last burn) and the fire danger index were critical to the probability of a previous burn slowing the rate of spread of a head fire. Prescribed burning was found to have a measurable effect in assisting suppression for up to 20 years after burning but the benefits started to reduce after about five years. On average, that benefit lasted about 11 years but benefits were conditional on other factors, in particular weather conditions, and the overall fine fuel hazard levels.[21]

Dr Tolhurst's work in Wombat State Forest indicates that one enduring effect of prescribed burning is to limit the production of embers (at least in stringybark trees), which are a significant cause of spot fires and therefore house loss in bushfires.[22] Mr Richard Sneeuwjagt, State Manager of the Fire Management Services Branch in the Department of Environment and Conservation Western Australia, noted that bark removal is important 'when it comes to minimising ember attack or spotting'.[23] Mr Cheney stated that firebrands, either embers or burning bark of trees, can be inhibited for as long as 20 years, in some forests.[24]

Studies conducted in south-west Western Australia since the mid 1980s have also examined the relationship between prescribed burning and the extent of bushfires.[25] Most recently, Mr Sneeuwjagt analysed the relationship between the area of prescribed burning in preceding years and bushfires in south-west Western Australian forests for the period 1961 to 2008. Using statistical analysis, Mr Sneeuwjagt found that the prescribed burning programs had reduced the area of bushfires for as long as eight years. The strongest correlation was evident when the average area of prescribed burning over five years was compared with the average area of bushfires over the following five years.[26] Dr Lachie McCaw, Principal Research Scientist in the Science Division of the Department of Environment and Conservation Western Australia, and others found that prescribed burning also reduced the incidence of bushfires by maintaining areas of sparse fuel that are less likely to remain alight following ignition.[27]

Project Vesta, a study conducted in the dry eucalypt forests of south-west Western Australia, examined the relationships between fuel age and fire behaviour by quantifying the age-related changes in fuel and fire behaviour in dry eucalypt forests. It aimed to establish the relationship between fire spread and fuel type and age. Over 100 experimental fires were lit under dry summer conditions of moderate to high fire danger at two sites with different vegetation understoreys and where it was between two and 22 years since fire had occurred.[28] The study concluded the following:

- The forward rate of spread of a fire is directly related to the characteristics of the surface fuel bed and understorey layers. The near-surface fuel layer has the strongest effect on rate of spread.

- Hazard reduction by prescribed burning reduces the rate of spread, flame height and intensity of a fire and the number and distance of spot fires by changing the structure of the fuel bed and reducing the total fuel load. The persistence of this effect is determined by the rate of change in fuel characteristics over time.
- It is difficult to control fires under average summer conditions of high to very high fire danger in open eucalypt forest where the fuels are older than about seven years.
- Further research is needed to understand fire–atmospheric interactions leading to 'abnormal' fire behaviour including conditions immediately after a cool, dry change.[29]

Recently Dr Matthias Boer, Bushfire CRC, and others used empirical data to quantify long-term regional-scale impacts of prescribed burning on the incidence and extent of bushfires in a eucalypt forest region of south-west Western Australia. They found the following:

- Prescribed burning had significantly reduced the incidence and extent of bushfires from 1953 to 2005.
- About four units of prescribed fire were required for each unit area reduction in bushfire.
- The probability of fire spread was low for three to four years after prescribed fire but after five years sufficient fuel had accumulated to support fire spread under a wide range of conditions. From six to seven years onwards fuel loads accumulate to levels that make high-intensity fire increasingly probable and suppression increasingly difficult.[30]

Effectiveness can also be measured by gauging the reduction in risk per unit of prescribed fire treatment. This can be applied to determine the proportion of the landscape that must be burned annually in order to reduce risk by a given proportion. Applying a 4:1 ratio, Professor Bradstock concluded that rates of treatment greater than 10 per cent of the landscape per annum are required to effect major risk reduction using prescribed burning. However, he also recognised that these levels of treatment may increase risks to biodiversity via habitat changes.[31]

Computer simulation benefits fire regime research because it has temporal depth, integrates complex, multi-scale spatial interactions and can be used to explore the effects of changing climates and vegetation types. Using computer simulation, Dr Tolhurst, Professor Bradstock, Dr Karen King, research fellow, Fenner School of Environment and Society, ANU and others have demonstrated the role of prescribed burning in reducing bushfire risk. Simulation is necessarily limited by present levels of data and its results depend on the assumptions embedded in the data models employed, but it is a valuable tool for fire management planners. The association of geographic information system technology with fire behaviour models makes predictions possible at landscape level.[32]

In addition, there have been few opportunities to research the effect of prescribed burning on landscape-scale fires occurring under catastrophic weather conditions (such as those of 7 February 2009) in Victoria. Understanding the interaction between fuel reduction and intense, landscape-scale fires, climactic conditions and terrain is therefore limited.[33] Research into the 'megafires' in the United States sheds some light on their impact on the landscape. This is discussed in Section 7.3.2.

Effectiveness on 7 February 2009

The effect of previous burning (prescribed and bushfire) on the fires of 7 February was assessed by Professor Bradstock and Dr McCaw. The results of the studies are significant given the dearth of opportunities to observe the interaction between fuel and extreme fire weather and their effect on fire behaviour at the landscape scale. The studies adopted different methodologies but reached comparable conclusions.[34]

Professor Bradstock (with Dr Owen Price) analysed the effects of weather, terrain and time since fire and logging for the Kilmore East, Murrindindi, Bunyip and Churchill fires. Around 4,500 point samples were taken across the burnt areas, and at each point a range of environmental variables (including data on fire history) was calculated and fire severity estimated using DSE data. The information collected was used to conduct statistical modelling to relate fire severity to the other variables including time since fire (as a 'surrogate' for fuel age). The objective of the study was to quantitatively analyse the determinants of fire severity. The study sought to identify the roles played by factors such as weather and fuel age in determining fire severity, which was indicated by whether a crown fire would develop or whether the fire would remain in the forest understorey.[35]

Professor Bradstock and Dr Price concluded that on 7 February the probability of effective suppression was negligible under the extreme conditions, irrespective of fuel age or forest type. However, the probability of effective suppression was enhanced by reduced fuel age under more moderate conditions, measured from about an hour after the wind change, particularly for fuels that were one to five years old.[36] The principal conclusions of the analysis were as follows:

- Under the most dire weather conditions there is some change in fire intensity for relatively young fuel ages. That change is not strong enough to facilitate suppression but it may reduce spotting and the rate of spread. Reduced fuel age can reduce intensity from total or near-total crown consumption to partial crown consumption, thus potentially reducing ember propagation.[37]
- It is unclear that higher levels of prescribed burning would have increased opportunities for safe and effective suppression on the afternoon of 7 February. Professor Bradstock believed it was plausible that following the south-westerly wind change higher levels of prescribed burning may have increased the ability to undertake safe and effective suppression at very high rates of treatment (15–20 per cent of the landscape treated per annum). Dr McCaw was of the opinion that the conclusion was still to some degree untested because 'there just weren't the examples there to consider'.[38]
- Extreme weather is the predominant influence on the likelihood that a crown fire will develop, followed by forest type then fuel age. In contrast, for more moderate and low weather conditions fuel age has a significant effect on the fire being confined to the understorey. This means that there is a significantly greater chance of effective suppression.[39]
- Fuel age and weather interact, and both are important in influencing fire severity. The effectiveness of prescribed burns is strongly contingent on weather. At the same time the impact of weather conditions on fire intensity will vary with fuel age and the younger the fuels the greater their effect on fire intensity. Prescribed burning increases the potential for successful fire suppression, under mild and moderate weather conditions, providing most effect up to five years after treatment.[40]

Dr McCaw analysed the role of previous fuel reduction in the Beechworth, Bunyip, Kilmore East and Murrindindi fires by visually comparing fire progression and fire severity with information about all fires that had occurred during the period 2000 to 2008. Fire progression was evident from the position of the fires at different times during the day. Fire severity was captured by remote high-resolution aerial photography and measured against patterns of graded crown or canopy scorch. The analysis comprised a series of case studies within each fire, with the aim of identifying differences in fire severity associated with fuel age, excluding other factors such as terrain. Specific observations about individual fires are included in the relevant section of the fires chapters (see Volume I). Overall, Dr McCaw concluded:

- While previous burns did not mitigate the immediate impacts under the most severe conditions, some prescribed burns had significantly assisted in ultimate fire containment.
  - Under very severe or extreme conditions the fuels had to be quite young (three years or less) to reduce the intensity and spread of a fire, depending on the extent of fuel removal during the prescribed burn. In addition, the treated areas need to be large—of the order of 600 hectares or greater.[41]

Dr Tolhurst, who had separately made observations of the Beechworth fire and relevant fire history, was of the opinion that previous fires, prescribed burns and bushfires had had a significant impact on the final outcome of that fire, reducing its final area. He considered that the Beechworth fire would have travelled much further with different outcomes had it started near Yackandandah in long-unburnt areas.[42] In his opinion prescribed burning had significantly modified fire behaviour, but it was just beyond suppressible limits, with 10-metre flame heights and extreme weather conditions. Milder weather conditions with less wind or higher humidity would have resulted in a high chance of suppression success.[43]

Summary

In summary, the effectiveness of prescribed burning is determined by the following characteristics and limitations:

- Fuel age and weather interact, and both are important in influencing fire severity. Extreme weather is the predominant influence on the likelihood that a crown fire will develop, followed by forest type and then fuel age. In contrast, in more moderate and low weather conditions fuel age has a significant effect on whether the fire is confined to the understorey, where it is more easily suppressed.[44]
- A well-conducted prescribed burn, if large enough, might stop a fire in the first one to two years after it is conducted. The expert panel considered that size *does* matter in relation to this question. Mr Cheney told the Commission that the placement of the prescribed burn block is also important: 'The key to a burning program for wide-scale protection is to have the blocks strategically located across the landscape in a pattern that, when repeated, large fires are going to sooner or later run into one of these *low* fuels and be checked …'.[45]
- Prescribed burning reduces the number of bushfires because the take-up rate of fire in more recently fuel-reduced areas is low to zero, whether the ignition source is lightning or embers.[46]
- Prescribed burning reduces fuel load and consequently reduces fire intensity. The intensity of bushfires and the average intensity of all fires will decrease as a function of the prescribed burning treatment rate, although overall fire frequency will increase.[47]
- Reduction in the rate of spread of fire will persist as a consequence of prescribed burning for five to eight years. Reduction in flame height, firebrand prevention, and less spotting downwind of the fire are effects of prescribed burning that last longer than five to eight years. There is congruence among the studies of vegetation for eucalypt forests suggesting that 'the period of five years matters'.[48]
- The slowing down of fire, reduced spotting, and reduced intensity of fire improve firefighter safety because they provide a strategic advantage for firefighting. Mr Cheney stated he did not believe there could be effective fire suppression without adequate prescribed burning.[49]

7.3 LEARNING FROM OTHERS

The Commission heard about fire management from witnesses involved in land or fire management in other jurisdictions. The differences in geography, constraints of prescribed burning, and implementation of prescribed burning allow for comparison and are instructive.

7.3.1 WESTERN AUSTRALIA

Since the 1960s the Department of Environment and Conservation in Western Australia has had a bold program of landscape-scale prescribed burning—more than 5 per cent a year—in the south-west forests of the state.[50] There have been no high-intensity, landscape-scale bushfires in these forests since this program started. It has also been accompanied by the development of internal research capacity and skills. There are aspects of this approach that can be translated to Victoria, although it is a comparatively small section of the public land estate and has less severe topography than Victoria, enabling easier implementation of prescribed burning and easier suppression of bushfire. The more stable weather conditions also allow prescribed burning to be more readily achieved.

The Department of Environment and Conservation manages more than 27 million hectares of lands and waters in total, including national parks, marine parks, conservation parks, regional parks, state forests, timber reserves, nature reserves and marine nature reserves. It also has responsibilities for fire management for community protection and biodiversity conservation. As a land management agency, the department recognises that in fire-prone environments proactive fire management—in particular, prescribed burning—is integral to good conservation and land management. The department uses prescribed burning for fuel hazard reduction, bushfire mitigation and ecosystem management. Water catchment management, native forest regeneration and forest regeneration after timber harvesting are other land management objectives supported by the use of prescribed burning.[51]

Mr Sneeuwjagt described the 2.4 million hectares of forested lands that receive particular land management attention by application of prescribed burning above 5 per cent. This area is the most densely populated rural area of the state, with significant rural–urban interface. From the 1920s the south-west forests were regenerated, after earlier clearing, and had been left to grow without much intervention. Heavy fuel loads accumulated over time in most forest areas so that in the late 1930s bushfires had become large and uncontrollable. In response, in 1953 the Forests Department cautiously introduced broad-scale prescribed burning into the south-west forests. However, little effective burning actually occurred in the dense southern forests due to lack of access and concerns about fire behaviour. In 1960–61 there were massive and intense bushfires (the Dwellingup fires) in these long-unburnt forests, which resulted in a royal commission and an endorsement of the 1953 policy.[52]

Since 1961 the Department of Environment and Conservation has consistently undertaken broad-scale prescribed burning in the south-west forests and monitored its effectiveness by the occurrence and impacts of bushfires. This has informed its thinking, as follows:

- Prescribed burning of landscape is done annually at 7 to 8 per cent.
- The proportion of burnt or fuel-reduced area is at least 60 per cent.
- Prescribed burns should have minimum dimensions in area (1,500 hectares), depth (3 kilometres) and width (3 kilometres).
- Fuel-reduction zones are maintained at relatively low levels by regular burning around settlements and at the urban–rural interface.
- Prescribed burns data have been collected over time, including costs, and fire research programs have enabled analysis of the effectiveness of this approach.

Since implementation of broad-scale prescribed burning following the 1961 bushfires in Western Australia, no forest fire has exceeded 30,000 hectares and no lives have been lost in forest fires. In the past 20 years the average annual area burned by bushfire in the region is about 20,000 hectares, and 95 per cent of all bushfires have been less than 100 hectares and less than 1 per cent are greater than 2,000 hectares. This contrasts favourably with the impact of bushfire in the south-eastern Australian states, but Mr Sneeuwjagt noted that the topography of Western Australia makes prescribed burning and fire suppression easier.[53] The Department of Environment and Conversation reports the costs of fire suppression and loss of assets from bushfires. These have been kept at very low levels in comparison with other jurisdictions. Furthermore, the department considers this approach has better supported biodiversity values.

The department developed and currently applies the *Red Book* as a guide for burn controllers in relation to the fuel moisture content and fire behaviour for each forest fuel structural type. The *Red Book* is based on field studies and assists managers to decide when to light, when burning is likely to burn out, and the preferred spacing of burns to achieve land management objectives. Mr Sneeuwjagt commented that they find the *Red Book* more useful than the forest fire danger meter used elsewhere in Australia.[54]

Mr Cheney endorsed the Western Australian model conducted over 50 years of continued prescribed burning accompanied by a research program. He said that the Department of Environment and Conservation is the only organisation that can guarantee tenure and treatment of experiments over a sufficient period to enable any changes to be identified.[55]

Victoria and south-west Western Australia: a comparison

There are important differences between the topography and climate of south-west Western Australia and Victoria. The topography is more undulating in Western Australia, so access to fire is easier and the chance of fire escaping is substantially reduced. The topography of Western Australia also makes it easier to burn up to 65–70 per cent treatment of the surface and near-surface fuels in any burn area, with sufficient intensity to affect the bark up to 3–4 metres, thus minimising spotting potential. Additionally, weather conditions are more stable in south-west Western Australia compared with Victoria, so that prescribed burning is conducted in spring as well as autumn, which gives staff the opportunity to extend the fuel-reduced areas and to build skills before the summer fire season. By contrast, in Victoria most prescribed burning occurs in the autumn.[56]

Mr Sneeuwjagt was of the view that, overall, there are 'more similarities' than differences between the forested regions of Victoria and the karri and jarrah forests of Western Australia. With the exception of the mountain ash species, the majority of all other eucalypt types in Victoria fall between the jarrah and the karri forest types of south-west Western Australia.[57]

Mr Sneeuwjagt described what he perceived to be the main differences between implementation of prescribed burning in Victoria and Western Australia. He identified differences between the scale, intensity and frequency of prescribed burns:

> In Western Australia forests between six (6) to eight (8) per cent of the landscape is burned by DEC each year, compared with less than one or two per cent in other States. In addition to the larger scale and size of the prescribed burn program across the forested landscape, the WA practice of burning more than 60 per cent of each burn unit differs with south-eastern states burn cover achievements that are often limited to much less than 50 per cent.[58]

The applicability of the Western Australian prescribed burning regime to the south-east forests of Victoria was discussed by the panel members. It was recognised there are differences between the forests of south-west and south-east Australia that would affect the way prescribed burning could be undertaken in each.[59]

- The Western Australian forests are relatively small (2.5 million hectares) and have a history of intensive treatment, yet in the opinion of Professor Bradstock the Western Australian work robustly clarified the relationship between the treatment rate and the expected reduction in bushfire.[60]
- Mr Cheney stated that the differences between the structure of the eucalypt forest in Western Australia and Victoria were relatively minor. He thought the modification in fire behaviour from the prescribed-burning practices in Western Australia was transferable to Victoria. In view of the Western Australian experience, Mr Cheney identified a need for Victoria to develop burning guides, based on better information for the more difficult forest types, such as those on steep southerly and easterly slopes that raise particular difficulties for prescribed burning.[61]
- Dr Tolhurst was of the opinion that the Western Australian prescribed-burning regime needs to be considered in the context of what he contended were less severe fire weather conditions experienced in Western Australia compared with south-eastern Australia. In his view, Victoria should learn from Western Australia rather than simply duplicate the regime.[62]
- Professor Adams described the Western Australian regime as a success despite the worst 10-year reduction in rainfall anywhere in Australia.[63]
- Mr Williams made the valid distinction between what he described as an 'operational response' in terms of management in Victoria against a 'programmatically oriented' approach in Western Australia—in other words, staffing and funding for the long term compared with a more short-term operational approach.[64]

The Commission recognises that the long-term commitment to prescribed burning in Western Australia has reduced the risks of bushfires and supported development of internal research skills and materials for implementing burning. There are areas of Victoria to which the prescribed-burning experience of the south-west Western Australian forests may be translated, despite the more difficult conditions in Victoria. There is opportunity to learn from the processes and experience of Western Australia to develop increased knowledge applicable to prescribed burning.

7.3.2 THE US FOREST SERVICE

The Commission heard evidence from Mr Jerry Williams who explained how the USFS has reviewed its thinking about landscape-scale 'wildfires'. The USFS found that there was a very small percentage of fires, based on the number of fires characterised by dramatic consequences for suppression costs and damage caused, that it has identified as megafires. These fires were occurring despite an ever-increasing focus on suppression. The USFS identified the need to shift to active land management across all landholdings, taking into consideration land condition and climate, to determine what actions are required for fire prevention and mitigation. It considers prescribed burning to be an important component of active land management.[65]

In the past 20 years asset loss and damage and natural resource damage have increased significantly despite substantial augmentation of fire protection resources. The increases have occurred in an era in which, as Mr Williams said, 'we have never enjoyed higher funding levels for fire suppression, greater technology in dealing with fires, better co-operation between government at state and local and federal levels in dealing with these fires'. In 2003, after a series of disastrous fire seasons, the USFS initiated a project with the aim of understanding the underlying causes of wildfire threat. At the start of the project it drew on the skills of a range of experts. Participants included the Forest Service, natural resource specialists, fire managers, predictive services personnel, researchers, academics and private citizens from local, state, tribal and federal agencies.[66]

They found that in the past there had been a focus on the 98 per cent of the fires that can be suppressed and do not cause most of the damage.[67] Traditionally the fires that escaped were seen as fire management failure. These few megafires accounted for only 1 per cent of all fires but burned 95 per cent of the total area burnt and consumed 85 per cent of total suppression costs. (This is also true of the bushfires in Australia, although our understanding about the nature of these fires is limited.) Professor Steven Pyne, Regents Professor in the School of Life Sciences at Arizona State University, described megafires as very large area fires, with related climate conditions favourable to large fires. He viewed the large, intense and often savage fires that occur in Southern California, which is subject to drought and explosive winds, as a separate phenomenon. Further, he regards the south-eastern corner of Australia as a 'fire flume', where very large fires will occur, and considered the Victorian mountains a special case that may be a separate phenomenon again, indicating differences in the nature of the megafires.[68]

The drivers of smaller scale fires are local fuel, weather and topographic conditions.[69] In contrast, the USFS project found that the drivers of the megafires are forest condition, landscape features and climate. Despite land management plans including active management strategies, constrained budgets, risks, public concerns or other factors have resulted in land being left undisturbed. Mr Williams noted that in the US 'we have tended to equate protecting a forest with preserving a forest. In other words, we have tended to equate saving a forest with not disturbing a forest'.[70]

The project found that high-hazard conditions were often the indirect consequence of land and resource management objectives that resulted in dense forests and undisturbed conditions in fire-dependent ecosystems. This means that ecosystems that historically burned the most frequently and at the lowest intensities have become some of the biggest fire threats because of the changes in the vegetation structure and composition and the fuel accumulation.[71] The prolonged absence of fire results in a 'melding' of broad landscapes, as forest age, structure and composition have become more homogeneous across the landscape. Drought is also a major driver, which may be tied to global warming, and as drought deepens there are fewer moisture differentials across the landscape.[72]

The Commission notes Mr Williams's observations:

> We have always put human life and property very high, if not highest on that list. Endangered species habitat, watershed integrity, these are all extraordinarily high values. The irony here is that we are managing the land for these values, but the way we are doing it may be imperilling those values over time.[73]

In several areas studied there were high-value private lands immediately adjacent to undisturbed public lands. The greatest losses were sustained when fuel hazards reached across the landscape and crossed onto private property.[74]

Mr Williams said Florida was doing more prescribed burning than the entire US Forest Service nationwide and was the only state that had experienced a decline in wildfire acres burned per areas protected. He noted that the geographical differences between Florida and California are similar to south-west Western Australia and Victoria. Nonetheless, he concluded that the safest, most resilient fire-dependent ecosystems have prescribed burning as a major component of their overall management strategy. They also have supporting laws, policies and plans, and leadership continuity to sustain the strategy. He was of the opinion that fuel modification done at a sufficient scale can affect even very high-intensity fires.[75]

The USFS has identified the importance of using a programmatic approach that is landscape scale, has long-term objectives, sustains political support, and is funded, staffed and organised with the long-term objectives clearly in focus. Mr Williams echoed the observations of Mr Sneeuwjagt, who was referring to the Western Australian situation, in emphasising the importance of bipartisan political support for long-term policy decisions to appropriately manage land.[76] The Commission has considerable sympathy with the views expressed by Mr Williams with respect to a programmatic approach for land management.

7.3.3 NEW SOUTH WALES

The New South Wales Rural Fire Service has a role in bushfire prevention on private lands that is different to that of the CFA in Victoria. In NSW there has been some formal resolution of the different legislative objectives for vegetation and fire prevention on private landholdings, as described by the evidence of Mr Robin Rogers, Director Operational Services (Assistant Commissioner), of the RFS.

Mr Rogers said that before 2002 there had been 21 pieces of legislation administered by different Commonwealth and State agencies relevant to bushfire prevention activities involving removal of vegetation in NSW. This led to perceptions of conflict, and was seen to impede effective environmental assessment and hazard-reduction activity. Legislative changes were made that are reflected in the introduction of the Bush Fire Environmental Assessment Code, which provides an environmental assessment process so there is a single approval process to perform bushfire hazard–reduction activities. In NSW there has been a shift to consolidate fire management to the RFS, rather than local councils.[77]

7.4 PRESCRIBED BURNING IN VICTORIA

The Department of Sustainability and Environment has a Land and Fire Management Division that is responsible for prescribed burning on public land. The DSE Chief Fire Officer resides in this division. Section 16 of the *Emergency Management Act 1986* allows the Chief Fire Officer of DSE to appoint a Burn Controller in the event of a prescribed burn. The section provides that '… it shall be the duty of the Secretary [of DSE] to carry out proper and sufficient work for the prevention and suppression of fire in every state forest and national park and on all protected public land …'. The obligation thus created is onerous.

The total public land estate in Victoria for which DSE has responsibility is 7.7 million hectares. Mr Liam Fogarty, Assistant Chief Officer, Land and Fire Division of DSE, identified that 5.5 million hectares of this land is treatable land for prescribed burning, and the expert panel referred to treatable land as 'available' land. Treatable public land excludes areas where prescribed burning is impractical, such as sand dunes, or harmful, as in the wet forests.[78]

The CFA has roles in the prevention and suppression of fires and the protection of life and property in country areas of Victoria. The CFA may be involved in prescribed burning by supporting DSE, conducting prescribed burning on roadsides on behalf of other authorities and providing to local councils and local residents guidance about fuel hazard–reduction activities.

Prescribed burning on public land has been part of Victoria's approach to land and fuel management for decades. The adequacy of the amount of prescribed burning for the purpose of risk reduction has been reviewed a number of times. DSE, as part of its public land management responsibilities, has developed a range of tools to underpin the complexities of land and fuel management, including prescribed burning.

Image 7.1

Source: Courtesy of the Department of Sustainability and Environment.

7.4.1 THE PAST

Australian ecosystems provide evidence demonstrating that regular, deliberate burning has occurred since the arrival of Indigenous Australians at least 40,000 years ago.[79] Reasons for burning varied, from maintaining open areas of vegetation for ease of travel to promoting plant growth and flushing out animals for hunting.

More recently, prescribed burning has been used by land management agencies in Victoria since the 1920s, including for silvicultural purposes.[80] Mr Athol Hodgson, currently representing Forest Fire Victoria and former Chief Fire Officer of the Department of Conservation Forests and Lands, indicated that fuel-reduction burning was undertaken by foresters, bushmen and graziers using local knowledge and that this generally bolstered fuel-reduction burning programs until the 1950s. He noted that these activities were directed at managing vegetation, reducing the destructive capacity of bushfire and more easily controlling bushfire.[81] In the 1960s fuel-reduction burning was introduced into Victoria on a more scientific basis. The Forests Commission began using grid ignition patterns rather than strip ignition to obtain effective fuel reduction and to better control the intensity of burning. Aircraft were also used to ignite the fires, allowing prescribed burning over larger areas.[82]

Until the 1990s mapping and recording of fuel-reduction areas was not done consistently across the state. Very few assessments were conducted to determine whether the level of fuel reduction achieved was satisfactory: 'Areas recorded as having been fuel reduced may well have been ignited, but with very little spread of fire and intensities necessary to effectively reduce fuel loads in those sections that were burnt'.[83]

Lessons from the past

The use of prescribed burning for fuel-reduction purposes has been raised in a number of inquiries and investigations. The amount of prescribed burning, the characteristics of prescribed-burning practices, the costs associated with prescribed burning, and the associated public reporting were raised and given weight in the recommendations of past inquiries.

The 1939 Royal Commission

The Royal Commission into the 1939 bushfires recognised that prescribed burning was an effective preventive and protective measure against bushfire. Justice Stretton commented in his report that the amount of prescribed burning done by the then Forests Commission was 'ridiculously inadequate' because of a shortage of staff and a tardy recognition of the importance of preventive measures.[84]

The Inquiry into the 2002–2003 Victorian Bushfires

The report of the Inquiry into the 2002–2003 Victorian Bushfires made a number of important recommendations about prescribed burning. They covered the following:

- the setting of an annual optimum area for prescribed burning—noting that setting of targets was a difficult yet primary task for fire managers
- the routine and explicit reporting of the effectiveness of the burning program, including mapping of fire extent and fuel array data
- measuring the total area subject to prescribed burning treatment in each fire management zone each year, together with the average proportion of that area successfully burnt
- training more personnel to carry out prescribed burning
- DSE conducting a formal study of the level of prescribed burning in south-west Western Australia for its possible application in Victoria.[85]

Following this report DSE increased its annual target for prescribed burning from 100,000 hectares to 130,000 hectares.[86] This increase represents an annual prescribed burning area of about 1.7 per cent of the total area of public land.

The Victorian Auditor-General's 2003 report

In 2003 the Auditor-General undertook an audit focusing on the allocation of resources for planning, prevention and preparedness to prevent or reduce the severity of Victoria's seasonal bushfires. The Auditor-General observed that the fire protection plan targets for fuel reduction were idealised, rather than practical, and aimed at maintaining ideal fuel loadings by implementing an environmentally acceptable burning regime for every identified hazard in each risk category.[87] The Secretary of DSE informed the Auditor-General in 2003 that '… Fuel reduction, at its most "idealistic" level, would occur in any one year on or around 3.3% of the public land estate'.[88]

Mr Greg Wilson, the current Secretary of DSE, characterised 3.3 per cent as a long-term aspiration.[89] If that is the case, seven years have passed since the aspiration was first announced. Mr Fogarty said he would favour a target of 4–5 per cent of treatable area as an effective percentage.[90]

The Auditor-General found that fuel-reduction burning was costly, that for DSE to meet targets it would require increased outlays, and that a risk and cost–benefit analysis would be needed to improve prescribed burning. The Auditor-General found that DSE's understanding of the level of fuel–reduction burning and overall risk was limited and recommended that DSE cost fuel reduction burning within the budget process, allocate appropriate funding levels, and allocate the cost of staff employed from other business units.[91]

The Environment and Natural Resources Committee's 2008 report

The ENRC report of the Victorian Parliament's Inquiry into the Impact of Public Land Management Practices on Bushfires in Victoria was explicit in relation to its recommendations concerning prescribed burning. The findings and recommendations included the following:

- The frequency and extent of prescribed burning have been insufficient for a number of decades for preservation of ecological processes and biodiversity across the public land estate.[92] The report quoted a report of the Victorian Fire Ecology Working Group (a partnership between DSE and Parks Victoria), which found biodiversity is threatened by the infrequency of current fire regimes in Victoria.

- An increase in the extent and frequency of prescribed burning should be a priority.
- 'A minimum average of 5 per cent of the public land estate', comprising 7.7 million hectares, should be adopted as the annual prescribed burning target by DSE.[93] This equates to increasing the prescribed burning target from 130,000 hectares to 385,000 hectares, to be treated as a rolling target.
- A comprehensive review of the effectiveness of the prescribed burning target in meeting ecological and bushfire suppression needs be conducted every three years.
- DSE should report its performance against the target in its annual report.
- DSE, the Department of Primary Industries, Parks Victoria and VicForests should separately cost and report annual expenditure on fuel-reduction burning, ecological burning and regeneration burning in their annual reports.

The committee report considered that a target was appropriate, understanding that achievement or underachievement of the target needed to be considered with care due to the constraints of weather and climate. Further, the actual risk reduction through fuel-reduction burning is not directly proportional to the area that has been fuel-reduced. Mr Wilson stated that at the time of the ENRC inquiry, government had 'articulated a preference to move away from simple hectare based targets which may lead to inappropriate prescribed burning programs as hectares targets do not necessarily reflect achievement of desired outcomes'.[94]

DSE further contended to the ENRC inquiry that a reason it could not quantify the increase in prescribed burning was because there was limited understanding about the ecological effects of fire, and research was ongoing. The Commission heard similar claims from a DSE witness.[95] The Commission agrees that more research is needed, but it does not see this as a rationale for inactivity. The Commission urges DSE to exercise leadership in relation to research on the effectiveness of prescribed burning.

The committee was unable to obtain data about the cost-effectiveness of fuel-reduction burning. In particular, it observed that the potential benefit of this information '… would be to demonstrate the reduced costs of fire suppression which flow from increased prescribed burning'.[96]

7.4.2 THE PRESENT

There does not appear to be an understanding of the links between prescribed burning for bushfire prevention and the consequences of bushfires. The system of funding might have inbuilt bias in favour of suppression at the expense of prevention. From a government perspective, increased suppression costs can be funded by an increased contribution from insurance companies, and inflation in property values will automatically provide part of this funding over time. In contrast, prevention activities compete for funds as part of the budget process.

Prescribed burning is technically challenging, and the consequences of implementation, and particularly of any escapes, can be significant to DSE. Further, the amount of prescribed burning must also be large enough in scale to effect hazard reduction. Following large bushfires attention generally focuses on failures in response and suppression, rather than on the adequacy of prevention activities.[97] The Commission is of the firm view that the benefits of properly implementing prescribed burning outweigh the difficulties of implementation.

Several weeks before 7 February Mr Kenneth Williamson, captain of the Whittlesea fire brigade, noted the 'excessive' fuel loads and dryness in areas around Mt Disappointment and Strathewen. He attributed these conditions to a lack of fuel reduction and drought, which has been worsening over the years.[98] Mr Glen Woods, captain of the Flowerdale brigade, also noted the 'extreme' fuel loads around Flowerdale.[99] The combination of higher fuel loads and drought had led to an increased bushfire risk. Climate change has been directly correlated with drought periods that are more intense and is also projected to negatively affect water and biodiversity in the future, which will further contribute to an increase in fuel loads.[100]

Implementation

Prescribed burning is a resource-intensive and costly activity accompanied by reputational, political and operational risks. The risks are increasing because more people are living at the forest interface, because of the changing demographics of the rural population with changing land use and development, and because the continuing drought increases fuel hazards.[101]

Intense bushfires pose a greater risk to the community than lower intensity prescribed burns, even though the consequences of prescribed burning, and problems with escapes, which comprise 2 per cent of total prescribed burns, have significant practical and reputational ramifications for the agencies engaged in the activity.[102] In contrast, when there are large bushfires, greater media attention is drawn to the failures of suppression rather than the failure of risk mitigation, so that there has been little incentive to change the approach to prescribed burning.[103]

DSE consults stakeholder groups, including industry representatives such as grape growers, before implementing prescribed burning programs. It is common for community members and those organising tourist events to seek to have prescribed burns deferred until after events are concluded.[104] Mr Fogarty said that many stakeholders take issue with some of the potential adverse impacts of prescribed burning, including its possible effect on biodiversity, and that 'stakeholder concerns and tensions are also especially acute at present because of the continued drought and already stressed ecosystems and industries in Victoria.'[105]

A range of physical factors must be considered before prescribed burning can occur. As with bushfire, the weather, topography and fuel loading affect the prescribed burn. As noted, most prescribed burning in Victoria occurs in autumn, when conditions are likely to be mild and stable. In terms of weather, the temperature, relative humidity, wind speeds, atmospheric stability and Forest Fire Danger Index are considered before burning, as is the time window for stability because burns can take days.[106] The report of the Inquiry into the 2002–2003 Victorian Bushfires found that the number of days that meet the weather prescriptions for prescribed burning are few, averaging around 10 a year.[107]

There are a number of operational matters that must be followed to prepare and conduct a burn, which is managed by means of a detailed approval process.[108] As Mr Shaun Lawlor, the DSE District Manager for Ovens, explained, a 'draft burn plan' must be prepared and must gain the necessary internal approvals. It outlines the method and pattern of ignition and planning and preparation of control lines. The public must be notified (including by the posting of notices of intention to burn), adjoining landholders and other stakeholders must be consulted, traffic management needs to be planned, resource needs for the duration of the burn must be determined, and escape routes, safety zones and potential hazards must be identified.[109] Weather and fine fuel moisture content are primary factors determining whether a burn proceeds.[110]

7.4.3 TARGETS

DSE has developed *Living with Fire—Victoria's Bushfire Strategy,* a corporate plan for 2008 to 2011 and a Fire Ecology Program. The Bushfire Strategy and the corporate plan document the need for increased prescribed burning, accompanied by increased numbers of personnel with the skills to carry out and support the activity. The corporate plan contains a prescribed burning target of 4 to 6 per cent of public land, in contrast with the current Treasury-funded measure of 130,000 hectares, which represents only 1.7 per cent of the total public land.[111]

In June 2008 the Government launched *Living with Fire.*[112] Former Secretary of DSE, Mr Peter Harris, stated:

> The Strategy recognises that the combination of high fuel loads due to decades of effective fire suppression and changes to land use and management practice, drought, 'tree change' lifestyles and climate change has collectively and significantly raised the risk of bushfire threat. A key theme in the Strategy is to significantly increase the amount of planned burning across Victoria to reduce fuel loads, in a manner that recognises ecosystems.[113]

The strategy provides a framework for increasing prescribed burning of public and private land by informing communities involved in bushfire prevention and response, optimising firefighting resources and improving land-use planning and adaptive management. It recognises that more than 80 per cent of Victorian fires are contained as small

fires and that it is the remaining 20 per cent of fires that result in 90 per cent of the areas burnt annually. The Bushfire Strategy and the corporate plan recognise the need for significant investment in trained and experienced firefighters to increase prescribed burning.[114]

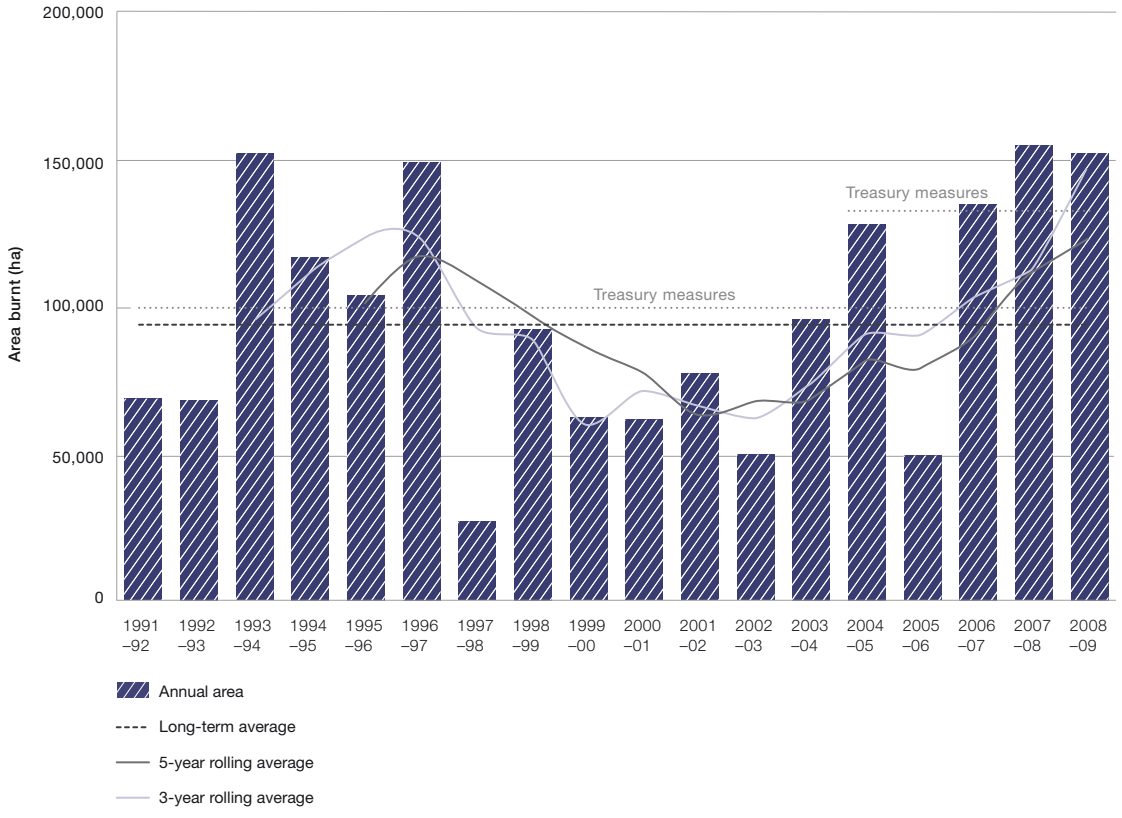
The corporate plan identified four strategic priorities for DSE, for the period 2008 to 2011, of which one was responding to fire threat. An important component of this priority was 'increasing and improving planned burning programs'.[115] The plan stated, '… fuel reduction burning will need to increase to between 4 and 6 per cent of public land each year', which underscored the importance of fuel-reduction burning in the overall strategy.[116]

In his evidence Mr Wilson retreated from the target and the need for the increased prescribed burning identified in the corporate plan. He stated that DSE 'ought to have strategies that build the capability to head towards that type of scale' and that 'a lot more of the work' was necessary.[117] Mr Wilson was unable to comment on the basis behind the target of 4–6 per cent on public land. He indicated the advice he received was to the effect 'that 3, 4, 5 per cent' was what 'may ultimately' be achieved but that DSE does not have the confidence to convert that to a target because 'we need to get more feedback from the science, we need to bring the community along …'.[118]

Mr Wilson was not even sure if the document remained the corporate plan. He advised there was '… some doubt about that'.[119] This answer from the person responsible for ensuring sufficient work for the prevention and suppression of fire on the public land estate highlights the lack of direction in Victoria on this vital matter.

At the end of 2001–02 the three-year rolling average for area burnt was 66,390 hectares; at the end of 2008–09 it had risen to 146,141 hectares. The reason provided for this increase was that '… risk factors (such as, climate change, land use and development in rural areas and increased fuel hazards) had been escalating relatively unchecked for approximately 20 years in the State'.[120] The 146,141 hectares equates to 1.9 per cent of the total public land estate.[121]

Figure 7.1 Annual and rolling trends in prescribed burning, 1991–92 to 2008–09



Source: Exhibit 716 – Supplementary Statement of Fogarty, Annexure LGF 1.[122]

In practice, the DSE target remains 130,000 hectares of prescribed burning a year. In his statement Mr Wilson said DSE was aiming to 'gradually increase' the scale of its prescribed burning program. He was unable to explain any strategy or science behind the current regime. His view was that the target of 130,000 hectares was set because that was a figure '… commensurate with resources that were given'.[123] His inability to justify or properly explain the basis of the current target of 130,000 hectares contrasts with the legislative duty imposed on him pursuant to s. 62(2) of the State's *Forest Act 1958.* Mr Fogarty could not point to any scientific justification for the figure either, stating 'There is no solid basis for those figures'.[124]

Mr Fogarty stated that DSE is committed to incrementally increasing prescribed burning.[125] In response to the counsel assisting submission about land and fuel management, the State indicated it would explore resource allocation for an incrementally higher target based on treatable public land.[126]

Targets: the expert panel

Members of the expert panel considered that the past prescribed burning regime of about 100,000 to 130,000 hectares a year is equivalent to a low level of risk reduction. They thought the strategic distribution and implementation of a prescribed burning regime of at least 5 per cent of the available land would reduce risk. To increase prescribed burning above 10 per cent carries greater risk of adverse ecological outcomes.[127]

Dr Clarke clarified that there is some evidence to support the notion that prescribed burning at 5 per cent a year in the dry eucalypt foothill forests would be unlikely to result in undesirable environmental impacts. The available evidence suggests that prescribed burning of that magnitude is justifiable if the primary goal is appreciable reduction of risk to life and property on days of severe fire weather. Scientific knowledge is also most advanced in relation to the dry eucalypt forests.[128]

Dr Tolhurst and Professor Adams both made the point that a target of 5 per cent across treatable public land was a starting point and the benefits would not be evident for 10 years at least.[129] Mr Cheney said an 8 per cent target for fuel reduction would be more effective.[130]

Professor Bradstock emphasised the importance of what he termed 'the other side of the ledger': there could be ecological benefits from 5 per cent prescribed burning and he pointed to the example of protecting water yield.[131]

Panel members agreed in their summary that a statewide target is useful because it provides a guide to the overall scale of prescribed burning that should be done. The target must, however, take into consideration the fact that each hectare burnt is not of equal 'value' and the location of prescribed burns affects the effectiveness of risk reduction.[132] Notwithstanding the usefulness of a statewide target, panel members were of the view that conducting prescribed burning strategically would involve placing prescribed burns to maximise risk reduction, assessing the most appropriate prescribed-burning regime for each region or habitat type, and considering the appropriate level of burning in particular regions.[133]

Targets: other views

The Victorian Association of Forest Industries and the National Association of Forest Industries considers that prescribed burning is most effective when applied at a landscape scale to continuous tracts of forest.[134] Ms Lisa Marty, Deputy CEO of VAFI, said VAFI 'consider that standing timber in a forest is a commercial asset and should be protected' and prescribed burning is a means of protection.[135] VAFI and NAFI both acknowledged that the skills and resources of the forestry industry could be better used for more effective forest management in terms of bushfire prevention and suppression. They mentioned reducing fire hazards by prescribed burning, by using forestry equipment to remove forest fuel close to housing and other developed assets, and by developing cost-effective techniques for thinning native forests.[136]

Forest Fire Victoria, a group describing itself as comprising 'like-minded and concerned practitioners and scientists', are also strong supporters of a target for prescribed burning in Victoria.[137] The group stated that 'an annual target of prescribed burning 460,000 hectares of public land is necessary to ensure the long-term wellbeing and safety of forest ecosystems and their surrounding rural and urban communities'.[138] The group also

called for the government to fund DSE to enable it to increase its workforce and skill levels to enable it to carry out higher levels of prescribed burning.[139]

Similarly, the Australian Workers Union supports increased prescribed burning. Mr Cesar Melhem, the State Secretary, described it as an important tool for reducing fuel loads and minimising the incidence and intensity of bushfires. The union strongly supports an annual 385,000-hectare rolling target.[140]

DSE has continued with a 130,000-hectare target for prescribed burning, despite the recognition by it and others that a substantial increase in such burning is necessary for community protection. DSE has not been held accountable for this. The State has failed to respond to numerous recommendations and provide the necessary resourcing for increased prescribed burning. This reflects a general lack of will to do the level of burning necessary for community and environmental protection by reducing the risk of large and intense bushfires.

The Commission considers that a target of 5 to 8 per cent prescribed burning of public land is necessary for community safety and would not pose unacceptable environmental risks, particularly if priority is given to the dry eucalypt forests referred to by the expert panel.

RECOMMENDATION 56

The State fund and commit to implementing a long-term program of prescribed burning based on an annual rolling target of 5 per cent minimum of public land.

RECOMMENDATION 57

The Department of Sustainability and Environment report annually on prescribed burning outcomes in a manner that meets public accountability objectives, including publishing details of targets, area burnt, funds expended on the program, and impacts on biodiversity.

7.4.4 COSTS

If the community is to understand and appreciate the benefits that accrue from prescribed burning, it must have an understanding of the costs and be able to compare those against the costs associated with fire suppression. The expert panel referred to the importance of this information being available.[141] Professor Bradstock noted that the rudimentary nature of current information 'imposes a major impediment to informed decision-making about prescribed fire'.[142]

Mr Wilson said he had been in his current job, as Secretary of DSE, for six months and is committed to being able to provide information on the cost of prescribed burning, but he was currently unable to provide a figure to the Commission. He stated that he had been advised that it was a 'vexed issue'.[143] Yet, the Code of Practice requires that the department record its expenditure on prescribed burning.[144]

The Commission finds it inexplicable that, despite recommendations since 2003 to report the costs associated with prescribed burning, DSE (or its former entity) is unable to provide this vital information. If the current cost is not recorded and reported, it is difficult to understand how future funding, resources and increases in prescribed burning can be properly assessed and allocated. There is also the important question of public accountability—not just of the efforts and resources applied, but also of the goal set by government and reflected in its annual budgetary allocations.

7.4.5 FIRE ECOLOGY

> The biological impact (killing power) of a single fire event and the rate of recovery (of bushland and/or of human communities) is proportional to the intensity and size of the fire. Very large and intense wildfires cause high levels of mortality and damage to native plants and animals, and irreversible loss of topsoil. Post-fire recovery may take many decades, or even centuries where old growth forests have been killed. On the other hand, low intensity, patchy fires have little long term impact on the biota, which recovers relatively quickly from such events.[145] —*Mr Richard Sneeuwjagt*

The intensity and frequency of fire, the season of occurrence, and the size and patchiness all influence the relative abundance of plant and animal species in a community and the viability or vulnerability of their continued existence in the landscape. Fires that occur outside an organism's range of tolerance can cause local extinctions. As Dr Clarke explained, fire planners need to know what biological assets they are attempting to conserve and where they are located.[146]

DSE's Fire Ecology Program aims to develop the science and community engagement to support appropriate fire regimes for biodiversity management and asset protection. The current statement of strategic directions for fire ecology describes the need to understand the relationship between fire events, fire regimes and biodiversity outcomes in an environment in which unpredictable bushfires are a major challenge.[147] It recognises the key drivers of fire management, some of which are also statutory obligations. Relevantly, they include:

- the requirement to achieve ecologically appropriate fire regimes to maintain biodiversity
- the requirement to reduce the occurrence, spread and severity of bushfires
- the need to improve knowledge about the requirements of fauna and to develop sound faunal vital attributes for use in fire planning decisions
- the need to develop sound and adaptive monitoring programs that also include fauna
- the need to increase understanding through research.[148]

DSE explicitly recognises the importance of understanding the ecology and spatial distribution of flora and fauna populations and communities, the necessity of conducting scientifically robust monitoring and assessment of the effects of fires, the need for fire managers to have timely and accessible fire ecology data and the requirement for adaptive management.[149] Mr Wilson agreed that appropriate management of prescribed burning programs is heavily reliant on the quality and availability of information about ecological values.[150]

The ability to apply prescribed fire events in locations that minimise adverse effects to biodiversity requires, at a minimum, accurate fire history mapping (including timing, location and severity) and a sound understanding of flora and fauna responses to fire. According to Professor Bradstock, currently available geographic information systems can be used to record and spatially map all fires and could commence routinely measuring fire severity and adding that to the record.[151] Mr David Tainsh, DSE Area Manager Land and Fire Services for East Gippsland, noted that 'Fireweb and its associated mapping links provide a database to allow planners to superimpose a detailed fire history across public land, as well as providing a systematic record of past and future programs'.[152] The Commission considers that DSE should enhance its recording and spatial mapping of all significant fires, prescribed and bushfire, in Victoria and progressively consolidate fire maps into fire histories.

Dr Clarke's evidence was that ignorance of the current distributions and needs of flora, and particularly fauna, in relation to prescribed burns and bushfire means that there is a very real risk of causing local extinctions through the application of inappropriate fire regimes. If habitat needs are known, prescribed burns can be implemented to take into account the needs of the least tolerant and therefore most vulnerable organisms in the region. This approach ensures prescribed burning does not jeopardise biodiversity.[153]

Dr Clarke considered that agencies should act as custodians of the long-term data sets of surveys of flora and fauna and that spatially explicit databases on the distribution of key species and their habitats are years out of date. In Victoria the largest surveys of flora and fauna were done in the 1970s.[154] Further, the State has recently identified

in the *Land and Biodiversity* White Paper that the health of Victoria's ecosystems is declining; increasing variability in weather patterns is likely to increase stresses on many ecosystems and threaten ecological function; and the capacity for adaptation to change has been reduced because our landscapes are highly fragmented.[155] In this context, developing our understanding of flora and fauna is becoming even more important.

Responses of biodiversity to fire regimes and prescribed burning are inherently complex, as is the task of managing fire and land for multiple values.[156] The Commission considers, however, that that is no justification for inaction. As Mr Philip Ingamells of the Victorian National Parks Association submitted, '… given our predicament with biodiversity in Victoria and our predicament as the most fire prone state by far … we have to become clearly the experts. We have to lead the game here. We don't have to wait for somebody to show us the way'.[157]

The Commission notes that the decline in the health of Victoria's ecosystems—which has not been helped by the decline in the quality and maintenance of biodiversity information—is having a deleterious impact on planning for community safety. The Commission agrees with the expert panel that the recommended increase in prescribed burning must be accompanied by a corresponding long-term commitment to monitor, map and model its ecological consequences.[158] A sustained and substantial commitment to long-term, ongoing research is also required, including studying the impact of large, high-intensity bushfires across landscapes.

RECOMMENDATION 58

The Department of Sustainability and Environment significantly upgrade its program of long-term data collection to monitor and model the effects of its prescribed burning programs and of bushfires on biodiversity in Victoria.

The Flora and Fauna Guarantee Act

DSE has separate statutory responsibilities for biodiversity conservation and for fire management on public land. Managing environmental values and bushfire risk mitigation are quite different objectives. Inappropriate fire regimes, either bushfire or prescribed burning, have been identified as processes that threaten biodiversity. Information about threatened biota is therefore essential to minimise the consequences of prescribed burning at the landscape scale. Yet DSE has limited understanding of the biology, ecology and distribution of flora and fauna.

The Secretary of DSE administers the *Flora and Fauna Guarantee Act 1988* to promote flora and fauna conservation and management objectives. The Act is the primary Victorian legislation providing for the conservation of threatened species and ecological communities. A potentially threatening process is one that threatens the survival, abundance or evolutionary development of any taxonomic group or community of flora or fauna. Such processes may be listed under the Act.[159] Inappropriate fire regimes were gazetted as potentially threatening processes in 2004.[160]

The Secretary of DSE must prepare an action statement for any listed potentially threatening process as soon as possible after that process is listed and must prepare a flora and fauna guarantee strategy setting out how the objectives of the Act are to be achieved, including the proper management of the potentially threatening process. Action statements are the primary tools for the conservation of threatened flora and fauna and 'set out what has been done to conserve and manage … that process and what is intended to be done'.[161]

In a review of the administration of the Act published in April 2009 the Victorian Auditor-General found that the effort being directed to listing threatened species and threatening processes had not been matched by effort to develop action statements, to monitor the implementation of actions or to assess their effectiveness, and that the gap between listed items and items the subject of action statements continues to widen. The Auditor-General found that at the current rate, assuming no additional listings beyond 2008, it would take 22 years to develop action statements for the remaining listed items. DSE broadly agreed with the main conclusions and findings of the review.[162]

The Auditor-General's recommendations included a review by DSE of the efficacy and efficiency of the tools and processes in the Act, and an assessment of the resources that DSE applies to developing, monitoring and reviewing action statements.[163] DSE agreed to undertake those reviews, which are still occurring. In 2009 the State indicated its intention to repeal the Act.[164] Dr Clarke said there is minimal understanding of the biology, distribution and ecology of many of the species listed under the Act. The assumption that, in the absence of information, inactivity is preferred may involve making a decision against the organism's interest.[165]

The Commission's hearings were not directed to a review of the implementation or the administration of the Act. The underlying issues detected by the Auditor-General's review—namely, a lack of resources or a failure to apply appropriate resources—is germane to the subject of fire management for biodiversity. In its response to the Auditor-General's recommendation that DSE continue to build its knowledge base in relation to threatened species, DSE said further development of its major biodiversity information systems was proceeding and 'will continue to be supported, subject to resource availability and competing priorities'.[166] When asked in the Commission's hearings whether DSE had the resources to meet its present statutory functions Mr Wilson said:

> I'm not sure I could conclude or have been advised that we don't have the resources to meet statutory requirements … I ought to be examining that issue and where we are at with action statement and biodiversity issues more generally. But my sense is that, yes, we could use more resources and we can use better science and so on. But I couldn't necessarily conclude that there is absolutely not enough to meet minimum statutory requirements.[167]

Nevertheless, Mr Wilson agreed that the situation was 'less than optimal'.[168]

The Commission notes the importance of current biodiversity data to enable objective decision making when implementing prescribed burning strategies. In the absence of such information, judgments are subjective and it is difficult to determine the consequences of actions taken. The Commission also recognises, however, that action—both increasing prescribed burning and increasing biodiversity knowledge—is essential for the protection of people and the environment.

The Environment Protection and Biodiversity Conservation Act

The Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* is administered by the Department of the Environment, Water, Heritage and the Arts. The Act provides a mechanism for protecting Australia's native species and ecological communities and for listing the species and ecological communities that are threatened.[169] DSE has primary responsibility for the management of fire and biodiversity on public land and is thus in the best position to determine whether increased prescribed burning will affect species and communities protected under the Environment Protection and Biodiversity Conservation Act and the appropriate course of action should that be the case.

7.4.6 THE CODE OF PRACTICE

DSE's Code of Practice for Fire Management on Public Land sets out the principles, standards and guidelines that apply to fire management on all public land in Victoria. It supports DSE in fulfilling its legislative obligations to protect human life and property by fire prevention and suppression, protect biodiversity, manage public lands, protect cultural values, and protect the health and safety of people affected by DSE work activities.[170]

Objectives and priorities

The Code of Practice refers to three main objectives for prescribed burning—'to reduce fuel levels for fire protection, to stimulate regeneration of tree species following timber harvesting and to maintain and enhance indigenous ecosystems'.[171] It aims to achieve multiple land management objectives while recognising that trade-offs might be required. The current expression of objectives encapsulated in the code is '… to promote the efficient, effective, integrated and consistent management of fire and fire related activities on public land for the purpose of protecting human life, assets, and other values from the deleterious effect of wildfire or inappropriate fire regimes …'.[172]

The expert panel members considered these to be broad goals and called for the governing code to provide an outcome-oriented approach, rather than consisting of statements of 'vague principles' or merely being a means of 'measuring activity'.[173]

The expert panel's summary advocated explicitly identifying objectives and assigning priority to them and called for a model for transparently resolving competing objectives in the Code of Practice. It recognised that trade-offs are inevitable in some situations where the priority is protecting human life.[174]

- Dr Clarke proposed a model that explicitly rates (or 'prioritises') values promoted by a prescribed burning regime. The model should set out the values sought to be maintained, possible actions and consequences, and the associated risks and costs. Decisions could be made based on transparently weighing up the costs and benefits of different choices, realising that there is uncertainty in estimates of risks and consequences.[175] Other panel members supported such a model.[176]
- Mr Sneeuwjagt described the Wildfire Threat Analysis tool used in Western Australia as a risk analysis tool that is used to locate and schedule prescribed burns through the development of a rolling three-year indicative prescribed burning program. This risk analysis process enables fuel-reduction zones around settlements and the rural–urban interface to be identified and maintained in a state of relatively low fuel.[177] Mr Cheney and Dr Tolhurst considered this an effective process for community engagement. Dr Tolhurst commented that it was a 'more open, transparent way of discussing the issues and what's at risk'.[178]
- Mr Williams advocated using what he called an 'optimisation model', which involves the whole community in determining a means by which one can use long-term trade-offs to optimise the outcomes for competing values.[179]

The Commission sees the value of a transparent process involving the community to identify the differing values, objectives and risks from which the desired outcomes, consequences and costs of different options could be considered. Ultimately, though, the need to keep communities safe should not be subordinated to other considerations.

DSE ought make sufficient information publicly available when planning its prescribed burning operations to enable community involvement in weighing up the risks, consequences and costs of benefits of future prescribed burning. It should engage in community consultation in order to gauge reaction to help in the information-sharing process and to help build public understanding and confidence in the purposes of the program.

Fire management zones

The Code of Practice allows for four fire management zones, which are determined on the basis of the importance of fire protection to the area, fuel management alternatives, land values, land management objectives, suppression alternatives and environmental management principles.[180] The zones are as follows:

- *The Asset Protection Zone.* This provides the highest level of protection to human life and other valued assets. High-intensity fuel management will take precedence over other values in this zone.[181]
- *The Strategic Wildfire Moderation Zone.* This consists of areas of sufficient width and continuity to provide a substantial barrier to the spread of bushfire. The aim in this zone is to reduce the speed and intensity of fires and the potential for spot fire development. This also assists in making fire suppression safer and more effective. The fuel management characteristics are generally broader than those set for an Asset Protection Zone. According to the Code of Practice, the treatments in this zone aim to maximise ecological outcomes by seeking to manage for ecologically desirable fire regimes, provided fire protection objectives can still be met.[182]
- *The Ecological Management Zone.* This aims to achieve ecologically appropriate fire regimes for native species and ecological communities that have specific fire regime requirements and manage particular areas and values, including forest regeneration and protection of water catchments at a landscape scale.[183]
- *The Prescribed Burning Exclusion Zone.* This is where prescribed burning is excluded for at least the duration of the relevant fire management plan. Such areas are identified as having high potential for economic, ecological or cultural loss if subjected to prescribed burning.[184]

With the exception of the exclusion zone, there is no guidance in the Code of Practice on the expected characteristics—the size of the prescribed-burn area, the percentage of the burn area to be burnt, fire intensity, frequency of a fire regime, or expected residual overall fuel hazard—of the prescribed burning applied to each zone.

DSE introduced a 'landscape mosaic burning component' to its prescribed burning program after publication of the Environment and Natural Resources Committee's report in 2008. Mr Fogarty suggested that landscape mosaic burning is 'a very different approach'. He described it as a process for the broad-scale burning of large areas of public land in which burn coverage could vary from 30 to 70 per cent. It is usually conducted over three years to achieve a range of land and fire management objectives and is 'supplementary and supporting' to 'strategic burning'. He said the idea was to use fire more broadly over the landscape and to burn larger areas—maybe 2,000 to 5,000 hectares—over a longer period.[185]

It is not clear how the introduction of 'landscape mosaic burns' fits within the zone system established by the Code of Practice. The use of landscape mosaic burning appears to operate outside, and in addition to, the zone regime. It is also not clear what portion of the total 150,999 hectares of prescribed burning conducted in 2008–09 was achieved through what Mr Fogarty calls 'traditional prescribed burns' compared with 'landscape mosaic burns'.[186]

Dr Clarke noted that virtually nothing is known about the scale at which mosaics should be implemented in Victoria or about how they should be composed in terms of age classes. This lack of understanding limits the ability of DSE to determine whether 'landscape mosaic burns' achieve good ecological outcomes.[187]

Fire management zones and February 2009

The State tendered maps of the areas surrounding Marysville, Kinglake, Flowerdale, Mudgegonga and Callignee.[188] These maps depicted past prescribed burns and planned prescribed burns as at February 2009. They did not show which zones the treated areas fell into; nor did they provide information about the size of treated areas or the intensity of the treatment. The Commission considers that this additional information is essential to any assessment of the age and accumulation of fuels and whether the prescribed burns have achieved what they set out to do. The maps—or at least the way in which they were explained in evidence—did not reveal the existence of systematic designation of Asset Protection Zones close to towns or of Strategic Wildfire Moderation Zones in areas designed to provide a further 'buffer' to towns.

Mr Fogarty also accepted that the maps in relation to Kinglake indicated there had been no fuel-reduction burning within 5 to 7 kilometres of Kinglake township since 1991.[189] This suggests that fuels in areas around the town were reasonably 'old' and not subjected to the sorts of intensive treatment the Code of Practice suggests for Asset Protection Zones.

Mr Fogarty explained (by reference to the map that depicted past prescribed burns around Marysville as at February 2009) that the aim had been to 'build some sort of moderation zone north of Marysville' and then build up 'asset protection burns just to the west of the township'. He was not able to say how large the treated sites were or were intended to be. He acknowledged, however, that the analysis of the 2009 fires indicated that 'those [prescribed] burns were largely overwhelmed by the force of the fire'.[190] He also indicated that part of the thinking behind the location of some burns near Marysville had been to try to pick places where 'if a fire starts, you have a chance of that fire running into a burnt area'. He also acknowledged that the areas 'do need to be larger' and that the 'thinking in the area was [to] get this broader landscape treated and get it treated more comprehensively in a strategic context'.[191] For example, he explained in evidence that the narrow fuel break that encircles the town of Marysville ought not be confused with an Asset Protection Zone or any sort of buffer aimed at protecting the residents. Rather, he said, the purpose of that fuel break was simply to provide opportunities for prescribed burning and, in some circumstances, back-burning or burning out.[192]

The Commission concluded from this evidence that there has clearly been insufficient prescribed burning in areas of high bushfire risk. It is also difficult to ascertain how an area has been determined to be an Asset Protection Zone or Strategic Wildfire Moderation Zone or how the zones' placement interlinks in the protection of people. There are also deficiencies in the data available about the scale and age of completed prescribed burning.

Fire management zones: the expert panel's views

Although the expert panel members felt there were strengths in the concept of the zone system, there was also recognition that it could be improved and that there were shortcomings in its application.

Dr Tolhurst described the present system as imperfect but as providing a 'good basis for discussion because the objective of what the zone is trying to achieve is clearly stated, and it then means that you are able to provide prescriptions and management objectives, operational objectives, that would help achieve that'.[193] Some panel members expressed the view that the zone system does not provide adequate guidance on how each zone should be treated to bring about effective reduction in risk, including the width or size of zones.[194] Professor Adams said a zone system was an 'explicit way of acknowledging the sorts of trade-offs' that may be required.[195]

Panel members highlighted concerns about the way in which the zone system has been applied. Dr Tolhurst said he was aware of locations where Wildfire Modification Zones had been selected on the basis that the level of treatment could be 'easily maintained', rather than as a result of a systematic analysis of the landscape in order to ascertain the best location of the zone for risk reduction.[196] Dr Clarke agreed that sometimes the applications of zones do not obviously reflect clear land management objectives.[197] Professor Bradstock stated that there are 'few quantitative insights that critically test whether typical zone configurations and associated rates of treatment provide an optimum reduction in risk'.[198]

The expert panel also had clear views about the expected characteristics of prescribed burning for the purpose of risk reduction. These views included the following:

- Mr Cheney explained what needs to be considered when selecting the location of a prescribed-burning block, and said:

> The key to a burning program for wide scale protection is to have the blocks strategically located across the landscape in a pattern that, when repeated, large fires are going to sooner or later run into one of these low fuels and be checked and in the lighter fuels suppression of the fire in subsequent hours or days after the extreme weather will be made much easier and can be done more efficiently.[199]

- The panel was unanimous in its view that burning areas smaller than 500 or 1,000 hectares is 'usually of minimal value in reducing the scale of unplanned fires'.[200] Dr Tolhurst indicated that the reference in the panel's summary to burning areas 1,000 hectares in size was not 'just a random number': it is the 'sort of size we are thinking of would be needed to capture the majority of embers falling within three kilometres of a wildfire'. It is not just to achieve a target of so many hectares.[201] Professor Bradstock stated, '… bigger is better and if you are going to push ahead with a more vigorous approach to prescribed burning it is inexorable that you are going to have to achieve that by treating larger slabs of country'.[202]
- Mr Sneeuwjagt explained that, for prescribed burns to be effective as buffers, they should have minimum dimensions of area (greater than 1500 hectares), depth (greater than 3 kilometres) and width (greater than 3 kilometres). He said that small, narrow burns do not allow time 'for a wildfire to pull up'.[203]
- The expert panel's summary noted that ideally a prescribed burn should achieve a burn of 70–90 per cent of the area being subjected to the burn.[204] Dr Tolhurst noted that it should be no more than 90 per cent to allow recovery of the fauna and flora in that area afterwards.[205] Dr Clarke explained that 'patchily burning landscape at a percentage less than 70 per cent' allows animals to navigate through the burnt areas and have necessary cover or resources for recolonising the area after fire.[206]

The 'fuel hazard' is defined as the sum of the influences of bark hazard plus elevated fuel hazards plus surface fine fuel hazards. These can be quantitatively measured before and after burning, according to the technical guide called the *Overall Fuel Hazard Guide.* Measuring the bark and elevated fuels is important because these are the elements that are mainly responsible for first attack failure and also general suppression difficulty.[207]

The panel members advocated that the treated area be left with an overall fuel hazard of 'high' or less where the goal of prescribed burning is fuel reduction. The term 'high' comes from the guide.[208] Dr Tolhurst explained that in a foothill dry eucalypt forest a 'high' fuel level would be a situation where there are few embers able to be produced by the trees, the shrub layer would be minimal with a small component of dead material, and the amount of litter on the ground would be less than 25 millimetres deep and less than 8 tonnes a hectare.[209]

The Code of Practice refers to terms such as 'intense' treatment, but there is no guidance about fuel hazard levels. In contrast, in Western Australia the level of treatment for different forest fuels is explicit and expressed in terms of tonnes per hectare. Mr Sneeuwjagt explained that the approach in Western Australia is to aim to maintain fine surface fuel quantity below about 8 to 9 tonnes per hectare for jarrah forests and at 15 to 19 tonnes per hectare for karri forests over about 50 per cent of the forest area. As a result, during fuel-reduction burns the aim in the jarrah forests is to bring fuels down to about 2 tonnes a hectare and in karri forest the threshold is about 5 tonnes a hectare. He explained that a fuel-reduction burn would see the near-surface and surface fuels reduced and a burn of sufficient intensity to affect the bark up to 3 or 4 metres. He noted that bark removal is important 'when it comes to minimising ember attack or spotting'. In some parts of the treated area, he said, one would be looking to see some scorching but almost no defoliation.[210]

Mr Cheney confirmed that, if the fire protection objective in a particular area is to reduce the amount of bark on the trees, the treatment needs to be of higher intensity than in other areas since it will be necessary to take the fire into the upper parts of the tree.[211] Dr Tolhurst noted that one of the most 'enduring benefits' of prescribed burning is a reduction in bark hazard.[212]

Overall, the information elicited confirms the suitability and sense of designating Asset Protection Zones and Strategic Wildfire Moderation Zones in a manner that allows the two zones to work together and to be of sufficient depth to provide layers of protection to townships and other settlements. The Commission is, however, concerned that there is a lack of clear guidance to ensure that the location of burns, the size of the burns, the percentage burnt and the intensity of the burn effectively support the use of prescribed burning for adequate risk mitigation.

The Commission considers that the Code of Practice should be revised so that it provides sufficient explicit guidance about the recommended size of a treatment block and intensity of treatment for each fire management zone. The Code of Practice ought make explicit the following:

- Where the aim is to reduce risk from bushfire (principally in the Asset Protection Zone and the Strategic Wildfire Moderation Zone) prescribed burns should be between 500 and 1,000 hectares in size. Protection near towns may require very large areas for prescribed burning in order to significantly reduce the risk of bushfire.
- In the fire management zones where the aim is to reduce risk from bushfire, between 70 and 90 per cent of an area selected for a prescribed burn should be burned.
- In fire management zones where the aim is to reduce risk from bushfire, the residual fuel load should be brought down to 'high' within the meaning of the *Overall Fuel Hazard Guide.* When the aim is to protect human life, it is desirable to ensure highly flammable bark is removed during prescribed burning in order to reduce the risk of firebrands and spotting.
- The purpose of landscape mosaic burns is clarified and described in the Code of Practice, and understanding is developed about their interaction with biodiversity values.

RECOMMENDATION 59

The Department of Sustainability and Environment amend the Code of Practice for Fire Management on Public Land in order to achieve the following:

- provide a clear statement of objectives, expressed as measurable outcomes
- include an explicit risk-analysis model for more objective and transparent resolution of competing objectives, where human life is the highest priority
- specify the characteristics of fire management zones—including burn size, percentage area burnt within the prescribed burn, and residual fuel loading
- adopt the use of the term 'bushfire' rather than 'wildfire'.

In the light of the proposed changes to the Code of Practice the operational manuals and guides for DSE staff should also be revised with respect to the characteristics of fuel management zones.

Fire Management Plans/Fire Operations Plans

The District Fire Management Plans and Fire Operations Plans are prepared by DSE at the fire district level and sit below the Code of Practice.

Fire management plans must have overarching fire management goals, objectives and strategies. They should include fire protection strategies for bushfire prevention and suppression, fire ecology strategies that outline ecological and cultural protection goals, and demonstrable links and alignment with municipal fire prevention plans. Draft fire management plans have to be made available for discussion at regional and municipal fire prevention committee meetings as part of community consultation. Following consultation, the plans are reviewed by senior managers before being approved by the Secretary of DSE.[213]

Fire operations plans contain the detail for implementation of the strategy enunciated in a fire management plan. They are prepared each year for each fire district and must be consistent with the applicable fire management plan. Proposed fire operations plans are made available in draft form for 28 days for public comment.[214] A fire operations plan must contain the following:

- a three-year forward program comprising a schedule and maps for fuel-reduction and ecological burns and any new preparedness works prescribed for the three-year period
- a detailed schedule of prevention and preparedness works prescribed for the immediate 12-month budget period.[215]

Fire operations plans are required to detail the 'priority areas selected for burning for fuel and ecological management purposes'.[216]

Mr Lawlor, explained that the development and implementation of fire operations plans requires 'ongoing management and communication with the relevant stakeholders'.[217] Steps are also taken to identify cultural sites, particularly sites of significance to Indigenous Australians, to ensure protection measures can be implemented. In Mr Lawlor's experience there was little community participation in the Ovens district in relation to prescribed burns before 7 February. Since the fires, however, there has been a significant increase in community interest in the program.[218] Dr Tolhurst said the public engagement process for developing fire management plans and annual operations plans is 'complex and time consuming' and could be significantly improved so that all parties can 'have a good appreciation of each other's perspective'.[219]

The underlying principles and approach of the fire operations plans are similar to those of the Wildfire Threat Analysis tool in Western Australia, where the community can have input into the proposed prevention activities occurring on public land.[220] Community consultation is valuable but should not degenerate into simply providing information to the community or become a conflict-resolution process. Developing ongoing community knowledge and participation needs more sophistication. The Commission is of the view that DSE, as the lead agency, needs to be a stronger advocate of an enhanced prescribed burning program with a stress on protecting human life and with sensitivity to biodiversity vulnerabilities.

The Commission considers that fire management plans and fire operations plans should reflect significant risk reduction by prescribed burning and other prevention activities, particularly for populations near forested areas.

7.5 FUEL BREAKS

A 'fuel break is any piece of land where fuel has been physically removed to create a gap in an area of uninterrupted fuel'.[221] The primary role of fuel breaks, which typically include roads and tracks, is to allow firefighters and equipment to be safely and rapidly deployed to control a fire. Mr Fogarty commented that the major uses of fuel breaks are during bushfire suppression, including doing back-burns or burning out, and also for prescribed burns. In extreme fire conditions fuel-break networks can enable quick access for rapid attack, provide an anchor point for firefighters engaged in suppression, and help restrict the lateral spread of the fire once the head fire becomes uncontrollable.[222]

Fuel-break location should be carefully selected and maintained to ensure that environmental and Indigenous cultural values are protected.[223] In terms of a road as a fuel break, roadside vegetation may be additionally reduced to widen the break already provided by the road, which also helps reduce the risk of fires starting.

The terms 'fuel break' and 'fire break' were used interchangeably in the evidence. DSE uses 'fuel break' as an umbrella term, although it differentiates definitions for fuel break, strategic fuel break, fire break and access road and track.[224] The Commission found the definitions DSE used confusing.

7.5.1 VICTORIA PLANNING PROVISIONS EXEMPTIONS

The fire protection exemption for the removal of native vegetation in clause 52.17-6 of the Victoria Planning Provisions prepared under the *Planning and Environment Act 1987* has two parts that specifically exempt fuel breaks from planning permit requirements. First, native vegetation can be removed, destroyed or lopped for firefighting measures, for periodic fuel-reduction burning, or for a fuel break or firefighting access track up to 6 metres wide. These can be constructed on public or private land, by a public authority or an individual.[225] Second, native vegetation can be removed, destroyed or lopped for fuel-break construction by or on behalf of a public authority in accordance with a strategic fuel-break plan approved by the Secretary of DSE. These fuel breaks can have a maximum width of 40 metres.[226]

In evidence before the Commission there appeared to be limited use of the first exemption for the 6-metre fuel break. Three council representatives, who gave evidence to the Commission in a panel format, indicated that the 6-metre fuel-break exemption does not appear to be actively used by Yarra Ranges Shire, Latrobe City Council and Colac Otway Shire, although there are some fuel breaks in Colac Otway Shire that have been in place for some years.[227] Mr Stephen Brown, Executive Director, Regional Services, Roads Corporation, said there are examples of VicRoads using the provision.[228] There was also one example of a lay witness, Mr Ray Maino, who had made use of this exemption as a private citizen.[229]

The Secretary of DSE approved plans for construction of fuel breaks by DSE, Parks Victoria and Melbourne Water to protect Melbourne's water catchments, based on the 'strategic fuelbreak plan' exemption of clause 52.17-6 of the Victoria Planning Provisions. Mr Fogarty said the water catchments were seen as 'being of high priority' and that new approaches were being modelled and trialled, based on initial work in 2007 in the Otway Ranges.[230] These forests are fire intolerant, and the occurrence of bushfire would damage water quality and yield in the short and long term.[231] When completed, this network of fuel breaks will extend 600 kilometres.

The Otways fuel breaks were designed to provide essential linkages across the landscape. They vary in width depending on location, forest type, expected fire behaviour and land management objectives, from 6 metres to greater than 20 metres with fuel-reduced zones on either side.[232] In this context the fuel breaks are really to enable rapid access by firefighters charged with protecting the state's water resources.

The fuel breaks were designed with environmental conservation in mind. Vegetation coverage is retained on the ground, and 30 per cent canopy cover from trees is retained to allow wildlife connection and shade. Although not required by the exemption, DSE provided offsets for native vegetation affected by the construction of the breaks. DSE referred to the Department of the Environment, Water, Heritage and the Arts with respect to compliance of intended works for fuel-break construction and asset-protection zones under the Environment Protection and Biodiversity Conservation Act. No assessment was required if the works were carried out as described in the referral.[233]

In 2009 the Victorian Government developed and funded the Melbourne Bushfire Protection Program Project, which builds on work already started for Melbourne's water catchments. This is a four-year project intended to deliver additional fire protection for Melbourne's urban interface areas, such as the Mornington Peninsula, the Dandenong Ranges, the Lower Yarra Valley and grassland reserves. Parks Victoria will lead the activities, which include planned construction of 100 kilometres of fuel breaks on public land.[234] The Commission supports ongoing fuel-break construction and maintenance to supplement the bushfire protection measures of townships, and it is pleased that threatened townships are being treated in the same manner as water catchments.

7.5.2 THE PRO FORMA OFFER

In January 2010 DSE prepared a pro forma agreement for use at the local level. This was to encourage councils to submit 'local strategic fuelbreak plans' for approval by the Secretary of DSE as part of fire protection works. Under these plans, vegetation offsets are required for fuel breaks located on public land, and fuel breaks wider than 20 metres are unlikely to be approved unless 'exceptional circumstances' can be demonstrated.[235]

At the time of the hearings only two councils had responded to DSE's offer, and both indicated they did not intend to submit these plans. It also appears that the Municipal Association of Victoria was not consulted before the offer being made to councils. Mr Robert Spence, Chief Executive Officer of MAV, said councils had concerns about the offsets requirement in the offer.[236]

The 20-metre restriction and the requirement for an offset imposed for the 'local strategic fuelbreak plans' is difficult to reconcile with the 40-metre fuel-break exemption without an offset requirement in clause 52.17-6 of the Victoria Planning Provisions. The differences between the regulations and local agreements for fuel-break widths appear arbitrary. The Commission considers that DSE should withdraw its 'offer' to councils in relation to proposed fuel breaks up to 20 metres wide and allow all public authorities to rely on the full scope of the exemption in relation to 40-metre fuel breaks in clause 52.17-6.

7.6 ROADSIDE CLEARING

The extreme conditions of 7 February meant that roadside fuels had minimal impact on fire spread.[237] The Commission heard evidence that on less severe days roadside fuels could contribute to fire behaviour, although it is unlikely they would have a major impact.[238] Nevertheless, a number of matters were raised in connection with roadside vegetation and clearing during the course of the Commission's work:

- the need to strike a balance between the complex and competing objectives of reducing bushfire risk and maintaining important environmental values
- the complexity of the current regulatory framework governing road management and roadside clearing, which involves various Victorian and Commonwealth Acts
- roadside clearing processes being resource intensive and the regulatory process being time consuming. This particularly affects councils, especially those in some regional areas. The objectives and obligations in various pieces of legislation that affect roadside clearing are also difficult for road managers to reconcile. There is an apparent emphasis on environmental protection rather than bushfire risk reduction
- roadside vegetation, particularly fallen trees, presenting a risk for firefighters and other emergency workers, who need access to roads to perform suppression activities, as well as residents seeking safety.

The Commission's recommendations in this area aim to redress the regulatory complexity in order to facilitate the process of roadside clearing and ease the administrative burden for road managers. Protection of human life is considered the highest priority, although the Commission is also mindful of the importance of environmental protection.

7.6.1 MANAGEMENT OF ROADS

Under Victoria's *Road Management Act 2004* responsibility for the management of roads is shared. Generally, VicRoads is responsible for rural freeways and arterial roads and councils are responsible for some local roads and some arterial roads within their municipality. DSE is responsible for roads on public land, including those in state forests and national parks. The objectives of the Act focus on safe and efficient road use, management of the road system and road users' rights.[239] They do not directly refer to bushfire risk reduction.

7.6.2 THE OBLIGATION TO REDUCE BUSHFIRE RISK

Section 43 of the *Country Fire Authority Act 1958* requires public authorities, councils and VicRoads to take all practicable steps to prevent and minimise fires, or the spread of fires, on land or roads under their control or management. It does not apply to roads on public land for which DSE has responsibility.[240]

Councils have tried to accommodate this obligation in close consultation with the CFA through municipal fire prevention plans, road management plans and roadside vegetation management plans. In contrast, VicRoads has adopted a minimalist approach, focusing on mowing or slashing roadside grass and deferring to CFA and DSE fire experts regarding other roadside risk management works. VicRoads has not developed its own comprehensive and proactive risk assessment program.[241]

Despite their obligations under the CFA Act, neither councils nor VicRoads appear to consider the bushfire risk posed by trees outside the regulated clearance space around power lines. Trees can cause fires by contacting power lines when they break or fall, as occurred with the Beechworth fire, for example. Such 'hazard trees' are discussed in Chapter 4.

7.6.3 THE OBLIGATION TO PROTECT THE ENVIRONMENT

The environmental importance of roadsides

In some parts of Victoria, particularly where there has been extensive clearing of land, roadsides might provide the only example of remnant native vegetation. Some flora and fauna species rely on roadside remnant native vegetation as habitat or to move across the landscape 'along the corridors', which are sometimes referred to as 'wildlife corridors'.[242]

Fallen logs and coarse woody debris on forest floors or along roadsides are particularly valuable remnant vegetation. They offer protection and shelter for animals, protect small plants from grazing and stormy weather and contribute to soil building as the debris breaks down. Fallen trees and branches can provide tree hollows, which are particularly important for some species, and generally take 100 to 150 years to develop.[243]

The Flora and Fauna Guarantee Act, the Environment Protection and Biodiversity Conservation Act, and the Victoria Planning Provisions under the Planning and Environment Act protect some native flora and fauna found along roadsides.

Commonwealth and state environment protection legislation

Before engaging in roadside clearing, road managers must consider the implications of the Commonwealth Environment Protection and Biodiversity Conservation Act and the Victorian Flora and Fauna Guarantee Act. These Acts have different processes to regulate activities that could affect native flora and fauna. The species protected under the Acts are also slightly different, and this adds to the complexity for road managers, although generally similar information is required for both processes.[244] The Environment Protection and Biodiversity Conservation Act includes exemptions for bushfire risk, but these are complex and do not sit well with road managers' obligations to manage bushfire risk.

Under s. 146 of the Environment Protection and Biodiversity Conservation Act the minister may assess the impacts of proposed actions under a policy, plan or program on matters of national environmental significance. This is known as a strategic assessment. Such an assessment provides greater certainty and reduces the administrative burden on road managers, who take action on an ongoing basis under a policy or plan.[245] The Commission considers that a strategic assessment should be sought in relation to roadside vegetation and bushfire risk in Victoria.

The State, DSE, the CFA, the Municipal Association of Victoria, and the Department of the Environment, Water, Heritage and the Arts will need to collaborate to facilitate this process. The Commission notes that in 2009 the State indicated it intended to repeal the Flora and Fauna Guarantee Act.[246] It encourages the State to ensure that any new legislation it introduces to protect native flora and fauna enables vegetation management for bushfire risk reduction.

The Victoria Planning Provisions

Clause 52.17 of the Victoria Planning Provisions under the Planning and Environment Act aims to avoid or minimise, through planning and design, native vegetation removal and offset any native vegetation losses. Road managers require a permit to 'remove destroy or lop native vegetation' on roadsides unless one of the exemptions in clause 52.17-6 applies. The exemptions include grasses, dead vegetation, weeds, fire protection and public roads.[247] The exemptions are, however, complex and difficult to interpret. For example:

- The grasses exemption applies where the mowing or slashing is for 'maintenance only'. It appears to include maintenance undertaken for bushfire risk reduction, but this is not explicit.[248]
- Under the fire protection exemption DSE treats removal 'for firefighting measures' as restricted to urgent measures taken to control an active fire.[249] It does not provide scope for roadside fuel-reduction works undertaken in anticipation of a fire or to reduce bushfire risk.
- The public roads exemption covers activities to provide safe and efficient roads. DSE offered a pro forma agreement to VicRoads and councils covering all works within this exemption, with the process to be implemented by the road manager. Works under the agreement include 'fire prevention maintenance', but this phrase is broader in scope than the fire protection exemption in clause 52.17-6. A number of councils expressed reluctance to sign the agreement because of concerns about the onerous reporting and record-keeping obligations.[250]

In terms of effective fire risk reduction, these exemptions are overly complex and lack clarity, and this is of concern to the Commission. In relation to the exemptions in clause 52.17-6, Mr Spence said, 'I think the thing that's missing out of it is we've got road safety and we've got environment as strong influences for the direction of the policy, but fire prevention isn't strong enough'.[251]

The Commission considers the exemptions in clause 52.17-6 of the Victoria Planning Provisions particularly problematic. As currently drafted, the exemptions do not enable road managers to meet their bushfire risk–reduction obligations. The VPPs also fail to provide clear guidance for councils trying to balance their competing bushfire risk–reduction and environmental obligations. The Commission considers that the exemptions in clause 52.17-6 should be changed in order to achieve the following goals:

- reflect the bushfire risk–reduction obligations that s. 43 of the Country Fire Authority Act imposes on road managers
- meet community bushfire risk–reduction expectations
- simplify the task for road managers seeking to rely on the exemptions.

In the Commission's view it is possible to frame an exemption that achieves these objectives, along the following lines:

> **Exemption: Roadside fuel fire risk–reduction works**
>
> Work on roadsides by councils, VicRoads or the Department of Sustainability and Environment that is performed for the purpose of reducing fuel levels on roadsides, or for the purpose of reducing the risk of fires starting on or spreading from or along roadsides where such work is approved, be recommended or requested by a municipal fire prevention committee, a municipal fire management planning committee, a CFA brigade or DSE.
>
> Notwithstanding the terms of any other provision of the planning scheme, no permit is required under any such other provision for the removal, destruction or lopping of vegetation, provided the removal, destruction or lopping is undertaken in accordance with this exemption.

RECOMMENDATION 60

The State amend the exemptions in clause 52.17-6 of the Victoria Planning Provisions to ensure that the provisions allow for a broad range of roadside works capable of reducing fire risk and provide specifically for a new exemption where the purpose of the works is to reduce bushfire risk.

7.6.4 COMPLEXITY AND COMPETING OBJECTIVES

The Municipal Association of Victoria's submission to the Commission highlighted the difficulties councils face in adhering to the different and competing obligations in the legislation just outlined. The submission stated that there is little legislative prescription or policy guidance for councils to assist them with resolving the competing tensions between fire protection and conservation of native vegetation.[252] The Commission considers the current processes cumbersome. In addition, the scope of activities does not fully account for bushfire risk reduction.

The regime constituted by the Country Fire Authority Act, clause 52.17 of the Victoria Planning Provisions, the Flora and Fauna Guarantee Act and the Environment Protection and Biodiversity Conservation Act is also likely to result in high administrative and compliance costs. The cost to councils of discharging their road management responsibilities is a significant burden, particularly on rural councils with a lower ratepayer base. It is essential that local government is adequately resourced to discharge its responsibilities in relation to roads and roadsides. This is discussed further in the next section.

RECOMMENDATION 61

The State and Commonwealth provide for municipal councils adequate guidance on resolving the competing tensions arising from the legislation affecting roadside clearing and, where necessary, amend environment protection legislation to facilitate annual bushfire-prevention activities by the appropriate agencies.

The State, working with DSE, the CFA and the Municipal Association of Victoria, should also adopt a collaborative approach and seek the most effective way to cover bushfire risk measures undertaken in Victoria, including the conduct of prescribed burning, construction of fuel breaks and roadside vegetation works whilst meeting environmental obligations.

7.6.5 MANAGEMENT OF FIRE RISK BY COUNCILS

Councils manage roadside bushfire risk by means of a number of instruments, including municipal fire prevention plans, road management plans, road vegetation management plans and local laws. MFPPs focus primarily on bushfire prevention and fire management, whereas RMPs and RVMPs cover overall policies for roads.[253] Mr Spence of the Municipal Association of Victoria and the panel of council representatives presented a large body of material to the Commission about roads and roadsides. It included information drawn from surveys that demonstrated great variation in how councils manage roads and roadsides, particularly for bushfire prevention.[254] A particular council's practice appears to depend on its rural and urban mix, approach to road safety maintenance, and commitment to fire prevention goals. A number of councils' MFPPs identify roads as 'strategic firebreaks' and usually specify that these roads receive wider slashing of grasses than other shire roads.[255]

The majority of councils have regard to the CFA Roadside Fire Management Guidelines 2001, either in the development of their MFPP or when resolving roadside vegetation problems. The Commission recommends in Chapter 4 that councils include in their MFPPs identification of hazard trees and coordination with entities responsible for removing such trees. Many power lines run alongside roads where councils and other road managers undertake bushfire risk reduction. This provides an opportunity to inform municipal fire prevention committees about hazard trees and notify entities responsible for responding to this risk.

Competing objectives and limited resources

Councils are the road managers affected by the current roadside clearing regime. Mr Spence explained that local government carries heavy responsibilities for bushfire risk management in relation to land-use planning, municipal fire prevention, municipal emergency management and management of roads and roadsides. Councils currently manage 129,235 kilometres of roads, most of which fall within rural and regional municipalities covered by the CFA and in the areas of greatest bushfire risk. These municipalities are often where resources are scarce. Most of the councils in CFA areas of Victoria have long road networks, very dispersed populations, large areas of state park and the lowest revenue relative to metropolitan councils.[256]

The State should ensure that councils are adequately supported through funding, training and technical assistance to discharge their bushfire risk management functions in relation to roads and roadsides and the safe use of roads during bushfires.

Community views

The council panel representatives told the Commission there had been 'significant shift' in people's attitudes to roadsides since the January–February 2009 fires, which had resulted in a 'significant increase in requests and awareness and activism'. For example, arborists in the Shire of Yarra Ranges had experienced a 160 per cent workload increase in the year following the fires. Further, council officers had received a 200 per cent increase in requests for roadside slashing.[257]

Residents were now calling for Latrobe City Council to 'get as much stuff off the roadside as you possibly can'.[258] Mr Grant Jack, Manager, Asset Maintenance and Services, Yarra Ranges Shire, noted that since the fires council staff had been dealing with 'very emotional people' seeking works, while others were still asking that native vegetation not be touched.[259] Councils are no doubt engaged in a delicate balancing act in trying to meet their obligations under competing regulatory regimes and also satisfy the divergent interests of community sectors.

7.6.6 VICROADS AND MANAGEMENT OF FIRE RISK

The 1985 Code of Practice

VicRoads manages about 80,000 hectares of roadside running along 22,300 kilometres of freeways and arterial roads. To meet its fire prevention obligations, VicRoads, in conjunction with the CFA, devised the VicRoads Code of Practice for Fire Prevention on Declared Roads Reserves in Rural Areas.[260] The code recites s. 43 of the CFA Act and notes that it (the code) is governed by a number of principles, among them the following:

> [VicRoads] prefers the provision of fire control measures by slashing, mowing or ploughing rather than burning but accepts that, in some situations, burning may be the only practical means. [VicRoads] will normally construct fire breaks immediately behind the guideposts to minimise the spread of fire caused by road makers or users or vehicles.
>
> It is important that, as far as possible, damage to trees, shrubs, grass and natural features of the landscape be avoided to preserve the appearance of the roadside and prevent erosion. The value of the roadside as a habitat area for wildlife is also considered.[261]

Significantly, the code gives primacy to fire prevention objectives.[262] It also requires protection and promotion of environmental values but makes it clear that the obligation to reduce bushfire risk prevails in the event of competing objectives. The code also contains valuable information and advice and should be reviewed to ensure that it is up to date and conforms to VicRoads' obligations under s. 43 of the CFA Act.

Roadside conservation management plans

VicRoads develops roadside conservation management plans (previously known as road management plans) based on the principles in the code. RCMPs are specific plans for a particular roadside that take into account VicRoads' broader roadside management objectives and local requirements. VicRoads prepares RCMPs for those road reserves with the most significant assets.[263] Overwhelmingly, these plans focus on protecting environmental values. It appears they have drifted from the clear fire prevention objectives expressed in the code. Further, VicRoads' RCMPs and RMPs do not demonstrate a risk assessment approach.

VicRoads involvement in municipal fire planning

Mr Stephen Brown noted that some roadsides managed by VicRoads are included in MFPPs. VicRoads' representatives attend municipal fire prevention committee meetings when invited but are not members of the committee and do not routinely attend. This means they might not be in attendance when the committee raises municipal fire planning matters that relate to roadside works on VicRoads' freeways and arterial roads. VicRoads staff have minimal involvement in the development of MFPPs.[264] The Commission considers it desirable that VicRoads representatives participate in such committees—at least for those councils where VicRoads is responsible for substantial parts of the road network.

Risk assessment and the use of contractors

VicRoads seeks to discharge its roadside fire prevention obligations using standard mowing and slashing contracts that require contractors to mow 3 metres behind the guideposts. Mr Brown stated that, as a general rule, VicRoads defers to the CFA, DSE or the relevant municipal fire prevention committee for any other treatments required to reduce roadside fire hazards from trees. The Commission also heard that VicRoads' mowing and slashing contracts are not always adhered to.[265] The Commission considers that VicRoads should review its standard contracts for mowing and slashing grasses and determine whether additional works to reduce bushfire risk are required (including in relation to shrubs and trees with flammable bark). VicRoads should also ensure that contractors engaged for this purpose meet their contractual obligations.

The Commission is concerned that VicRoads does not carry out any systematic roadside bushfire risk assessment. It appears not to have considered whether particular stretches of road carry increased fire risks and require different or additional treatments, but it 'would take advice from fire experts'.[266] It has also been suggested to the Commission that the trigger for seeking such expert advice is public complaint. The evidence suggested that VicRoads has adopted an inconsistent approach from year to year and for different sections of the Hume freeway.[267] This should be dealt with as a priority.

RECOMMENDATION 62

VicRoads implement a systematic statewide program of bushfire risk assessment for all roads for which it is responsible, to ensure conformity with the obligations in s. 43 of the *Country Fire Authority Act 1958* and with the objectives expressed in the VicRoads 1985 Code of Practice.

Such a program should demonstrate a commitment to reducing the fire risk posed by roadside vegetation. It should also entail a review of the content of VicRoads' road management plans and roadside conservation management plans.

7.6.7 THE CFA AND ROADSIDE WORKS

Under s. 42 of the Country Fire Authority Act, CFA brigades are empowered but not obliged to engage in roadside fuel-reduction works, including prescribed burning. These works must be carried out with the consent of, or at the request of, the road manager. If the road manager requests the works it is obliged to pay the CFA for the work carried out.

Mr Leonard Leslie, a CFA Fire Planning Coordinator, explained that the CFA generally does roadside works at its own expense (often through the use of its volunteers) and rarely enforces the payment provisions in the Country Fire Authority Act. Usually there is no formal 'request' for the works, which are often prompted 'from the field'.[268] The Commission commends the CFA for devoting considerable resources, including volunteer time, to roadside works, despite not being principally responsible for roadsides under the Act.

The CFA's 2001 guidelines, although not formally in force, continue to influence the CFA's policy and its performance of bushfire prevention works, including on roadsides. In relation to roadside fuel management, the guidelines contain useful scientific and practical guidance that supports VicRoads' and councils' approaches to roadside works. This includes the standard 3-metre slashing as a 'fuel free area' and cutting grass to a maximum height of 10 centimetres.[269]

Since 2005 the CFA has altered its ad hoc roadside bushfire risk–reduction practices in response to legislative changes. It has tried to develop a comprehensive and uniform approach to fire management on roadsides. Mr Leslie explained that the CFA has spent significant funds and relied on volunteers' expertise and time to do this.[270]

The Commission acknowledges Mr Leslie's assertion that the process for approval of roadside vegetation works is 'complex, time consuming and costly for the CFA. Clear, transparent and accountable arrangements, supported by appropriate public compliance reporting against responsibilities, are needed to facilitate roadside vegetation management work'.[271] The CFA is canvassing initiatives to streamline roadside vegetation management and hopes to use DSE's biodiversity data in the early stages of planning roadside works to identify biodiversity concerns.[272]

Another burden on CFA resources is the need to pay external contractors to provide traffic management training to CFA staff and volunteers. Traffic management is required during bushfire risk–reduction works. Mr Leslie said the CFA would like to investigate ways of alleviating this burden, with traffic management services being provided by VicRoads or some other road authority.[273]

The Commission considers that CFA volunteers should be suitably supported to allow them to focus on core bushfire risk–reduction works along roadsides. The State should ensure that the CFA is satisfied that its volunteers are appropriately deployed when carrying out bushfire-related works and not completing administration or traffic management responsibilities on behalf of others. VicRoads could consider an annual contribution recognising the important work done by the CFA; alternatively, other emergency services could provide traffic management support.

7.6.8 ROAD SAFETY DURING FIRES

A number of public submissions raised the question of safe road use during fires. This affects members of the community seeking to escape fires as well as emergency services trying to obtain access. The Commission heard from Mr Chris Petreis evidence about his frightening escape along a virtually impassable section of Coombs Road, Kinglake West, a road on which six residents died.[274] There were a number of other instances during the late January and February 2009 fires when residents and emergency services workers experienced difficulties with safe road use. Mr Roger Strickland, a CFA Fire Investigator, said, '… falling trees during and after fires is probably one of the biggest hazards that firefighters face'.[275] He also provided several examples where access or safety concerns arising from fallen or unstable trees compromised firefighters' capacity to suppress fires safely.[276]

The Commission acknowledges that individuals' capacity to escape from a fire or a fire-affected area and firefighters' capacity to render assistance and engage in suppression are compromised if roads are impassable, poorly maintained or blocked by fallen trees. Tackling this problem calls for a cooperative and collaborative approach.

Box 7.1 Township Protection Plan—Essential Access and Egress Roads

Since February 2009 VicRoads, the Municipal Association of Victoria, DSE and the CFA have developed the Township Protection Plan—Essential Access and Egress Roads. The initial aim was to analyse the first 52 towns to be provided with township protection plans. The roads of these towns have been assessed to determine which locations have only 'one road in and one road out, and are therefore particularly vulnerable. For each town the project considered the applicable township protection plan, whether the town had a 'neighbourhood safer place' and its risk and road access generally.[277]

By February 2010 the project had identified 15 high-risk roads requiring urgent critical works, including removing dangerous trees and built-up debris. The aim is to make the 'one road out' safe and to carry out fuel reduction. To expedite action, DSE issued a general permit under the Flora and Fauna Guarantee Act to the CFA, to enable it to undertake the crucial works, and offered councils an agreement providing them an exemption under clause 52.17 of the Victoria Planning Provisions.[278]

The project has been very successful in meeting the needs of towns in high-risk areas and with limited road access. The Commission commends the parties for their swift and cooperative approach.

7.6.9 ROADSIDE VEGETATION AND FIRE BEHAVIOUR

The evidence suggests that if conditions had been less severe on 7 February roadside vegetation is likely to have affected fire behaviour more significantly.[279] For that reason the management of roadside vegetation to reduce fire intensity remains important. In particular, reduction of flame height (that is, by slashing or mowing grass) will be an important feature in reducing fire intensity and radiant heat, both of which assist suppression efforts.[280]

Mr Strickland provided a detailed report and expert advice about nominated locations where roads and roadsides might have been relevant to the late January and February 2009 fires. He reviewed fire investigation reports, fire progression reports, maps and photographs of locations and the witness statements of fire investigators, interviewed eyewitnesses and conducted field investigations. Significantly, he did not find any instance where roadside vegetation changed the overall shape or forward rate of spread of a fire. He noted, however, that there were some instances where roadside vegetation contributed to the spread, speed or intensity of a fire on 7 February. This usually involved the roadside vegetation burning more intensely than surrounding fuels and a contribution only to lateral, not forward, spread.[281]

Mr Strickland's evidence suggested that in some limited instances roadside vegetation:

- caused a temporary or localised change in fire behaviour by increasing flame height or spotting, which might appear to increase the fire's rate of spread near the roadside. Roadside vegetation might have precipitated, 'a shower of embers across the road, allowing the fire to spread across the road and perhaps even giving the fire a momentary increased rate of spread by virtue of that spotting'[282]
- may have caused the fires to move faster than in surrounding pasture because the roadside vegetation was a heavier fuel load and was in more continuous form than the surrounding vegetation[283]
- caused increased lateral spread of the fire for a period. He also found examples where roadside vegetation retarded fire spread or speed or acted as a wind break. O'Gradys Road in Kilmore East appeared to have acted as a fuel break by providing a wind break. During the Bunyip fire the positioning of a run of oak trees on Labertouche North Road provided a wind break and also acted as a 'water jacket' radiation barrier because of the high moisture content of the oak leaves.[284]

In relation to the suggestion in public submissions that roadside vegetation acted as a 'fuse' or 'wick' along certain roads, Mr Strickland made a number of observations:

- Roadside vegetation itself did not contribute substantially to fire spread where the fire crossed the road.[285]
- Higher intensity fires on some roadsides were due to more fine fuels along the roadsides than in the adjacent pastures (particularly where the pastures were eaten out), resulting in the fire moving in uneven tongues, which may have given the perception of a fuse effect.[286]

- Roadside vegetation contributed to forward fire spread by increasing flame height and spotting but did not contribute to lateral fire spread.[287]
- The presence of trees on the southern side of the road increased spotting distance and assisted the spread of the Coleraine fire on the Glenelg Highway.[288]
- Aspects of the roads other than vegetation contributed to fire spread—for example, the position of a road in a gully system, the presence of a ridge throwing massive firebrands showering down on the road, and spotting from nearby plantation fuels creating a 'surge forwards' like a fireball just before the fire crossed the highway.[289]

Mr Fogarty also considered roads relevant to the fires for which DSE was the control agency. He concluded that roadside vegetation was 'largely inconsequential with fires of the intensity of 7 February'.[290] He agreed in evidence with the opinions expressed by Mr Strickland and confirmed that, although he had found some localised contribution or change in fire behaviour, he had not found any example of roadside vegetation affecting overall fire spread.[291]

Mr Strickland said that had the fire conditions had been less severe the fuel on roadsides would have played a 'greater role'.[292] Mr Fogarty also said that in less severe conditions roadside vegetation 'could' have an impact, although it was unlikely to be 'major' given the localised nature of the impact of such fuels.[293]

7.6.10 FIREWOOD

Public submissions suggested that allowing people to collect more firewood from roadsides could assist in fuel reduction and consequently diminish bushfire risk. The Commission also heard that fallen logs and tree hollows can provide an important native habitat for some species and that roadside vegetation can contain highly significant remnant ecological values and can act as wildlife corridors.[294] It explored the role of firewood during the hearings. Mr Lee Miezis, Director of Forests, Forests and Parks Division, DSE, said DSE's research showed that firewood collected on roadsides tended to be larger than 10 centimetres in diameter. He explained that fire behaviour is primarily determined by the fine fuels that are less than 6 millimetres in size, so removing firewood or 'coarse woody debris' does not significantly affect rate of spread or flame height.[295] This was confirmed by Mr Strickland, who said heavy logs do not usually 'carry' fire. They might impede suppression and mopping up because they tend to smoulder, but they do not contribute to fire behaviour in the same way as fine fuels, which ignite quickly.[296]

All forest produce in Victoria is the property of the Crown. There is no freestanding public entitlement to take firewood from state forests, from other public land or from roadsides.[297] Before the late January and February 2009 fires firewood could be collected from public land and roads managed by DSE only under a domestic firewood permit issued by the Secretary of DSE.[298] In September 2009 the State announced a new firewood policy, relaxing the requirements for members of the public wanting to take firewood from roadsides. The new policy allows people to remove firewood from certain roadsides without a permit during 'firewood collection periods'. The periods are advertised in local papers and occur in the two weeks before prescribed burning takes place. The public must still obtain permits to collect firewood outside the advertised periods.[299]

The Commission considers the introduction of new measures permitting firewood removal from roadsides earmarked for prescribed burning a pragmatic step aimed at promoting efficient public use of firewood fuel, while making a small contribution to reducing fuel loads on roadside vegetation.

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1 Tolhurst T15175:2–T15175:18

2 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [6]–[7]

3 Exhibit 801 – Clarification of Clarke Report (EXP.016.002.0001) at 0001; Exhibit 738 – Williams Report, Part B (EXP.014.001.0021) at 0021

4 Exhibit 746 – Statement of Brown (WIT.3027.001.0070) [16]–[18]; Exhibit 748 – Statement of Leslie (WIT.3004.028.0001) [30], [42], Annexure 4 (WIT.3004.028.0086); Brown T15544:23–T15545:4

5 Mitchell T15648:20–T15649:9

6 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [1], [3], [9]–[12], [16.4], [21]–[24]; Exhibit 761 – Statement of Fogarty (WIT.3024.004.0331) [34], [37]–[43]; Strickland T15773:1–T15774:10

7 Exhibit 754 – Statement of Spence, Attachment 4 (WIT.4014.001.0037) at 0038

8 Exhibit 745 – Statement of Liddle (WIT.3027.001.0001) [21]; Exhibit 154 – General Submission by Local Government in Victoria (SUBM.002.040.0002) at 0090

9 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001). Additional comment supplied by Dr Michael Clarke dated 28 February 2010: Exhibit 801 – Clarification of Clarke Report (EXP.016.002.0001)

10 Exhibit 734 – Cheney Report (EXP.017.001.0001) at 0003

11 Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0002; Dr Tolhurst stated that whilst humans can control fuel, the other sources of energy and their contribution to fire should not be underestimated, for example weather: Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) at 1326

12 Exhibit 1002 – Australian Emergency Management Glossary (TEN.316.001.0001) at 0101

13 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [183]

14 Exhibit 734 – Cheney Report (EXP.017.001.0001) at 0006; Exhibit 721 – Supplementary Statement of Lawlor (WIT.3024.005.0199) at 0207; Cheney T15164:21–T15164:23; Williams T15165:12–T15165:16; Adams T15167:3–T15167:10

15 Exhibit 735 – Clarke Report (EXP.016.001.0002) at 0010

16 Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0029

17 Exhibit 722 – McCaw Report (EXP.026.001.0001) at 0004; Clarke T15169:5–T15169:7

18 Exhibit 720 – A Review of Prescribed Burning Effectiveness in Hazard Reduction (TEN.223.001.0001) at 0008

19 Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0014; Exhibit 735 – Clarke Report (EXP.016.001.0002) at 0006

20 McCarthy and Tolhurst (2001), *Effectiveness of broadscale fuel reduction burning,* cited in Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0006–0007, 0014–0019

21 Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0006–0009

22 Tolhurst T15172:1–T15173:5

23 Sneeuwjagt T14974:25–T14974:30

24 Tolhurst T15172:4–T15173:5; Sneeuwjagt T14974:21–T14975:21; Cheney T15164:28–T15165:1

25 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [90]–[99]

26 Exhibit 725 – Statement of Sneeuwjagt, Attachment 4 (WIT.135.001.0099) at 0107

27 McCaw, Gould and Cheney (2008), *Quantifying the effectiveness of fuel management in modifying wildfire behaviour,* cited in Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [105]

28 Exhibit 716 – Supplementary Statement of Fogarty, Annexure 7 (DSE.0179.1449.0001) at 0004–0005

29 Exhibit 716 – Supplementary Statement of Fogarty, Annexure 7 (DSE.0179.1449.0001) at 0005–0006

30 Exhibit 720 – Long-Term Impacts of Prescribed Burning on Regional Extent and Incidence of Wildfires (TEN.175.001.0002) at 0002, 0010

31 Exhibit 733 – Bradstock Report (EXP.012.001.0001) at 0015–0019, 0031–0032; Bradstock T15187:17–T15187:29

32 Exhibit 736 – Gill Report, Part B: Issues (EXP.015.001.0016) at 0036–0037; Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0023–0024; Exhibit 720 – A Review of Prescribed Burning Effectiveness in Hazard Reduction (TEN.223.001.0001) at 0003

33 Tolhurst T15167:12–T15168:8

34 Exhibit 722 – McCaw Report (EXP.026.001.0001); Exhibit 723 – Bradstock and Price Report (EXP.025.001.0001); Bradstock T14950:11–T14950:17, T14951:24–T14952:6

35 Exhibit 723 – Bradstock and Price Report (EXP.025.001.0001) at 0003–0005; Bradstock T14924:13–T14924:23, T14926:4–T14926:7

36 Exhibit 723 – Bradstock and Price Report (EXP.025.001.0001) at 0017–0018; Bradstock T14945:3–T14945:31

37 Exhibit 723 – Bradstock and Price Report (EXP.025.001.0001) at 0014, 0018; Bradstock T14946:9–T14947:23, T15165:17–T15166:1

38 Exhibit 723 – Bradstock and Price Report (EXP.025.001.0001) at 0018; McCaw T14912:22–T14913:3

39 Exhibit 723 – Bradstock and Price Report (EXP.025.001.0001) at 0015; Bradstock T14939:3–T14939:24, T14940:3–T14940:25

40 Exhibit 723 – Bradstock and Price Report (EXP.025.001.0001) at 0017–0018; Bradstock T14941:19–T14942:18

41 Exhibit 722 – McCaw Report (EXP.026.001.0001) at 0008–0009; McCaw T14887:30–T14889:2, T14885:26–T14886:1, T14910:23–T14911:7

42 Exhibit 740 – Beechworth Hypothetical (EXH.740.0001) at 0001–0011; Tolhurst T15339:4–T15340:15

43 Tolhurst T15341:30–T15342:10

44 Exhibit 723 – Bradstock and Price Report (EXP.025.001.0001) at 0015; Bradstock T14939:2–T14939:24, T14940:3–T14940:25

45 Cheney T15164:21–T15164:24, T15171:24–T15171:31; Williams T15165:12–T15165:16; Adams T15167:3–T15167:10

46 Tolhurst T15162:2–T15162:13

47 Exhibit 733 – Bradstock Report (EXP.012.001.0001) at 0020; Adams T15161:27–T15161:30

48 Cheney T15164:3–T15165:1; Bradstock T15177:22–T15178:11

49 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [7]; Tolhurst T15210:4–T15210:17; Cheney T15211:12–T15211:25

50 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [71]

51 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [16], [28], [30]

52 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [25], [36]–[39], [71]; Sneeuwjagt T14976:13–T14976:18

53 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [50], [86]–[88]

54 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [66]; Sneeuwjagt T14982:5–T14982:13, T14969:29–T14969:31

55 Cheney T15362:22–T15363:3
56 Sneeuwjagt T14971:29–T14972:26, T14974:25–T14974:30, T14989:21–T14990:6
57 Sneeuwjagt T14970:31–T14971:11
58 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [89]
59 Gill T15287:16–T15287:21; Tolhurst T15288:9–T15288:11
60 Bradstock T15350:9–T15350:24
61 Cheney T15348:25–T15349:16
62 Tolhurst T15346:27–T15346:31, T15353:16–T15353:23
63 Adams T15352:1–T15352:10
64 Williams T15352:18–T15352:27
65 Exhibit 738 – Williams Report (EXP.014.001.0001)
66 Exhibit 738 – Williams Report (EXP.014.001.0001) at 0001; Williams T15387:16–T15387:20
67 Williams T15389:3–T15389:19
68 Pyne T18438:4–T18439:8
69 Exhibit 738 – Williams Report (EXP.014.001.0001) at 0006–0007; Williams T15395:12–T15396:11
70 Williams T15403:5–T15403:10
71 Exhibit 738 – Williams Report (EXP.014.001.0001) at 0009; Williams T15391:28–T15392:7
72 Williams T15392:23–T15393:4, T15396:1–T15396:11
73 Williams T15412:28–T15413:3
74 Exhibit 738 – Williams Report (EXP.014.001.0001) at 0012
75 Exhibit 738 – Williams Report (EXP.014.001.0001) at 0013; Williams T15352:11–T15352:13, T15385:23–T15386:3, T15404:9–T15405:23
76 Sneeuwjagt T15018:7–T15018:19; Williams T15416:27–T15417:16
77 Exhibit 698 – Further Statement of Rogers (WIT.132.001.0001) at 0003–0004
78 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [6]; Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) at 0003; Submissions of the State of Victoria – Planned Burning (RESP.3000.006.0060) [29]; Fogarty T14747:8–T14748:2
79 Exhibit 794 – Ecological Burning in Box Ironbark Forests – Literature Review (DSE.HDD.0021.1896) at 1904, 1911
80 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [9]; Exhibit 720 – ENRC Report (TEN.090.001.0001) at 0068
81 Exhibit 720 – Submissions of Forest Fire Victoria (SUBM.002.026.0002_R) at 0008_R
82 Exhibit 795 – Rawson Report (DSE.HDD.0021.0325) at 0328
83 Exhibit 795 – Rawson Report (DSE.HDD.0021.0325) at 0328
84 Exhibit 81 – 1939 Victorian Bushfires Royal Commission Report (TEN.028.001.0001) at 0015
85 Exhibit 720 – 2002–03 Victorian Bushfires Inquiry Report (INF.018.002.0001) [11.71]–[11.72]
86 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [88]
87 Exhibit 720 – Fire Prevention and Preparedness (TEN.216.001.0001) at 0059
88 Exhibit 720 – Fire Prevention and Preparedness (TEN.216.001.0001) at 0059, recognising that a number of forest types for technical and ecological reasons cannot be fuel reduced using prescribed fire
89 Wilson T15073:12–T15074:5
90 Fogarty T14747:19–T14748:2
91 Exhibit 720 – Fire Prevention and Preparedness (TEN.216.001.0001) at 0013
92 Exhibit 720 – ENRC Report (TEN.090.001.0001) at 0125, 0131, 0134, 0137, 0139–0140, 0144
93 Exhibit 720 – ENRC Report (TEN.090.001.0001) at 0131
94 Exhibit 729 – Statement of Wilson (WIT.3024.005.0265) [6]
95 Exhibit 720 – ENRC Report (TEN.090.001.0001) at 0133; Fogarty T14740:23–T14741:9
96 Exhibit 720 – ENRC Report (TEN.090.001.0001) at 0144
97 Exhibit 734 – Cheney Report (EXP.017.001.0001) at 0017; Exhibit 732 – Adams Report (EXP.018.001.0002) [7]
98 Williamson T4428:1–T4428:14
99 Woods T11448:22–T11448:25
100 Exhibit 679 – Statement of Gilmore, Attachment 89 (WIT.3018.001.1559) at 1562, 1565, 1573
101 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) at 0147
102 Exhibit 11 – Statement of Esplin, Attachment 12 (WIT.005.001.1393) at 1396, 1447
103 Exhibit 734 – Cheney Report (EXP.017.001.0001) at 0013; Exhibit 732 – Adams Report (EXP.018.001.0002) at 0005–0006
104 Exhibit 721 – Supplementary Statement of Lawlor (WIT.3024.005.0199) [21]–[24]

105 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [34]

106 Exhibit 721 – Supplementary Statement of Lawlor (WIT.3024.005.0199) [14]–[16], [39], [48]; Exhibit 719 – Supplementary Statement of Tainsh (WIT.3024.005.0182) [11]–[12]; Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [89]; Lawlor T14857:28–T14858:4

107 Exhibit 720 – 2002–03 Victorian Bushfires Inquiry Report (INF.018.002.0001) at 0020

108 Exhibit 720 – Fire Management Manual 10.1 – Prescribed Burning (DSE.HDD.0021.0340) at 0368–0386, 0418–0420, 0434–0438; Exhibit 719 – Supplementary Statement of Tainsh (WIT.3024.005.0182) [35], [42]–[49]

109 Exhibit 720 – Fire Management Manual 10.1 – Prescribed Burning (DSE.HDD.0021.0340) at 0450; Exhibit 721 – Supplementary Statement of Lawlor (WIT.3024.005.0199) [43]

110 Exhibit 721 – Supplementary Statement of Lawlor (WIT.3024.005.0199) [54]

111 Exhibit 730 – Statement of Harris, Annexure 2 (WIT.006.001.0012) at 0016; Exhibit 716 – Supplementary Statement of Fogarty, Annexure 1 (DSE.HDD.0082.0955) at 0958

112 Exhibit 716 – Supplementary Statement of Fogarty, Annexure 4 (WIT.002.001.0137)

113 Exhibit 730 – Statement of Harris (WIT.006.001.0001) [12]–[13]

114 Exhibit 716 – Supplementary Statement of Fogarty, Annexure 4 (WIT.002.001.0137) at 0140, 0147; Exhibit 730 – Statement of Harris, Annexure 2 (WIT.006.001.0012) at 0016

115 Exhibit 730 – Statement of Harris, Annexure 2 (WIT.006.001.0012) at 0016

116 Exhibit 730 – Statement of Harris, Annexure 2 (WIT.006.001.0012) at 0016

117 Wilson T15074:6–T15074:18

118 Wilson T15075:19–T15076:16

119 Wilson T15081:7–T15081:9

120 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [17]

121 Fogarty T14747:8–T14748:2

122 Exhibit 716 – Supplementary Statement of Fogarty, Annexure 1 (DSE.HDD.0082.0955) at 0958

123 Exhibit 729 – Statement of Wilson (WIT.3024.005.0265) [8]; Wilson T15068:20–T15069:2

124 Fogarty T14740:19–T14740:22

125 Fogarty T14748:17–T14748:26

126 Submissions of the State of Victoria – Planned Burning (RESP.3000.006.0060) [29]

127 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [11], [13]–[14]; Bradstock T15195:18–T15195:24, T15217:19–T15217:27

128 Exhibit 801 – Clarification of Clarke Report (EXP.016.002.0001); Tolhurst T15249:6–T15249:18

129 Tolhurst T15246:21–T15247:3; Adams T15250:19–T15251:7

130 Cheney T15250:8–T15250:16

131 Bradstock T15249:23–T15249:27

132 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [10]

133 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [12]

134 Exhibit 742 – Statement of Marty (WIT.7537.001.0001) [129(b)]

135 Marty T15465:12–T15465:15

136 Exhibit 742 – Statement of Marty (WIT.7537.001.0001) [129]

137 Mr Hodgson's very extensive experience in the fields of forestry and fire management is set out at Hodgson T15040:23–T15044:15. His previous roles include Chief of the Division of Forest Management with the Forests Commission, 1977 to 1983; Commissioner of Forests, 1983 to 1984, and Chief Fire Officer with what became the Department of Conservation Forests and Lands between 1984 and 1987. He is a member of Forest Fire Victoria Inc., a group that describes itself as comprising 'like-minded and concerned practitioners and scientists'. The members of Forest Fire Inc. include other former fire officers, board members, scientists, forest ecologists, authors in the field and persons involved in the forestry industry, among them Ron Incoll, Phil Cheney, David Packham, Bob Graham, Peter Attiwill, Bill Middleton, Tony Manderson, Kevin Wareling and Brian Gibson: Exhibit 720 – Submissions of Forest Fire Victoria (SUBM.002.026.0002_R) at 0002_R–0003_R

138 Exhibit 720 – Forest Fire Victoria Inc Policy on Increased Fuel Reduction Burning and Ecological Burns (TEN.185.001.0001)

139 Exhibit 720 – Forest Fire Victoria Inc Policy on Increased Fuel Reduction Burning and Ecological Burns (TEN.185.001.0001)

140 Exhibit 727 – Statement of Melhem (WIT.7535.001.0001) [11], [14]

141 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [20]; Adams T15199:16–T15199:24; Tolhurst T15200:6–T15200:11

142 Exhibit 733 – Bradstock Report (EXP.012.001.0001) at 0019

143 Wilson T15125:1–T15125:23

144 Exhibit 720 – DSE Code of Practice for Fire Management on Public Land (DSE.HDD.0012.1267) [231], [543]

145 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [49]

146 Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0029; Exhibit 735 – Clarke Report (EXP.016.001.0002) at 0010, 0018

147 Exhibit 720 – Fire Ecology Program Strategic Directions 2009–2011 (DSE.USB9.0050.0163) at 0164

148 Exhibit 720 – Fire Ecology Program Strategic Directions 2009–2011 (DSE.USB9.0050.0163) at 0165

149 Exhibit 720 – Fire Ecology Program Strategic Directions 2009–2011 (DSE.USB9.0050.0163) at 0166–0169

150 Wilson T15139:8–T15139:12

151 Bradstock T15368:14–T15368:26

152 Exhibit 719 – Supplementary Statement of Tainsh (WIT.3024.005.0182) [8]

153 Exhibit 735 – Clarke Report (EXP.016.001.0002) at 0017, 0019

154 Exhibit 735 – Clarke Report (EXP.016.001.0002) at 0018; Clarke T15364:1–T15364:16

155 Exhibit 720 – Securing Our Natural Future (DSE.HDD.0137.0081) at 0100–0104

156 Exhibit 733 – Bradstock Report (EXP.012.001.0001) at 0027; Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [29], [32]–[33]

157 Ingamells T15451:6–T15451:10

158 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) at 0001, 0004

159 *Flora and Fauna Guarantee Act 1988*, ss. 3(1), 7(1), 10(2)

160 Clarke T15371:29–T15373:6; Victorian Government Gazette, No. S247, Friday 26 November 2004

161 *Flora and Fauna Guarantee Act 1988*, ss. 17, 19

162 Exhibit 720 – Administration of the Flora and Fauna Guarantee Act 1988*,* Victorian Auditor General's Report April 2009 (TEN.222.001.0001) at 0010, 0014, 0039

163 Exhibit 720 – Administration of the Flora and Fauna Guarantee Act 1988, Victorian Auditor General's Report April 2009 (TEN.222.001.0001) at 0012

164 Exhibit 720 – Administration of the Flora and Fauna Guarantee Act 1988, Victorian Auditor General's Report April 2009 (TEN.222.001.0001) at 0014–0016; Exhibit 720 – Securing Our Natural Future (DSE.HDD.0137.0081) at 0139

165 Clarke T15329:20–T15329:30; Adams T15330:2–T15330:18

166 Exhibit 720 – Administration of the Flora and Fauna Guarantee Act 1988, Victorian Auditor General's Report April 2009 (TEN.222.001.0001) at 0015

167 Wilson T15146:23–T15147:10

168 Wilson T15146:11–T15147:12

169 Exhibit 800 – Statement of Burnett (WIT.6007.001.0001) [11]

170 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) at 1275–1277

171 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) at 1289

172 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) at 1275

173 The reference by the Panel to the 'governing code' is a reference to the Code of Practice for Fire Management on Public Land February 2006: Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267); Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [1]

174 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [1]; Cheney T15269:1–T15269:24; Bradstock T15269:27–T15270:8; Gill T15223:19–T15223:20

175 Exhibit 740 – Choice in Land Management – Managing Fire for Multiple Purposes (EXH.740.0012) at 0013–0019

176 Tolhurst T15326:2–T15326:22

177 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [73]

178 Tolhurst T15359:1–T15359:9; Cheney T15324:4–T15324:13, T15324:29–T15325:1

179 Williams T15220:7–T15220:18, T15223:2–T15223:16

180 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [147]–[153]

181 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [156]

182 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [162]–[164]

183 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [167]–[169]

184 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [173]–[174]

185 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [89]; Fogarty T14762:20–T14763:10

186 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) [90]

187 Exhibit 735 – Clarke Report (EXP.016.001.0002) at 0011

188 Exhibit 716 – Marysville (EXH.716.0002); Exhibit 716 – Flowerdale (EXH.716.0003); Exhibit 716 – Humevale & Kinglake West (EXH.716.0004); Exhibit 716 – Strathewen & Kinglake (EXH.716.0005); Exhibit 716 – St Andrews (EXH.716.0006); Exhibit 716 – Callignee (EXH.716.0007); Exhibit 716 – Mudgegonga (EXH.716.0008); Fogarty T14823:24–T14824:31

189 Fogarty T14837:17–T14838:4

190 Fogarty T14825:3–T14825:21; Nichols T17761:5–T17761:7

191 Fogarty T15861:5–T15861:27

192 Exhibit 678 – Marysville Pre Fire Aerial Photograph (EXH.678.0005); Fogarty T14753:31–T14754:14, T14757:6–T14757:17, T14838:31–T14839:14, T15819:1–T15819:8; Parsons T14290:12–T14290:28

193 Tolhurst T15266:1–T15266:12

194 Tolhurst T15267:11–T15267:23; Clarke T15285:1–T15285:23

195 Adams T15272:29–T15273:13

196 Tolhurst T15283:20–T15284:31

197 Clarke T15285:1–T15285:12

198 Exhibit 733 – Bradstock Report (EXP.012.001.0001) at 0037

199 Cheney T15171:24–T15171:31

200 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [16]

201 Dr Tolhurst also said in his report that strategic landscape firebreaks in eucalypt forest need to be 3 to 5km wide if they are to collect the majority of spot fires potentially occurring on hot windy days: Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0039; Tolhurst T15191:25–T15192:1

202 Bradstock T15188:23–T15188:31

203 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [68]; Sneeuwjagt T14998:15–T14998:19

204 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [17]. It is noted that this applies in relation to burning undertaken for the purpose of reducing fuel—as Dr Clarke noted that in circumstances where burning is conducted for other purposes (for example, in the Ecological Management Zone) then one might employ rates of treatment of 30–50 per cent to ensure survival of relevant species: Clarke T15270:24–T15271:7

205 Tolhurst T15192:3–T15192:16

206 Clarke T15271:10–T15271:22

207 Exhibit 720 – Overall Fuel Hazard Guide – Third Edition – Fire Management – Research Report No: 47 (DSE.0106.1220.0001) at 0004

208 Exhibit 739 – Fuel Management Topic – Facilitated Expert Conference, Expert Panel Summary (TEN.227.001.0001) [18]

209 Tolhurst T15280:23–T15281:4

210 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) [67]; Sneeuwjagt T14974:3–T14974:14, T14974:25–T14975:21

211 Cheney T15268:20–T15268:26

212 Tolhurst T15173:2–T15173:5

213 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [90]–[93], [104], [108]

214 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [141]; Exhibit 719 – Supplementary Statement of Tainsh (WIT.3024.005.0182) [19], [27]

215 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [141]–[143]

216 Exhibit 720 – DSE Code of Practice For Fire Management on Public Land (DSE.HDD.0012.1267) [145]

217 Exhibit 721 – Supplementary Statement of Lawlor (WIT.3024.005.0199) [18]

218 Exhibit 721 – Supplementary Statement of Lawlor (WIT.3024.005.0199) [19], [28]–[30]

219 Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0037

220 Sneeuwjagt T15004:13–T15004:27

221 Exhibit 761 – Statement of Fogarty (WIT.3024.004.0331) at 0337

222 Exhibit 761 – Statement of Fogarty, Attachment 4 (DSE.HDD.0052.1751) at 1754, 1756, 1762; Fogarty T15849:13–T15849:31

223 Exhibit 761 – Statement of Fogarty, Attachment 4 (DSE.HDD.0052.1751) at 1754–1756, 1762–1764, 1776

224 Exhibit 761 – Statement of Fogarty, Attachment 4 (DSE.HDD.0052.1751) at 1754

225 Dripps T15586:21–T15586:27

226 Exhibit 678 – Clause 52.17 – Native Vegetation (TEN.111.001.0041) at 0045

227 Council Panel: Mr Grant Jack, Manager Asset Maintenance and Services of Yarra Ranges Shire; Mr Paul Buckley, Chief Executive Officer of Latrobe City Council; and Mr Jack Green, General Manager Sustainable Planning and Development of Colac Otway Shire; Council Panel T15729:10–T15730:21

228 Brown T15535:7–T15535:31

229 Exhibit 724 – Statement of Maino (WIT.138.001.0001_R) [4], [7]; Maino T14955:5–T14965:11

230 Dripps T15587:7–T15587:30; Fogarty T15851:22–T15852:14

231 Exhibit 733 – Bradstock Report (EXP.012.001.0001) at 0029; Exhibit 734 – Cheney Report (EXP.017.001.0001) at 0013; Exhibit 737 – Tolhurst Report (EXP.013.001.0001) at 0034–0036; Exhibit 989 – Submission of Victorian Association of Forest Industries (SUBM.002.028.0179_R) at 0197_R, 0202_R

232 Exhibit 761 – Statement of Fogarty, Attachment 4 (DSE.HDD.0052.1751) at 1755

233 Exhibit 989 – Strategic Fuelbreaks – Protecting Melbourne's Precious Water Supply (TEN.303.001.0001); Exhibit 800 – Statement of Burnett (WIT.6007.001.0001) at 0004, 0009; Dripps T15624:29–T15625:4; Fogarty T15853:11–T15853:31

234 Exhibit 931 – Statement of Armytage, Attachment 13 (WIT.3003.002.0177) at 0180–0181

235 Exhibit 749 – Supplementary Statement of Dripps, Attachment 8 (DSE.HDD.0142.0037); Dripps T15588:22–T15589:28

236 Exhibit 749 – Supplementary Statement of Dripps (WIT.3024.005.0287) [8]; Dripps T15593:1–T15593:5; Spence T15685:12–T15685:29, T15686:1–T15686:15

237 Exhibit 761 – Statement of Fogarty (WIT.3024.004.0331) [34], [37]–[43]; Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [27.3], [27.14], [27.16]

238 Fogarty T15843:6–T15843:21

239 Exhibit 745 – Statement of Liddle (WIT.3027.001.0001) [21], [24]–[28]; Exhibit 746 – Statement of Brown (WIT.3027.001.0070) [10]; Exhibit 754 – Statement of Spence (WIT.4014.001.0001) [15]–[16]

240 Exhibit 748 – Statement of Leslie (WIT.3004.028.0001) [14], [17]; *Country Fire Authority Act 1958,* s. 33

241 Exhibit 746 – Statement of Brown (WIT.3027.001.0070) [21]; Exhibit 754 – Statement of Spence (WIT.4014.001.0001) [17]–[26]

242 Mitchell T15648:20–T15649:9

243 Exhibit 753 – Statement of Miezis, Annexure 6 (DSE.HDD.0052.1169) at 1183; Miezis T15665:8–T15665:27; Mitchell T15650:8–T15650:28

244 Dripps T15621:27–T15622:12, T15598:3–T15599:5

245 Exhibit 800 – Statement of Burnett (WIT.6007.001.0001) [37]–[39]

246 Exhibit 720 – Securing Our Natural Future (DSE.HDD.0137.0081) at 0139

247 Exhibit 749 – Supplementary Statement of Dripps (WIT.3024.005.0124) [6]–[7]; Exhibit 685 – Statement of Dripps, Annexure 6 (DSE.HDD.0081.0095) at 0095

248 Dripps T15584:26–T15584:31

249 Dripps T15585:7–T15585:17

250 Exhibit 749 – Supplementary Statement of Dripps (WIT.3024.005.0124) [15]–[21], Annexure 3 (DSE.HDD.0052.1862) at 1864; Exhibit 685 – Statement of Dripps, Annexure 6 (DSE.HDD.0081.0095) at 0101; Dripps T15593:13–T15593:28; Spence T15696:3–T15696:12

251 Spence T15697:10–T15697:14

252 Exhibit 154 – General Submission by Local Government in Victoria (SUBM.002.040.0002) at 0090

253 Green T15717:4–T15717:19; Buckley T15717:27–T15718:2

254 Exhibit 754 – Statement of Spence, Attachment 2 (WIT.4014.001.0013), Attachment 3 (WIT.4014.001.0029); Exhibit 754 – Response to VBRC Request for Supplementary Information – Roadside Clearing (CORR.1002.0001); Exhibit 754 – Table Summarising Council Responses to Matters Raised in Witness Statement of Ms Dripps (CORR.1002.0004)

255 Exhibit 754 – Statement of Spence (WIT.4014.001.0001) [25], Attachment 2 (WIT.4014.001.0013), Attachment 3 (WIT.4014.001.0029)

256 Spence T15677:26–T15678:1, T15679:7–T15679:17

257 Buckley T15749:30–T15750:4; Jack T15750:24–T15750:31

258 Green T15749:19–T15749:25

259 Jack T15750:31–T15751:4

260 Exhibit 745 – Statement of Liddle (WIT.3027.001.0001) [16]; Exhibit 746 – Statement of Brown, Annexure 2 (WIT.3027.001.0085); Mr Brown explained in evidence that references in the 1985 Code to the Road Construction Authority (RCA) are to be read as references to VicRoads: Brown T15544:7–T15544:20

261 Exhibit 746 – Statement of Brown, Annexure 2 (WIT.3027.001.0085) at 0086

262 Brown T15546:10–T15546:25

263 Exhibit 746 – Statement of Brown (WIT.3027.001.0070) [12]

264 Exhibit 746 – Statement of Brown (WIT.3027.001.0070) [13]

265 Exhibit 746 – Statement of Brown (WIT.3027.001.0070) [16]–[18], [21]; Exhibit 746 – Supplementary Statement of Brown, Annexure 10 (WIT.3027.002.0002) at 0032; Brown T15544:23–T15545:4, T15559:1–T15559:13

266 Brown T15538:13–T15538:18

267 Exhibit 747 – Letter to the Regional Director of VicRoads from Keiran Klemm (SUBM.002.035.0347_R) at 0347_R; Brown T15542:22–T15543:3, T15547:26–T15549:7

268 Exhibit 748 – Statement of Leslie (WIT.3004.028.0001) [8]; Leslie T15565:1–T15565:13, T15565:22–T15566:7, T15579:24–T15579:31

269 Exhibit 748 – Statement of Leslie, Annexure 1 (WIT.3004.028.0029) at 0039

270 Exhibit 748 – Statement of Leslie (WIT.3004.028.0001) [23]–[26], [46]–[47]

271 Exhibit 748 – Statement of Leslie (WIT.3004.028.0001) [71]

272 Exhibit 748 – Statement of Leslie (WIT.3004.028.0001) [70]

273 Leslie T15575:10–T15575:30

274 Exhibit 750 – Statement of Petreis (WIT.142.001.0001_R) [16]–[19]; Petreis T15631:22–T15633:3. Further examples of difficulties with road access, include Ms Hainsworth (in relation to the impassable section of Pine Ridge Road): Exhibit 134 – Statement of Hainsworth (WIT.059.001.0001_R); Dr Fraser (in relation to tree coming down on corner of Lyell and Sedgwick streets, trapping driver): Exhibit 95 – Statement of Fraser (WIT.048.001.0001_R) [19]; Mr Kennedy (fallen trees along Maroondah Highway): Kennedy T8550:7–T8550:13; Mr David Brown (CFA forced to drive through private property to reach residents in Strathewen when road became blocked): Exhibit 48 – Statement of Brown (WIT.029.001.0001_R) [13]; Ms Barrow (CFA forced to clear trees with chainsaw): Exhibit 533 – Statement of Barrow (WIT.121.001.0001_R) [75]–[76]; Mr Wood (CFA led convoy of residents from Callignee oval to Traralgon South blocked by fallen trees): Exhibit 426 – Statement of Wood (WIT.3004.017.0268); Exhibit 883 – Interactive Presentation – INTMEN 001831 (EXH.883.0001); Exhibit 764 – Interactive Presentation INTMEN 001785 and INTMEN 001979 (EXH.764.0001)

275 Strickland T15802:18–T15802:20; Hollowood T12543:29–T12543:31

276 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [51]–[56], Annexure 3 (WIT.3004.034.0073) at 0082–0090

277 Exhibit 754 – Statement of Spence, Attachment 4 (WIT.4014.001.0037) at 0038; Spence T15688:2–T15691:14

278 Exhibit 754 – Statement of Spence, Attachment 4 (WIT.4014.001.0037) at 0038; Spence T15687:11–T15689:14; Dripps T15605:22–T15606:6

279 Strickland T15801:7–T15801:27; Fogarty T15843:6–T15843:21

280 Strickland T15777:30–T15778:14

281 Mr Strickland is also a Senior Wildfire Instructor, level 3 Planning Officer and near-miss incident investigator who, before joining the CFA, worked with Parks Victoria and DSE, and at Holmesglen TAFE, delivering courses on wildfire behaviour and wildfire suppression. Following the 7 February fires Mr Strickland was seconded to the Bushfire CRC to conduct fire spread mapping in relation to three of the fires that burned on 7 February: Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [1], [3], [9]–[12], [16.4], [21]–[24], [26.1]–[26.7], [31], [32.1]–[32.12], [64.1]–[64.3], Annexure 3 (WIT.3004.034.0073) at 0075–0077; Strickland T15773:1–T15774:10, T15775:10–T15776:1, T15784:14–T15784:26, T15792:23–T15793:1, T15794:3–T15795:1, T15796:5–T15796:9

282 Strickland T15784:15–T15784:26

283 Strickland T15784:31–T15785:13

284 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [35.1]–[35.7], Annexure 3 (WIT.3004.034.0073) at 0080–0081, Annexure 9 (WIT.3004.034.0127) at 0127; Strickland T15785:14–T15785:24, T15799:4–T15799:27

285 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [37.2]–[37.7]

286 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [37.9]–[37.12]

287 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [41.9]–[41.11], Annexure 14 (WIT.3004.034.0137)

288 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [47.1]–[47.4], Annexure 3 (WIT.3004.034.0073) at 0113, Annexure 18 (WIT.3004.034.0146)

289 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) [37.2]–[37.7], [37.13]–[37.20], Annexure 3 (WIT.3004.034.0073) at 0094, Annexure 10 (WIT.3004.034.0129)

290 Exhibit 761 – Statement of Fogarty (WIT.3024.004.0331) [34]

291 Fogarty T15842:7–T15842:10

292 Strickland T15801:16–T15801:27

293 Fogarty T15843:6–T15843:21

294 Exhibit 753 – Statement of Miezis, Annexure 6 (DSE.HDD.0052.1169) at 1180

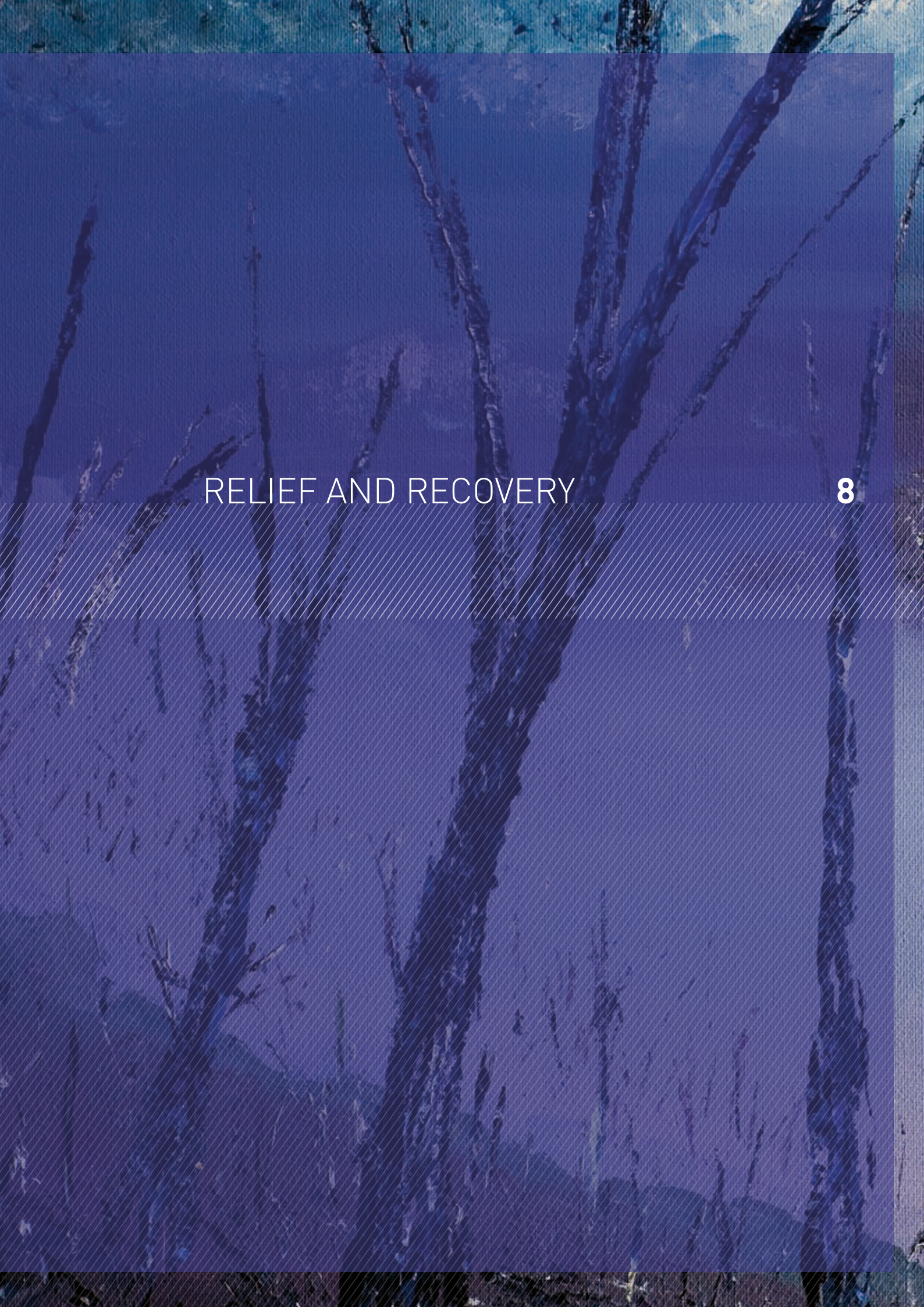
295 Miezis T15664:25–T15665:7

296 Strickland T15800:10–T15800:17

297 Exhibit 753 – Statement of Miezis (WIT.3024.004.0315) [9], [13]–[14]; Miezis T15662:14–T15662:28

298 *Forests Act 1958*, s. 52

299 Exhibit 753 – Statement of Miezis, Annexure 5 (DSE.HDD.0052.1576) at 1576–1577; Miezis T15667:12–T15667:25, T15668:8–T15668:30



RELIEF AND RECOVERY 8

8 RELIEF AND RECOVERY

The destruction caused by the bushfires in January and February 2009 has resulted in one of the largest recovery efforts seen in Australia. All tiers of government, in combination with many other agencies, community organisations, individuals and the affected communities, have been engaged in the relief and recovery efforts in Victoria. In the early stages action was needed to provide relief and initial recovery from disaster. Longer term, as needs change, different responses have been required to effect recovery.

The Victorian Bushfire Reconstruction and Recovery Authority was established on 10 February 2009, in the week before the Commission came into being. The role of VBRRA is to oversee and coordinate recovery and reconstruction after the bushfires. It reports on progress to government and communities.[1] The Commission is able to make observations about early relief and recovery efforts on the basis of people's individual experiences and the information that came before it. Overall, these efforts were effectively coordinated by government and community agencies with recovery roles. Agency activities were supported by the spontaneous contributions of businesses, community groups and private individuals. In some situations their support extended for weeks and months, meaning other commitments were put aside.

At first, people from local communities, and then the wider community, responded extremely generously to the obvious needs of people rendered homeless and dislocated by the fires. Food, clothing and bedding flooded into relief centres, and a great debt of gratitude is owed for this generosity.

Government and other agencies engage in considerable pre-planning for emergency management and recovery. This planning is mostly invisible to the community but is essential during and after an emergency. The Commission saw evidence about the links and planning considerations that occur between the different tiers of government. That evidence confirmed that there was a rapid response by state and Commonwealth governments, and relief initiatives were generally prompt and well coordinated: the Australian Government Disaster Response Plan, or COMDISPLAN, was activated by early 8 February and VBRRA was established on 10 February.[2] The Victorian Minister for Police and Emergency Services, the Hon. Bob Cameron MP had an operational role for recovery and he coordinated this quickly at Cabinet level, as the community would expect.[3]

The establishment of relief centres specified in local government emergency management plans generally worked well. The centres were activated quickly in most cases. They provided assembly points and places of refuge for people displaced by the fires and assisted greatly in laying a foundation for the progressive build-up of relief and recovery services. The Commission heard from many people affected by the bushfires expressions of gratitude for the care and attention they received at relief centres.

The chaos caused by the disaster inevitably meant that unexpected situations occurred and some plans failed. Relief and recovery form a complex process that is made more difficult when the emergency is rapidly escalating and occurring at multiple locations. Continuing fires, inaccessible roads and loss of power and telecommunications hindered the relief efforts and interfered with communication and mobility. As discussed later in this chapter, the following are areas where improvements are needed:

- *The registration process in relief centres.* This was frustrating for many because recovery agencies began separately collecting personal information from bushfire-affected people, adding to their trauma and retarding the agencies' ability to respond. It took some time for central collection of information to become fully effective.
- *Medical services.* These were not always available, and there appeared to be poor coordination of some first aid services.
- *Post-fire welfare checks.* Problems occurred with coordination of the checking process for small communities and for individuals who remained on their properties.
- *Roadblocks.* These were a source of frustration and difficulty for local residents, Victoria Police, the Department of Primary Industries, the Country Fire Authority volunteers and others coordinating relief efforts.
- *Inadequate insurance.* Lack of insurance and under-insurance impeded the rebuilding process.
- *Fencing bordering public land.* The requirement that private landowners bear the full cost of restoring damaged fencing between their property and public land was a source of concern for many.
- *Animal welfare.* Coordination of animal relief after bushfire is fragmented.

Since Black Saturday government agencies have initiated changes to improve many of these processes. The Commission notes those areas where further action by government agencies would effect improvements in relief and recovery.

Medium- and long-term recovery and reconstruction is still under way, facilitated by VBRRA. Recovery for people, communities, local economies and the environment is difficult, and a long-term approach is needed. The Commission considers it too soon for it to comment in detail on medium- to long-term recovery and reconstruction, although it recognises the importance of formal review to support learning from experience.

Box 8.1 Definitions

'Relief' means providing assistance to individuals or groups in danger or easing their distress. In times of emergency relief is needed first; the focus shifts later to recovery. The transition from relief to recovery is not always easily defined.

'Recovery' is the broadly coordinated process that supports disaster-affected communities reconstructing physical infrastructure, restoring people's emotional, social, economic and physical wellbeing, and restoring the environment. Recovery for people entails returning to normalcy and daily life, even though things are not necessarily the way they were. In some situations it is desirable and possible to replace what was there before; in others there might be an opportunity to improve community infrastructure and safety. Recovery is an individual experience, but it can be protracted both for people and for communities.

Image 8.1

Source: Courtesy of the *Herald & Weekly Times*.

8.1 PLANNING

Emergency management planning is the responsibility of all levels of government (Commonwealth, state and local) and entails involvement with many community agencies. Table 8.1 summarises the roles of each level of government in the relief and recovery process.

Table 8.1 Government roles in relief and recovery

Agency	Recovery response and roles	Details
Commonwealth Government	Australian Emergency Management Arrangements	Overview of federal, state, territory and local governments' collective response for emergency management, which includes recovery.
	Disaster Response Plan (COMDISPLAN)	Describes the coordination arrangements for Commonwealth physical assistance to states and territories in the event of disaster.
Victorian Government	*Emergency Management Act 1986*	The purpose of the Act is to provide for the organisation of emergency management in Victoria. This includes planning, preparedness, operational coordination and community participation in recovery. According to the Act the Coordinator in Chief must arrange for preparation and review of the state emergency recovery plan, after consultation with the Victoria Emergency Management Council.
	Emergency Management Manual Victoria	Developed in accordance with the Emergency Management Act. The manual recognises that recovery is a whole-of-government and whole-of-community process. It specifies and includes roles for government and non-government agencies. The Department of Human Services is the nominated agency for recovery in the manual. Recovery begins at the municipal level and escalates to the regional or state level, depending on the scale of the emergency. There are four functional areas of recovery in the manual: social, health and community environment ■ economic environment ■ natural environment ■ built environment. Examples of recovery activities are information services, financial assistance, temporary accommodation, material aid, food, rebuilding, utility restoration, personal support services and community development.
Department of Human Services (head office)	State Recovery Coordinator	The DHS Executive Director, Operations, is appointed State Recovery Coordinator and chairs the State Emergency Recovery Planning Committee.
	State Emergency Recovery Planning Committee	The State Emergency Recovery Planning Committee develops and maintains the State Emergency Recovery Arrangements. These arrangements: ■ describe ways recovery services are delivered to affected people and communities ■ present the roles and responsibilities of agencies contributing to recovery ■ identify the agencies responsible for coordination of specific recovery activities.
	DHS Emergency Coordination Centre	The ECC operates during an emergency in combination with DHS regional operations centres where required. The ECC has a role in overseeing and identifying priority issues and locations. It establishes networks and contacts with other organisations and services to coordinate activities and resources for recovery.

Agency	Recovery response and roles	Details
DHS Regional	Regional Emergency Recovery Planning Committee Regional Emergency Recovery Plan	The *Emergency Management Manual Victoria* states that this committee plans for establishing community recovery committees and reviews and comments on the Municipal Emergency Management Plan as part of a statutory audit program.
Municipal council	Municipal Emergency Management Planning Committee	The committee must develop the Municipal Emergency Management Plan according to the guidelines in the *Emergency Management Manual Victoria.*
	Municipal Emergency Management Plan	The MEMP covers activities and agencies that are allocated a role in recovery. It identifies government and non-government service agencies and activities. It describes the purpose and primary and secondary locations of the Municipal Emergency Coordination Centre. The MEMP includes information about potential relief centre locations and coordination of emergency relief.
	Councils appoint: ■ Municipal Emergency Resource Officer ■ Municipal Recovery Manager	According to the Act the MERO is responsible for ensuring the coordination of council resources used in emergency recovery. The *Emergency Management Manual Victoria* directs that a separate role, the MRM, is also appointed. The MRM coordinates municipal and community resources for recovery.
	The Municipal Emergency Response Coordinator	Victoria Police has responsibility under the Emergency Management Act for emergency response coordination at municipal, regional and state levels for most emergencies. The MECC is activated at the request of the MERC, who is a member of Victoria Police. In terms of relief and recovery the MERC ensures the MERO is advised of the emergency and other relevant information, attends the MECC if it is activated, and advises the Regional Emergency Response Coordinator if the emergency potentially needs extra resources from outside the municipality.
	Municipal Emergency Coordination Centre	The MECC is the location of municipal support and not a control centre for emergency response. The MECC can become the operations centre for recovery, with handover from the MERC to the MRM.
	Emergency relief centre	The council establishes and manages relief centres away from the emergency. The relief centre provides shelter, first aid treatment, catering, and information for the community. Victoria State Emergency Service assumes relief centre coordination if the emergency outstrips council resources.

Source: Exhibit 831 – *Emergency Management Manual Victoria; Emergency Management Act 1986.*[4]

8.2 PREPARATION FOR RELIEF AND RECOVERY

Some relief and recovery operations were already in place before 7 February 2009. The Delburn fires had been active since 30 January, and people were attending the emergency relief centres at Mirboo North and Churchill. Registration with the Red Cross and personal support teams were available.[5]

The Victoria Emergency Management Council advises the Coordinator in Chief (Minister Cameron) about coordination of emergency response and recovery. It met on 5 February in response to the heatwave and the forecast weather conditions. The Minister sought and received assurance that all agencies were prepared for 7 February.[6]

The Department of Human Services helped prepare for the predicted extreme weather. Mr Craig Lapsley, the State Recovery Manager, stated that the emergency coordination centre was operating and working with the integrated Emergency Coordination Centre (now the State Control Centre) on 7 February to coordinate recovery activities.[7]

In addition, before 7 February other relevant authorities, agencies and individuals prepared for emergency relief operations on the basis of the weather conditions of the preceding days and the forecast warnings. The municipal emergency response coordinators and municipal emergency resource officers were asked to prepare for bushfire emergency by the Chief Commissioner of Police and the Municipal Association of Victoria.[8] A number of MERCs and MEROs provided the Commission with evidence on preparation before the bushfires. Their preparation was predominantly disposed towards response, as would be expected for their roles, and to a lesser extent relief.[9] Outside government, the Red Cross activated the State Emergency Operations Centre, where state operational relief activities are managed.[10]

8.3 DURING AND AFTER THE FIRES

Personnel at the incident control centres liaised with personnel in the municipal emergency coordination centres to provide information relevant to emergency relief. Personnel at an ICC are in the best position to advise about the locations of fires, traffic management and safety concerns of importance to the community. Where the ICCs were operating well the communications were effective—for example, the Bunyip and Horsham fires. There were, however, situations where poor communication between personnel in the ICC and the MECC created difficulties for the MECC and police in terms of resource management and community information—for example, the Kilmore East and Beechworth–Mudgegonga fires.

During the passage of the fires and in their immediate aftermath emergency response agencies provided relief where possible as individuals sought shelter, first aid and information. People who had evacuated or fled the fires collected in public places such as the oval at Gallipoli Park in Marysville, the main street of Kinglake, Country Fire Authority sheds, a range of pubs and hotels, in large open spaces such as the car park and the racecourse in Yarra Glen, and council-operated relief centres.[11]

During an emergency many factors can present difficulties for relief activities, and some of these were experienced on 7 February. Provision of relief was hampered by the failure of essential services such as power, water and communications, and there were continuing risks from the fires; for example, road safety was a problem because of falling trees, burning vegetation and vehicle crashes, all of which had to be navigated.[12] Mr David Brown from Strathewen reported that CFA rescue was hindered when the CFA was unable to gain access to roads because of burning trees falling across them.[13] A lay witness reported seeing ambulances queued in Kinglake at the bottom of the mountain, waiting for a tree to be removed by a front-end loader.[14]

Emergencies are dynamic: as situations unfold and change and new information becomes available decisions might need review. When Healesville came under ember attack the MERC decided, with the municipal recovery manager, to establish a relief centre at Coldstream to provide a safe place for people self-evacuating. Shortly after this the MERC was advised that about 200 local residents were at the Don Road Reserve in Healesville. It would have been difficult for them to get to the relief centre because there were roadblocks. There were no people at the Coldstream relief centre so the MERC transferred the relief centre to a more accessible shire building in Healesville.[15]

8.3.1 FIRST AID

While responding to the fires emergency services agencies tried to provide medical relief and assistance where possible. Police vehicles transported people to hospitals.[16] Community first aid teams tried to respond despite the fires. The CFA provided initial relief, as did individuals with first aid skills. The Commission commends the efforts of the teams and individuals who provided first aid to those hurt as a consequence of the fires. The following brief examples are indicative of people's efforts and some of the challenges they faced. Anecdotally, a number of witnesses indicated the community could not rely on ambulance support.

In areas where the fires caused death and destruction 'local CFA personnel were faced with the huge task of providing initial recovery services as they were the only personnel capable of entering burnt areas'.[17] Mr Geoffrey Mortimer of St Andrews said five people sheltered in his house during the passage of the fires. Eventually the house was destroyed. Friends contacted the police on the Saturday, alerting them to the group's survival and saying some elderly members needed rescue and medication. Late on the Sunday afternoon the CFA went to the property, as part of checking houses and looking for people, and took the group out on the back of utilities.[18]

The CFA also provided first aid or requested ambulance support for people. Ms Karen Barrow, a CFA lieutenant in the Kinglake West brigade, reported using a CFA ladder as a makeshift stretcher and transporting an injured person to meet the ambulance.[19] Mrs Helen Kenney, the St Andrews CFA captain, was managing a stream of people and volunteers coming to the CFA station. One of the CFA members had a key to the local community centre, which they opened. The CFA then arranged refreshments and the local community and businesses also provided food. First aid was available until Mrs Kenney stood the CFA members down late that evening.[20] Dr Lachlan Fraser, a general practitioner from Marysville, received first aid treatment from CFA crew members at Gallipoli Park oval and also provided first aid assistance in Marysville.[21]

Ambulance Victoria manages, equips, and trains the Kinglake Community Emergency Response Team, one of the volunteer teams that provided first aid while waiting for an ambulance to arrive. The team was called out to assist during the fires but was caught by the fires and forced to retreat. Mr Bart Wunderlich, a member of the team, said he arrived at the Kinglake West CFA shed with other members of the team early on the Sunday morning. They established a first aid area, where they treated firefighters and locals for burns, eye irritations and respiratory complaints and one person with chest pain. The team decided to stand down six days later because medical support was available and they had themselves and their families to care for as well.[22]

Box 8.2 Case study of first aid initiative by volunteers

Ms Katherine Harland, a registered nurse and resident of Montmorency, decided to attend the Whittlesea Community Centre on Monday 9 February after hearing of the death of Mr Brian Naylor. She joined other volunteer nurses who had set up a first aid station, sought assistance on local radio for medical support and medical supplies, and liaised with the CFA and Victoria State Emergency Service to identify first aid response needs and locations.

These nurses and other medical profession volunteers worked with career ambulance officers, Red Cross first aid workers, district nurses and doctors deployed by the Department of Human Services, and Army medical officers. For 10 days after the bushfires they provided first aid for local residents, emergency workers and visitors to the Whittlesea Community Centre and in Kinglake West, Kinglake Central and to a lesser extent Flowerdale. The volunteer nurses reported planning the roster for the three medical response centres and thought there was no one else to do so at the time.

Initially they treated burns, cuts, eye irritation, respiratory irritation for firefighters, and even dog bites. As time passed, however, patients showed signs of shock and grief, and some received injuries as a result of sorting through debris on burnt-out properties. Ms Harland reported that on 17 February the Department of Human Services took control of the first aid centres the volunteer nurses had established.[23]

The Alfred Hospital Victorian Adult Burns Service presented a submission to the Commission, having treated 19 patients with severe burns. The submission stated that only two patients had received appropriate first aid. Some patients had described the immersion of burns in horse and cattle troughs and dams, exposing them to infection. The submission stated that this is consistent with previous research showing that there is poor public awareness of appropriate first aid treatment for burns. Most of the injuries resulted from exposure to radiant heat, suggesting that the fire message about fully clothing the body when responding to bushfire is not universally understood.[24]

8.3.2 WELFARE CHECKS

There was no systematic approach to checking the welfare of small communities and people remaining on properties. Some CFA brigades initiated this in their local area. Similarly, local individuals ventured out or rang around to check on people. The Department of Primary Industries also went to rural areas and conducted a welfare check.

Mr Glen Woods, captain of the Flowerdale CFA brigade, reported that after the fires no-one came to check on the town of Flowerdale, where there were about 100 survivors:

> Flowerdale was a ghost town. We did not hear or see anyone from the outside world for three days. There were no police and the bodies were just left in situ for three days. We were still extremely busy putting out fires in the town. We had no phone communications and I could not get through on the radio channel.[25]

The brigade was involved in the recovery and identification of people in the aftermath of the fires.[26] A number of other CFA brigades took the initiative in instituting welfare checks of people after the fires.[27]

People who had remained on their properties during the fires and who were able to leave their property after the passage of the fires began to check on each other. In many instances properties had lost power, telecommunications and water and had limited fuel for generators and vehicles. Fire outbreaks continued for several days after the main fires had passed. Ms Peta Whitford of Steels Creek received visits from the local council, the police and a vet.[28] She stated:

> I spent most of the days following Black Saturday walking around to various neighbours' properties to see who was there. Ian and I called a lot of people in the neighbouring properties with our mobile phones (as the power remained cut off for 14 days). We spoke to neighbours about how we were going to get clean water, how we were going to get food, and how we were going to get in contact with people.[29]

Mr Peter Olorenshaw of Callignee also went house to house, checking on people. He realised they would need to mobilise to get essential supplies to residents, as did Mr John Bennett of Kinglake West.[30]

Ms Judy Frazer-Jans, a resident of Marysville, commented on the difficulty of staying in Marysville in the week after the fires. She was surrounded by devastation, there were few people around, no visitors, and no fresh food until it was brought in by the hearse on the following Tuesday. There were also dead bodies still in their homes, their relatives not allowed to return.[31] Mr Doug Walter of Taggerty observed that local residents of Taggerty were unable to get to Alexandra, where recovery resources were available. It took over two weeks for services to come to Taggerty, and the loss of electricity and telecommunication services, plus the roadblocks, compounded the sense of isolation.[32]

Mr Lapsley noted that the Department of Primary Industries is the primary contact for rural landholders and enters fire-affected areas as soon as it is safe to do so.[33] DPI provides a valuable service in checking on people and properties. An internal DPI review after the bushfires found that in some areas it was difficult to gain access to the fireground. This was because it was unsafe, the Coroner's Office restricted access to some areas, and there was a lack of access through roadblocks as a consequence of a poor understanding of the role of DPI in some shires.[34] There was also some confusion about the definition of 'rural', which determined what properties could be visited. The review report stated that:

> DPI plays a role in collecting information on urgent personal needs of rural landholders because it is often the first agency to contact them. However, this is often an understated 'relief' role, and sometimes overlooked in terms of importance and potential impact (on both staff and landholders) if not managed effectively.[35]

Acting Inspector Gary Barton of Cobram Police Station reported allocating significant resources in response to requests from relatives and friends anxious to locate people in fire-affected areas.[36] Dr John Ferguson, a resident of Murrindindi Shire, reported that the police had visited him to check on his welfare at the request of family members.[37]

The Commission considers that agencies involved in seeing to the welfare of people after bushfires—for example, the Department of Human Services, the Department of Primary Industries, Victoria Police, the CFA and local government—should determine how to systematically implement post-fire welfare checks in the future. It cannot be assumed that survivors are able to attend relief centres using their own resources.

8.4 COUNCIL RELIEF AND RECOVERY CENTRES

Council relief and recovery centres provided refuge, facilities and services to meet material needs, first aid, contact with other people and information. Many government and non-government agencies and volunteers attended these centres. In the main, people's comments reflect a feeling that they were well supported. Nevertheless, after the bushfires government agencies reviewed operations and did find areas for improvement.

Relief centres were established in many locations.[38] Mr Lapsley reported that in the days immediately after the fires the Department of Human Services deployed additional staff to assist at ICCs, MECCs and relief and recovery centres. Because of the complexity and size of the emergency, DHS appointed 'captains' to lead and manage the relief centres.[39] VICSES (the Victoria State Emergency Service) reported that it played an important role overseeing the coordination of emergency relief centres.[40] More than a thousand Red Cross volunteers worked in relief centres, providing personal support and 5,200 first aid treatments.[41]

Some residents were impressed by the relief centres and the interagency cooperation. Mr John Edmonds commented, 'The experience was positive and the generosity which was shown to us was quite overwhelming'.[42] Mr Rainier Verlaan, a resident of Callignee, said he received 'amazing support' from the Traralgon relief centre.[43] Mr Roger Cook attended the relief centre at Whittlesea and was grateful for cups of tea, food and telephone diversion, which enabled family members from overseas to contact him.[44] Mrs Jaan Enden commented that the Labertouche recovery centre was 'fantastic'; it and Warragul Community Church provided drinking water to them for three months because their tank water had been contaminated.[45] In contrast, Ms Mary Kenealy, a resident of Marysville at the time, said the volunteers were kind and did their best in the circumstances, but that the Alexandra relief centre seemed underprepared and disorganised on the night of 7 February. Initially there was no designated first aid area, no bedding and inadequate medical resources.[46]

The Municipal Association of Victoria in partnership with DHS and VICSES, coordinated a relief centre debrief in May 2009 so that bushfire-affected councils could share what they had learnt. They also participated in a subsequent Municipal Emergency Management Enhancement Group, which dealt with relief centre management.[47] As a result, individual councils have improved their recovery processes since the January and February 2009 bushfires.[48]

The Department of Health, DHS and VICSES developed a State Coordination Agreement for 2009–10 relief centre operations. It is envisaged that this will improve efficiency in relief centre operations by centralising coordination of relief arrangements and improving support for regional areas.[49]

A recommendation in the Commission's interim report directed councils to review their municipal emergency management plans to ensure the adequacy of relief centres.[50] Mr Neil Comrie, Bushfires Royal Commission Interim Report Implementation Monitor, reported on implementation of this recommendation. He noted that VICSES, DHS, the Department of Justice, Victoria Police and the Municipal Association of Victoria have developed guidelines for the operation of emergency relief centres. The central elements of the State Implementation Plan have been taken account of in the guidelines, among them standardising processes for the choice of relief centre location, facilities staffing, and the activities that should be catered for.[51] Mr Comrie also reported that the Municipal Association of Victoria had sent out to its 77 participating councils a survey about reviewing their municipal emergency management plans. Of these, 53 responded and 28 of them had conducted the recommended review; most had done so using the new guidelines.[52] The remaining councils have said the reviews are part of the overall MEMP review and are still in progress.

The Commission notes the work under way to review and improve the consistency and services of emergency relief centres. This work must be completed: it is vital to improving the State's capacity to deal effectively with large-scale disasters affecting people in various localities.

8.5 INFORMAL RELIEF CENTRES AND COMMUNITY INITIATIVES

In different communities there were examples of locals gathering together for refuge and having limited options for moving elsewhere at the time. The local pub or hotel became a focal point in a number of cases. The Flowerdale, Kinglake, Buxton and Narbethong Hotels, and the Marysville Golf Club and the Buxton Hotel were all gathering points before evacuation or were used for shelter, although not all these places were safe during the fires.[53] People also gathered at CFA sheds.[54]

The Commission was impressed by the many examples of community initiative providing local support, and it commends the spontaneous generosity of countless Victorians who sprang to the relief of people needing immediate help. Informal relief centres experienced various challenges, reflecting the complexity of relief and recovery activities and the level of distress in the community.[55]

Box 8.3 An informal relief centre and community initiative

Mr Jim Kennedy and his wife, Di, own and manage the Black Spur Inn, also known as the Narbethong Pub. They voluntarily operated a relief centre for their local community after the fires. They initiated contact with the council and about a week after the fires they became an 'official' relief centre, which meant more support from the council and the Red Cross. The Red Cross and the CFA provided bottled drinking water because the water supply from the river had been contaminated by bushfire debris.

Other individuals, community organisations and businesses supported the Kennedys in their efforts. Donations of food and clothing were delivered to the hotel by the wider community. An employee, Ms Joanne Kasch, coordinated the donations and continued working for several weeks without pay because the hotel was not generating income. Ms Kasch sought help from her brother, who arranged for a team of chefs, catering equipment and food supplies. The Kennedys provided free accommodation and food to emergency service workers and community members. They also supplied donated clothing and other goods to the community for almost five months after the fires. Mr Kennedy's final comments were, 'and what you say about the local community—the generosity, I think every day for five weeks I cried with the way that people just helped'.[56]

Mr Graeme Collery, a resident of Narbethong, commented on the support from the community and, in particular, the Black Spur Hotel, which provided food and facilities without charge to bushfire-affected people for five weeks.[57]

The actions of the Bayles CFA are an example of how individual and CFA activities went beyond their traditional role to meet urgent community need.

Box 8.4 Case study of community initiative

On 8 February Mrs Karleen Elledge, captain of the Bayles CFA brigade, and her husband, collected hay and fencing gear for the Labertouche area and surrounds. Acting as community members they wrote a flyer seeking donations, took it down to the general store and emailed it to a business associate. Within two days the Bayles CFA shed had become a relief centre.

The Baw Baw Shire Council, the Cardinia Shire Council, the Victorian Farmers Federation, the Livestock Exchange, and the Salvation Army started sending people who needed help. Cardinia Shire supplied disaster plan phones and there were seven full-time volunteers at the CFA shed coordinating activities. The relief centre organised fencing, feed and other donations. Victoria Police and the CFA also provided support.

After three weeks, the Elledges transferred the relief activities to Labertouche where a centre had opened up.[58] However, they continued to provide labour to local residents. Mrs Elledge noted that 'There are a lot of people who are still going through a lot of pain'.[59]

The Bayles CFA arranged for site clean-up and salvage of items. Ms Michelle Buntine found this practical assistance invaluable.[60]

Image 8.2

Source: Jason South, courtesy of *The Age.*

8.6 NATIONAL REGISTRATION AND INQUIRY SYSTEM

After an emergency the registration of individuals is required for different purposes:

- people register so that friends and family can confirm they are alive
- those affected by the emergency may need to register with different government agencies and departments to access services and funding to meet immediate needs
- the police need to identify people who are unaccounted for.

The National Registration and Inquiry System was established following Cyclone Tracy primarily to provide family and friends with basic details about the whereabouts of people affected by emergencies.[61] The NRIS is owned by the Commonwealth Attorney-General's Department and operated by the Red Cross nationally and on behalf of Victoria Police in Victoria. As the commissioning authority the police activated the NRIS for Victoria during the bushfires. The Red Cross has been operating the NRIS for 30 years reconnecting people with family, friends and community. In previous disasters inquiries have numbered in the hundreds. In response to the 2009 bushfires the Red Cross logged over 22,000 registrations and more than 21,000 inquiries, nationally and internationally. The reconnection rate for family and friends was 31 per cent, better than any previous reconnection rate. The data is used only for the duration of the disaster.[62]

The scale of the disaster exposed some of the weaknesses of the NRIS system. Personal information was collected on paper registration forms and these were sent to a centralised location where the data was entered into the NRIS. Data quality was compromised as the information was provided by people who were in shock and it was not collected in a consistent way. In addition, there were issues with the transfer of data from paper to electronic records.[63] Details in the NRIS system were matched to inquiries from people looking for family and friends, providing the affected person had given consent for information sharing. Before Black Saturday, to be registered into the NRIS a person had to physically attend a location to provide their information. During the fires, the Red Cross adjusted this practice and registered people by telephone or email due to the large numbers of people involved, their level of physical dislocation and the continuing nature of the fire threat.[64]

The registration of people occurred mainly at relief centres and proved frustrating at times for individuals. Some people were advised to register at different relief centres, sometimes resulting in more than one registration per person. Some people found that despite their repeated registrations, they were still contacted a number of times to confirm they were alive.[65] Mr Peter Brown of St Andrews commented:

> In addition to the two occasions when I reported my family as survivors to the police and the one occasion when we reported ourselves to the Red Cross, I was contacted personally three times by people enquiring about whether we had survived and my colleagues at the Moreland City Council were contacted five times with similar enquires. Some of these enquiries occurred several weeks after 7 February 2009.[66]

People attending relief centres were able to seek support services and funding from government agencies, including the Department of Human Services and Centrelink. Due to privacy concerns, and different registration forms for different government agencies, individuals had to repeat their personal details and experiences of the fires to each agency. In 2008 Victoria Police and the Red Cross forwarded a paper (endorsed by the Chief Commissioner of Police) to Emergency Management Australia for consideration. It recommended making NRIS the key tool for family reunification and an entry point for national, state and territory recovery systems. An upgrade of the system to allow electronic data capture was also proposed.[67] Unfortunately, neither of these capabilities were available at the time of the bushfires.

The Victorian Bushfire Reconstruction and Recovery Authority also identified issues with privacy and information sharing. VBRRA reported that where individuals authorised sharing of information between agencies, those agencies better understood their problems and supported them more effectively. VBRRA established data sharing groups to try and protect privacy and also allow information to be shared with agencies to provide better client support. Nevertheless, privacy remained a significant issue.[68]

The police were responsible for identifying people who were unaccounted for as a consequence of the fires. They used the NRIS and other government agency information as part of that process, but it proved difficult. The NRIS does not capture information about individuals who do not self-report or who are not reported by others. The police also found that information held by Commonwealth and Victorian government agencies is not standardised and there is no unique identifier for a specific individual. Privacy legislation restricted quick access to information and the ability to share information (particularly bulk information), because the information was not being used for the purposes for which it was originally collected. For the same reasons, the police were unable to share information with recovery agencies, which slowed the ability of those agencies to act.[69]

There is scope to reduce the difficulties experienced with privacy and improve future relief response. The *Privacy Act 1988* (Cth) allows relevant personal information to be collected and disclosed in an emergency for specific purposes relating to that emergency. For this to occur an emergency must be formally declared. The Commonwealth Cabinet Secretary made such a declaration on 11 February 2009.[70] The State submitted to the Commission that a similar provision could be included in the *Information Privacy Act 2000* and the *Health Records Act 2001* to permit disclosure of personal information in emergency situations. This would allow a targeted response during emergencies that would not interfere with the privacy of individuals who were not directly affected.[71] The Commission supports this approach and encourages the State to make such changes.

Two national NRIS meetings have been held since 7 February to address the shortcomings of the NRIS that were identified before and during the bushfires. The main lessons were:

- The NRIS is ideally placed to be the primary registration system for everyone affected by an emergency, 'enabling people registering for assistance to tell their story once', and thus reduce their stress, and improve effective information sharing.
- There is a need to upgrade NRIS technology to enable real-time information access for the community and base data for agencies involved in recovery.[72]

Mr Peter Channells, Assistant Secretary within the Emergency Management Capability Development Branch of the National Security Capability Development Division of the Attorney-General's Department, reported that the NRIS enhancement project started in November 2009. The project aims to enhance online and telephone registrations and inquiries, source secure system servers, improve reporting and data interrogation capacity, and develop a framework for future system enhancements.[73]

The Commission supports the improvement and further development of the NRIS to better serve the community by making it the primary source of information for community members and recovery agencies during emergencies. The Commission considers ongoing technological development is necessary to enable the NRIS to be robust and web-enabled with a single point of entry into the database. The paper registration system would be retained only as a back-up.

8.7 COMMONWEALTH SUPPORT FOR RECOVERY

The Australian Government Disaster Response Plan, or COMDISPLAN, was activated early on 8 February.[74] The Prime Minister established the Commonwealth Victorian Bushfires Ministerial Taskforce to coordinate the Commonwealth's contribution to the response and recovery.[75] Support for recovery was provided by Emergency Management Australia, the Department of Defence, and the Australian Federal Police.

The Victorian State Emergency Response Coordination Centre prepared 20 requests to EMA for Commonwealth assistance between 8 and 23 February; one was withdrawn before action was required.[76] These were made as civil community category 2, or DACC2, requests to the Department of Defence. DACC2 assistance is emergency assistance in an extensive and continuing disaster, where action is needed to save human life, alleviate suffering, prevent significant loss of animal life or property, and when the resources of the state are exhausted or inadequate.

The Commonwealth reported:

> A broad array of requests were received and actioned, ranging from the supply of mattresses, tents, stretchers, sleeping bags and food rations, to forensic assistance, aerial imagery capability and the deployment of an information, surveillance and reconnaissance officer.[77]

The Department of Defence provided an Interim Head of VBRRA, Major General John Cantwell AO, and supporting staff. The department also provided temporary accommodation and general support, such as catering, laundry and shower facilities for bushfire-affected people, primary health and psychological support teams, and Navy dentists who assisted the Victorian Coroner. Accommodation and catering support was also supplied to emergency services and Australian Defence Force personnel in the Marysville area. In addition, support was provided to establish community service hubs and manage donations.[78]

At the same time EMA worked with the Australian Federal Police and the Department of Defence to provide emergency relief, additional capacity on the ground, and funding through the Commonwealth Natural Disaster Relief and Recovery Arrangements. The AFP supported Victoria Police as requested. In relation to recovery, the AFP provided a chaplaincy service for deployed personnel that also engaged with the community. The AFP and ADF conducted property searches looking for human remains. The AFP also provided relief staff for police at roadblocks in the worst affected areas, such as Marysville and Kinglake, and contributed to community policing.[79] Over 1,200 Defence personnel provided extensive support, searching fire-affected areas with police and emergency service personnel.[80]

In addition, the Commonwealth Department of Human Services and portfolio agencies deployed employees and infrastructure to support people affected by the bushfires. Customer service advisers, case managers, social workers, and Centrelink services were made available.[81] The Australian Taxation Office also provided assistance to people affected by the fires as they began putting their lives in order.[82]

In Kinglake, once the roads re-opened allowing residents to return to the area, the Australian Army played a vital role in recovery efforts. The Army was involved in moving and distributing material aid and food, cleaning facilities, getting rid of wasps, and expanding cooking facilities.[83]

After the bushfires the Minister for Environment Protection, Heritage and the Arts granted the State of Victoria an exemption to the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). This allowed bushfire mitigation activities such as vegetation clearance, building of fuel breaks and back-burning.[84]

8.8 VICTORIAN BUSHFIRE RECONSTRUCTION AND RECOVERY AUTHORITY

The scale of the disaster in Victoria meant it was essential to consider and ensure the complex recovery requirements for people, the environment (flora and fauna), the local economy, and buildings. Experience from previous disasters showed that the establishment of a body responsible for coordinating and monitoring expenditure is the best way to facilitate recovery.[85] The Commonwealth and Victorian Governments set up the Victorian Bushfire Reconstruction and Recovery Authority to work with government departments and agencies, councils, communities, businesses, and charities.[86] VBRRA adopted a modified version of a New Zealand recovery framework that has the concept of community at its centre.[87] The framework includes the same functional areas as the *Emergency Management Manual Victoria.* The elements of the VBRRA recovery model are set out in Figure 8.1.

Figure 8.1 The VBRRA model

- Local community is core to the framework
- People–safety, health, welfare and wellbeing
- Reconstruction–of built environment including residential, commercial, rural and public buildings
- Economic–individuals, business, infrastructure and government
- Environment–biodiversity and ecosystems, amenities, water and pollution management and natural resources.

Source: Exhibit 139 – VBRRA 100 Day Report.[88]

VBRRA has provided a series of reports that detail short-, medium- and long-term actions, time lines, and the money allocated to support recovery.[89]

Ms Christine Nixon, the inaugural Chair of VBRRA, told the Commission she considered community recovery committees an effective model to involve communities in their recovery. The committees were included in municipal emergency management plans coordinated by local councils and bring together community members to work out what is needed to effect recovery. A core task of the committee is to devise a community recovery plan that addresses support, physical recovery, environmental recovery and economic recovery.[90]

In response to the bushfires, community service hubs and the case management service were established by the Department of Human Services. They enable people to access a range of government services and advice from one location. Ms Nixon considered the 12 community service hubs as 'one of the outstanding successes' of the recovery effort.[91] These were designed to support the existing relief and recovery centres due to the scale of the disaster.[92]

The case management service was the biggest program of its type in Australia and was 'put in place probably within a period of two and a half months'.[93] The Commission considers this was very slow considering the acute and immediate needs of people who were affected by the bushfires. Ms Nixon commented that, 'I think there was some scrambling, for want of a better description, to get it into place and to get it to the size that it eventually became, and all of the materials about who was a case worker, how do we obviously pay for that process'. She noted that there were some criticisms of the case managers and the support offered, but that VBRRA had dealt with these. At one point there were about 15,000 people being supported by this system.[94]

Many people made favourable comments about the way case managers helped with services and grant applications.[95] Mr Cook said of his case manager, 'He was fantastic and made sure we knew about every grant that was available. It has been a shock to pay rent after 25 years, but our unit is very nice'.[96] In contrast, Ms Buntine dealt with a range of temporary case managers over a period of days who asked the same questions. A permanent case manager was allocated but was then moved, and the family had to develop a relationship with yet another case manager.[97]

A Victorian government brochure described the case management service as being designed for bushfire-affected people with the highest need but available to all Victorians affected by the bushfires. The brochure recommended that people who had lost homes, and their direct family members, use the service.[98] Evidence before the Commission from individual witnesses indicated there may have been a lack of clarity in agency and community understanding

about the meaning of 'bushfire affected'. One witness who lost family members, but who had not personally experienced the fires, faced limited access to assistance initially, which added to the distress.[99] This contrasts with another witness who was given access to the case management system and found the support very helpful.[100]

Mr Andrew Kleinig, co-owner of a property in Callignee that burnt down despite active defence by the two owners, reported having little access to government support because his primary residence was in Melbourne. This contrasted with the experience of the other owner for whom it was the primary residence.[101] Mr Russell Glenn, who owned a property in Marysville, hosted a meeting for 'weekenders', many of whom had lost properties in Marysville. He stated that they had received little support or information and, because they were not permanent residents, had been precluded from existing networks. In response they established the Marysville One Community Association for information sharing and support.[102]

After the 2009 bushfires Loddon Mallee Housing Services, within DHS, released a review of their initial crisis response, and ongoing work, as part of the case management service. The purpose of the review was to build capacity for future emergency response. Overall, LMHS staff believed their response was outstanding with great leadership from the acting Chief Executive Officer and management. However, staff identified challenges such as inequities in treatment of clients, community members who were reluctant and unfamiliar service users, and the significant demands placed on staff to contact bushfire-affected people within 24 hours. The review included feedback from a very small sample of community members who used the case management service. The key elements valued were outreach, emotional support, practical support and brokerage to other services. The experiences of individuals were generally positive, but it was evident that there needs to be 'a sophisticated case management framework that supports staff' to enable them to support clients more effectively. The report also highlighted the importance of maintaining the case management system in the longer term, recognising people's ongoing trauma.[103]

Since the bushfires the Municipal Association of Victoria has been working with the Department of Human Services and participating in the Victorian Psychosocial Recovery Plan Advisory Group and the Victorian Bushfire Case Management Coordination Committee regarding state recovery planning, psychosocial planning, case management, community service hubs and the community development officer program.[104] The Department of Health and DHS are updating emergency centre coordination arrangements to improve inter-agency integration and the triggers that activate services. New procedures have been developed such as an operations manual for community service hubs. DH and DHS have also reviewed and re-issued the State Recovery Operational Plan. The Plan states that DHS leads the case management service, but it provides no further information about how the service is delivered.[105]

8.9 TRAUMA

Many people who experienced the fires were traumatised by their experiences. The death of and injuries to family, friends and community members has caused deep distress. People suffered loss and damage to homes, assets, livelihoods and belongings. The death of and injuries to stock, companion animals, pets, wildlife and environmental damage has also distressed people.

The impact of disaster is felt by people in the short, medium and long term. In the short term (days to weeks) people have to focus on immediate physical and material needs, but they may have difficulties with thinking, planning and decision making. In the medium term (weeks to months) people may experience a wide range of emotions and strong feelings. They are often emotional and traumatised, or in constant distress, which can affect health and relationships. They also tend to be involved in more accidents. In the longer term (months to years) the effects of disaster can become apparent as financial consequences, health, emotional wellbeing, and other aspects of life that may have been postponed due to earlier demands, come to the fore.[106]

In the short term for many people the support of family, friends, the community, and community support agencies will help them to recover. However, some people may experience more severe responses, such as post-traumatic stress disorder, anxiety or depression, which may impact within a few months, or a year or more. According to

research there are bushfire-affected people who may need help from a specialist mental health service at some stage and this need increases where they have been associated with death or injury.[107]

VBRRA and the Department of Health conservatively estimate that at least 1,000 people have been directly affected by the 173 deaths that resulted from the fires.[108] The consequences for families and communities who experienced fire-related deaths is significant. Family and friends are involved in making funeral arrangements, interacting with the Coroner's Office and bureaucracy, and cleaning up properties. These compound grief and suffering.

Dr Margaret Grigg, Assistant Director Bushfire Psychosocial Recovery Team, Department of Health, reported that mental health services in bushfire-affected areas had experienced increases in demand, particularly child and adolescent services: there was a 40 per cent increase in the number of people seen and a 34 per cent increase in time spent on clinical work between February and September 2009. The services for adults are more diverse, but there was an increase of 10 to 15 per cent in the number of people seen in bushfire-affected areas.[109]

The CFA, DSE, Ambulance Victoria, and Parks Victoria also reported increased use by employees and volunteers of peer support programs, relevant training programs, counselling and chaplain services.[110]

8.9.1 LONG-TERM EFFECTS OF TRAUMA

Two expert witnesses gave evidence about trauma: Professor Alexander McFarlane, Head of Centre for Military and Veterans Health, University of Adelaide and Clinical Professor of the University of Queensland; and Dr Paul Valent, Psychiatrist and co-founder of the Australasian Society for Traumatic Stress Studies. Both experts worked with communities affected by the Ash Wednesday fires and provided insights into trauma arising from disaster. Dr Valent noted that 'Trauma therapy is a new concept' and 'there is a lot to be learned about trauma'.[111] Professor McFarlane stated people suffer trauma disaster in everyday life and 'we completely underestimate or plan for their needs'.[112] They observed that trauma may not become evident for a long time and it is often not well-recognised by the affected individual or treating medical professionals.[113]

Professor McFarlane's research identified that after a disaster people can need assistance for many years. He stated that about 20 per cent of the community will have a psychological disorder at the time of the disaster, which may be exacerbated by the event. Adversity after the disaster, for example, re-establishing homes, employment, and dealing with grief, can have significant ongoing effects on people's health and wellbeing. He cited research that indicates a quarter of people will have delayed onset of disorders, and may or may not seek treatment.[114]

Professor McFarlane conducted longitudinal studies of children affected by the Ash Wednesday bushfires. He considered this group of children and compared them with children from a similar socio-demographic region who were not directly exposed to the fires. He found that the trauma and hardship caused by the fires was a significant, but not overwhelming, cause of psychological disorders in children. Parental distress and over protection after the fires had a significant ongoing impact on children. Adversity after the bushfires exacerbated parental distress, potentially impacting further on children.[115]

Many people present to general practitioners rather than mental health services with relatively minor or unrelated medical complaints. Individuals may not understand the link between their physical symptoms and their mental state. Professor McFarlane commented that most treatment is provided by private practice, rather than the government sector, and that individuals who have moved out of the disaster-affected region may not receive treatment. In the past general practitioners often failed to link observed physical symptoms to trauma that may have occurred years before.[116] Dr Valent affirmed that physical symptoms can reflect trauma and appear after the disaster, and that GPs need to be aware of this.[117]

The expert witnesses also pointed out that individuals experience personal disaster in everyday life, causing mental health issues, and that these are currently inadequately treated. They were of the view that establishing an appropriate response within mainstream healthcare services would be a resource after a disaster, and also help to develop a better understanding of trauma in the community.[118]

Dr Grigg stated that the Victorian Bushfire Psychosocial Recovery Framework Advisory Committee has recognised the important role that local GPs play as the main providers of health care services.[119] In Victoria there are mental health teams that provide secondary consultation and supervision of some treatment in support of general practice. In addition, the Commonwealth has invested for some years in education and training for GPs to increase their capacity to identify mental health problems.[120]

The Commission notes the importance of an integrated medical response in recognising, and appropriately treating, trauma arising from the 2009 bushfires. The special needs of children also need to be considered in the longer term.

8.10 COMMUNITY

The Red Cross Victorian Bushfire Appeal 2009, launched by the Victorian and Commonwealth Governments, has been the largest single charitable appeal in Australia's history, raising funds totalling $389 million. Funds are allocated at the direction of an independent advisory panel. The panel was originally chaired by former Victorian Governor, Mr John Landy, and is now chaired by the Hon. Pat McNamara. The panel is supported by a secretariat and implementation unit that is operated and funded by the Department of Human Services, which distributes the funds. The secretariat develops the policy for fund payments, and the implementation unit assesses applications, makes payments and works with case managers.[121]

Private organisations provided staff free of charge to assist VBRRA's operations, in some instances, for several months.[122] Workplaces also donated services and equipment, and granted leave to staff who were volunteering.[123] The Commission heard about many actions initiated by individuals, volunteer organisations, community groups, and people in their work capacity, who provided help beyond normal expectations and hope. This did not lessen the trauma experienced but extended the opportunities for recovery.

Mrs Sue Exell of Haven, for example, worked for weeks following the fires organising recovery and community events. She arranged the logistics for community meetings, met with politicians, participated in radio reports and local council meetings for clean up work, and shared information with the community. She was involved in organising a fundraising 'Thank You' concert and family day for the CFA, Red Cross, VICSES and local community.[124] Similarly, Ms Anne Leadbeater provided outstanding leadership at the local level (see Box 8.5).[125]

Box 8.5 Case study of Kinglake

At the time of the fires Ms Leadbeater was Manager of Community Development for the Murrindindi Shire Council. After Black Saturday she had a key role in coordinating recovery efforts at Kinglake, Kinglake West and Toolangi. Initially there were twice daily agency briefings and community meetings three times a day. The daily community meetings continued for two weeks in Toolangi and five weeks in Kinglake and Kinglake West. This was considered the most effective way to share information and determine the issues requiring resolution. The communication model used was accurate, locally relevant, and addressed 'what we know', 'what we don't know',' what we are doing', and 'what we need you to do'.

At the daily meetings agencies that typically attended were the police, the CFA, Centrelink, DHS, Red Cross, the Department of Primary Industries, RSPCA, the Army, the Department of Sustainability and Environment, VICSES, VicRoads, Telstra, SP AusNet, Community Health, Ambulance Victoria, Victorian Council of Churches, and local volunteers. The agencies briefed the community and also responded to the issues raised by the community. This two-way communication enabled recovery to keep pace with changing needs. For example, on the first day water and fuel were required and by the ninth workplace safety and tax issues for small business were dominant.

Many people were traumatised and Ms Leadbeater observed that, 'Just before I would start each community meeting, I would look out at the hundreds of faces and it felt like I was looking out on a sea of grief'.[126]

Help came from within and outside the local community. A Post Office employee provided torches and prepaid mobile phones. A Telstra employee also provided mobile phones, connected the council telephone, and slept in his car for the first night and then on the pub floor while he worked to establish communications. The SES did shuttle runs bringing back jerry cans of fuel. There were many examples of generosity, support and kindness: metropolitan chefs cooked for hundreds of people; coffee carts dispensed free coffees, the ice-cream man handed out free ice-creams, and volunteers sorted and distributed donated goods.

Ms Leadbeater commented that one of the essential elements of recovery is to find and engage with the strengths and networks that existed in the community before the disaster as this facilitates recovery.

Shortly after the fires, the Marysville and Triangle Development Group, or MATDG, was established at the request of Ms Fran Bailey, the local Federal MP. She asked local community members to ensure the group represented the communities of Marysville, Buxton, Taggerty, Narbethong and Granton. The group organised community meetings at the Marysville Golf Club to work out who needed help and what they needed. This led to the development of a temporary residential village in Marysville. The group assisted with funerals and memorial services and organised counselling rooms in Taggerty. MATDG established a charter with key principles and a range of sub-groups. Members of the group voiced concerns about the slow pace of recovery and government action.[127] Separately, local GP Dr Lachlan Fraser worked with the Red Cross, and developed a list of survivors in Marysville and put it on the internet for public access.[128]

8.11 INSURANCE AND RECOVERY

Community recovery after a disaster is impacted by the adequacy of insurance cover taken by individuals and businesses. When insurance cover is insufficient to allow for rebuilding, the recovery process will be stifled. In Chapter 10, the Commission found that there was a lack of definitive evidence about the extent of both non-insurance and under-insurance. There was, however, sufficient evidence to conclude that although a proportion of homes are not covered by building insurance, a much greater proportion of households do not have contents insurance, and many households are under-insured.

Research by the Brotherhood of St Laurence shows that the main reason people on low incomes do not obtain insurance is perceived affordability. As one participant in the Brotherhood's study put it, 'Insurance is a luxury when your income is that way'.[129]

The reasons for under-insurance appear to be complex. Following the ACT bushfires in 2003 the Australian Securities and Investments Commission investigated why houses are under-insured. A 'sum insured' policy caps the insurer's liability for rebuilding in the event of a total loss at an amount specified by the property owner—called the 'sum insured'. Under this type of policy, property owners are responsible for determining the sum insured and are likely to under-insure if they lack information about current building costs. In 2005 ASIC found only a small number of insurers provided property owners with access to reliable or comprehensive tools to estimate the cost of rebuilding their home. ASIC also noted the failure of property owners to increase the sum insured over time to keep up with changes in building costs, and that property owners do not necessarily increase their level of cover after renovations.[130]

Replacing the main building is not the only cost of rebuilding following a fire. There are often supplementary costs such as landscaping, site clearing, architect fees and temporary accommodation. Many of the 16 building insurance policies reviewed by ASIC following the ACT fires did not cover some types of supplementary costs. In addition, respondents to ASIC's survey of ACT bushfire victims reported significant under-insurance of many supplementary costs.[131]

In a follow up report in 2007 ASIC found that the insurance industry had developed initiatives to address under-insurance. Since the 2005 report a small number of additional insurers had begun to offer total replacement policies.[132] ASIC recommended the following measures: insurers investigating whether total replacement policies and extended replacement policies (under which the insurer agrees to pay the sum insured plus an additional amount up to a certain percentage above the specified sum insured) can be made more widely available. Educating consumers about under-insurance and making web-based calculators available were also recommended.

In submissions to the Commission, the Commonwealth said that despite government and industry initiatives, under-insurance is often the biggest problem policy holders face in the rebuilding process.[133] Mr Denis Nelthorpe, a community lawyer who provided assistance on insurance issues to people affected by the bushfires, told the Commission that some consumers had difficulty understanding the nature of their policy. Mr Nelthorpe said that many who suffered losses in Victoria's fires had 'sum insured' policies and would have experienced difficulty rebuilding had funds not been made available from the bushfire compensation fund.[134] Given the persistence of under-insurance, the Commission considers that ASIC's 2007 recommendations remain relevant. The Insurance Council of Australia and members of the insurance industry should continue to improve communication with consumers about under-insurance, including in relation to total replacement cover and extended replacement cover, and the assessment of rebuilding costs.

A recommendation of the Commission in Chapter 10—to replace the fire services levy with a property based levy—would result in a substantial reduction in the amount that consumers pay for a given level of insurance cover. For example (and assuming that stamp duty on insurance and GST are retained), the cost of insurance would fall by 45 per cent for a country business, by 34 per cent for a metropolitan business, by 24 per cent for a country house, and by 17 per cent for a metropolitan house.

The Commission's support for the introduction of a property-based levy rests on the inequity and lack of transparency of the current arrangements. It is possible, however, that the consequential fall in the cost of insurance could result in greater uptake of building and contents insurance. The extent of any uptake is difficult to predict. While insured property owners would pay less for insurance (as outlined above) they would have less disposable income as a result of paying the property-based levy.

Mr Nelthorpe believed that these changes would have no impact on the insurance take-up of low to middle income earners.[135] Dr Richard Tooth, a consultant with insurance experience, gave evidence about international studies on the demand for insurance and his own research. Dr Tooth concluded that the demand for insurance increases slightly with a fall in its price. Households are more price sensitive when deciding to purchase contents insurance than house insurance.[136] Dr Tooth also gave evidence that the removal of the fire services levy in Western Australia was followed by a small uptake in building and contents insurance.[137] However, Dr Tooth acknowledged that to understand the full effect, long-term data would be required and that the economic boom in Western Australia at the time may explain any increase in the take-up of insurance.[138]

Affordability for those on low incomes has been consistently recognised as an impediment to greater uptake of insurance. The Commission heard that changes to payment methods, such as the ability to make fortnightly payments and to make those payments where appropriate through Centrepay, would assist low income earners to insure.[139] Similarly, insurance products, particularly contents policies, have not been tailored to the needs of low income earners. The minimum level of cover may exceed the customer's requirements and the excess payable may act as a disincentive, particularly if the items to be insured are of low value.[140]

According to Mr Nelthorpe, the recent introduction of tenants insurance targeted the upper end of the market. He welcomed the lowering of contents limits to facilitate the take-up of insurance, though.[141] The Commission expects that tenants would be the initial beneficiaries of a change to a property-based levy as they would see a noticeable fall in the cost of contents insurance and they would not be subject to the property-based levy. Members of the insurance industry should create or continue to offer 'no frills' insurance products that allow appropriate levels of cover for people with limited household assets, allow fortnightly payments and, where appropriate, receipt of payments through Centrepay.

The Commission also notes that building and contents insurance would become more affordable if the State Government adopted the final report of the Australia's Future Tax System Review (the Henry report) and discontinued the practice of subjecting insurance products to stamp duty.[142]

8.12 OTHER RECOVERY ISSUES

Immediately after a bushfire people need shelter, water, food, material goods and access to services as part of re-establishing their lives. Other consequences of bushfires may not be immediately apparent to the wider community. Issues relating to the environment, control lines, fencing, fodder, and animals, illustrate the complexity of recovery.

8.12.1 ENVIRONMENT

Large severe fires leave few refuges for plants and animals, and reduce the viability of threatened species.[143] The Victorian Association of Forest Industries stated that the impact of high intensity fires includes: complete burning of large areas; death of flora and fauna; damage to soil, plants, seeds and fungi; damage to waterways and aquatic species; and habitat loss.[144] Professor Mark Adams, Dean, Faculty of Agriculture, Food and Natural Resources, University of Sydney, noted that high intensity fires have caused enormous damage to soils, killing plants and animals and changing the hydrology of water catchments.[145] Mr Phil Cheney, Honorary Research Fellow, CSIRO, observed that bushfires burning under drought conditions burn most surface fuels. This was evident in the 1983 bushfires, where swamps and usually damp areas were burnt down to mineral soil and organic soil was removed. Some plant species were killed and did not regenerate either by regrowth or seed.[146]

The Department of Sustainability and Environment is responsible for the initial rehabilitation and stabilisation works on public land after fire and for the longer term recovery of the natural environment. This includes: regeneration of vegetation; protection of threatened species; and protection of water quality and supply, cultural heritage, and built assets on public land. DSE addresses erosion, animal welfare, pests and weeds, and coordinates and delivers this recovery function with other relevant agencies. Urgent environmental works coordinated by DSE after the fires included erosion control, water catchment protection, fence repairs, rehabilitation of control lines and construction of silt traps.[147]

Image 8.3

Source: Craig Abraham, courtesy of the *Sunday Age.*

Immediately after the fires, Melbourne Water, DSE and Parks Victoria rehabilitated fire tracks and roads. Melbourne Water improved road drainage and erosion control to protect water quality and to prevent debris, soot and ash being washed into the water storages by rain.[148]

The Department of Primary Industries' main responsibility during environmental disasters is to help primary industries recover. DPI staff assist with immediate and longer term recovery by visiting landholders to assess their needs, the welfare of their animals, their livestock losses and fencing damage. After 7 February DPI responded to hundreds of referrals about stock containment, erosion control, and farm water supplies. DPI also issued the publication, *Recovery after Fire.* It includes guidance to landholders about livestock and water management, soil erosion and pasture recovery, fencing and property planning, and pest and weed control.[149]

Control lines

During bushfires Victorian fire agencies can go onto any land and create fire control lines by pushing soil aside with heavy machinery.[150] In general, control lines must be rehabilitated after fires or they can become a source of environmental damage. There are also secondary consequences: fences may have been demolished to create the control line, which can have implications for stock management for private landholders.

The State rehabilitates fire control lines on public and private lands by pushing back the top soil and undertaking erosion control measures. This protects water quality and the land from soil erosion. The government may also provide the landholder with seed to assist with erosion control. Planting of trees and re-establishing pasture and agricultural crops is not included.[151] After the fires, Ms Judith Clements, in her capacity as President of the Whittlesea branch of the Victorian Farmers Federation, was contacted by the CFA and informed that firebreaks would be cut by bulldozers and graders through the properties on the edge of the fire control line, and the affected farmers would have to contain their livestock because the equipment would not stop for fences. Ms Clements reflected the concerns of some farmers that the fire agencies adopted a 'blanket' approach to creating fire control

lines without consulting landholders, potentially causing unnecessary environmental damage and loss of fencing. In addition, despite the rehabilitation works the loss of productivity is ultimately borne by the farmer.[152]

After the fires DSE and the CFA completed an operational review and debrief. They identified that even with past experience excessively wide control lines had been created and major rehabilitation tasks were required as a result. The agencies attributed this to incident management tactics and the poor supervision of some bulldozer operators. There were also difficulties determining whether fences were burnt in back-burn operations or from bushfire.[153]

Fencing

Over 10,000 kilometres of internal and boundary fencing was destroyed by the bushfires.[154] This affected landholders' ability to maintain livestock, and is also costly to replace. Fifteen months after the bushfires fencing was still being replaced, which gives some idea of the scale of the activity.[155]

The Victorian Government pays 100 per cent of the cost of restoring fences damaged by machinery used by fire agencies during bushfire emergencies. It will reimburse up to $400 insurance excess on all insured Crown land boundary fences that are damaged by bushfires.[156] Under the *Fences Act 1968* the private landholder bears the responsibility and full cost of replacing fences bordering public and private land. The government expects landholders to have appropriate insurance to cover boundary and internal fences. It remains the responsibility of the private landholder to fence and secure stock on their property.[157] Ms Clements stated that many farmers do not insure fencing due to the cost and for those who are insured the $400 reimbursement is inadequate.[158] The Victorian Farmers Federation State Office and government agencies including the Department of Primary Industries undertook a fencing coordination program with volunteers providing labour.[159] There was also a program in the Mudgegonga area where prisoners from Beechworth worked on roadside fencing.[160]

Many public submissions were made to the Commission urging a change to the present law on the basis it is unfair. There was insufficient time to consider in any depth the question of whether change is required. That the landowner is invariably solely responsible for the cost of replacing fencing that borders public land does seem unreasonable, particularly as the landowner has very limited ability to ensure that fire prevention activities on adjoining public land adequately reduce the risk of fencing damage from bushfires. The Commission encourages the State to re-examine its position on this matter.

8.12.2 FODDER

After bushfires food and water supplies for animals is essential because pasture and fodder may have been destroyed. The Department of Primary Industries supported the Victorian Farmers Federation to coordinate and transport emergency fodder and agistment for livestock. The Commission recognises the important contribution a number of individuals and groups made to this process (see Box 8.6).[161]

Box 8.6 Feeding stock after fire

Mr Peter Hay, a CFA volunteer, cattle farmer, and VFF representative from Weerite, set up a meeting with the municipal fire prevention officer, local fire brigade captains, and representatives of DPI and the United Dairy Farmers of Victoria.

Following the meeting Mr Hay agreed to coordinate an appeal for fodder and cattle feed and a clean-up working bee. For the next three months he and his wife did a range of community work. DPI assessed farms affected by the fires and prioritised needs. Mr Hay was in constant communication with fire-affected people, arranged a public appeal for hay and firewood donations, organised and directed cartage, and organised cattle agistment and donations of farm supplies. About 180 volunteers attended the working bee. The equipment used in the working bee was supplied for free, the Lions Club did the barbecue, and the Country Women's Association made cups of tea. 'The day was a huge success and the work that was done made a big difference to the fire affected people'.[162]

8.12.3 ANIMALS

Ms Juliet Moore, a resident of Kinglake, gave evidence about fleeing the fires in a car while a passenger held onto a horse through the car window. She recounted her observations during their flight:

> I remember all these animals just appeared from nowhere. We had two deer running next to the car, so there was a horse and deer and the deer looked at the horse and horse looked at the deer and then we had kangaroos and lizards and koalas and they were all just running with us.[163]

In general the protection and care of animals falls under a range of Acts and agencies: mainly the Department of Sustainability and Environment, the Department of Primary Industries, councils, the RSPCA and other volunteer organisations.[164] Animals are grouped into categories such as wildlife, livestock, companion animals and domestic pets, rural and urban. During and after the fires the relief and recovery of animals raised issues, some of which are unable to be readily resolved, for example, habitat loss for wildlife.

The Emergency Management Act does not address animal welfare. The *Emergency Management Manual Victoria* also does not specifically address animal welfare after bushfire under the State Emergency Recovery Arrangements. Under Part 7, which sets out the 'Emergency Management Agency Roles', DPI is nominated as the primary agency for support services for animal welfare and the RSPCA and DSE are secondary agencies. The participating emergency management agencies also supply their own role statements for inclusion in the manual. DPI identified responsibilities for stock, DSE for recovery of wildlife, the RSPCA for rescue and care of pets, and councils for the disposal of dead animals (domestic, native and feral).[165]

The RSPCA estimated that over 1 million animals were killed in the fires. The most common injuries to animals were from wounds sustained while escaping the fires, burns and smoke inhalation.[166] The Victorian Association of Forest Industries estimated that millions of native animals and birds were killed, either during the fires or from starvation or predation after the fires.[167]

The Department of Primary Industries manages large-scale immediate rural recovery including animal welfare services. DPI identified animal welfare as a high priority after the fires and sought additional resources from interstate to assist with the inspection of properties. They assessed 4,700 properties for losses and estimated that more than 8,000 farm animals were killed, either directly by the fires or euthanased.[168]

Image 8.4

Source: Wayne Taylor, courtesy of *The Age.*

Ms Pat Easterbrook from Mudgegonga gave evidence about neighbours getting together to shoot cattle. She noted, 'The sound of the shots was just awful, especially as the rest of the valley was so quiet and looked like the end of the world had come'.[169] Mrs Robin McDonald, a cattle farmer from Rosewhite, stated that, 'One of the most difficult decisions after the fires was working out what to do with our herd. We had little for the cattle to eat and, with no fences, we had no way to keep them in'. Ultimately, the McDonalds agisted the herd in Queensland, bearing the costs because the cattle provided their income source and they had spent many years developing the quality of the herd, and were reluctant to sell.[170]

The importance of companion animals and pets to the welfare of people is well known. Animal needs have been identified in CFA guidance for people planning for bushfire and also guidance for councils about catering for animals at relief centres.[171] Mr Tim Streblow from the California Department of Forestry and Fire Protection commented that people may be reluctant to evacuate unless they can do so with their animals.[172] Further, the RSPCA considers that surviving animals can be important to the recovery of bushfire-affected people.[173] The impact of animals on individual's decisions is discussed in more detail in Chapter 1.

The Sorraghan family are dog breeders and escaped with all of their 21 dogs having attempted to defend their house in St Andrews. They reported that 'watching the house burn was not easy, but it would have been a completely different experience if we had lost any of the dogs'.[174] In contrast, Ms Samantha Siddle, who evacuated from Redesdale with her children after her property started burning, described her children's distress at the suffering and death of companion animals and pets.[175]

The Department of Primary Industries' review of its response after the fires noted the complexity of recovery due to the high number of fires on private land, the loss of life, the impact on the peri-urban areas made up of small landholdings, and the number of shires involved. The loss of fencing meant it was impossible to link stock to properties and owners, or to contain animals, and it also hampered the treatment of animals. There was a lack of clarity about which agencies had responsibility for which animal grouping, and if animals were found together whether all were treated by that agency.[176]

The fire agencies also recently updated *Protocols for Volunteers involved in Wildfire Rescue Operations.* It details arrangements for fire agencies, independent wildlife shelters, foster carers and rescue organisations, and differentiates between native wildlife, companion animals and agricultural stock.[177] However, this does not address the issues identified by DPI.

There does not appear to be a coordinated approach to animal welfare during relief operations. Improving agency coordination would help to provide more effective relief to all animals regardless of whether they are wildlife, stock, companion animals or pets. There is a good argument to address the welfare of all animals holistically in the *Emergency Management Manual Victoria.*

8.13 THE FUTURE

The Commission acknowledges that recovery from disaster is a long-term process. The Victorian Bushfire Reconstruction and Recovery Authority has supported the short- and medium-term recovery of people and communities. Long-term assistance will be provided through normal services and thus reduce the need for a coordinating agency beyond 2010.[178] It is not part of VBRRA's terms of reference to identify lessons from the reconstruction and recovery process. The 2003 ACT bushfires taskforce identified lessons learnt and future improvements. It recognised the 'seriousness of the task—remembering in particular that people's lives and their futures will be affected by how well the job is done'.[179] Similarly, Victoria should review reconstruction and recovery from the Black Saturday bushfires to maximise learnings for future improvement, and determine whether long-term recovery is adequately supported.

1 Exhibit 837 – Victorian Bushfire Reconstruction and Recovery Authority Report (VBRA.300.001.0001) [8], [9.10]

2 Exhibit 139 – Victorian Bushfire Reconstruction and Recovery Authority – 100 Day Report (TEN.046.001.0001) at 0004; Exhibit 21 – Police Forward Command Post Log, 7 February 2009 (TEN.003.001.0001) at 0009

3 Cameron T19718:24–T19719:8

4 Exhibit 831 – Emergency Management Manual Victoria (RESP.3001.003.0001_R); Exhibit 938 – Statement of Lapsley (WIT.3001.002.0001) [12], [68], [76]; *Emergency Management Act 1986*

5 Exhibit 45 – National Bushfire Situation Update #3 – 30 January 2009 (AGD.910.0013)

6 Cameron T19715:10–T19715:27, T19716:31–T19717:8; Esplin T18889:30–T18890:19

7 Exhibit 938 – Statement of Lapsley (WIT.3001.002.0001) [13]–[16]

8 Exhibit 285 – Statement of Tune, Attachment 7 (WIT.4005.001.0361) at 0362; Exhibit 590 – Statement of Allen (WIT.3010.006.0131) at 0132

9 Exhibit 593 – Statement of Dickson (WIT.4018.001.0001) [56]–[63]; Exhibit 282 – Statement of Eltringham (WIT.4003.001.0001) [39]–[66]; Exhibit 285 – Statement of Tune (WIT.4005.001.0001) [39]–[54]; Exhibit 428 – Statement of Adams (WIT.4009.001.0001) [42]–[52]; Exhibit 377 – Statement of Ellett (WIT.4006.001.0001) [54]; Exhibit 378 – Statement of Jack (WIT.4007.001.0001) [57]–[63]; Exhibit 427 – Statement of English (WIT.4008.001.0001) [54]–[63]; Exhibit 465 – Statement of Malone (WIT.4010.001.0001) [51]–[55]; Exhibit 594 – Statement of Venville (WIT.4022.001.0001) [58]–[64]; Exhibit 650 – Statement of Creedon (WIT.4011.001.0001) [52]–[53]; Exhibit 651 – Statement of Hocking (WIT.4012.001.0001) [43]–[44]; Exhibit 677 – Statement of Kittel (WIT.4004.001.0001) [44]–[45], [47]–[50], [55]–[57]

10 Exhibit 851 – Submissions of Australian Red Cross – National Registration and Inquiry System (NRIS) (ARC.001.001.0002) at 0005

11 Exhibit 73 – Statement of McCulloch (WIT.043.001.0001_R) [40]; Exhibit 114 – Statement of O'Halloran (WIT.058.001.0001_R) [43]–[45]; Exhibit 173 – Statement of Wiltshire (WIT.075.001.0001_R) [25]; Exhibit 181 – Statement of Wasley (WIT.073.001.0001_R) [46]; Exhibit 373 – Statement of Thompson (WIT.3010.009.0291) [29]–[32]; Exhibit 545 – Statement of Ruhr (WIT.122.001.0001_R) [79]; Exhibit 718 – Statement of Grimmant (WIT.139.001.0001_R) [17]–[18]; Barton T8879:2–T8879:8

12 Strickland T15802:18–T15802:20

13 Exhibit 48 – Statement of Brown (WIT.029.001.0001_R) [22]

14 Cowdery T6871:27–T6872:8

15 Exhibit 640 – Statement of Butera (WIT.3010.001.0098) [41]–[43]

16 Exhibit 173 – Statement of Wiltshire (WIT.075.001.0001_R) [25]; Exhibit 208 – Statement of Hughes (WIT.080.001.0001_R) [47]

17 Exhibit 210 – Statement of Brown, Attachment 4 (SOV.001.001.0029) at 0058

18 Exhibit 522 – Statement of Mortimer (WIT.118.001.0001_R) at 0009_R–0016_R; Mortimer T11234:7–T11234:18

19 Exhibit 533 – Statement of Barrow (WIT.121.001.0001_R) [93]

20 Exhibit 906 – Statement of Kenney (WIT.161.001.0001_R) [21]–[24]

21 Exhibit 95 – Statement of Fraser (WIT.048.001.0001_R) [32]–[35]

22 Exhibit 889 – Statement of Wunderlich (WIT.157.001.0001_R) [63], [93]

23 Exhibit 929 – Statement of Harland (WIT.163.001.0001_R)

24 Exhibit 989 – Submissions of the Victorian Adult Burns Service (SUBM.002.052.0117) at 0119

25 Exhibit 530 – Statement of Woods (SUMM.044.002.1112_R) at 1117_R

26 Exhibit 530 – Statement of Woods (SUMM.044.002.1112_R) at 1117_R

27 Exhibit 587 – Statement of Smith (WIT.3004.030.0001) [160], [234]; McGahy T2256:18–T2257:13, T2258:7–T2258:16

28 Exhibit 537 – Statement of Whitford (WIT.120.001.0001_R) [50]

29 Exhibit 537 – Statement of Whitford (WIT.120.001.0001_R) [47]

30 Exhibit 61 – Statement of Olorenshaw (WIT.034.001.0001_R) [104]–[105]; Exhibit 200 – Statement of Bennett (WIT.078.001.0001_R) [23]

31 Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [78]–[79]

32 Exhibit 77 – Statement of Walter (WIT.041.001.0001_R) at 0010_R

33 Exhibit 938 – Statement of Lapsley (WIT.3001.002.0001) at 0088

34 Exhibit 838 – Internal Review of DPI's Response to the February 2009 Fires (DPI.001.001.0258) at 0288

35 Exhibit 838 – Internal Review of DPI's Response to the February 2009 Fires (DPI.001.001.0258) at 0287

36 Exhibit 364 – Statement of Barton (WIT.3010.005.0001) [35]; Barton T8868:18–T8868:20

37 Ferguson T948:15–T948:20

38 Exhibit 938 – Statement of Lapsley (WIT.3001.002.0001) [20]

39 Exhibit 938 – Statement of Lapsley (WIT.3001.002.0001) [21]

40 Exhibit 989 – Victoria State Emergency Service Annual Report 2008–2009 (TEN.308.001.0080) at 0099

41 Exhibit 139 – Victorian Bushfire Reconstruction and Recovery Authority – 100 Day Report (TEN.046.001.0001) at 0007; Exhibit 989 – Australian Red Cross Annual Report 2008–2009 (TEN.308.001.0001) at 0014

42 Exhibit 212 – Statement of Edmonds (WIT.063.001.0001_R) [47]

43 Exhibit 416 – Statement of Verlaan (WIT.095.001.0001_R) [51]

44 Exhibit 680 – Statement of Cook (WIT.131.001.0001_R) [29]

45 Exhibit 785 – Statement of Enden (WIT.147.001.0001_R) [47]

46 Exhibit 323 – Statement of Kenealy (WIT.101.001.0001_R) [46]–[59]

47 Exhibit 987 – Schedule 1 – MAV Initiatives (DOC.MAV.003.0001)

48 Exhibit 988 – Schedule 2 – Council Initiatives (DOC.MAV.003.0005)

49 Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) [83]

50 B Teague, R McLeod, S Pascoe, ***2009 Victorian Bushfires Royal Commission: Interim Report***, Parliament of Victoria, Melbourne, August 2009, Recommendation 6.4

51 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004)

52 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004); Comrie T17462:1–T17462:17

53 Exhibit 114 – Statement of O'Halloran (WIT.058.001.0001_R) [43]–[45]; Exhibit 73 – Statement of McCulloch (WIT.043.001.0001_R) [24]; Exhibit 367 – Statement of Hunter (WIT.3009.001.0001) [27]; Barton T8879:2–T8879:7

54 Exhibit 103 – Statement of Barber (WIT.046.001.0001_R) [34]

55 Exhibit 848 – Statement of Elledge (WIT.154.001.0001_R) [15]–[41]; Exhibit 349 – Statement of Kennedy (WIT.102.001.0001_R)

56 Kennedy T8561:1–T8561:3

57 Exhibit 342 – Statement of Collery (SUMM.044.003.0706_R) at 0711

58 Exhibit 848 – Statement of Elledge (WIT.154.001.0001_R)

59 Exhibit 848 – Statement of Elledge (WIT.154.001.0001_R) [41]

60 Exhibit 586 – Statement of Buntine (WIT.127.001.0001_R) at 0019_R–0020_R

61 Exhibit 850 – Statement of Channells (WIT.6008.001.0001) [5]–[6]; Exhibit 851 – Submissions of Australian Red Cross – National Registration and Inquiry System (NRIS) (ARC.001.001.0002)

62 Exhibit 851 – Submissions of Australian Red Cross – National Registration and Inquiry System (NRIS) (ARC.001.001.0002); Exhibit 850 – Statement of Channells (WIT.6008.001.0001)

63 Grant T17579:3–T17579:7, T17580:13–T17581:4

64 Exhibit 851 – Submissions of Australian Red Cross – National Registration and Inquiry System (NRIS) (ARC.001.001.0002) at 0003

65 Exhibit 176 – Statement of Haggar (WIT.072.001.0001_R) [32]; Exhibit 208 – Statement of Hughes (WIT.080.001.0001_R) [49]–[53]; Exhibit 116 – Statement of Matthews (WIT.057.001.0001_R) [49]–[50]

66 Exhibit 108 – Statement of Brown (WIT.053.001.0001_R) [45]

67 Exhibit 849 – Statement of Grant (WIT.3010.010.0001) [12]–[15]; Grant T17593:12–T17593:31

68 Nixon T17383:2–T17384:24

69 Exhibit 849 – Statement of Grant (WIT.3010.010.0001) [28]–[42]

70 Exhibit 849 – Statement of Grant, Annexure 5 (WIT.3010.010.0044)

71 Submissions of the State of Victoria – Leadership – Emergency Management Coordination – Command and Control (RESP.3000.006.0217) [137]

72 Exhibit 851 – Submissions of Australian Red Cross – National Registration and Inquiry System (NRIS) (ARC.001.001.0002) at 0013

73 Exhibit 850 – Statement of Channells (WIT.6008.001.0001) [1], [23]–[24]

74 Exhibit 21 – Police Forward Command Post Log, 7 February 2009 (TEN.003.001.0001) at 0009; Exhibit 45 – Statement of Pearce (WIT.032.001.0001) [45]; Pearce T1482:20–T1482:29

75 Exhibit 838 – Ministerial, Commonwealth and Victorian Bodies Governance Arrangements (DOC.AGS.001.0054)

76 Exhibit 845 – Commonwealth Response and Recovery Assistance Following the 2009 Victorian Bushfires (RESP.6007.001.0001) [3.2]

77 Exhibit 845 – Commonwealth Response and Recovery Assistance Following the 2009 Victorian Bushfires (RESP.6007.001.0001) [3.2]

78 Exhibit 845 – Commonwealth Response and Recovery Assistance Following the 2009 Victorian Bushfires (RESP.6007.001.0001) [3.6]

79 Exhibit 989 – Australian Federal Police – Background Briefing on Involvement in Recovery From 7 February 2009 Bushfires (DOC.AGS.001.0002); Exhibit 845 – Commonwealth Response and Recovery Assistance Following the 2009 Victorian Bushfires (RESP.6007.001.0001) [3.27]–[3.29]

80 Exhibit 502 – Statement of Power (WIT.6002.001.0001) [18]

81 Exhibit 845 – Commonwealth Response and Recovery Assistance Following the 2009 Victorian Bushfires (RESP.6007.001.0001) [3.90]–[3.101]

82 Exhibit 845 – Commonwealth Response and Recovery Assistance Following the 2009 Victorian Bushfires (RESP.6007.001.0001) [4.50]–[4.54]

83 Exhibit 839 – Statement of Leadbeater (WIT.153.002.0001_R) [84]–[90], [101]–[102]

84 Exhibit 774 – Exemption under Section 158 of the Environmental Protection and Biodiversity Conservation Act 1999 (DEWH.001.001.0411)

85 Exhibit 837 – Victorian Bushfire Reconstruction and Recovery Authority Report (VBRA.300.001.0001) [5]–[8]

86 Exhibit 139 – Victorian Bushfire Reconstruction and Recovery Authority – 100 Day Report (TEN.046.001.0001) at 0004

87 Nixon T17375:22–T17375:23, T17377:18–T17377:20

88 Exhibit 139 – Victorian Bushfire Reconstruction and Recovery Authority – 100 Day Report (TEN.046.001.0001) at 0006

89 Exhibit 139 – Victorian Bushfire Reconstruction and Recovery Authority – 100 Day Report (TEN.046.001.0001); Exhibit 838 – Victorian Bushfire Reconstruction and Recovery Authority – 12 Month Report (TEN.250.003.0001)

90 Nixon T17378:5–T17379:15

91 Nixon T17379:16–T17379:31

92 Exhibit 837 – Victorian Bushfire Reconstruction and Recovery Authority Report (VBRA.300.001.0001) [67]

93 Nixon T17381:17–T17381:19

94 Nixon T17380:31–T17381:4, T17381:8–T17381:19

95 Exhibit 385 – Statement of Cherry (WIT.107.001.0001_R) [38]; Exhibit 224 – Statement of Cowdery (WIT.081.001.0001_R) [31]; Exhibit 244 – Statement of Easterbrook (WIT.085.001.0001_R) [76]; Exhibit 380 – Statement of Lynch (WIT.094.001.0001_R) [25]

96 Exhibit 680 – Statement of Cook (WIT.131.001.0001_R) [31]

97 Exhibit 586 – Statement of Buntine (WIT.127.001.0001_R) [69]–[71]

98 Exhibit 989 – Victorian Bushfire Case Management Service (TEN.303.001.0003)

99 Exhibit 873 – Statement of Abotomey (WIT.155.001.0001_R) [17]–[24]

100 Exhibit 380 – Statement of Lynch (WIT.094.001.0001_R) [25]–[28]

101 Exhibit 391 – Statement of Kleinig (WIT.099.001.0001_R) [19]–[21]; Exhibit 390 – Statement of Wigginton (WIT.100.001.0001_R) [21]–[22]

102 Exhibit 362 – Statement of Glenn (WIT.066.001.0001_R) [35]–[37]

103 Exhibit 989 – Loddon Mallee Housing Services – Response to Black Saturday (TEN.305.001.0247) at 0248, 0252–0255, 0261, 0264

104 Exhibit 987 – Schedule 1 – MAV Initiatives (DOC.MAV.003.0001) at 0002

105 Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) [30]–[31], Annexure 9 (WIT.3003.001.0326)

106 Exhibit 538 – Statement of Grigg, Annexure 4 (WIT.3001.001.0123) at 0130–0131

107 Exhibit 538 – Statement of Grigg, Annexure 4 (WIT.3001.001.0123) at 0130–0131, 0137

108 Exhibit 837 – Victorian Bushfire Reconstruction and Recovery Authority Report (VBRA.300.001.0001) [140]

109 Grigg T11712:6–T11712:24

110 Exhibit 855 – CFA Annual Report 2009 (TEN.205.001.0001) at 0048; Exhibit 857 – Department of Sustainability and Environment Annual Report 2009 (TEN.201.001.0001) at 0024; Exhibit 989 – Parks Victoria Annual Report 2009 (RSCH.040.001.0632) at 0687; Exhibit 989 – Ambulance Victoria Annual Report 2008–2009 (TEN.303.001.0290) at 0339

111 Exhibit 536 – Valent Report (EXP.009.001.0001) at 0007; Valent T11673:13–T11673:15

112 McFarlane T11638:4–T11638:8

113 Exhibit 535 – McFarlane Report (EXP.007.002.0005) [172], [174], Attachment 2 (EXP.007.002.0071); Exhibit 536 – Valent Report (EXP.009.001.0001) at 0007, Attachment 1 (EXP.009.001.0010)

114 Exhibit 535 – McFarlane Report (EXP.007.002.0005) [5], [12], [25], [97]

115 Exhibit 535 – McFarlane Report (EXP.007.002.0005) [2]–[13]

116 Exhibit 535 – McFarlane Report (EXP.007.002.0005) [18], [93]–[96], [172]

117 Valent T11659:4–T11660:19

118 McFarlane T11638:2–T11638:23; Valent T11673:21–T11673:28

119 Exhibit 538 – Statement of Grigg (WIT.3001.001.0001) [83]–[84]

120 Grigg T11711:1–T11711:26

121 Exhibit 837 – Victorian Bushfire Reconstruction and Recovery Report (VBRA.300.001.0001) [54]–[57]

122 Exhibit 837 – Victorian Bushfire Reconstruction and Recovery Report (VBRA.300.001.0001) [125]

123 Exhibit 533 – Statement of Barrow (WIT.121.001.0001_R) [112]–[114]; Exhibit 889 – Statement of Wunderlich (WIT.157.001.0001_R) [84]; Exhibit 929 – Statement of Harland (WIT.163.001.0001_R) [14]

124 Exhibit 265 – Statement of Exell (WIT.083.001.0001_R) [33]

125 Exhibit 839 – Statement of Leadbeater (WIT.153.002.0001_R) [80]–[88]

126 Exhibit 839 – Statement of Leadbeater (WIT.153.002.0001_R) [85]

127 Exhibit 170 – Statement of Frazer-Jans (WIT.074.001.0001_R) [80]–[88]; Exhibit 77 – Statement of Walter (WIT.041.001.0001_R) [2]; Exhibit 369 – Statement of Brown (WIT.108.001.0001_R) [34]–[40]

128 Exhibit 95 – Statement of Fraser (WIT.048.001.0001_R) [41]

129 Exhibit 781 – Statement of Nelthorpe, Annexure 2 (WIT.148.001.0026) at 0030

130 Exhibit 781 – Statement of Nelthorpe, Annexure 6 (WIT.148.001.0081) at 0085, 0127, 0172

131 Exhibit 781 – Statement of Nelthorpe, Annexure 6 (WIT.148.001.0081) at 0132–0133

132 Exhibit 781 – Statement of Nelthorpe, Annexure 7 (WIT.148.001.0169) at 0172–0173

133 Submissions of the Commonwealth – Fire Services Levy and Insurance Discussion Paper (DRSP.001.001.0210_R) at 0213_R

134 Nelthorpe T16356:16–T16357:4

135 Nelthorpe T16361:8–T16363:15

136 Exhibit 778 – An Analysis of the Demand for House and Contents Insurance in Australia (WIT.7538.001.0084) at 0089–0090

137 Exhibit 778 – The Non-Insured – Who, Why and Trends (WIT.7538.001.0040) at 0071–0072

138 Tooth T16304:23–T16307:12

139 Exhibit 781 – Statement of Nelthorpe (WIT.148.001.0001_R) [47]–[49]

140 Exhibit 781 – Statement of Nelthorpe (WIT.148.001.0001_R) [50]

141 Nelthorpe T16364:21–T16364:25, T16358:28–T16359:3

142 Exhibit 947 – Australia's Future Tax System – Report to the Treasurer, December 2009 (TEN.296.001.0001) at 0002

143 Exhibit 6 – Statement of Waller, Annexure 4 (WIT.002.001.0137) at 0145

144 Exhibit 989 – Submission of the Victorian Association of Forest industries (SUBM.002.028.0179_R) at 0203_R–0204_R

145 Exhibit 732 – Adams Report (EXP.018.001.0002) at 0007

146 Exhibit 734 – Cheney Report (EXP.017.001.0001) at 0013

147 Exhibit 857 – Department of Sustainability and Environment Annual Report 2009 (TEN.201.001.0001) at 0005, 0051

148 Exhibit 989 – Melbourne Water Sustainability Report (RSCH.040.001.1019) at 1022–1024; Exhibit 857 – Department of Sustainability and Environment Annual Report 2009 (TEN.201.001.0001) at 0037

149 Exhibit 989 – Department of Primary Industries Annual Report 2008–09 (TEN.303.001.0414) at 0423, 0440

150 *Country Fire Authority Act 1958,* s. 30

151 Exhibit 903 – Statement of Clements, Attachment 5 (WIT.162.001.0040) at 0042

152 Exhibit 903 – Statement of Clements (WIT.162.001.0001_R) [32]–[35]

153 Exhibit 210 – Statement of Brown, Attachment 4 (SOV.001.001.0029) at 0058

154 Exhibit 139 – Victorian Bushfire Reconstruction and Recovery Authority – 100 Day Report (TEN.046.001.0001) at 0007

155 Exhibit 989 – Victorian Bushfire Reconstruction and Recovery Authority – 15 Month Report (TEN.306.001.0001) at 0004

156 Exhibit 903 – Statement of Clements, Attachment 5 (WIT.162.001.0040) at 0042

157 Exhibit 903 – Statement of Clements, Attachment 5 (WIT.162.001.0040) at 0041

158 Exhibit 903 – Statement of Clements (WIT.162.001.0001_R) [36]–[39]

159 Exhibit 903 – Statement of Clements (WIT.162.001.0001_R) [38]

160 Exhibit 244 – Statement of Easterbrook (WIT.085.001.0001_R) [74]

161 Exhibit 903 – Statement of Clements (WIT.162.001.0001_R) [25]–[29]

162 Exhibit 308 – Statement of Hay (WIT.092.001.0001_R) [1], [24]–[28]

163 Exhibit 182 – Statement of Moore (WIT.076.001.0001_R) [36]–[40]

164 *Conservation, Forests and Lands Act 1987*; *National Parks Act 1975*; *Catchment and Land Protection Act 1994*; *Wildlife Act 1975*; *Prevention of Cruelty to Animals Act 1986*; *Domestic Animals Act 1984*

165 Exhibit 831 – Emergency Management Manual Victoria (RESP.3001.003.0001_R) at 0165, 0219, 0249

166 Exhibit 989 – RSPCA Victoria Annual Report 2009 (RSCH.040.001.0547) at 0571

167 Exhibit 989 – Submissions of the Victorian Association of Forest Industries (SUBM.002.028.0179_R) at 0197_R–0198_R

168 Exhibit 989 – Department of Primary Industries Annual Report 2008–09 (TEN.303.001.0414) at 0423; Exhibit 838 – Internal Review of DPI's Response to the February 2009 Fires (DPI.001.001.0258) at 0277

169 Exhibit 244 – Statement of Easterbrook (WIT.085.001.0001_R) [66]–[67]

170 Exhibit 246 – Statement of McDonald (WIT.084.001.0001) [56]–[62]

171 Exhibit 831 – Emergency Management Manual Victoria (RESP.3001.003.0001_R) at 0196_R; Exhibit 831 – Defending Your Property – Prepare and Act Early to Survive (RESP.3001.001.0083) at 0107

172 Streblow T18719:4–T18719:12

173 Exhibit 989 – RSPCA Victoria Annual Report 2009 (RSCH.040.001.0547) at 0571

174 Exhibit 864 – Statement of Sorraghan (WIT.156.001.0001_R) [31]

175 Exhibit 459 – Statement of Siddle (WIT.115.001.0001_R) [30]

176 Exhibit 838 – Internal Review of DPI's Response to the February 2009 Fires (DPI.001.001.0258) at 0277, 0290

177 Exhibit 838 – Working with Fire Agencies at Bushfires – Protocols for Volunteers Involved in Wildlife Rescue Operations – February 2010 (TEN.250.005.0001)

178 Exhibit 837 – Victorian Bushfire Reconstruction and Recovery Authority Report (VBRA.300.001.0001) [208]

179 Exhibit 989 – The Report of the Bushfire Recovery Taskforce – ACT October 2003 (RSCH.040.001.0202) at 0332

SHARED RESPONSIBILITY 9

9 SHARED RESPONSIBILITY

The bushfire safety policy for Victoria, recommended in Chapter 1, is designed to ensure that people can be safe during bushfires and assigns responsibility for this to both government and individuals. This chapter, which should be read in conjunction with Chapter 1, focuses on how those responsibilities are shared and calls for all parties to assume greater responsibility.

9.1 THE COMMISSION'S VIEW

Pervading the Commission's report is the idea that responsibility for community safety during bushfires is shared by the State, municipal councils, individuals, household members and the broader community. A fundamental aspect of the Commission's recommendations is the notion that each of these groups must accept increased responsibility for bushfire safety in the future and that many of these responsibilities must be shared.

The term 'shared responsibility' can be interpreted in various ways. During the 1990s a policy change in Australian emergency management led to a move towards 'shared responsibility', also called a 'community safety approach'. The state agency–centred approach to hazard management was replaced by a model that sought to make community members increasingly self-reliant.[1] In keeping with the policy, contingency options such as community refuges were decommissioned.[2] It was also during this period that the 'Prepare, Stay and Defend or Leave Early' policy was developed in Victoria—consistent with the focus on community self-reliance.[3]

In this report the Commission uses the expression 'shared responsibility' somewhat differently, with the purpose of implying increased responsibility for all concerned, albeit at different levels. In Chapter 1 the Commission proposes that state agencies and municipal councils assume augmented roles in relation to emergency management, contingency planning and education. For example, it recommends that municipal councils designate community refuges and bushfire shelters for the community. Such a recommendation envisages that, in turn, communities (and individuals and households in those communities) will assume greater responsibility for their own safety.

Shared responsibility would create a situation in which the State, municipal councils, individuals, household members and the broader community all contribute to mitigating bushfire risk. Some of these contributions would overlap. For example, all landholders need to take bushfire risk–reduction measures: being a landholder, the Department of Sustainability and Environment should conduct prescribed burns on public land, and individual property owners and tenants should maintain their properties in a manner that reduces risk from bushfires. The State needs to provide educational material that describes risks and advises the community about ways of managing them. In turn, community members need to be open to this advice.

Shared responsibility does not mean equal responsibility: in the Commission's view there are some areas in which the State should assume greater responsibility than the community. For example, in most instances state fire authorities will be more capable than individuals when it comes to identifying the risks associated with bushfire; the State should therefore assume greater responsibility for working to minimise those risks.

9.2 STATE AGENCIES AND MUNICIPAL COUNCILS

The Commission considers that, in general, the State and local governments need to provide better leadership and guidance. For the State (including fire agencies), this includes strengthening fire mitigation measures, providing more effective warnings and education, providing evacuation advice as required during bushfires, improving fire-suppression techniques and practices, deftly managing people during an emergency, providing assistance for vulnerable people, and offering frank advice about the defendability of property to individuals and households.

Among the responsibilities of municipal councils are developing local plans, providing community refuges and bushfire shelters (in partnership with the State), implementing vegetation and roadside management programs (in accordance with simplified legislative processes) and ensuring compliance with building and land-use planning provisions.

Individuals and communities also play an important part in contributing to community safety during bushfires, but they need support from the State and from municipal councils. The support offered must be relevant, appealing and easy to obtain; it should be available in a variety of forms; and it should cater for a variety of needs.

9.3 INDIVIDUALS

Bushfire safety depends greatly on the behaviour of individuals and involves considerations that can be difficult, time consuming and complex. The Commission envisages that individuals in areas of high fire risk will take responsibility for their own safety. This might mean them doing the following:

- attending community education meetings, adequately maintaining properties to minimise fire risk, and preparing a comprehensive household fire plan
- ensuring the safety of vulnerable people
- deciding on options and, if a severe bushfire threatens, where they will relocate
- balancing the cost of building and maintaining protective infrastructure such as a bunker and buying robust but expensive firefighting equipment against other measures
- deciding what to do with pets and other animals during an evacuation or when defending a property
- deciding what personal property to take and what to abandon in an emergency.

People living in rented housing might not be able to deal with some of these considerations independently. The Commission urges tenants to be active in raising any concerns with their landlords.

The factors affecting bushfire safety are dynamic: conditions can change radically during a bushfire.[4] This means individuals need to have contingency plans and to make decisions as the situation evolves. For example, plans to stay and defend a property can be compromised by a sudden loss of water or a wind change that makes the property undefendable. Similarly, plans to evacuate might be foiled by road blockages or car failure.

Individuals who live in fire-prone areas need to take the initiative in learning about, preparing for and responding to bushfires. This means they need to devote a considerable amount of time and effort to learning about bushfires and about how fire in their local area might affect them. They must also update and refresh their bushfire knowledge regularly, to make sure they are as well prepared as possible during each fire season.

Crucially—and in accordance with the proposed Black Saturday Upgrade (see Chapter 1)—individuals must develop an understanding of the difference between a 'normal' bushfire and a ferocious fire (like those experienced on 7 February 2009) and how to respond in each case. It is also important to accept that it might not always be possible to anticipate what type of fire is approaching before it actually arrives. In such cases individual planning needs to be 'worst case'.

For most people, it will not be enough to rely on the bushfire awareness of family, neighbours and friends: personal awareness is essential. The Commission was disappointed to hear evidence about poorly attended CFA information sessions before 7 February.[5] It urges all who live in bushfire-prone areas to avail themselves of the information and education sessions fire authorities provide.

In Chapter 1 the Commission recommends improving official warnings when bushfires threaten communities, to help community members understand the safest available options. If warnings are to be effective, though, individuals must listen and watch for those relevant to them. And they must act on them without delay and be ready to change their plans to suit changing local conditions. If possible, on days of high fire danger people should monitor radio and television stations and websites and contact the Victorian Bushfires Information Line and their neighbours in their 'phone tree' to obtain information. Mobile phones should be charged in advance and carried at all times. People should not wait to receive personal warnings from authorities.

Depending on the severity of a fire, the weather conditions and the topography, some individuals and groups of people will need help to protect themselves when a bushfire looms. Some people will need more assistance than others, and people with vulnerabilities will probably need different levels of support from the State and from municipal councils. The Commission recommends planning and evacuation support for vulnerable people, as discussed in Chapter 1.

To the extent that they are able to contribute to their own safety, vulnerable people should be encouraged and empowered to do so, but they should be discouraged from staying to defend property.

9.4 HOUSEHOLDS

Household planning is vital. Each household should have a customised bushfire safety plan that can be adapted to suit changing circumstances. The plan should take into account the health and age of the household members, the number of people who live in the house (and the fact that some might not be home or visitors might be present when bushfires threaten), the location of the house, the topography and vegetation, and advice received about the defendability of the house. A 'one size fits all' approach is not suitable: plans are likely to differ between households in the same street. Similarly, household members need different plans for different types of bushfires. For example, it might be feasible for some people to stay and defend a well-prepared and defendable property against a 'normal' bushfire, but that plan could prove lethal in the face of a ferocious fire, when some properties are simply not defendable.

Household members are dependent on each other during a bushfire. The Commission received evidence showing that disagreement among household members about what to do during a bushfire can have tragic consequences.[6] Before each fire season all household members need to agree about the terms of their bushfire safety plan (including contingency plans), the triggers for action, and how they will act on the plan during an emergency.

Households should pay specific attention to the safety of vulnerable people.

9.5 COMMUNITIES

Communities that have a large number of informed individuals who work together will be safer and stronger. Individual members of these communities can make themselves safer by drawing on the support and resources of others.

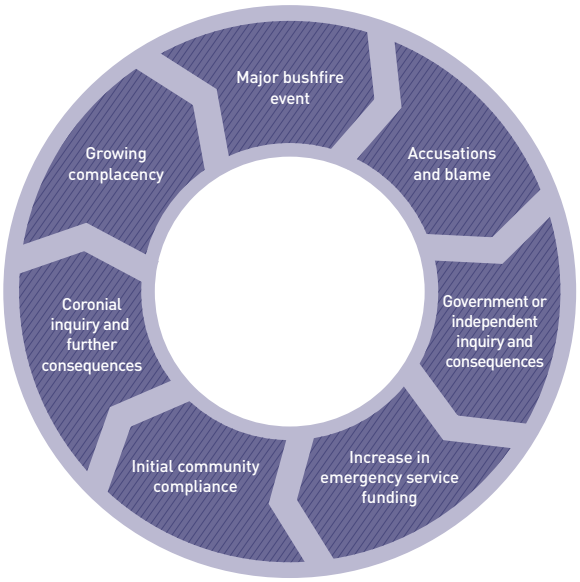
Evidence the Commission received suggests that some of the best prepared people on 7 February were those who were involved with their communities in forming community 'fireguard' groups and 'phone trees'. The Commission observed, however, that being well prepared is no guarantee of survival: the extreme conditions of the day overwhelmed many, and some well-prepared people died because the fire was savage and their home was not defendable.[7] The entire community must come to understand the difference between this type of fire and a 'normal' bushfire and plan accordingly.

9.6 COMPLACENCY

Fast-moving fires of extreme intensity can occur in Victoria during any summer, and in the past century they have increasingly occurred in populated areas. Bushfires causing 10 or more deaths have occurred roughly once in a generation, although climate change could cause fires of this nature to become more numerous in future.[8]

The Commission considers that community and government complacency can place some people at risk of death when bushfires occur. The State needs to help break this cycle with sustained efforts to deliver frank education and public awareness campaigns. Individuals, household members and communities share responsibility for ensuring lasting compliance with Victoria's revised bushfire safety policy. Figure 9.1 illustrates how complacency sets in between catastrophic bushfires.[9]

Figure 9.1 The bushfire cycle



Source: Exhibit 142 – 2004 COAG Report.[10]

9.7 COMMUNITY MEMORY

The Commission is concerned that 'community memory' of ferocious fires is difficult to maintain.[11] A lack of such memory has been evident in the past. For example, in his report on the 1939 Black Friday fires, Justice Stretton described the severe drought conditions that preceded those fires and observed:

> Men who had lived their lives in the bush went their ways in the shadow of dread expectancy. But though they felt the imminence of danger they could not tell that it was to be far greater than they could imagine. They had not lived long enough. The experience of the past could not guide them to an understanding of what might, and did, happen.[12]

The Commission notes with approval the memorials that are being or have been built in some of the places that were worst affected on 7 February and former Prime Minister Kevin Rudd's proposal to observe each anniversary of 7 February with a minute's silence and flags flying at half mast.[13] In Chapter 1 the Commission proposes measures (such as changes to school curricula) to help maintain community memory of bushfire safety and history.

The State's bushfire safety campaign should bluntly deliver the messages that ultimate responsibility for health and safety lies with individuals, that tragedy can come suddenly, and that bushfire can kill or have lifelong consequences. The Commission also urges the State to develop a range of incentives relating to individuals' bushfire safety behaviour.

9.8 DECISION MAKING

One theme that emerged from the evidence before the Commission was that people underestimated the threat posed by the bushfires of 7 February and appeared reluctant to change their plans, sometimes with fatal consequences.[14] Further, the experience of facing a bushfire can be very stressful, which can lead to poor decision making at the time. People need to take these factors into account when they plan their response to fire.

There are a number of situations in which people who would like to defend their home should abandon the idea, even if this is a difficult decision. Among such situations are the following:

- Household members have been advised or are otherwise aware that, because of the surrounding terrain and vegetation, their property is undefendable in any bushfire.
- A property is partially, but not adequately, equipped or prepared.
- The people who plan to fight the fire are responsible for the welfare of others who are vulnerable or are themselves vulnerable.
- Extreme weather conditions are predicted or there is a Black Saturday Upgrade, or both.

On the question of inadequate equipment, the Commission observed that suitable firefighting equipment is expensive and beyond the means of many people who live in bushfire-prone areas. It is the Commission's opinion that people who, for whatever reason, cannot adequately equip themselves to defend their properties should not try to defend them in any circumstances. The State should reinforce this message through educational programs and advice to individuals.

Bushfires also interrupt personal plans and create dilemmas. A number of people who died or almost died on 7 February were planning to celebrate a birthday party that evening.[15] Others were tourists.[16] When making the decision to stay and defend their properties, some people were influenced by their attachment to their pets or their 'dream home'.[17] Their decision making was often further complicated by insufficient warnings about the danger of the situation.

Even with better warnings, however, these personal dilemmas are not trivial or easily resolved. The Commission does not suggest that any of those who died gave insufficient priority to their safety, but it does consider that these types of dilemmas should be openly discussed in education programs. The education delivered should prompt people to consider their personal circumstances, not just their capacity to fight fire or evacuate in a particular way. For example, individuals need to be challenged to think about what they would do if bushfire threatened them before or during a party, or about whether they would protect or leave their pets. People need to be aware that bushfires do not necessarily arrive at convenient moments or allow time to make plans for the safety of people and property.

The simple message is that everyone who lives in (or visits) bushfire-prone areas in Victoria needs to understand that fires can occur regularly in those places during summer. When bushfires—particularly fast-moving fires of extreme intensity—occur in populated areas, there is potential for tragedy.

Sound preparation and effective responses on the part of the State, municipal councils, the community and individuals will collectively help to minimise harm.

1 Exhibit 101 – Statement of Rhodes (WIT.3004.002.0001) [86]–[88]

2 Free T2999:19–T2999:22; Esplin T18917:4–T18917:9

3 Exhibit 85 – Statement of Gledhill (WIT.025.002.0001) [10], [12], [14], [21]

4 Cova T18855:28–T18856:17

5 For example: Exhibit 390 – Statement of Wigginton (WIT.100.001.0001_R) [13]–[14]; Exhibit 385 – Statement of Cherry (WIT.107.001.0001_R) [7]

6 Exhibit 767 – Interactive Presentation – INTMEN 001825 (EXH.767.0001); Exhibit 835 – Statement of Thomas (WIT.152.001.0001_R) [8]

7 Exhibit 884 – Interactive Presentation – INTMEN 001835 (EXH.884.0001); Exhibit 567 – Interactive Presentation – INTMEN 001887 (EXH.567.0001); Exhibit 763 – Interactive Presentation – INTMEN 001873 (EXH.763.0001); Exhibit 950 – Interactive Presentation – INTMEN 001779 (EXH.950.0001)

8 Buxton T14526:24–T14526:28; Pinfold T14535:4–T14535:7

9 Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0267

10 Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0267

11 McFarlane T11633:3–T11634:19, T11634:29–T11635:14 ('Community memory' is used interchangeably with 'generational memory')

12 Exhibit 81 – 1939 Victorian Bushfires Royal Commission Report (TEN.028.001.0001) at 0004

13 Exhibit 998 – Address on the National Day of Mourning for the Victims of the Victoria Bushfires – Rod Laver Arena – Melbourne (TEN.310.001.0001)

14 Exhibit 362 – Statement of Glenn (WIT.066.001.0001_R); Exhibit 949 – Interactive Presentation – INTMEN 001868 (EXH.949.0001); Exhibit 293 – Interactive Presentation – INTMEN 001784 (EXH.293.0001)

15 Exhibit 805 – Interactive Presentation – INTMEN 001854 (EXH.805.0001); Exhibit 764 – Interactive Presentation – INTMEN 001785 and INTMEN 001979 (EXH.764.0001); Exhibit 765 – Interactive Presentation – INTMEN 001810 (EXH.765.0001)

16 Exhibit 829 – Statement of Wallace (WIT.151.001.0001_R); Exhibit 490 – Interactive Presentation – INTMEN 001976 (EXH.490.0001); Exhibit 565 – Interactive Presentation – INTMEN 001870 (EXH.565.0001)

17 Exhibit 567 – Interactive Presentation – INTMEN 001887 (EXH.567.0001); Exhibit 949 – Interactive Presentation – INTMEN 001868 (EXH.949.0001); Exhibit 809 – Interactive Presentation – INTMEN 001818 (EXH.809.0001); Exhibit 182 – Statement of Moore (WIT.076.001.0001_R) [23]; Exhibit 489 – Interactive Presentation – INTMEN 001797 (EXH.489.0001); Exhibit 770 – Interactive Presentation – INTMEN 001877 (EXH.770.0001)

ORGANISATIONAL STRUCTURE 10

10 ORGANISATIONAL STRUCTURE

The structure of Victoria's fire agencies is of long standing. The Department of Sustainability and Environment has links to the early 1900s, when its equivalent was the Department of State Forests. Firefighting brigades, representing the interests of municipalities, insurance companies and businesses, have been working in fire suppression throughout metropolitan Melbourne since 1845, and volunteer bushfire brigades have been working to suppress fires in rural and regional Victoria since 1926. The *Fire Brigades Act 1890* established the organisational structure of brigades that is still in effect today.[1]

The Commission acknowledges this long history of fire agencies. The events of 7 February 2009 tested the arrangements, however, and it became apparent to the Commission that some organisational factors inhibited the fire authorities' response on the day. There were serious deficiencies in the top-level leadership arrangements as a result of divided responsibilities, and the full potential of the operational capability that was available was not exploited because of differences in processes and procedures.

The Commission proposes the introduction of a new position of Fire Commissioner to lead the fire services and to undertake a program aimed at improving integration and interoperability between the different fire agencies. The occupant of the new position would also perform the role of State Controller under Victoria's emergency management framework.

Changes in the manner in which Victoria's fire services are funded are also warranted, and abolition of the Fire Services Levy is recommended. Further, revision of the geographic boundary delineating Metropolitan Fire and Emergency Services Board and Country Fire Authority areas of responsibility is proposed.

10.1 CURRENT ARRANGEMENTS

Three entities constitute Victoria's fire agencies, dating back to the *Fire Brigades Act 1890* and the *Forests Act 1907*. Their responsibilities are allocated according to the location of incidents within or outside the metropolitan fire district and whether land is publicly or privately owned.[2] Details of the organisations' human and financial resources are provided in Chapter 2 of Volume I as context for the discussion of the fire response on 7 February. The focus of this chapter is more on the governance and organisational structures than the workforce and resource base, however the remainder of this section is provided by way of background.

The CFA appoints a Chief Officer, and the operational equivalents in Department of Sustainability and Environment and Metropolitan Fire and Emergency Services Board are referred to as Chief Fire Officers. Collectively these officers are referred to here as Chief Officers for ease of reference. The organisational arrangements discussed in this chapter are those that applied on 30 June 2009 and were typically the arrangements applying on 7 February. The Commission notes from evidence provided by the Secretary of the Department of Justice that some changes to these structures have since been made.[3]

10.1.1 THE COUNTRY FIRE AUTHORITY

The Country Fire Authority was established in 1945 and operates under the *Country Fire Authority Act 1958*.[4] It is responsible for fire and emergency services (outside the metropolitan fire district) on private property throughout Victoria.[5] In addition to fire suppression, the CFA is involved in planning decisions, fire prevention programs and, most recently, provision of advice on community refuges and bushfire shelters.[6]

The CFA is a statutory authority with a government-appointed board, which is responsible to the Minister for Police and Emergency Services.[7] The organisation is headed by a Chief Executive Officer supported by seven directors, including the Chief Officer.[8] Figure 10.1 shows the CFA's organisational structure as at 30 June 2009.

The agency has a mix of equipment and resources to support its urban and rural firefighting activities and a large personnel base:

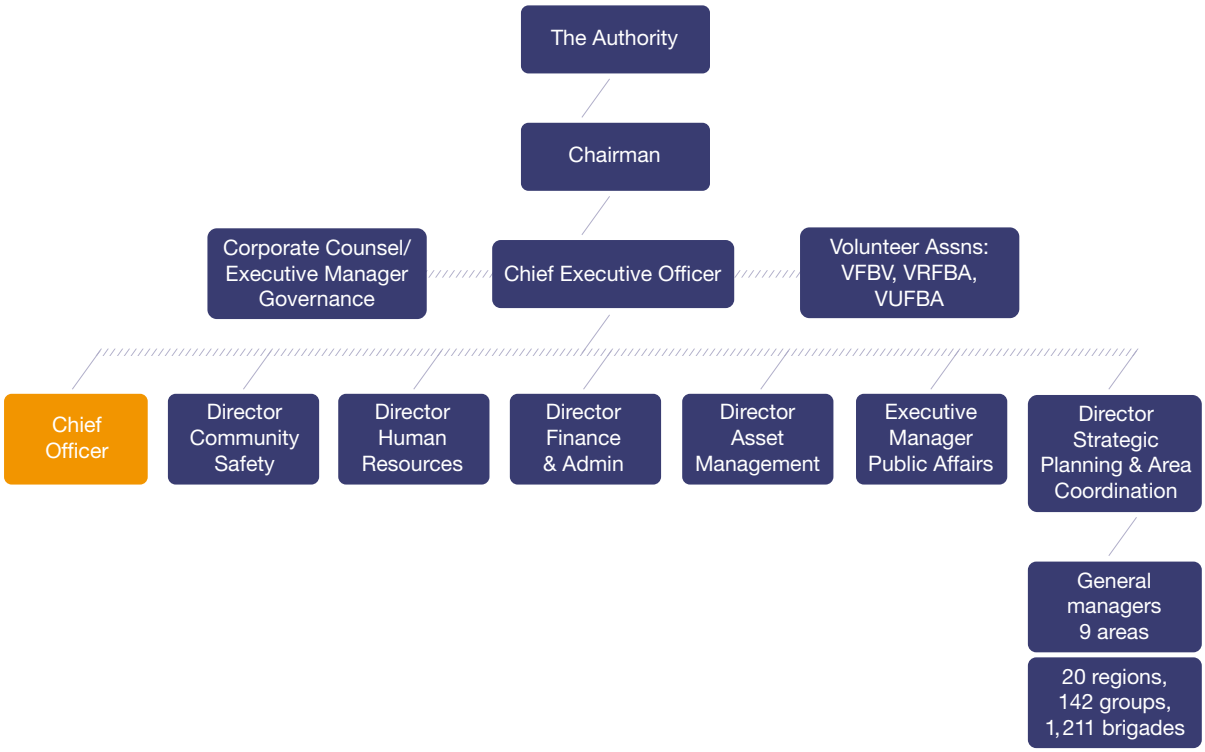
- some 60,000 volunteers—including more than 30,000 operational volunteers
- almost 2,000 employees—including more than 500 career (paid) firefighters.[9]

Chapter 2 in Volume I provides additional information about resourcing for the CFA.

A matrix management model is used to organise staff into seven directorates within CFA head office, nine general managers in area offices and 20 operational regions.[10] The Commission was advised that, like most Victorian government agencies, the CFA is moving its regional boundaries to align with those delineated in the State's social policy framework, A Fairer Victoria.[11] Firefighters are organised into 1,211 brigades, managed in 142 'groups' throughout Victoria; this includes 31 integrated stations operated by career and volunteer firefighters, which are typically located in outer metropolitan Melbourne and major regional centres.[12]

The CFA's large volunteer base offers comprehensive coverage of Victoria and considerable surge capacity for rural firefighting. As the organisation's Chief Officer, Mr Russell Rees, put it, this is a 'real strength for CFA'.[13] It is also a cost-effective way of delivering fire services, and it plays an important part in the life of many Victorian communities.[14]

Figure 10.1 Country Fire Authority organisation, 30 June 2009



Source: Drawn from Exhibit 855 – CFA Annual Report 2009.[15]

10.1.2 THE DEPARTMENT OF SUSTAINABILITY AND ENVIRONMENT

The Department of Sustainability and Environment is responsible to the Minister for the Environment and Climate Change, the Minister for Water, and the Parliamentary Secretary for Water and Environment.[16] DSE derives its primary legislative responsibilities relating to fire from the *Conservation, Forests and Lands Act 1987,* the *Forests Act 1958*, the *Country Fire Authority Act 1958*, the *Emergency Management Act 1986* and (for fire management on public land) the *National Parks Act 1975.*[17] DSE was created under the *Public Administration Act 2004* and evolved from the Department of State Forests, established in 1907, and more recently the Department of Natural Resources and Energy.[18]

At 30 June 2009 DSE was headed by a Secretary supported by one Deputy Secretary and three General Managers heading three offices.[19] One of these offices is Land and Fire Management, where the Chief Fire Officer and the Director Land and Fire Services report to an executive director. The Chief Fire Officer is responsible for managing fire on public land, including developing and maintaining fire management plans, prescribed burning programs and emergency response, although he (or she) is reliant on the Director Land and Fire Services, who manages 750 staff on the ground.[20] Figure 10.2 shows DSE's organisational structure as at 30 June 2009.

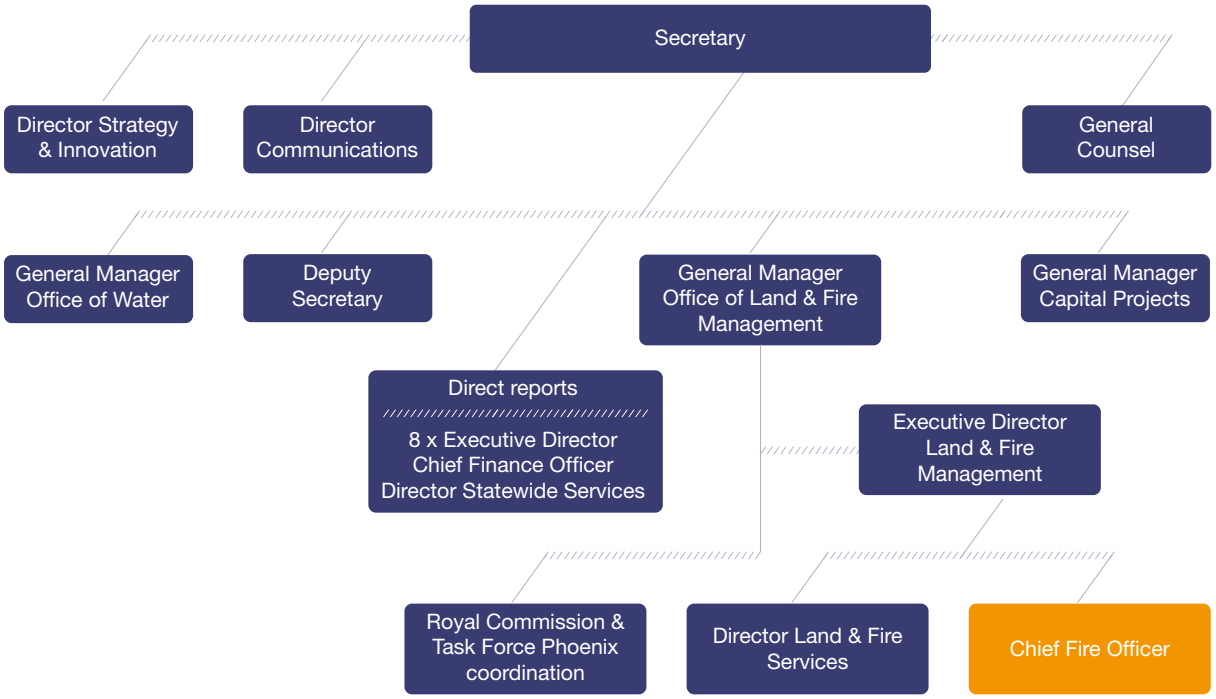
Victorian government departments (among them DSE) are organised according to the eight administrative regions set out in A Fairer Victoria. DSE fire organisations, however, continue to be organised into five fire regions and 18 fire districts.[21] The Commission heard evidence that DSE is committed to realigning its fire and emergency management planning and exercises consistent with the administrative regions.[22] Having also been advised that the CFA is changing to reflect A Fairer Victoria's regions, the Commission considers it advantageous for fire management within DSE to do the same.

DSE's firefighting equipment and resources are primarily designed for forest firefighting.[23] The department has access to the following firefighting personnel:

- 2,700 staff across the state with defined fire roles, of which more than 1,200 are on-ground firefighters
- 700 project or seasonal firefighters during summer.[24]

DSE coordinates the Networked Emergency Organisation, consisting of public sector agencies that contribute people and resources to fire management on public land—Parks Victoria, Melbourne Water, VicForests, the Department of Primary Industries and the Department of Planning and Community Development.[25]

Figure 10.2 Department of Sustainability and Environment organisation, 30 June 2009



Source: Drawn from Exhibit 857 – Department of Sustainability and Environment Annual Report 2009.[26]

10.1.3 THE METROPOLITAN FIRE BRIGADE

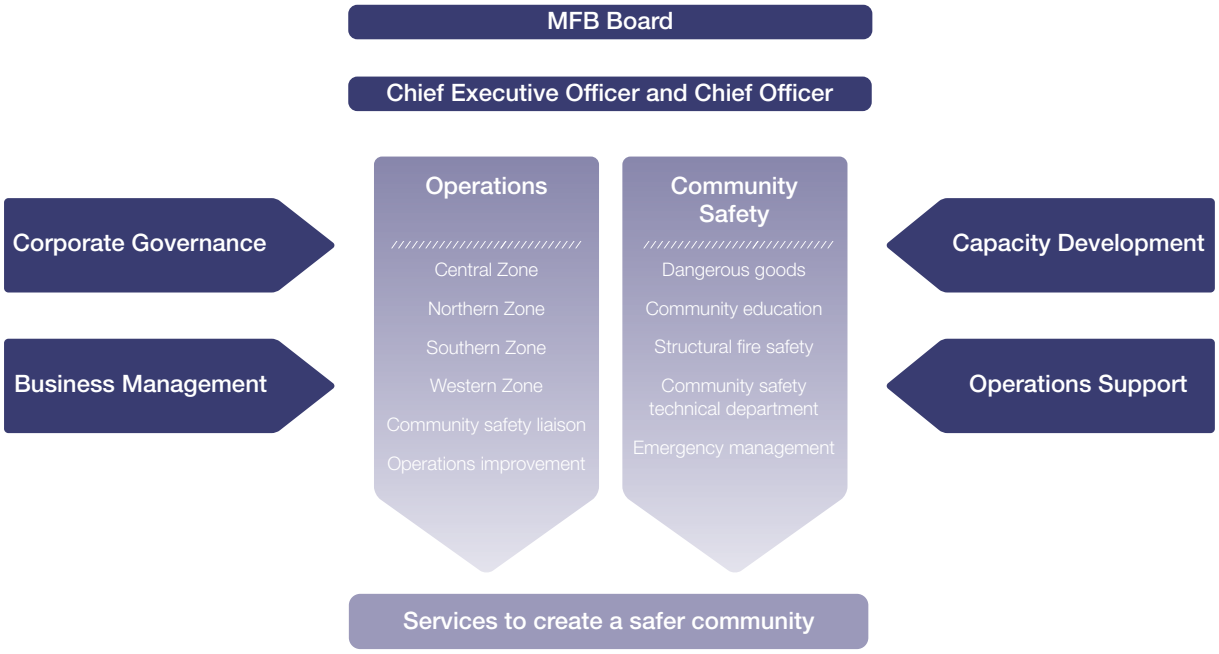
The Metropolitan Fire Brigade (formally known as the Metropolitan Fire and Emergency Services Board) was established in 1891 under the Fire Brigades Act. It currently operates under the *Metropolitan Fire Brigades Act 1958* and is responsible for fire and emergency services in the metropolitan fire district. This district was originally defined as a circle centred on the GPO in Melbourne and with a radius of 10 miles (about 16 kilometres). This was expanded, most notably in the 1960s, to include much, but certainly not all, of metropolitan Melbourne.[27]

The MFB is a statutory authority governed by a board appointed by government; the board is responsible to the Minister for Police and Emergency Services.[28] The Chief Executive Officer heads the organisation and also holds the position of Chief Officer. The CEO is supported by seven directors, including one appointed Chief Fire Officer, to whom four zone managers responsible for overseeing operations report.[29] Figure 10.3 shows the MFB's functions as at 30 June 2009.

The MFB employs over 2,000 staff, of which more than 1,700 are career firefighters.[30] It is 'a very highly urbanised brigade', maintaining in the metropolitan fire district 47 stations organised into four zones requiring 269 operational staff per shift.[31] Its equipment is generally not suited to off-road operations, and static, reticulated water is usually required.[32] When necessary, the MFB does provide a response outside the metropolitan fire district, in an arc within an hour's travel time along major transport routes.[33]

Both the MFB and the CFA come within the purview of the Department of Justice.

Figure 10.3 MFB functions, 30 June 2009



Source: Drawn from Exhibit 856 – MFB Annual Report 2008–2009. [34]

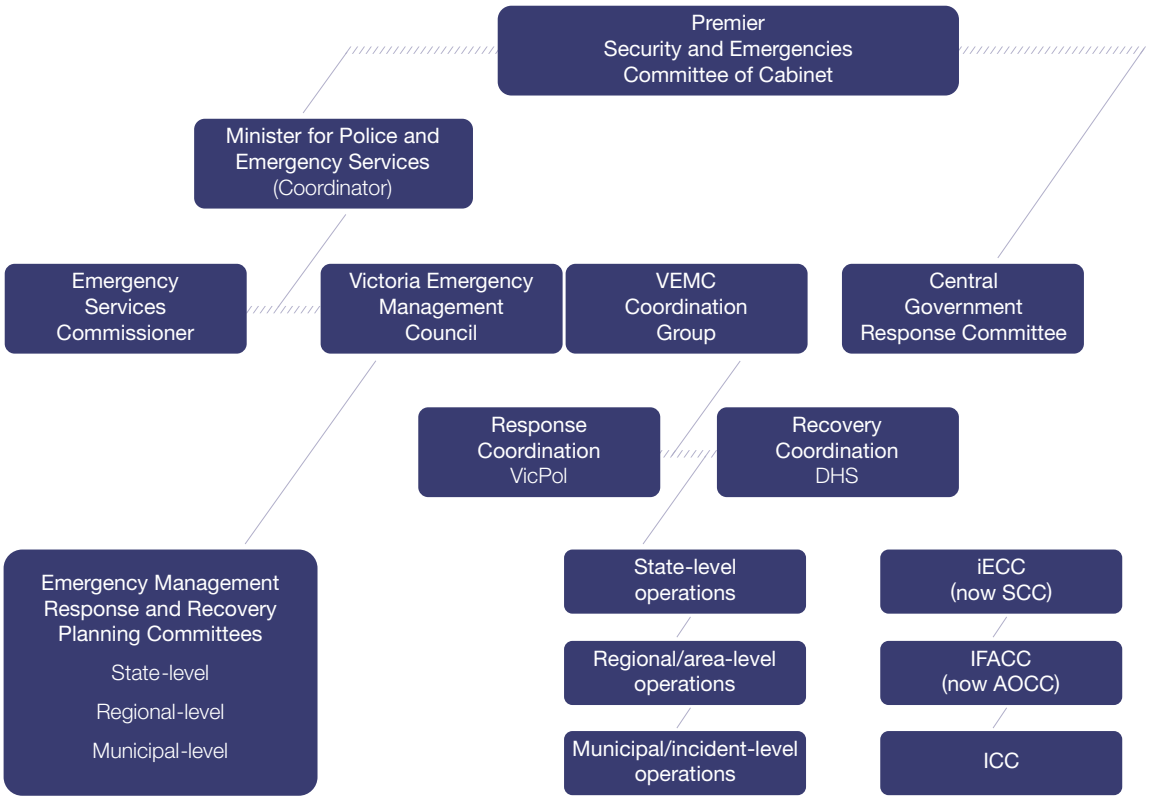
10.1.4 OTHER BODIES AND COORDINATION ARRANGEMENTS

Victoria has a multi-agency framework for emergency management, and arrangements are governed primarily by the Emergency Management Act. Specific emergency management arrangements are generally detailed in the *Emergency Management Manual Victoria,* although some arrangements are established directly between organisations.

Figure 10.4 shows the State's emergency management operational arrangements. The arrangements are not necessarily mandated in legislation, but they are central to the Government's planning of, response to and recovery from emergencies. The figure is taken from the *Emergency Management Manual Victoria.* The Commission identified where the integrated Emergency Coordination Centre (now the State Control Centre) sits within the overall structure; this is the centre from which bushfires are managed at the state level.[35] It also identified integrated fire agency coordination centres (now area of operations control centres), where bushfires are managed at the regional level, and incident control centres, where bushfires are managed at the local level. This is further discussed in Chapter 2.

Insertion of the three levels of operational response for fire reflects the State's overall emergency management structure.

Figure 10.4 Emergency management across agencies for operations



Source: Exhibit 831 - Emergency Management Manual Victoria.[36]

The roles and responsibilities of the Emergency Services Commissioner and Victoria Police are discussed in Chapter 2 of Volume I and in Chapter 2 of this volume.

10.1.5 INTEROPERABILITY

Each fire agency is governed and managed independently. In practice, however, as on 7 February, there are degrees of interoperability between the agencies:

- coordinated operational management between the CFA and DSE—such as regional and local joint control centres and co-location at the integrated Emergency Coordination Centre in Melbourne[37]
- joint incident management teams[38]
- joint standing operating procedures between the CFA and DSE[39]

- joint management of the Victorian Bushfire Information Line by the CFA and DSE[40]
- statewide strategies such as the 2008 Living with Fire strategy and joint fire prevention programs[41]
- integrated operational units such as the State Aircraft Unit[42]
- mutual aid agreements through memoranda of understanding between the MFB and the CFA that help both agencies respond on either side of the metropolitan fire district boundary[43]
- the Emergency Services Telecommunications Authority's provision of services to both the MFB and the CFA.[44]

10.2 THE NEED FOR OPERATIONAL IMPROVEMENT AND REFORM

The Commission heard evidence of examples of successful management of resources across agencies on 7 February.[45] There were, however, also instances of existing arrangements hindering operational performance, demonstrating that change is required.[46] The Commission developed its understanding of the operational strengths and weaknesses in order to ensure that any recommendations it makes target them well. The remainder of this section summarises the main shortcomings with implications for organisational structure. Operational shortcomings dominated, followed by matters of policy, at times reflected in legislation, and governance, which in some cases diluted and confused the chain of command.

10.2.1 OPERATIONAL SHORTCOMINGS

Unambiguous leadership and unity of command

On 7 February there was no single person in charge of operational planning, tasking and accountability. Responsibilities were divided between the CFA, DSE, the Chief Commissioner of Police, and the Emergency Services Commissioner. The two Chief Officers were responsible for the prevention and suppression of fire by their respective agencies. The Chief Commissioner of Police was responsible for coordination across agencies and ensuring the adequacy of public warnings.[47] The Emergency Services Commissioner advised and kept the Minister for Police and Emergency Services informed.[48]

This divided responsibility and accountability reflects arrangements in the Emergency Management Act, the Country Fire Authority Act and the *Emergency Management Manual Victoria.* It also reflects past practice and administrative arrangements agreed between agencies and with the minister. This meant that cooperation and coordination were the only viable approaches for managing the emergency on the day, since neither bushfire control agency nor anyone else had pre-eminence over the other in a statutory or practical sense. As a consequence, there was no cohesive and unambiguous leadership structure. This matter is further considered in Chapter 2 of this volume.

At the incident level, the appointment of Incident Controllers reflected which agency had legislative responsibility for the fire—DSE on public land and the CFA on private land. This was supported by a longstanding practice by the agencies but did not always result in the most appropriate person being appointed (see Chapter 2). Where control lines were not clear—for example, with the Alexandra Incident Management Team, where CFA Group officers continued to manage CFA resources—problems arose.

Implementation before the 2009–10 fire season of the new coordination, command and control arrangements (as detailed in Chapter 2) was an acknowledgment by the State that the arrangements on 7 February were unsatisfactory. Importantly, this also led to the designation of a single State Controller in the revised *Emergency Management Manual Victoria.*[49]

Duplication of systems and resources

Despite the best efforts of many in the CFA and DSE, and a memorandum of understanding promoting cooperation, the two agencies' systems were not aligned. Information could not always be transferred between the agencies, and nor could they readily or fully gain access to each other's systems (for example, mapping).[50] This made it harder for agencies to respond when a decisive response was most crucial. The failings in information sharing and management also had severe consequences for people making decisions on the fireground, potentially putting lives at risk.

- *Unity of effort.* There were instances of CFA and DSE staff planning and preparing together and coordinating arrangements before 7 February. For example, the CFA and DSE Chief Officers appeared together at statewide media events foreshadowing the conditions for 7 February and, at the local level, joint incident management teams prepared and practised before the day.[51] There were also instances of staff from both agencies failing to prepare cooperatively. Effective cooperation appeared to depend on local arrangements and individual initiatives.[52]
- *Duplication of resources.* The duplication of resources between the CFA and DSE in mapping, IT, information systems and manual uploading of warning information contributed to a lack of information collection, analysis and dissemination on 7 February. This led to weaknesses in public bushfire warnings and contributed to some warnings being delayed or not issued at all. In the Murrindindi fire, for example, the response was managed from two separate facilities in the same town, without coordination between the DSE and CFA teams.[53] The Commission considers this unacceptable.
- *Information requirements.* On 7 February the incident management teams managing the Beechworth–Mudgegonga, Bendigo, Churchill, Kilmore East and Murrindindi fires did not produce an incident action plan, incident action plan summary or incident shift plan.[54] For these fires, which the Commission examined closely, essential information was not fully recognised, demanded or provided. This included wind change advice, warnings to the public and updates provided to the integrated Emergency Coordination Centre. Under the acute conditions on Black Saturday, too much emphasis and firefighting effort was devoted to 'putting out the fire' and not enough to 'putting out the information'.[55]
- *The State Aircraft Unit.* The State Aircraft Unit reports directly to the Chief Officers of the CFA and DSE. It is an example of how agency resources can be jointly managed effectively, avoiding duplication and without the individuals concerned leaving their parent agencies.[56] The Commission discusses the unit's operational performance on 7 February in Chapter 3; suffice it to say here that this organisational arrangement has merit. A similar arrangement could be considered for areas such as information, prediction and resourcing.

Accreditation of Incident Controllers

There are substantial differences in the training and accreditation of CFA and DSE Incident Controllers, despite both being required to do the same thing. DSE developed and maintained an effective Incident Controller accreditation program that both agencies trialled. Subsequently the CFA chose to continue with an existing system based on the Chief Officer's endorsement of Incident Controllers rather than a system of accreditation. The Commission discusses this in Chapter 2 and concludes that the CFA approach is inferior.[57] The failure to align accreditation processes was a significant systemic shortcoming that demonstrated the apparent difficulty of reconciling operational systems and approaches between agencies.

Maintaining decentralised control

The Commission confirms the effectiveness of AIIMS (the Australasian Inter-service Incident Management System) in Chapter 2 and the need for decentralised control. The newly introduced coordination, command and control model keeps incident control at the local level and establishes 'area of operations controllers' as well as the State Controller.[58] These additional controller positions clarify lines of responsibility, but there is no intention, as the Commission understands it, for this to erode the decentralised control of individual fires.

Professor Paul 't Hart of the School of Politics and International Relations at the Australian National University endorsed a model of decentralised authority, power and discretion but did not suggest that the central commander

(that is, the State Controller or Chief Officer) be divested of ultimate responsibility.[59] He observed that when a key objective of the Incident Controller is not being met—particularly where there might be serious consequences, including loss of life—this is precisely the occasion on which the Chief Officer should act.[60] The Commission agrees with this position and notes that such action did not occur on Black Saturday at the Kilmore East fire.

Effectiveness of mutual aid arrangements

The evidence provided to the Commission suggested that the MFB worked effectively operating 'out of area' on 7 February in support of the other fire agencies.[61] Similarly, the mutual aid arrangements between the CFA and the MFB, in existence since about 1983, in relation to the metropolitan fire district appear sound. Mr Anthony Murphy, Director of Operations and Chief Fire Officer of the MFB, attested that there was no discernible conflict between these agencies in the course of shared operational activity.[62]

Specialist capability

The greatest risks in rural firefighting in Victoria arise in forested areas. On 7 February the heaviest losses occurred in and around forests and the greatest challenges that were presented related to forest fire management. Managing fuel loads in forests is far more complex than managing bushfire safety around homes or on rural properties. Public land managers have the greatest experience and competence in fighting fires in forests. The Commission proposes that there be large increases in prescribed burning as an important bushfire-mitigation measure for the state. To achieve and maintain this strategic risk reduction, DSE fire management capability needs to be strengthened.

The Commission also acknowledges the specialist skills of MFB firefighters, who attend structural fires in heavily populated areas as well as a range of other emergencies, such as vehicle accidents and incidents associated with hazardous materials.[63] Equally, it acknowledges the breadth of skills and service delivery—including the suppression of grass fires, attending vehicle accidents and the delivery of community education—required of CFA firefighters.

The Commission considers it important that these specialist skills are acknowledged and strengthened.

10.2.2 GOVERNANCE, POLICY AND LEGISLATIVE MATTERS

Ministerial responsibility

As noted, DSE Land and Fire Management, including the Chief Officer, reports daily through two line managers to the Secretary, who reports to the Minister for Environment and Climate Change.[64] The CFA Chief Officer reports through the CEO and the CFA Board to the Minister for Police and Emergency Services, and a similar arrangement exists for the MFB.[65] This means that one of the central fire agencies does not come within the purview of the minister responsible for emergencies, which gives rise to the potential to impede clarity in accountabilities and expectations and integration of preparation and response.

Policy advice versus operational responsibility

The Commission thought it inappropriate that the Emergency Services Commissioner, a senior official responsible for emergency management policy, was the conduit for operational advice to the minister on 7 February. This intervention by a non-operational official in the chain of command led to out-of-date information being passed to the minister.[66] Although this situation had become the agreed practice over a number of years, it incorrectly implied that the Emergency Services Commissioner was part of the operational 'chain of command'.[67] This was not the case.[68] Chapter 2 in Volume I provides further detail about the role of the Emergency Services Commissioner.

Governance

It became apparent to the Commission that the CFA Chief Officer and the DSE Chief Fire Officer were not at a suitable level within their organisations, potentially affecting the level of influence they were able to assert in comparison with the level of responsibility they bore for their agency's performance on 7 February.[69] As shown in Figure 10.1, while the CFA Chief Officer reports to the CEO, he (or she) does so as a member of the executive management team together with six other directors, one of whom manages the nine area general managers responsible for 'delivery of all services' in their area.[70]

The appointment of the DSE Chief Fire Officer is an internal departmental matter and is not made pursuant to a delegation of particular statutory power. The Chief Fire Officer is responsible for performing fire prevention and suppression activities on behalf of the Secretary, as set out in s. 62(2) of the Forests Act.[71] Depending on the circumstances, the Chief Fire Officer may also rely on s. 33(2)(b) of the Country Fire Authority Act and s. 16 of the Emergency Management Act to perform these functions.[72] The Commission wonders why this position is not a statutory appointment, in keeping with the Chief Officers of the CFA and the MFB. As Figure 10.2 shows, in February 2009 the DSE Chief Fire Officer reported to an executive director, then through a general manager to the Secretary of the department. In turn, the Chief Fire Officer is reliant on a further director (Director Land and Fire Services), who is responsible for firefighting resources.

The Commission sees the DSE Chief Fire Officer position as being entwined within complex bureaucratic reporting arrangements. The position of the Chief Officers within their organisations and the overall emergency management structures are discussed further in Chapter 2. The Secretary of the Department of Justice and the Secretary of DSE both acknowledged that these positions in the respective organisational hierarchies warrant review.[73]

The Commission was not satisfied that financial allocations within DSE ostensibly for fire management purposes were in fact directed to fire-related outcomes. Annual reporting by DSE did not confirm that the appropriate (and necessary) allocations were made.[74] The inability of DSE's Secretary to provide to the Commission details of the expenditure and resources applied to DSE fire-related activity is unacceptable. This lack of transparency compromises policy analysis and erodes public accountability. It also reinforces the Commission's concern that Land and Fire Management reports to a minister who does not have primary responsibility for preparation and planning for and responding to unplanned fire.

Apart from these matters, no substantial criticisms of the broader governance arrangements for the fire agencies were brought to the Commission's attention. As a result, it did not examine in detail the operation of the CFA and MFB boards and DSE's internal governance arrangements.

The metropolitan fire district

Urban growth around Melbourne has far exceeded the metropolitan fire district boundary, and risk profiles of suburbs have changed. In addition, regional growth has led to the CFA being responsible for large urban centres in country Victoria. It has met this demand by maintaining integrated stations of career and volunteer firefighters and using urban firefighting vehicles and equipment. Continued urban growth does not necessarily mean that the MFB ought to be responsible for emergency response in those areas. But the fact that the metropolitan fire district does not reflect metropolitan Melbourne is incongruous—increasingly so with continuing demographic changes and urban growth.[75]

The State expressed concern that, because of the MFB's funding model, the cost of expansion of the metropolitan fire district would be passed on to ratepayers in the newly assigned areas. In addition, expansion of the metropolitan fire district boundary would probably decrease the critical surge capacity of the CFA through a reduction in the number of volunteers available to deploy elsewhere in the state.[76]

10.2.3 OTHER CONSIDERATIONS

The Commission became aware of the differing cultures in the various fire agencies. Recognition of volunteers is fundamental in the CFA, and some underlying tensions were exposed where it appeared that volunteer capabilities were not being fully used.[77] The United Firefighters Union of Australia—Victoria Branch, representing the MFB workforce and career CFA firefighters, was a strong proponent of paid employment.[78] This, however, is not the view of Volunteer Fire Brigades Victoria.[79] The State, on behalf of DSE, argued that responsibility for fire on public land should rest with the land manager, rather than an external response agency.[80] Mr Phil Cheney, a fire behaviouralist, and honorary research fellow at CSIRO, agreed with this view.[81]

The existing organisational cultures have strengths and weaknesses. Some adjustments will be needed if greater interoperability between agencies is to be achieved. Organisational culture should be harnessed to provide impetus for operational and organisational change, and this task should not become a distraction, draining resources and crippling reform.

Conclusion

The Commission concluded that the three fire agencies, as currently structured, did not collectively contribute to their maximum potential on 7 February. Most of the concerns identified related to operational matters such as control, operational integration and interagency standards. The Commission therefore considers the problems identified need to be substantively redressed, with a focus on augmenting operational capability. The problems were not mere inconveniences that resulted from the size and scope of the disaster: they were serious failings that limited the agencies' ability to comprehensively fulfil their responsibilities. The Commission therefore sought others' views on the options for clarifying responsibilities and improving integration and coordination among agencies.

10.3 OPTIONS FOR CHANGE: PROPOSALS TO THE COMMISSION

The Commission sought from experts and interested parties, including the agencies themselves, views on the best way to resolve the problems identified in the foregoing sections. It sought the views of experts but also wanted to add a practical dimension to allow it to consider reforms that would improve outcomes and be amenable to implementation. The State presented a whole-of-government view, encompassing the fire agencies, through the Secretary of the Department of Justice.[82] Practically, this meant the Commission did not directly hear the agencies' views on governance and structural matters. As a result, the Commission sought the views of those who had previously led and managed fire agencies and organisational experts, together with unions and the volunteers association.

Mr Athol Hodgson was Commissioner of Forests from 1983 to 1984 and Chief Fire Officer of what became the Department of Conservation, Forests and Land (a predecessor of DSE) from 1984 to 1987. He considers that under the arrangements that applied on 7 February the DSE Chief Fire Officer was too buried within the structure and that in the 1980s 'the chief officer at the time stood between the minister and the fire', indicating a clear line of accountability.[83]

Mr Neil Bibby, recently retired CEO of the CFA, advocated the creation of a single agency.[84] He noted the limited progress made in response to a series of past recommendations that sought improved cooperation between agencies and proposed a single fire services board comprising representative and skills-based members reporting to a single minister.[85] The board would be supported by a CEO heading the three fire agencies and a fire commissioner or chief operations officer heading three deputy commissioners for urban, provincial and bush landscapes. He saw corporate functions such as human resources, finance and administration being the province of one entity and supporting all three operational arms.[86]

Mr Len Foster, former CEO, Executive Chairman and Chairman of the CFA, proposed a less radical model, with a 'country fire services board' providing non-metropolitan fire services statewide through an agency combining the CFA and DSE fire functions and reporting to a single minister. The MFB would remain a stand-alone metropolitan fire service. A state fire operations commander would be one of a number of directors reporting to the CEO, and the Networked Emergency Organisation work teams would be managed as industry brigades. Essentially, this model is the existing CFA model with DSE's fire functions drawn into it.[87]

The United Firefighters Union Australia proposed amalgamating the MFB and the CFA into a Victorian fire board with urban and rural divisions. This model was initially proposed in 1890 and again by the Public Service Board of Victoria almost a century later, in 1982.[88] DSE firefighters would remain in the department but would be part of a single command and control arrangement for operations. The UFUA argued that this model would generate 'substantial cost savings' (although no detail was provided), would deliver 'standardised fire cover … particularly in urban and large regional centres', and would allow for the provision of standardised equipment, training, command and control, safety and risk management, funding, administration and governance.[89]

The Australian Workers Union, representing DSE field staff, strongly opposed the UFUA model. It argued that the demarcation between the provision of fire services on public and private land was vital and that removing command and control responsibility from DSE would mean a loss of accountability. It did not oppose the idea of the CFA and the MFB being brought together but suggested the creation of a 'land and fire commission' to manage public land—in concept, effectively bringing together DSE and the agencies that currently comprise the NEO and similar to the previous Forests Commission.[90]

Volunteer Fire Brigades Victoria opposed all proposals for amalgamation of the fire agencies for two important reasons: amalgamation could not be effectively implemented and it 'poses a real risk of destabilising the fire fighting framework and seriously undermining Victoria's fire fighting capacity'.[91] It essentially supported the status quo with the extension of the new coordination, command and control arrangements to all bushfires—that is, that the CFA's Chief Officer should be 'assigned the overall responsibility to manage any bushfire in the State of Victoria' and the power to issue directions to other agencies in relation to prevention and planning.[92]

A further option was put forward by counsel assisting the Commission, who proposed a Victorian Fire Service Board with the following membership:

- the Chief Officers of DSE, the CFA and the MFB
- nominees of Volunteer Fire Brigades Victoria, the United Firefighters Union Australia and the Australian Workers Union
- three skills-based representatives
- a representative of the Municipal Association of Victoria.[93]

The proposed board would be responsible for agency governance, operational standards, comprehensive planning, boundary review, development planning and community education in relation to each of the three fire agencies. The option would link the CFA and DSE in a common command and control arrangement, leaving the MFB reporting separately. This model did not identify the requirement for a senior operational chief.[94]

10.3.1 THE STATE'S POSITION

Ms Penny Armytage, the Secretary of the Department of Justice, advised the Commission that the State is implacably opposed to any significant organisational change or amalgamation. She argued that no change was necessary and, indeed, change could threaten operational capability. This was presented as a whole-of-government view, with Ms Armytage adding that the fire agencies 'acknowledged the State's position'.[95]

The model the State proposed involved strengthening the existing system, with a focus on continuous improvement and increased interagency cooperation.[96] Ms Armytage suggested this could be achieved in part through 'enhancing' the State Coordination and Management Council's Bushfires Sub-committee (created after Black Saturday), which is an administrative group comprising departmental secretaries (or their delegates) and other invited representatives. Its role is to coordinate the response to fires, develop policy and advice for government, and manage the State's engagement with the Commission and the implementation of the Commission's recommendations.[97]

Ms Armytage also proposed 'enhancement' of the Victoria Emergency Management Council. She acknowledged the council was too large, sometimes having 60 attendees, and that it could be restructured to become a 'more effective advisory body to the Minister' and hold its member agencies accountable for sector-wide strategy and planning.[98]

Apart from this concession, Ms Armytage offered no other suggestions for changes or improvements to the current arrangements and embraced the observation of Professor 't Hart, that 'amalgamation [of the agencies] might produce an entity that, while nominally unified, actually consists of separate silos'. She highlighted the 'industrial fallout' that would probably accompany any such move because of the different positions adopted by the United Firefighters Union, the Australian Workers Union and Community and Public Sector Union. She also said that 'beneficial and enduring changes in large organisational systems generally tend to be the product of incremental rather than radical change', again referring to the evidence of Professor 't Hart.[99]

Although not specifically called as a witness in relation to organisational structure, Mr Mick Bourke, who took office as CEO of the CFA in September 2009, was asked to comment. He agreed that interoperability of operational systems was 'strongly desirable', but he expressed concern, based on his previous experience, that it took up to 10 years to gain 'lasting value' as a result of amalgamations and asked, 'Do we understand what we are trying to gain and where the value is added?'[100] He also pointed out that a single entity need not be a single organisational structure but 'Could mean one entity, one physical statutory entity, or it could mean one virtual entity that is joined by, in the setting we talk about, a single and unambiguous command and control chain'.[101]

10.3.2 OTHER VIEWS

Professor 't Hart, an expert in management and organisational change, emphasised the risks associated with 'overstretching the lessons from Black Saturday':

> Redesigning emergency management systems or organisations often happens as a result of the sheer momentum for change created by the occurrence of a recent high impact tragedy. Unfortunately, there is plenty of research to suggest that such crisis-induced reforms may create as many vulnerabilities as they seek to eliminate—particularly when they are too narrowly focussed on 'winning the most recent war'.[102]

Professor Dutch Leonard, Professor of Public Management at the Harvard University Kennedy School of Government in the United States, warned of the tendency after major fire disasters to imagine that a centralised, omniscient control and command structure would provide a better response.[103] He pointed to the inevitability of some degree of chaos in the management of an extreme event and commented on the 'fantasy' that the only method for achieving effective management is the centralisation of command.[104]

Both Professors Leonard and 't Hart urged caution before embarking on a merger or amalgamation. The 'virtues of mergers are way overrated … that is particularly true when the different kinds of organisations that you are merging are actually quite different from each other'.[105]

Major General Jim Molan AO, DSC, a retired operational military commander, stressed the importance of training for the management of extreme events and said it would be 'folly to consider the tragedy of the events of [7 February] as existing at the extremes of our ability to manage'.[106] He said experience must be gained and maintained through the stability of command teams and exercising (or practising) responses.[107] Professors Leonard and 't Hart also emphasised the need to train and practise for emergencies, Professor Leonard pointing out that the greater the decentralisation the greater the need for that training.[108] This point was reinforced by Mr Jerry Williams, former National Director of Fire and Aviation Management for the US Forest Service, who noted that more practised organisations were generally more successful in anticipating, organising for, staffing for and responding to disaster.[109]

10.4 OTHER MODELS AND PAST REVIEWS

In view of the diversity of opinions presented to it, the Commission also looked at the organisational arrangements for fire services in other jurisdictions and the recommendations of previous reviews in order to help it assess what type of structural reform, if any, is required.

10.4.1 THE SITUATION INTERSTATE

The Commission heard evidence about the organisational and operational arrangements relevant to the fire agencies in other Australian states that are prone to significant bushfire threat. The following representatives gave evidence of the arrangements in their jurisdiction:

- Mr Michael Brown, Chief Officer of the Tasmanian Fire Service, which is an amalgamated career (paid), retained volunteer (receive a retainer) and volunteer (unpaid) fire service.[110] Mr Brown discussed the 'Multi Agency Coordinating Group' approach, whereby the three Tasmanian fire agencies—the Tasmania Fire Service, Forestry Tasmania and the Parks & Wildlife Service—work cooperatively within an overarching statewide arrangement[111]
- Mr Craig Hynes, Chief Operations Officer of the Western Australian Fire and Emergency Services Authority, which has career and volunteer brigades and is an umbrella organisation for a wider suite of emergency services—the Fire and Rescue Service, the Bush Fires Board and the State Emergency Service[112]
- Mr Euan Ferguson, Chief Officer of the South Australian Country Fire Service, which is an organisation similar to the CFA, although legislative arrangements in South Australia mean that all rural fire agencies—including the Department of Environment and Heritage and ForestrySA—respond to fires as members of the CFS[113]
- Mr Robin Rogers, Assistant Commissioner, Director of Operations of the New South Wales Rural Fire Service, which is similar to the CFA, although the RFS Commissioner can assume control of major fires on both public and private land, including fires that start on land in NSW National Parks and Wildlife Service and NSW Forestry tenure.[114]

The Commission observed that there is little consistency in the organisational arrangements between the various fire services, and it appears that each state's arrangements have evolved out of local history and circumstance, not necessarily by design or intent.

In recent years, it seems that every state has tried to draw its fire services closer together, either operationally or at the governance level. Tasmania is the only state the Commission considered where this has led to a single fire service for urban and rural areas, using career and volunteer firefighters.[115] Although Queensland has a single fire service it continues to badge its rural and urban services separately.[116]

10.4.2 THE SITUATION IN THE UNITED STATES

Witnesses provided to the Commission information about the US federal arrangements for fire management and those of the California Department of Forestry and Fire Protection.

Mr Williams explained how the US Federal Emergency Management Agency 'leads' the response to domestic disasters but noted that wildfire (as it is called in the United States) on federal land is managed through the National Interagency Fire Center, which has a national incident command centre in Boise, Idaho.[117] The centre brings together five federal organisations involved in 'wildland' firefighting—including the Bureau of Land Management, whose responsibilities are comparable with those of DSE.[118] The bureau is 'principally organised' for the purpose of managing federal lands but also sustains 'a high-quality and efficient firefighting service' that works cooperatively with other firefighting agencies. Command and control occurs through the use of the National Incident Management System (from which AIIMS evolved).[119]

Mr Tim Streblow, Deputy Chief of the Sonoma–Lake–Napa Unit of CALFIRE (the California Department of Forestry and Fire Protection), explained that responsibility for fire suppression and emergency response in California is shared between levels of government and federal, state, county and municipal fire agencies. CALFIRE has overarching state-level responsibility.[120] This, he said, was a further example of multiple agencies operating collectively, with the National Incident Management System used for command and control without need for further amalgamation.[121]

10.4.3 PREVIOUS REVIEWS

The organisational and funding arrangements for Victoria's fire services have been the subject of a number of previous reviews. The Commission heard evidence about several of these:

- In 1983 the Public Service Board of Victoria examined proposals for changes to the MFB and the CFA. It recommended the creation of a new Victorian Fire and Emergency Services Board to 'rationalise overlapping support activities and systems between the country and metropolitan fire services'. The public was opposed to this proposal and it was not implemented.[122]
- In 1994 the Public Bodies Review Committee examined the MFB and made a number of recommendations in relation to the delivery of fire services by the MFB and the CFA. It did not recommend amalgamation, considering that any merger would be 'expected to produce major disadvantages given the different basis of day-to-day operations between the two organisations'.[123] The committee did, however, recommend as follows:
  - that it was inappropriate for an emergency services provider to develop its own standards, core objectives and functions
  - that one standard of fire cover be developed for Victoria as a matter of urgency
  - that performance monitoring standards be established, reviewed and maintained through a common reporting system by the Minister for Police and Emergency Services.[124]

  These recommendations were only partly implemented.
- In 2003 the CFA presented a submission to the inquiry into the 2002–03 Victorian bushfires. It called for 'radical change' to achieve a single, integrated fire service operating outside the metropolitan fire district.[125] The inquiry did not support this proposal.[126]

10.4.4 LACK OF CONSENSUS

It is clear that there is very little common ground in relation to whether structural reform is needed and, if so, the nature, scope and merits of various models. A number of the parties argued for change, but there was little agreement about the form and extent of that change: some argued for a merger and some argued against one. Many who gave evidence on organisational structures acknowledged that the operational problems that arose on 7 February 2009 ought to be tackled and that organisational change might assist with this. As noted, however, the proposed solutions ranged from improving mechanisms for coordination while substantively leaving the existing structures untouched to moving to a single, integrated fire service. Similarly, none of the models and experiences from other jurisdictions provides a distinctive and compelling solution for the Victorian context.

The Commission determined that an alternative structure for Victoria's fire agencies is required. In assessing the evidence on how various organisational structures might support and improve operational performance, the Commission had a number of questions in mind:

- How can the operational capacity and performance of Victoria's fire agencies be improved?
- Would performance be better if two or more of the fire services were amalgamated?
- Are public versus private land, or rural versus urban, divides still relevant?
- Should the governance structure within any single fire service be altered or should that service be combined with other fire services?
- What is the relative status and role of the Chief Officers within each organisation and should these be changed?
- What are the best arrangements for coordinating integrated responses and exercising control over major incidents and command within agencies, having regard to centralised versus decentralised responsibility?
- Do the changes in operational procedures that have been made since 7 February 2009 resolve the problems?

10.5 THE COMMISSION'S VIEW

A disaster of the scale of 7 February will always put strain on organisational processes and structures. As outlined, the evidence revealed failures in or impediments to achieving an optimal operational response in several areas:

- policy
- practice and protocol
- systems
- structures
- capability.

The detail of these failures (and successes) is set out in the descriptions of the fires in Volume I and the relevant chapters in this volume.

The Commission considered the views and options the parties put forward for redressing the deficiencies observed on 7 February through structural reform and organisational arrangements, but it found none compelling.

The Commission was unconvinced by the State's view that structural change is not needed. Broadly, the existing arrangements have been in operation since early last century, but the demands made of and the expectations attached to the agencies have outpaced these structures and the environment in which they operate. In the case of many of the operational problems described in this chapter, previous attempts to improve coordination have failed. Typically, progress has been slow or incomplete or has not achieved the level of interoperability required—for example, the failure to adopt common information and communications systems (see Chapter 3) or to implement a common approach to accrediting Incident Controllers (see Chapter 2). Similarly, state-level coordination has not led to clear lines of responsibility, accountability and leadership (see Chapter 2).

When considered individually, the problems might be resolved through changes to the working arrangements that exist between the CFA and DSE. Work is already under way towards this—for example, through implementation of the revised coordination, command and control arrangements.[127] Further, many of the changes made since Black Saturday and the recommendations of this Commission will contribute to improving agencies' operational capacity. When considered collectively, however, the problems identified are symptomatic of systemic failings that led the Commission to ponder whether structural change is necessary.

The Commission does not consider that the flaws identified in connection with Black Saturday can be overcome simply by doing more of the same, even if it is done better. Nor does it consider that use of the State Coordination and Management Council Bushfire Sub-committee, or restructuring the Victoria Emergency Management Council, would be sufficient, not least because both have limited public accountability. Continued reliance on cooperation and coordination to achieve unity of purpose is inadequate and was found wanting on 7 February. Although the Commission agrees that the Victoria Emergency Management Council should be improved, it does not consider the council to be the right vehicle for implementing operational change and introducing unity of control. A more direct approach is necessary.

The Commission is not persuaded that radical reform, such as moving to a single fire service, is either necessary or desirable at this time. There may be an intuitive attraction to merging agencies as a means of overcoming operational incompatibilities, duplications and inefficiencies, but there is a risk that the merger itself becomes the focus of effort, which could easily distract attention and focus from the operational improvements the Commission considers to be the priority.

Examination of the recommendations of past reviews and organisational structures in other jurisdictions is informative, but again no compelling model emerges. In fact, the example of Tasmania is evidence of the difficulties that can arise in the amalgamation of fire services: it has taken 10 years to amalgamate the rural and urban fire services in a state where the entire fire service is about the size of a single CFA region.[128] Further, subsuming all elements into one agency poses the risk of undermining the strengths of each agency. For instance, care would be needed to ensure that DSE's specialist expertise in forest firefighting, which is crucial given the fire risk inherent in Victoria's forests, is maintained and strengthened.

The Commission did not examine in detail the current governance structures of the fire agencies. Equally, no compelling criticism of these arrangements was advanced to support an argument for fundamental structural change. The evidence and subsequent analysis focused on the need for operational improvements—in particular, to support high-risk days. The Commission is therefore of the view that it is premature to move to a single fire service. There could, however, be benefits in adopting a structure that keeps open the option of a greater degree of integration in the future.

The Commission views improved operational performance as the absolute priority. In support of this, it considers modest and targeted structural reform is needed as a catalyst for change and to tackle the identified operational shortcomings in order to achieve four goals:

- improved common operational policy and standards
- stronger coordination and unambiguous command and control
- improved interoperability
- a strengthened capacity for agencies to provide an integrated response.

The Commission sought an approach that would facilitate and provide clear and decisive leadership to achieve these goals while preserving the best aspects of each of the fire agencies and their current governance arrangements. It decided on three areas on which to focus organisational effort and change in the short and longer term:

- promoting operational improvements and reform
- better management of level 3 fires
- accommodating the potential for future change.

If these are to be implemented effectively there needs to be appropriate ministerial responsibility and those responsible for managing fire must have sufficient seniority and authority within their agencies. There are risks in the current system in which DSE, as one of Victoria's fire agencies, reports to a minister not concerned with emergency management. The Commission accepts that viewing prescribed burning as part of land management is prudent, but it considers that preparing for unplanned fire and the associated emergency response—which must be focused on protecting human life—should be the responsibility of the Minister for Police and Emergency Services. The Commission is also concerned that the status and authority of the Chief Officers within their agencies have the potential to adversely affect their ability to discharge their responsibilities.

10.5.1 PROMOTING OPERATIONAL IMPROVEMENT AND REFORM

The immediate priority must be to lift baseline operational capacity and interoperability in all of Victoria's fire agencies. A clear commitment and a concerted effort are needed now. Leadership is required to create the environment and impetus for continuous improvement and to build capacity, resilience and operational fire management expertise in recognition of Victoria's status as the most fire-prone state in Australia.

Administrative approaches to coordination have often proven ineffective, so the Commission considers that an organisational structure is needed to strengthen operational integration and establish a source of authority to ensure that change happens. To avoid parochialism, which can compromise reform, the source of authority needs to rest outside the individual fire services.

10.5.2 BETTER MANAGEMENT OF LEVEL 3 FIRES

Beyond lifting the State's operational fire capacity through general agency improvements, a different kind of response is required for high-end level 3 fires such as those that occurred on Black Saturday, Ash Wednesday and Black Friday. Fires of that nature, although historically few, bring with them an intensity and a propensity for devastation that requires a greater capability than can be had through a business-as-usual approach. Evidence of the probable impact of climate change on the frequency and intensity of ferocious fires in Victoria lends further support to arguments for change.

It is not sufficient to continue to rely on the best endeavours of the Chief Officers and others dependent on personal relationships or working in cooperation. Leadership and responsibility for the preparation, planning and management of level 3 incidents needs to be explicit, in order to lift overall operational capacity to deal with exceptional weather conditions and ferocious fires.

10.5.3 ACCOMMODATING THE POTENTIAL FOR FUTURE CHANGE

The Commission considers that operational improvement is a precursor and precondition to any consideration of radical structural reform. Major structural change, particularly amalgamation, would necessitate significant commitment, planning, resources and change management over time to be successful, as demonstrated by the Tasmanian experience. Attempting operational reforms and major structural reforms simultaneously would risk diluting the focus, and potentially the speed and effectiveness, of the essential operational changes required. The Commission was not persuaded that a merger is warranted at this stage, but it sees merit in moving to greater integration over time, and there is obviously a trend toward this. The enhanced baseline and level 3 fire capacity and improved interoperability would better position the agencies to take the next step towards integration if further change is seen as desirable in the future. It would also allow the inherent strengths and specialisations of each agency to be supported and provide time for the consultation necessary in view of the different cultures of the fire agencies. Consideration of further reform could occur following a review—say, in three years—of the extent and effectiveness of the operational reform agenda.

10.5.4 THE PROPOSED COURSE: A FIRE COMMISSIONER FOR VICTORIA

In keeping with the priorities just outlined, the Commission sees the immediate appointment of a full-time Fire Commissioner as a prudent and necessary first step. This would be an independent statutory appointment, and the incumbent would be responsible to the Minister for Police and Emergency Services.

The Fire Commissioner would be the senior professional fire officer in Victoria and would be charged with improving those areas in which problems have been identified. He or she would be responsible for the following:

- developing and building operational capacity to prepare for the days of highest risk
- being responsible for the control of level 3 fires as the permanent State Controller
- promoting and leading a program of reform to improve operational capability and interoperability and increase the resilience of Victoria's fire services
- advising government on the metropolitan fire district boundary
- representing Victoria on operational matters in national committees.

It is expected that, in discharging these responsibilities aimed at systemically improving Victoria's future operational firefighting capacity, the Fire Commissioner will do the following:

- lead operational reform and improvements, including implementation of the recommendations in this report that relate to improving interoperability
- oversee the development (where relevant) and implementation of state-level operational policy
- as Victoria's senior professional fire officer, be the permanent State Controller, as proposed in the current coordination, command and control model
- be responsible and accountable for the operational management of all level 3 fires but routinely delegate this function to the Chief Officers in the CFA, DSE and the MFB, according to circumstance and risk
- set the requirements and processes for training for level 3 incidents and what is expected from those responsible for controlling such fires
- develop and maintain all joint standard operating procedures
- identify and oversee the implementation of common operational standards and systems such as IT, mapping, communications and common equipment
- manage the State Control Centre and the state units for the Information Prediction, Aircraft, and Resource
- appoint Area of Operations Controllers and level 3 Incident Controllers, ensuring that all agencies adopt and maintain common standards and accreditation requirements for operational controllers
- set and maintain the standards required of level 3 incident control centres, including overseeing the current project for upgrading facilities (see Chapter 2)
- set standards for, and assess the performance of, the services provided by the Victorian Bushfire Information Line
- coordinate all interstate and overseas deployments.

A small secretariat and a sufficient budget would be necessary to support the Fire Commissioner's work. Legislative amendment would be required to underpin the role and functions of the position.

To advance operational improvements and reform, the Fire Commissioner would develop a rolling three-year action plan that would be endorsed by the Minister and would set out the priorities and outcomes to be achieved. The plan would be supported by a work program that is assessed and updated annually. Crucially, during development of the priorities the Fire Commissioner must consult the CFA and MFB boards and CEOs and the Secretary of DSE, with the aim of obtaining support for the priorities.

Practically, the Fire Commissioner would work closely with and through the agencies' Chief Officers to achieve these outcomes. In turn, the Chief Officers would be expected to lead operational change within their respective organisations and ensure alignment of the improvements already under way to lift baseline capability. Alignment of the agencies' and the Fire Commissioner's priorities would maximise the output from the invested effort and resources, allow for the establishment of priorities for resource allocation, and strengthen bids for joint initiatives and investment needs.

The Chief Officers would be directed by the Fire Commissioner on operational matters in preparation for and on extreme and code red days, and for level 3 fires. Unless intervention was required, standing delegations for level 3 fires would be made to the Chief Officers, particularly for prescribed burning and urban firefighting. The Chief Officers would retain operational control over level 1 and level 2 fires within their purview and continue to use the State Control Centre to maintain situational awareness. In the interest of continuous improvement, they would provide to the Fire Commissioner operational performance review reports on these lesser events.

National committees are important in the development of a range of emergency management policies and standards, including AIIMS and warnings. Given the proposed scope of the Fire Commissioner's role in Victoria for operational policy and standards, it is sensible and apt that the Fire Commissioner become the State's senior representative on national committees dealing with operational matters.

The Fire Commissioner would also maintain close relationships with the Chief Commissioner of Police, the Emergency Services Commissioner and the heads of other emergency services in order to contribute to Victoria's all-hazard capabilities. The Fire Commissioner would be the senior fire representative on the Victoria Emergency Management Council and the State Coordination and Management Council Bushfire Sub-committee (as required). More broadly, the Fire Commissioner would engage and consult with other stakeholders, as relevant, including the Networked Emergency Organisation agencies and the Municipal Association of Victoria.

The Commission considered the option of giving authority to the Chief Officer in one agency over the others but concluded that this would not adequately recognise the relative strengths of the agencies and had the potential to act as a disincentive to cooperative effort.

The Office of the Emergency Services Commissioner would not audit the activities of the Fire Commissioner, as it does the activities of other agencies. The operational standards and position developed by the Fire Commissioner would form the baseline against which the Office of the Emergency Services Commissioner would assess and audit the fire agencies.

The Commission is not wedded to the title 'Fire Commissioner' and thinks other designations—such as Chief Commissioner of Fire or Chief Fire Commissioner—would work equally well. Establishing agreement on terminology is discussed in Chapter 11.

10.5.5 THE EXISTING FIRE AGENCIES

Consistent with the Commission's view that reform should be implemented within a framework that does not undermine the strengths of fire agencies, it is envisaged that the Fire Commissioner would have no governance or management responsibility for the fire agencies. The CFA and the MFB would retain their boards and CEOs, and the Chief Fire Officer of DSE would continue to operate within the structure of DSE. With the exception of those operational matters just identified as the responsibility of the Fire Commissioner, the agencies would remain independently responsible for discharging their various statutory functions—among them employing staff, engaging volunteers, and budget management and internal resource allocations. The fire agencies would also retain responsibility for existing programs such as community education and fire prevention.

The MFB and the CFA would continue to report to the Minister for Police and Emergency Services. In recognition of the importance of an integrated approach to land management, including prescribed burning, DSE would continue to report on its fire functions to the Minister for Environment and Climate Change. With a view to strengthening cross-agency coordination, however, those aspects of DSE's fire functions that relate to emergency response activities would be reported to the Minister for Police and Emergency Services. The Commission notes the concern of the Secretary of the Department of Justice that a bifurcated reporting relationship for DSE would be problematic. But this is not a unique or, indeed, unusual arrangement within government: departmental secretaries often report to more than one portfolio minister.[129]

This dual reporting mechanism would need to be reflected in legislation. Under the current legislative provisions the Minister for Police and Emergency Services has no jurisdiction over DSE. Section 62(2) of the Forests Act would also need to be amended to separate out the responsibilities relating to prevention and suppression of fire and to allocate these responsibilities to the appropriate minister.

The Commission acknowledges the importance of volunteers in Victoria's fire and emergency management response. The model it proposes respects and preserves their contribution while introducing changes to support operational improvement. The Commission is also reluctant to see DSE's fire management responsibilities subsumed into the larger agencies because of the risk that DSE's forest firefighting capability would be diluted and this capacity might no longer be available to the State. Furthermore, the continued co-location of land and fuel management responsibilities within the same government department helps ensure a balanced consideration of bushfire mitigation and environmental conservation. Neither the CFA nor DSE should, however, be immune to change. And neither volunteers nor current administrative arrangements should be used as excuses for not making the changes needed to improve performance.

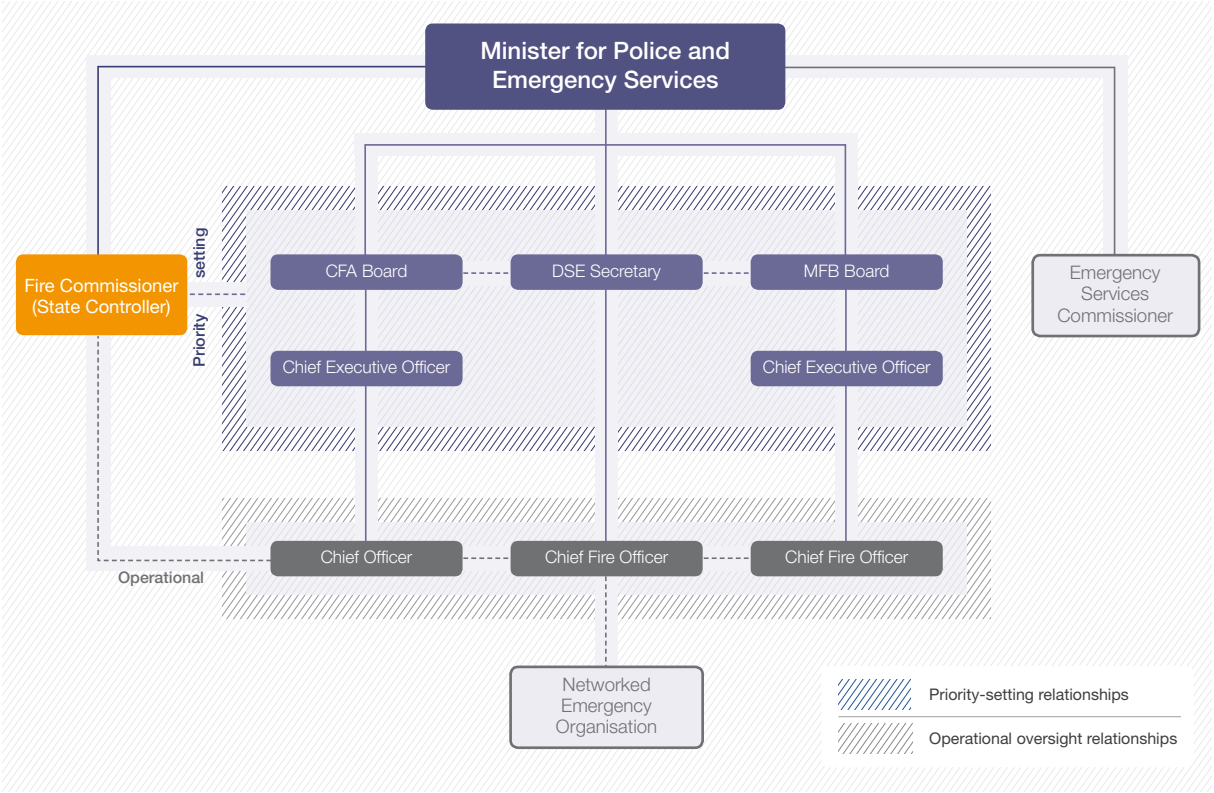
Additionally, the Commission is of the view that the accuracy and currency of the designation of the CFA as the 'Country Fire Authority' is questionable. Consideration should be given to a new badging as the 'Community Fire Authority' after consultation with interested parties—in particular, country communities. Among other things, this would acknowledge the substantial part the CFA plays on the fringe of Melbourne and its responsibilities in regional cities and large towns. It would also be an acknowledgment of the important role the CFA has in communities, would symbolically position the organisation as forward looking, and would allow the acronym 'CFA' to be retained. This last matter is incorporated in a broader discussion of terminology in Chapter 11.

The Commission also proposes changes in relation to the DSE Chief Fire Officer. First, the firefighting personnel and equipment within Land and Fire Management should come under the direction of the Chief Fire Officer. This will ensure that the Chief Fire Officer has authority over DSE's operational fire resources and their deployment. Second, land and fire policy should be developed in consultation with the Chief Fire Officer within the office of Land and Fire Management but not be under the authority of the Chief Fire Officer. The position would be responsible for implementing the policy through its work program and operational resources. The Secretary of DSE must ensure that sufficient resources are available for the Chief Fire Officer to effectively and fully discharge these obligations, noting the increased responsibility for fuel reduction detailed in Chapter 7.

The Commission is confident that this approach presents the best opportunity to effect major operational change and improvement. It offers a greater chance of success and less risk than other models of change that were put forward. It also offers considerable operational efficiencies, reduces duplication, increases community safety through integrated warning systems, retains clarity and unity of command and, importantly, improves fire management for the very few fires that have the potential to cause extensive death and damage.

Figure 10.5 gives a broad indication of the organisational and reporting relationships between the proposed new Fire Commissioner, the existing fire agencies and the Minister for Police and Emergency Services.

Figure 10.5 Proposed operational relationships



10.6 IMPLICATIONS OF THE NEW STRUCTURE

10.6.1 POSITIONS

In the light of the proposed changes in organisational structure, and without restating the role and functions of the Fire Commissioner and agencies, as already described, the Commission sees implications for the following positions:

- *The Minister for Police and Emergency Services.* The minister would become responsible for management of unplanned fire for the three fire agencies (including operational elements of the Networked Emergency Organisation through DSE). The Fire Commissioner would be appointed by and report to the minister.
- *The Chief Officers.* The positions of agency Chief Officers are being reviewed within their respective organisational structures. This is timely. The Chief Officers would remain members of their parent agencies but would report on level 3 fire operational matters to the Fire Commissioner. They would be responsible for 'raising, training and maintaining' operational capabilities within their agencies and for the day-to-day management of level 1 and 2 fires. Unless the Fire Commissioner decides otherwise on the basis of circumstance and risk, the Chief Officers will routinely manage level 3 fires under delegation.
- *The DSE Chief Fire Officer.* To facilitate clear communication and reporting, the Commission proposes that the role of DSE Chief Fire Officer be made a statutory role, with clear authorities, responsibilities and accountabilities. In particular, establishment of this statutory role would bring the position in line with that of the CFA Chief Officer. Additionally, the role of DSE Chief Fire Officer is already recognised and has responsibilities under both the Country Fire Authority Act and the Emergency Management Act: this could be regularised across the legislation with the proposed move to a statutory role.

- *The Emergency Services Commissioner.* The role of Emergency Services Commissioner would return to consisting of auditing agreed standards and emergency management coordination, noting that the Emergency Services Commissioner would not have jurisdiction over the Fire Commissioner. The Emergency Services Commissioner would withdraw from providing fire-related operational advice and emergency information to ministers and government.

10.6.2 BOUNDARY CHANGES

The metropolitan fire district is not reflective of metropolitan Melbourne.[130] This is one of the reasons given earlier in this chapter for reviewing organisational arrangements. The boundary appears to have lagged behind urban growth for a number of reasons, among them the following:

- As operational demands have increased with the greater urban profile outside the metropolitan fire district, the CFA has continued to meet community expectations by adapting its delivery model to include 31 integrated stations.[131] Planning identifies the requirement for a further seven integrated stations by 2020, and a Board of Reference decision in 2009 identified the requirement for an increase in integrated stations and career firefighters.[132]
- The Metropolitan Fire Brigades Act requires that municipalities request a change in service delivery from the CFA to the MFB, and this comes at a cost to councils, as discussed in the next section.[133]
- The CFA's integrated service delivery provides the service at less cost to the community overall. The Secretary of the Department of Justice noted that the average annual cost for integrated CFA stations abutting the metropolitan fire district was $1.5 million and for MFB stations it is about $2.4 million, although no basis for these figures was supplied.[134]
- Despite there being some reservations about volunteers and the career workforce operating in the same environment, the operation of 31 integrated CFA stations suggests it is a viable option. Mr Bibby stated, 'Ninety percent of the people that are there work well together and integrate well together', although he did acknowledge that there are some volunteers and career staff who have extreme views.[135]

The Commission considers it appropriate to place responsibility for altering the metropolitan fire district boundary within the scope of the Fire Commissioner's role. If the State were to choose not to take this approach, though, timely adjustment of the metropolitan fire district boundary could nevertheless be achieved by means of a different review mechanism.

The question of whether the CFA integrated model remains suitable in an urban environment (including in larger regional cities) requires continuing review, which the Commission did not venture into. The Commission was advised that many of the volunteer and career firefighters in these integrated stations provided surge capacity for rural areas on 7 February and their urban firefighting obligations were taken up by MFB firefighters during their absence.[136] The State noted that if the boundary were extended there would be fewer CFA integrated stations and a reduced CFA surge capacity.[137] If the existing model can deliver the service the community expects and continues to deliver it, this provides social capital for local communities and a depth of operational capacity. On the limited evidence available, the Commission considers the CFA integrated service delivery should be maintained as a viable model.

The Commission is satisfied that there should be a better process for determining changes to the metropolitan fire district boundary. It notes that the New South Wales *Fire Services Joint Standing Committee Act 1998* has resulted in numerous changes to service delivery between the New South Wales Fire Brigade and the New South Wales Rural Fire Service.[138] A range of considerations influence the boundary question, and decisions for future change should be made on the basis of objective factors such as the following:

- comparable service delivery between similar MFB and CFA stations
- community expectations
- municipal requests and requirements
- considerations of social capital
- value for money.

Meeting community expectations and the requirements of local government are two potential triggers for initiating a review of service delivery. The Commission considers that the metropolitan fire district boundary should be reviewed no more than once every three to five years. The proposed Fire Commissioner should lead these reviews, which would involve consultation with interested parties, and be responsible for providing to the Minister for Police and Emergency Services advice on any proposed changes. As a first step, the Fire Commissioner would need to advise and seek approval from government as to the appropriate triggers and the frequency of and criteria for undertaking such reviews.

RECOMMENDATION 63

The State enact legislation designed to achieve two specific ends:

- appoint a Fire Commissioner as an independent statutory officer responsible to the Minister for Police and Emergency Services and as the senior operational firefighter in Victoria
- make the Chief Fire Officer of the Department of Sustainability and Environment a statutory appointment.

The Fire Commissioner should have responsibility for the following:

- promoting and directing reform aimed at increasing the operational capability, interoperability and resilience of Victoria's fire services
- developing and building operational capacity to prepare for the days of highest bushfire risk and exercising control over level 3 fires as the permanent State Controller
- providing to government periodic advice on the metropolitan fire district boundary on the basis of triggers, frequency and criteria approved by government
- representing Victorian interests on operational matters in national committees.

10.7 FUNDING AND THE FIRE SERVICES LEVY

The budgets of the main providers of fire services in Victoria—the CFA, the MFB and DSE—account for annual expenditure of over $1 billion.[139] Fire services are currently funded through a mix of contributions from insurance companies, the State and local government.[140] The proportion of funding provided by the different contributors to the MFB and the CFA is determined by s. 37 of the Metropolitan Fire Brigades Act and s. 77A of the Country Fire Authority Act respectively. The MFB, CFA and DSE funding arrangements are as follows:

- the MFB—insurance companies contribute 75 per cent of MFB annual estimated expenditure; the State and local governments each contribute 12.5 per cent[141]
- the CFA—insurance companies contribute 77.5 per cent of CFA annual estimated expenditure and the State contributes 22.5 per cent[142]
- DSE—funded by means of an annual appropriation in the State's budget.[143]

Local government does not at present contribute to funding the CFA, so, if the boundary of the metropolitan fire district were extended, local governments in the new areas covered by the MFB would be required to increase their contribution to funding fire services.[144] This, of course, has implications for the extent to which local governments are likely to seek or support boundary changes.

Insurance companies recoup the cost of their statutory contribution to the CFA and MFB by imposing the Fire Services Levy on insurance premiums for building and contents insurance.[145] The amount the insurance companies pass on to customers is determined by the companies themselves, with guidance from the Insurance Council of Australia.[146]

Both the Metropolitan Fire Brigades Act and the Country Fire Authority Act allow these agencies to charge uninsured property owners for firefighting services, but there is little evidence about how often this occurs. Mr Joe Monforte, Director of Tax and Intergovernmental Financial Relations in the Victorian Department of Treasury and Finance, said, '… In principle, fire services impose these charges unless there is an acceptable reason to waive them' (for example, if damage is minimal or the property owner is receiving Centrelink benefits) and that he was not aware of the CFA or the MFB charging anyone for fire services during the 7 February 2009 fires.[147]

The Commission's interest in the Fire Services Levy and insurance arose from various sources. The levy was mentioned in numerous submissions to the Commission and is the subject of a Green Paper—*Fire Services and the Non-Insured*—issued by the State in October 2009.[148] The Green Paper put the State's view that 'it is now appropriate to review the model again given that the Victorian Government has committed to reconsidering all aspects of our State's ability to prepare for and respond to major bushfires'.[149]

The Fire Services Levy funding model was criticised by reviews before 2009, mainly on the grounds that it lacks equity and transparency. For example, tax reviews in New South Wales in 2008 and Victoria in 2001 recommended replacing the levy with an equivalent property-based levy collected by local councils.[150] A detailed examination of budgetary processes and taxation policy is beyond the remit of the Commission, but it did hear sufficient evidence (much of it consistent with the findings of previous inquiries) to persuade it recommend the abandonment of the Fire Services Levy.

The current model is rationalised on efficiency grounds—specifically that the charge imposed on the purchasers of insurance, being a percentage of their insurance premium, reflects the insurer's assessment of the fire risk associated with what is being insured.[151] This was pointed to as a strength of the model in a 2003 Department of Treasury and Finance review of funding arrangements for Victorian fire services.[152] Mr Monforte told the Commission:

> The system was premised on the basis that insurance companies are in the business of spreading risk and at the time of the 2003 review … that was one of the advantages. So if insurance companies do spread—calculate premiums based on risk—you would expect that there would be some risk factor in how the statutory contribution is spread amongst individual insurance policy holders.[153]

In contrast, Mr David Whittle, an actuary with extensive experience in the Australian insurance industry, gave evidence to the Commission that fire and bushfire risk is only one of many risks factored into the calculation of insurance premiums. Typically, fire risk accounts for less than 30 per cent of domestic building insurance premiums and less than 15 per cent of contents policy premiums. Furthermore, Mr Whittle said a number of major insurers do not assess fire and bushfire risk in detail, meaning that their rates are not differentiated according to geographical locations. In short, domestic property premiums are a very imperfect proxy for fire and bushfire risk, although fire risk appears to make up a higher proportion of the insurance premium for commercial property insurance than for domestic property.[154]

10.7.1 INEQUITY

The fundamental problem with the current funding model is that it is inequitable: those who do not insure or who under-insure avoid making a proportionate contribution to the funding of fire services but are afforded the same protection as those with insurance. A disproportionate share of the cost of providing fire services benefiting the entire community falls on insurance policyholders.

There is a lack of definitive evidence on the extent to which Victorians are uninsured or under-insured. Although the State is conducting a study of levels of insurance, the Commission disagrees with the State's suggestion that, in the absence of further data on insurance levels, it (the State) is not in a position to conclude that a change to a more equitable model is necessary.[155] In the Commission's view, it is sufficiently clear from studies conducted by the Australian Securities and Investments Commission and the Insurance Council of Australia, and from evidence tendered to the Commission, that a proportion of homes are not covered by building insurance, a much greater proportion of households do not have contents insurance, and many households are under-insured.[156]

Dr Richard Tooth, a consultant who has insurance experience, gave evidence about his work for the Insurance Council of Australia on levels of non-insurance. Using Australian Bureau of Statistics data, Dr Tooth has estimated that 4 per cent of Victorian households (about 51,000 households) do not have property insurance and 26 per cent (about 490,000 households) have no contents insurance.[157] Department of Human Services and Insurance Council of Australia data suggest that about 13 per cent of total property losses in the areas affected by the January–February 2009 bushfires were not insured.[158] Dr Tooth raised the possibility that this high level of non-insurance might be explained by the high proportion of destroyed properties that were holiday homes and therefore less likely to be insured.[159]

Estimating under-insurance is difficult because of the difficulty of establishing the replacement value of insured property. In its 2005 report, following the ACT bushfires, the Australian Securities and Investments Commission found there was a high level of under-insurance for properties and contents destroyed in the fires.[160] For Victoria's 2009 bushfires, Suncorp reported that sums insured were 'materially below' estimated rebuilding costs for total loss properties. Under-insurance was often a consequence of failure to insure items other than the main dwelling—for example, fences, water tanks and sheds.[161]

Another reason the current model is inequitable is that it places an unreasonable tax burden on insurance policyholders. Despite the State arguing that the Fire Services Levy is not a tax per se when charged by insurers to consumers as a 'pass through' of a business cost, in the Commission's view the effect is the same.[162] Policyholders must pay three levels of taxation, each building on the preceding one. The interaction of the Fire Services Levy, the GST and stamp duty substantially increases the final cost of insurance to consumers (see Table 10.1).

Table 10.1 Victorian Fire Services Levy rates, GST and stamp duty, September 2009

	($)			
	Metropolitan		Country	
	Home	Business	Home	Business
Premium	100.00	100.00	100.00	100.00
Fire Services Levy	20.00	50.00	31.00	84.00
GST	12.00	15.00	13.10	18.40
Stamp duty	13.20	16.50	14.41	20.24
Total cost	**145.20**	**181.50**	**158.51**	**222.64**

Note: The marked difference between metropolitan and country Fire Services Levy rates primarily reflects the smaller rural population base over which the cost of providing fire services must be spread.

Source: Exhibit 777 – Statement of Monforte, Annexure 2.[163]

In its final report in 2003 the HIH Royal Commission said that this 'cascading' application of taxes '… lacks transparency, is inequitable and is contrary to good tax policy'. It recommended that Victoria, New South Wales and Tasmania abolish their Fire Services Levies and that, in any event, state and territory governments abolish stamp duty on general insurance products and exclude the cost of GST for the purposes of calculating duties levied on insurance premiums.[164] More recently, in its final report the Review of Australia's Future Tax System (the Henry review) recommended 'that all specific taxes on insurance products, including the fire services levy, be abolished. Insurance products should be treated like most other services consumed within Australia and be subject to only one broad based tax on consumption'.[165]

10.7.2 LACK OF TRANSPARENCY

A second fundamental problem with the Fire Services Levy is its lack of transparency. There is no accountability in relation to the amount the insurance companies collect from their customers and nor is there accountability about how the revenue thus gained is dealt with by insurance companies.[166] Apart from imposing the tax and requiring that it be paid, the State regards the contribution as a business cost of the insurance companies and assumes that the market will keep the insurers accountable. There is no legal requirement that insurers recover the cost of making statutory contributions or that they explicitly identify such a charge to consumers. Further, there is no requirement that the amount of the levy equate to the amount of the statutory contribution.[167]

The extent to which a levy is collected and how the size of the levy is calculated are commercial decisions for insurers.[168] The difficulty in forecasting the market can result in tax collections that vary considerably from the amount required as a statutory collection. The 2003 Department of Treasury and Finance review found that, assuming contributing insurance companies had charged Insurance Council of Australia–recommended rates, in the four years to 2003 Fire Services Levy collections had exceeded the amount required to meet statutory contributions by $46.85 million for the MFB and $3.68 million for the CFA.[169] The review also found that, although the current model has 'limited' transparency, it is a stable source of revenue, is simple to administer and has low administration and compliance costs.[170] But as the Insurance Council of Australia points out, overheads for administration of the system are managed by insurers. The council considers that the process of determining the recovery amount is 'complex and extremely difficult' because contributions are calculated by reference to the insurer's market share and the mix of business but must be paid in advance of premium collection, which means the insurers must predict the market. The statement about low administration costs is true only in respect of the State's costs.[171]

10.7.3 CONCLUSION

The lack of equity and transparency in the current arrangements amounts to a good reason for moving to another system. Queensland (1985), South Australia (1999), Western Australia (2003) and the ACT (2006–07) have introduced funding systems for fire services that require all property owners to contribute via a levy on property. Tasmania levies residential property owners while retaining an insurance-based levy on businesses.[172]

The Commission heard from Western Australia and South Australia evidence about the operation of their property-based levies, including that their arrangements had a strong measure of public acceptance.[173] Collection costs in South Australia account for 3.1 per cent of the revenue raised, a figure that could be expected to be less in Victoria because of the economies of scale involved in collecting the levy in a more populous state.[174]

The Commission notes the State's incomplete review of the funding of fire services but has heard sufficient evidence to reach a conclusion. It considers that the Fire Services Levy should be replaced by a property-based levy. It acknowledges that there will be a number of administrative questions to be resolved in the establishment of a property-based scheme and does not wish to prescribe the design of the model. The State can, however, benefit from the experience of other jurisdictions that have moved to a property-based model when considering the following:

- the range of services to be funded
- the revenue base—this could include vehicles, which are responsible for about 15 per cent of fire service call-outs[175]
- the levy rate
- the potential to adjust the levy rate to reflect risk
- the collection agency—collection by a single agency, such as the State Revenue Office, might offer advantages over the local government alternative
- transition arrangements
- the possibility of establishing a single fund from which CFA and MFB services are funded.

The Commission is aware that changing to a property-based model might create problems for some uninsured property owners with low incomes. This group would find themselves paying the new levy out of limited income, without a compensating reduction in their insurance costs. The Commission notes that jurisdictions with a property-based levy offer concessions to seniors, pensioners and concession card holders.

RECOMMENDATION 64

The State replace the Fire Services Levy with a property-based levy and introduce concessions for low-income earners.

1 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0088–0089

2 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0088–0089

3 Exhibit 931 – Statement of Armytage, Attachment 10 (WIT.3003.002.0172), Attachment 12 (WIT.3003.002.0175)

4 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0088, 0122; Exhibit 3 – Statement of Rees (WIT.004.001.0001) [19]

5 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [66]; Exhibit 3 – Statement of Rees (WIT.004.001.0001) [22]

6 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0122, Attachment 9 (WIT.3003.002.0170)

7 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [68], Attachment 4 (WIT.3003.002.0085) at 0122

8 Exhibit 931 – Statement of Armytage, Attachment 10 (WIT.3003.002.0172)

9 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [65], [71]–[72], Attachment 4 (WIT.3003.002.0085) at 0122–0123; Exhibit 909 – Statement of de Man (WIT.3004.046.0240) [58]

10 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [69], Attachment 10 (WIT.3003.002.0172)

11 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [170.2]

12 Exhibit 909 – Statement of de Man, Annexure 11a (WIT.3004.047.0229_02); Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0001) [170.2]

13 Exhibit 3 – Statement of Rees (WIT.004.001.0001) [43]

14 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045; Exhibit 931 – Amendments to Statement of Armytage (TEN.293.001.0001); Exhibit 3 – Statement of Rees (WIT.3004.001.0001) [41]–[42]; Exhibit 909 – Statement of de Man, Annexure 22 (WIT.3004.047.0398) at 0399

15 Exhibit 855 – CFA Annual Report 2009 (TEN.205.001.0001) at 0069

16 Exhibit 857 – DSE Annual Report 2009 (TEN.201.001.0001) at 0008

17 *Forests Act 1958*, ss. 67–68

18 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [74], Attachment 4 (WIT.3003.002.0085) at 0088, 0124

19 Exhibit 857 – DSE Annual Report 2009 (TEN.201.001.0001) at 0157

20 *Forests Act 1958*, s. 62(2); Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [75]–[79], Attachment 4 (WIT.3003.002.0085) at 0124; Exhibit 6 – Supplementary Statement of Waller (WIT.002.002.0001) [28]

21 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0124

22 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [170.2]

23 Graystone T6026:26–T6027:7

24 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0124

25 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [82]–[85]

26 Exhibit 857 – DSE Annual Report 2009 (TEN.201.001.0001) at 0157

27 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [58], Attachment 4 (WIT.3003.002.0085) at 0088–0089, 0120

28 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0120; Exhibit 856 – MFB Annual Report 2008–2009 (TEN.206.001.0001) at 0066

29 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [58]–[61]; Exhibit 576 – Statement of Murphy (WIT.3006.001.0001) [11]; Exhibit 856 – MFB Annual Report 2008–2009 (TEN.206.001.0001) at 0062–0064

30 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [63], Attachment 4 (WIT.3003.002.0085) at 0120

31 Exhibit 576 – Statement of Murphy (WIT.3006.001.0001) [11], [24], Annexure 1 (WIT.3006.001.0041); Murphy T12565:17–T12565:24, T12577:26–T12578:3

32 Exhibit 576 – Statement of Murphy (WIT.3006.001.0001) [46]

33 Exhibit 576 – Statement of Murphy (WIT.3006.001.0001) [74(g)]

34 Exhibit 856 – MFB Annual Report 2008–2009 (TEN.206.001.0001) at 0065

35 Exhibit 831 – Emergency Management Manual Victoria (RESP.3001.003.0001_R) at 0015_R–0019_R

36 Exhibit 831 – Emergency Management Manual Victoria (RESP.3001.003.0001_R) at 0018_R

37 Exhibit 3 – Statement of Rees (WIT.004.001.0001) [115]–[116]; for example, the ICC based at Colac: see Exhibit 309 – Statement of Fallon (WIT.3004.015.0001) [62], [127]

38 Exhibit 701 – Standard Operating Procedure – Planning for Joint Incident Management Teams (DSE.USB9.0035.1602)

39 Exhibit 701 – Joint SOPs as at 7 February 2009 (DSE.HDD.0082.0253, DSE.USB9.0035.1600, DSE.USB9.0035.1602, DSE.USB9.0035.1604, DSE.USB9.0035.1606, DSE.USB9.0035.1610, DSE.0034.0291.0316, DSE.USB9.0035.1614, DSE.HDD.0082.0246, DSE.USB9.0035.1624, DSE.HDD.0012.1341, DSE.USB9.0035.1628, DSE.0034.0291.0323, DSE.USB9.0035.1588)

40 Exhibit 137 – Statement of Venters (WIT.3024.002.0001) [8]–[11]

41 Exhibit 101 – Statement of Rhodes, Annexure C (WIT.3004.003.0283) at 0284

42 Exhibit 6 – Supplementary Statement of Waller (WIT.002.002.0001) [130]

43 Exhibit 576 – Joint Operational Activities – Memorandum of Understanding (WIT.3006.001.0164) at 0165–0166

44 Exhibit 576 – Statement of Murphy (WIT.3006.001.0001) [50]; Exhibit 62 – Statement of Foster (WIT.012.001.0001) [16]–[17]

45 For example, the State Aircraft Unit: Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [23], Annexure 2 (DSE.HDD.0154.0014_R) at 0016_R

46 For example, the interoperability of the mapping systems used by CFA and DSE: Rees T2373:29-T2374:10

47 Exhibit 11 – Statement of Esplin, Attachment 2 (WIT.005.001.0123) at 0176; Exhibit 836 – Statement of Nixon (WIT.3010.009.0377) [22]; Nixon T17388:26–T17389:4

48 Cameron T19733:23–T19733:30

49 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300); Exhibit 831 – Appendix 13 – Command and Control for Victorian Emergencies – Emergency Management Manual (RESP.3001.001.0163)

50 Exhibit 3 – Statement of Rees (WIT.004.001.0001) [134]; For example, the CFA did not have access to DSE mapping systems, despite an agreement this would be in place for the 2008–09 fire season: Exhibit 820 – Statement of Garvey (WIT.3004.034.0153) [71]; Garvey T16820:31–T16821:15; Griffiths T17718:21–T17719:14

51 Exhibit 11 – Statement of Esplin, (WIT.005.001.0001) [183]–[184], Attachment 61 (WIT.005.001.2361); Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [78]; Exhibit 277 – Statement of Speirs (WIT.3004.014.0001) [44]; Speirs T7520:15–T7520:18, T7523:19–T7523:30, T7524:11–T7524:17

52 Exhibit 92 – Statement of Free (WIT.049.001.0001) [38]

53 Rush T10354:10–T10355:7

54 Exhibit 854 – Statement of Beasley, Annexure 12 (WIT.3004.043.0081)

55 Rees T144:14–T144:15; Rozen T13757:14–T13758:2

56 Exhibit 861 – Statement of Ryan (WIT.3024.006.0001) [19]–[27]

57 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [56]–[57]; Exhibit 551 – Second Supplementary Statement of Slijepcevic (WIT.3024.005.0001) [83]–[85], [93], Annexure 17 (DSE.HDD.0074.0284) at 0286; Haynes T12073:5–T12073:9, T12073:27–T12073:31, T12075:7–T12075:9

58 Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300) at 0307, 0314

59 't Hart T19056:29–T19057:7

60 't Hart T19060:20–T19060:31

61 Submissions of Counsel Assisting – Narre Warren, Cranbourne & Upper Ferntree Gully Fires (SUBM.202.003.0001) [10.5]

62 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0097; Murphy T12609:4–T12609:13

63 Exhibit 576 – Statement of Murphy (WIT.3006.001.0001) [30]

64 Exhibit 857 – DSE Annual Report (TEN.201.001.0001) at 0157

65 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [68], [74]

66 The advice to government on 8 February that all at Marysville were safe: Exhibit 11 – Statement of Esplin, Attachment 19 (WIT.005.001.1661) at 1758

67 Cameron T19710:12–T19710:22; Esplin T18887:30–T18888:6; Rees T2410:27–T2411:1

68 *Emergency Management Act 1986*, s. 5

69 Rees T19545:15–T19547:22

70 Exhibit 855 – CFA Annual Report 2009 (TEN.205.001.0001) at 0069

71 Exhibit 6 – Statement of Waller (WIT.002.002.0001) [19]; Wilson T15135:26–T15136:4

72 Exhibit 6 – Statement of Waller (WIT.002.002.0001) [13]; Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [79]

73 Armytage T19416:20–T19417:14, T19419:11–T19419:28; Wilson T15135:26–T15136:27

74 Wilson T15128:4–T15130:23

75 Exhibit 917 – The Case for a Single Firefighting Service in Victoria (UFU.002.002.0786) at 0795; Exhibit 927 – Information Paper – Metropolitan Growth (CFA.600.004.0334); Haywood T19753:24–T19754:15

76 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045–0046

77 Exhibit 552 – Statement of Small (WIT.7529.001.0001) [22]–[23], [25]; Exhibit 553 – Statement of Monti (WIT.7530.001.0001) [21]–[23]

78 Exhibit 916 – UFU Position Paper (UFU.002.001.0001) [66]

79 Exhibit 910 – Submission of VFBV (VFBV.002.001.0001) [8]–[9]

80 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [145]–[147]

81 Exhibit 734 – Cheney Report (EXP.017.001.0001) at 0017

82 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [18]–[21]

83 Hodgson T15044:16–T15045:9

84 Bibby T19468:18–T19469:8

85 Bibby T19469:8–T19470:23

86 Bibby T19472:4–T19473:22

87 Exhibit 907 – Foster Report (TEN.277.001.0001) at 0004–0005, Figure 1 – Possible State Bushfire Response Model (TEN.277.001.0006)

88 Exhibit 916 – UFU Position Paper, Attachment 1 (UFU.002.001.0027)

89 Exhibit 916 – UFU Position Paper (UFU.002.001.0001) [4], [24]–[27], [33], [36], [47]–[48], [58]–[63]

90 Exhibit 933 – Statement of Melhem (WIT.7556.001.0001) [5], [13(a)]–[13(f)], Attachment 2 (SUBM.002.057.0384) at 0403, Attachment 3 (AWU.001.001.0001) at 0002–0009

91 Exhibit 910 – Submission of VFBV (VFBV.002.001.0001) [5]

92 Exhibit 910 – Submission of VFBV (VFBV.002.001.0001) [42], [45], [56]–[65]

93 Submissions of Counsel Assisting – Organisational Structure (SUBM.1200.001.0001) [15.10]–[15.13]

94 Submissions of Counsel Assisting – Organisational Structure (SUBM.1200.001.0001) [15.19]–[15.22], [15.30]

95 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [114], [125]–[126]; Armytage T19389:14–T19389:28

96 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [134]–[141]

97 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [165]

98 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [166.1]; Armytage T19424:23–T19424:28

99 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [123]–[124], [126]; Exhibit 905 – 't Hart Report (EXP.3031.001.0001) [5.4]

100 Bourke T19329:18–T19330:29

101 Bourke T19331:12–T19331:24

102 Exhibit 905 – 't Hart Report (EXP.3031.001.0001) [5.1]

103 Exhibit 904 – Leonard Report (EXP.3031.001.0018) at 0021

104 Leonard T18975:1–T18975:24

105 Exhibit 905 – 't Hart Report (EXP.3031.001.0001) [5.3]–[5.4]; Leonard T18993:26–T18993:29

106 Exhibit 897 – Molan Report (EXP.030.001.0001) at 0003

107 Exhibit 897 – Molan Report (EXP.030.001.0001) at 0012

108 Exhibit 904 – Leonard Report (EXP.3031.001.0018) at 0025; Exhibit 905 – 't Hart Report (EXP.3031.001.0001) [2.6B]; 't Hart T19048:6–T19049:11

109 Exhibit 738 – Williams Report (EXP.014.001.0001) at 0019

110 Exhibit 476 – Statement of Brown (WIT.7521.001.0001) [14], [76]

111 Exhibit 476 – Statement of Brown (WIT.7521.001.0001) [146], [161]–[168]

112 Exhibit 477 – Statement of Hynes (WIT.7523.001.0001) [14]–[16], [22]–[23], [95], [100]

113 Exhibit 478 – Statement of Ferguson (WIT.7522.001.0001) [158], [393], [400]; Ferguson T10444:14–T10444:25

114 Exhibit 486 – Statement of Rogers (WIT.7525.001.0001) [15]–[16], [21], [60]

115 Exhibit 476 – Statement of Brown (WIT.7521.001.0001) [21]

116 Exhibit 931 – Statement of Armytage, Attachment 4 (WIT.3003.002.0085) at 0135

117 Exhibit 738 – Williams Report (EXP.014.001.0001) at 0017–0018; Williams T15381:15–T15381:21

118 The five federal organisations are the Forest Service, Bureau of Land Management, Parks Service, National Fish and Wildlife Service, Bureau of Indian Affairs; Williams T15381:24–T15382:8; Leonard T19018:13–T19018:18

119 Exhibit 738 – Williams Report (EXP.014.001.0001) at 0017–0018; Warrington T6675:27–T6675:31; Leonard T19018:17–T19018:25

120 Exhibit 896 – Statement of Streblow (WIT.158.001.0001) [4]–[7]; Streblow T18693:15–T18694:16

121 Exhibit 896 – Statement of Streblow (WIT.158.001.0001) [29]

122 Exhibit 916 – UFU Position Paper, Annexure 2 (UFU.002.001.0137) at 0139; Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [118]

123 Exhibit 916 – UFU Position Paper, Annexure 3 (UFU.002.001.0268) at 0275–0276, 0288

124 Exhibit 916 – UFU Position Paper, Annexure 3 (UFU.002.001.0268) at 0276

125 Exhibit 925 – From the Foothills to the Alpine Heights (SUMM.022.019.0013_001) [4.4.4]

126 Exhibit 720 – 2002–03 Victorian Bushfires Inquiry Report (INF.018.002.0001) at 0037

127 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [165]–[166]

128 Foster T19129:16–T19130:1

129 Exhibit 622 – Hodge Report (EXP.011.001.0001) at 0004–0005; Foster T1937:4–T1937:5, T1937:24–T1937:26

130 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045; Exhibit 917 – Haywood Report (UFU.002.002.0786) at 0795

131 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045; Exhibit 931 – Amendments to Statement of Armytage (TEN.293.001.0001); Exhibit 909 – Statement of de Man, Annexure 11a (WIT.3004.047.0229_02)

132 Exhibit 927 – CFA Board Information Paper 'Metropolitan Growth' Dated 31 March 2008 (CFA.600.004.0334) at 0334; Exhibit 932 – Statement of Thomas, Attachment 26 (WIT.7557.001.0316)

133 *Metropolitan Fire Brigades Act 1958,* s. 4; Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045; Exhibit 931 – Amendments to Statement of Armytage (TEN.293.001.0001); Submissions of Counsel Assisting – Organisational Structure (SUBM.1200.001.0001) [14.32]–[14.34]

134 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045

135 Bibby T19476:11–T19476:17

136 Submissions of Counsel Assisting – Organisational Structure (SUBM.1200.001.0001) [2.24]–[2.26]; Murphy T12587:26–T12588:24

137 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045, [133]; Armytage T19440:4–T19440:9

138 Exhibit 486 – Statement of Rogers (WIT.7525.001.0001) [23], [123]–[129]; Rogers T10537:27–T10537:31

139 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [62] (MFB), [70] (CFA), [77] (DSE)

140 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045; Exhibit 931 – Amendments to Statement of Armytage (TEN.293.001.0001)

141 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045; Exhibit 931 – Amendments to Statement of Armytage (TEN.293.001.0001)

142 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045; Exhibit 931 – Amendments to Statement of Armytage (TEN.293.001.0001)

143 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [77]

144 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) at 0045; Exhibit 931 – Amendments to Statement of Armytage (TEN.293.001.0001)

145 Submissions of Counsel Assisting – Insurance and the Fire Services Levy (SUBM.900.001.0001) [2.8]

146 Exhibit 777 – Statement of Monforte (WIT.3021.001.0001) [8.1]

147 Exhibit 777 – Statement of Monforte (WIT.3021.001.0001) [11]; Monforte T16284:20–T16284:23

148 Exhibit 777 – Statement of Monforte, Annexure 2 (WIT.3021.001.0156)

149 Exhibit 777 – Statement of Monforte, Annexure 2 (WIT.3021.001.0156) at 0158

150 Exhibit 989 – IPART Review of State Taxation (TEN.303.001.0490) at 0605–0606; Exhibit 989 – DTF Review of State Business Taxes (TEN.303.001.0050) at 0138

151 Exhibit 777 – Statement of Monforte (WIT.3021.001.0001) [7.2], [14]

152 Exhibit 777 – Statement of Monforte, Annexure 1 (WIT.3021.001.0012) at 0023

153 Monforte T16262:19–T16262:26

154 Exhibit 779 – Whittle Report (WIT.7539.001.0001_R) at 0003_R–0004_R; Whittle T16332:29–T16333:22

155 Exhibit 777 – Statement of Monforte, Annexure 2 (WIT.3021.001.0156) at 0160; Submissions of the State of Victoria – Insurance and the Fire Services Levy (RESP.3000.006.0100) [5]

156 Exhibit 778 – Tooth Report (WIT.7538.001.0001) at 0007–0008; Exhibit 781 – Statement of Nelthorpe, Annexure 6 (WIT.148.001.0081)

157 Exhibit 778 – Tooth Report (WIT.7538.001.0001) at 0002

158 Exhibit 777 – Statement of Monforte, Annexure 2 (WIT.3021.001.0156) at 0168

159 Tooth T16297:24–T16298:7

160 Exhibit 781 – Statement of Nelthorpe, Annexure 6 (WIT.148.001.0081) at 0095–0096

161 Exhibit 989 – Submission of Suncorp (SUBM.002.032.0008_R) at 0021_R–0022_R

162 Exhibit 777 – Statement of Monforte (WIT.3021.001.0001) [7.3], [8]

163 Exhibit 777 – Statement of Monforte, Annexure 2 (WIT.3021.001.0156) at 0163

164 Exhibit 989 – HIH Royal Commission Final Report, Chapter 10 (TEN.303.001.0790) at 0794

165 Exhibit 947 – Australia's Future Tax System – Report to the Treasurer, December 2009 (TEN.296.001.0001) at 0002

166 Monforte T16261:3–T16261:13, T16275:18–T16275:21

167 Exhibit 777 – Statement of Monforte (WIT.3021.001.0001) [7.3], [8]; Submissions of Insurance Council of Australia – Fire Services Levy and Insurance (DRSP.001.001.0279_R) at 0281_R; Monforte T16258:18–T16259:4

168 Exhibit 777 – Statement of Monforte (WIT.3021.001.0001) [7.3], [8]; Submissions of Insurance Council of Australia – Fire Services Levy and Insurance (DRSP.001.001.0279_R) at 0281_R

169 Exhibit 777 – Statement of Monforte, Annexure 1 (WIT.3021.001.0012) at 0019

170 Exhibit 777 – Statement of Monforte, Annexure 1 (WIT.3021.001.0012) at 0071

171 Submissions of Insurance Council of Australia – Fire Services Levy and Insurance (DRSP.001.001.0279_R) at 0281_R–0282_R

172 Exhibit 777 – Statement of Monforte, Annexure 1 (WIT.3021.001.0012) at 0129–0137; Exhibit 1001 – ACT 2009–2010 Budget Paper (TEN.317.001.0001) at 0010–0011

173 Exhibit 782 – Statement of Walker (WIT.145.001.0001); Exhibit 783 – Statement of Place (WIT.144.001.0001); Exhibit 784 – Statement of Harrison-Ward (WIT.146.001.0001) [47]; Walker T16395:4–T16395:10, T16396:17–T16396:22

174 Exhibit 782 – Statement of Walker (WIT.145.001.0001) [53], [57]; Walker T16398:6–T16398:17

175 Exhibit 777 – Statement of Monforte, Annexure 1 (WIT.3021.001.0012) at 0048

RESEARCH AND EVALUATION 11

11 RESEARCH AND EVALUATION

Research and evaluation were raised by many witnesses during the term of the Commission. Evidence before the Commission demonstrated the need for policies, programs and practices to be regularly reviewed in the light of new technologies and current research. Specific research gaps were also identified by experts and practitioners before the Commission, as well as by some authors of written submissions. The Commission considers it an opportune time for Australia to regain its capacity in both pure and applied research in the fire sciences and allied disciplines such as land management. Creation of a dedicated national research body with secure funding and collaborative partnerships would ensure this.

If fire agencies are to lift their own capability and performance and lead an improvement in the response capacity of individuals and communities, the agencies need to become true evidence-based learning organisations. The Commission proposes that the fire agencies adopt and fund a culture of reflective practice that routinely pursues current research, searches for best practice, and habitually evaluates policies, programs and procedures with a view to improving internal practice and that of the communities they serve.

This chapter considers the current state of bushfire research in Australia, identifies research gaps and priorities, notes the challenges in the way of progress, and proposes a model for future research and continuing evaluation. Although the focus is on research relating to bushfire, the Commission is aware that associated disciplines need to be involved and that there are considerable benefits to be gained from integrated research activity.

11.1 BUSHFIRE RESEARCH IN AUSTRALIA

Having been a leader in fire science research through institutions such as CSIRO, by the late 1980s Australia had only a handful of internationally recognised fire researchers and most of them were nearing retirement age.[1] Funding was ad hoc, often only increasing in response to major fire events, and most fire agencies have not had adequate funding to employ and sustain researchers in house.[2] This has led to relatively uncoordinated, short-term local research, rather than research with a coordinated, strategic or national focus.

Internationally and nationally there has traditionally been a strong focus on physical fire research such as studies into crown fires.[3] This has been promoted by people with forestry interests and has resulted in suppression-focused outcomes.[4] A new approach is required to fund and promote coordinated bushfire research. It should be national with a focus on pure, applied and long-term physical, biological and social research relevant to bushfires. It should also promote continued scholarship in a broad range of disciplines. Experts before the Commission argued that in bushfire research there is no international leader 'where the best and the brightest students aspire to train'.[5] Australia has the potential to become a global leader in bushfire research, and by building on existing resources Victoria is well placed to lead the field.

Continuing research into fire is fundamental to the advancement of bushfire management. Research results in the development of new technologies and methods for dealing with fire that have the potential to save lives. Bushfire policies that are based on a robust research foundation and are regularly reviewed enable policy makers to determine if they are meeting their original objectives or if those objectives could be delivered more effectively.

The Commission sees a need to consider fire in broader terms than the physical study of fire and for this to be reflected in the research agenda. Greater research effort is needed, covering a broader range of disciplines, including basic and commissioned research. It requires a funding model that can sustain long-term research as well as shorter term investigative projects. Research should embrace future challenges facing Australia, among them the impact of climate change on the frequency and nature of bushfire and the subject of fire at the peri-urban fringe.

11.1.1 THE BUSHFIRE COOPERATIVE RESEARCH CENTRE

The Bushfire Cooperative Research Centre was initiated in 2003 by the fire and land management agencies in Australia and New Zealand, their research partners and the Commonwealth Government. As Australia's first nationally coordinated multidisciplinary bushfire research program, the Bushfire CRC has a governing board of 10 members and more than 30 partners from fire and land management agencies and research organisations.[6] It does research in five interrelated areas:

- safe prevention, preparation and suppression
- management of fire in the landscape
- community self-sufficiency for fire safety
- protection of people and property
- education, training and communication.

Overall, the Bushfire CRC has been a welcome initiative that has made gains in re-establishing a community of researchers and a consolidated research agenda. It does not, however, meet all research needs and it is unlikely to continue in its current form.[7] Commonwealth funding for it is due to expire in 2013. (It received initial funding for seven years and this was extended for another three years after the Black Saturday fires.[8]) The Bushfire CRC's strengths come from its broad focus, the fact that it is industry driven, and the fact that it has caused a cultural shift towards evidence-based approaches.[9] Its five streams of research provide information that is sought by the fire agencies and is therefore readily adopted.

Although the involvement of fire and land management agencies is a strength of the Bushfire CRC, it is also a weakness because of the associated funding arrangements. Research priorities for the Bushfire CRC are determined by its stakeholders, who are predominately 'industry' based. Consequently, most of the research funding is tied up in applied research.[10] The 2004 Council of Australian Governments report on bushfire mitigation and management noted that 'maintaining sufficient research capacity beyond the term of the Cooperative Research Centre is … problematic, and action must be taken if research is to continue to adequately inform bushfire mitigation and management'.[11] This has not occurred. The Bushfire CRC's funding cycle results in research projects being relatively short term. The funding cycle of seven years means that research projects tend to be completed within four years, with two years spent on research and one to two years on research adoption.[12]

11.1.2 OTHER RESEARCH INSTITUTIONS

Universities and other organisations, including CSIRO, conduct some bushfire research, but it is fragmented and highly dependent on limited funding.[13] The University of Melbourne's Bushfire Research and Development Group within the Department of Forest and Ecosystem Science, does research in the following areas:

- prevention, preparation and prediction of fire behaviour
- risk management decision-support systems for communities, town planners, power supply companies, firefighters and land managers
- measuring and modelling the impact of fire on stream flow and water quality and developing improved strategies for protecting water from fire risks
- assessing the impacts of fire management strategies on biodiversity and determining how adverse impacts can be minimised.

The School of Land and Environment at the University of Melbourne is also doing social research into the communication of science and risk associated with bushfire warnings.

Disciplines such as forestry that have been historically linked with the study of bushfire have experienced a decline in student interest in recent years, leading to discontinuation of undergraduate courses and a decline in the number of postgraduate scholarships. For example, the CSIRO Division of Forest Research has been disbanded, the Australian National University School of Forestry no longer exists, and the University of Melbourne no longer offers an undergraduate degree in forest science.[14] Professor Richard Roush of the University of Melbourne noted, 'Universities have the breadth and organisational continuity to sustain bushfire research, but depend on short-term grants to fund research and therefore lack a continuity of support to solve bushfire problems'.[15]

11.2 RESEARCH GAPS AND PRIORITIES

There is no shortage of bushfire-related research to be done. As noted by Mr Jim Gould, Principal Research Scientist of CSIRO:

> Because bushfire cuts across many management and scientific disciplines, because fire affects so much of the country, and because the risks to life and property are public and political issues, the breadth of opportunities for relevant, needed research is nearly unlimited. The great challenge is perhaps not so much what to do next as it is what to leave out in a limited budget climate.[16]

Many of the experts who were asked to advise the Commission on this topic adopted the model of bushfire research proposed by Professor Stephen Pyne, School of Life Sciences, Arizona State University. He identified three streams of bushfire research—the physical, the biological and the cultural (or social) science streams. In the physical research stream gaps still exist in relation to many aspects of fire behaviour, such as physical fire processes (for example, fire transitions, heat transfer and fire emissions), the dynamics of weather, the interactions of wind and the aerodynamic drag of vegetation.[17] Among the gaps in the biological stream of research is the recording of the effects of fire regimes on the abundance of plants and animals and on plants' attributes such as seeding or sprouting.[18] Dr Michael Clarke, Associate Professor in the Department of Zoology at La Trobe University, noted that it was necessary to map plants and animals to know 'where they exist in the landscape and the effectiveness of our actions in conserving them'.[19] There is also a need to research the value of fire for biodiversity and how fire can be harnessed to benefit flora and fauna, agriculture and farming.[20]

Among the gaps in the cultural stream are research into how people develop their beliefs about and understanding of fire behaviour, fire threat and fire response.[21] This needs to be redressed by researching people's values in a fire environment, what it means to live 'in harmony with fire', how communities see and deal with fire in their environment, the economic costs and benefits of fire, and effective means of modifying human behaviour in relation to fires.[22]

The evidence before the Commission demonstrates the need for further research in a wide range of bushfire-related subject areas, such as the following:

- the effects of fire activity and smoke on radio communications (see Chapter 3)[23]
- the effects of prescribed burning and bushfire on biodiversity and on reducing bushfire risk (see Chapter 7)[24]
- the establishment of databases to map Victoria's flora and fauna, to register Victoria's fire risk and to identify its bushfire-prone areas (see Chapters 6 and 7)
- the extent of deliberately lit bushfires, as well as the causes of these behaviours (see Chapter 5)[25]
- the long-term effect of trauma resulting from the experience of bushfire and specifically the effect of trauma on children (see Chapters 3 and 8)[26]
- the use of cars as shelters in bushfires (see Chapter 1)[27]
- improved measures of house defendability in extreme conditions (see Chapter 1)[28]
- the circumstances of the thousands who survived the Black Saturday bushfires, whether by leaving early or late or by defending their homes or by sheltering (see Chapter 1)

- the need for greater understanding of the relationship between people's intentions and actions in connection with bushfire (see Chapter 1)
- the shelter options, including factors affecting the safety of different places of shelter, particularly motor vehicles in the open, dams, pools, creeks and water tanks (see Chapter 1).

The Commission received almost 1,700 public submissions, over 70 of which identified specific products or technology the submitters thought could help government and individuals deal with bushfires in Victoria. About another 45 submissions proposed new or innovative ideas or concepts the submitters thought could be further considered or developed for this purpose. It was not the Commission's role to assess the merits of commercial products. Nevertheless, it is desirable that these submissions be further analysed as part of future bushfire research.

The research gaps and priorities the expert witnesses identified, as well as the work and views of the Commission and the public submissions to the Commission, are a good starting point for considering short- and long-term priorities for bushfire research in Australia. Any national approach would benefit from setting agreed priorities for research and collaborating across institutions and jurisdictions.

In addition to this, the Commission invites the Commonwealth to take the initiative on two matters outside the proposed research framework. The first is to consider the development of nationally acceptable bushfire terminology. During the hearings it became apparent that there are a number of bushfire-related terms that are cumbersome, for which meaning is obscure or that have the potential to confuse the general public. Examples are 'neighbourhood safer places', 'designated refuges', 'traffic management points', 'code red/catastrophic days', and 'strategic fuel' and 'strategic firebreaks'. During its hearings the Commission deliberately explored the most suitable word or phrase for fires such as those that occurred on Black Saturday and a more accurate designation for the Country Fire Authority, but it ultimately leaves these matters for resolution by the responsible authorities. Emergency Management Australia has done work on standard terminology in relation to emergency warnings: the Commission considers this work should be extended to bushfire terminology.

The second matter the Commission invites the Commonwealth to take up relates to the absence of an agreed methodology for estimating the cost of bushfires. In undertaking an analysis of the cost of the 2009 bushfires, the Commission experienced difficulty because of the lack of available data and the absence of an agreed methodology for estimating the various costs (see Appendix A in Volume I). This is a deficiency in the nationally available bushfire information and an area in which further research is warranted. If the Commonwealth were to assist in developing a national methodology for estimating the cost of natural disasters, including bushfires, this would be valuable to policy makers and the community.

11.3 CHALLENGES

11.3.1 LONG-TERM, SECURE FUNDING

There was general agreement among the experts who addressed the Commission about the need for dedicated funding for bushfire research and a funding model that supports long-term research projects for pure as well as applied research.[29] Professor Richard Roush, Dean, Melbourne School of Land and Environment, University of Melbourne, noted that in Australia the research 'gaps will require decades of research and education to resolve'.[30] Professor Mark Adams, Dean, Faculty of Agriculture, Food and Natural Resources, University of Sydney agreed that there is 'an obvious need for a far more significant research effort than has been the case to date'.[31] Australia's investment in bushfire research is very low compared with that of other countries. Professor Pyne noted that internationally 'there are too few researchers, and their study [is] too narrow and exclusive'.[32]

11.3.2 CHANGING THE RESEARCH AGENDA

There was among the experts general support for Professor Pyne's three-part research model and for his contention that to date bushfire research has primarily focused on the physical sciences to the detriment of cultural, or social, research. If a comprehensive and integrated approach to bushfire research is to be established, urgent priority should be given to the social sciences. Professor Adams noted that for researchers 'the cultural heading is the most difficult

and challenging and needs a "long view"'.[33] Notably, Mr Gould of CSIRO and Mr Gary Morgan, CEO of the Bushfire CRC, agreed with the need for more emphasis on social science research in relation to fire.[34]

Professor Pyne posited that each stream is coherent but insufficient on its own and that there is value in keeping them segregated: 'each can only realise its conceptual potential if it can follow its own internal logic to conclusion'.[35] Professor Ross Bradstock, Director, Centre for Environmental Risk Management of Bushfires, University of Wollongong agreed that the reality of 'disciplinary silos' needs to be built into any future approach to fire research, but he added there needs to be some means of coordinating the three streams and promoting integrated research.[36]

Future research models and priorities need to encompass all three streams. As Professor Bradstock noted, 'A highly varied portfolio of research is … required and this will require a matching commitment from a diverse range of research disciplines and institutions'.[37] The Commission considers that it is necessary to continue physical research because 'there remain significant gaps in our knowledge of how fires burn' but that this investment should not be at the expense of research in the biological and social sciences.[38]

11.3.3 BALANCING PURE AND APPLIED RESEARCH

At present the majority of funding is directed to applied research, with very little being available for pure research (also referred to by the academics as 'blue sky', 'basic' or 'fundamental' research).[39] The experts before the Commission acknowledged that this balance needs to be redressed.[40] Professor Gould considered that there should be a focus on basic research to build new knowledge, applied research to solve practical problems, science applications to develop and improve current knowledge, and scholarship to provide educational assistance.[41] Professor Bradstock put the view that funding 'needs to encompass pure, applied and cross-disciplinary research needs'.[42]

The Bushfire CRC is a good example of some of the advantages of directed research. (Much of its research could also be described as applied and commissioned, none of these terms being mutually exclusive.) One advantage is the high rate of fire agencies' adoption of the research results and the results' influence on evidence-based operations and policies.[43] The Commission supports the view that research into the application and adoption of science-based knowledge and tools is important, but it also considers that pure research is essential for developing new knowledge and can lead to important breakthroughs in thinking.[44] When conducted through universities, pure research provides vital links with teaching, which are important for continuity, ongoing scholarship, links between disciplines, and generating interest in disciplines relevant to bushfire.[45] Pure research is, however, traditionally subject to fluctuations in funding, and outputs have not always been available to bushfire agencies or the community. One of the challenges of pure research is translating findings into practical applications and moving tools and knowledge into work practice.[46]

Similarly, there is a need for 'integrated research' and the sharing of scientific knowledge both within Australia and overseas.[47] Professor Bradstock nominated as a priority 'an ongoing and far-reaching "fire research dialogue"'. He said, 'Research problems can be articulated in differing ways, from widely varying contributors. The widest possible range of contributors needs to be heard'.[48]

The land and fuel management expert panel identified the importance of fire agencies conducting in-house research in order to improve the outcomes of land management programs. There are two examples of this approach in the Department of Environment and Conservation in Western Australia. The first is research mapping the effects of fire on flora and fauna, which has allowed the department to tailor its prescribed burning regime for the benefit of a range of plants and animals.[49] Related in-house research was begun after the 1961 bushfires; it focused on fire behaviour and led to the department's development of fuel accumulation and fuel moisture models for Western Australia. The models are used by managers and field staff implementing fuel-reduction burns.[50]

Experts stressed the importance of independence in developing a true research culture associated with bushfires. Fire agencies are important players in the development of research priorities, but they should not be the sole or primary motivator. As Professor Adams noted, 'Effective research, education, training and outreach require establishment of a culture of inquiry and intellectual rigour, free from but informed by the needs and demands of emergency response'.[51]

The Commission accepts that in-house research has a greater chance of influencing policy makers and decision makers and is therefore more likely to be implemented.[52] It notes additional benefits of in-house research, such as the potential to increase organisational capacity, promote a learning culture and increase an organisation's ability to engage in collaborative applied research with other bodies. Fire agencies should report summaries of their research activities and findings in their annual reports and record the budgets allocated to these projects. For their part, governments should ensure that adequate resources are provided for in-house research.

The Commission considers that a fully developed bushfire research agenda in Australia would have scope for enhanced in-house research capacity for fire and land management agencies, as well as significantly boosted resources for research institutes and universities. The full benefit of these improved arrangements would be realised if personnel from various organisations could share knowledge and ideas and if attention were given to disciplinary as well as integrated research.

The Commission further believes that there is potential for a revitalisation of education and training in forestry studies and in bushfire (and emergency) management if universities regain some of their research capacity in this area. As noted in Chapters 1 and 6, there are school curriculum gaps in connection with the nature of bushfire and its impact on the Australian community and environment, and in training in areas such as assessing bushfire-prone areas.

11.3.4 COORDINATING AND DEVELOPING PRIORITIES FOR BUSHFIRE RESEARCH

The Commission considered the different approaches suggested by the experts—among them models for a national research centre or institute. The suggested models included the competitive research market model (for example, the National Health and Medical Research Council) and the not-for-profit research company model (for example, the National Aerial Firefighting Centre).[53] There was some support for the Bushfire CRC model, either as a primary vehicle with additional funding or with modifications to take it to the 'next level'.[54]

The experts also put forward a range of options for operating a national centre or institute, among them physical and 'virtual' centres and mixed-mode options. Many of the experts suggested that a national centre or institute should be university based (for example, an endowed chair). Professor Roush noted that universities are 'uniquely placed to provide critical underpinning scientific research and education', well placed to conduct long-term research, 'offer a breadth of related critical disciplinary expertise (such as engineering, economics, law, sociology, medicine, and urban planning)' and link directly to teaching.[55] He suggested that endowed chairs create a 'hub of activity in perpetuity' and cost less than funding an entire centre.[56]

Professor Adams argued that any national centre or institute should be clearly aligned with the university sector but not embedded in one institution. He considered there should be a major presence of several universities within the national centre.[57] Professor Adams argued that physically co-locating multidisciplinary teams, even for time-limited periods, would offer opportunities for people 'to really get their teeth into specific problems' and would encourage a 'research culture'.[58] He suggested that the physical location of the national centre or institute be in Victoria and that it be a venue for training, public outreach, visiting researchers and students, as well as a meeting place and an administrative office.[59] In addition, there should be a mixed mode of delivery through 'nodes', mainly universities.[60]

Good governance was seen as essential for any model, as was the need for public accountability, including annual reporting.[61]

11.4 A PROPOSED MODEL FOR FUTURE RESEARCH

The Commission considers that a national research centre or institute is required for bushfire research. It is obvious that governments need to invest more in bushfire research and that there is a need for a 'far more significant research effort than has been the case to date'.[62] The Commission is aware that the Victorian Government has sought advice on establishing a university-based centre of excellence to be both a training centre for leaders in emergency services agencies and a research body with a multidisciplinary approach to inform policy and strategy development.[63] The research exemplar highlighted by the Victorian Government for consideration is the Monash University Accident Research Centre.[64]

The Commission does not consider that its role is to design the proposed national research institute or to determine such an organisation's governance arrangements. It has, however, heard sufficient evidence to form the view that, in developing the model, governments should consider incorporating the following features:

- funding that supports pure and applied research
- funding that supports long-term research projects
- strong governance arrangements, including research independence
- the location of the research centre preferably in Victoria
- a balanced focus that includes physical, biological and social research
- links with teaching and promotion of graduate scholarships
- cross-institutional and jurisdictional collaboration
- international collaboration and sharing of knowledge
- the research priorities highlighted in evidence before the Commission.[65]

RECOMMENDATION 65

The Commonwealth establish a national centre for bushfire research in collaboration with other Australian jurisdictions to support pure, applied and long-term research in the physical, biological and social sciences relevant to bushfires and to promote continuing research and scholarship in related disciplines.

11.5 EVALUATION AND CONTINUING POLICY DEVELOPMENT

Policy development and implementation are not linear processes. They require continuing evaluation and review to test that desired policy outcomes are being achieved and to re-assess where the evidence suggests the outcomes are not being achieved. Policies need to be based on current research, the experiences and lessons learnt by agencies, the views of the people affected by the policies, and good data and formal evaluations (which need to be built into policy and program development).

Translating these elements into workable policy solutions can be difficult. The evidence before the Commission suggests that some policies and standards have not been well evaluated or reviewed in a timely or ongoing way—for example, the State's 2005 Fire Refuges Policy and the 1999 Australian Standard for the Construction of Buildings in Bushfire Prone Areas. This situation should be remedied.

Similarly, the Commission heard evidence of some agencies waiting for research to be completed before implementing change. There is a risk that incomplete research might be used as a reason for delaying policy implementation. The Commission is strongly of the view that policy should be underpinned by robust research and that there are times when programs and standards should not proceed without a solid research base. In relation to prescribed burning targets, however, the experts who appeared before the Commission stressed the need for new targets in the foothill forests of Victoria to be introduced without delay.[66] DSE's stance—to wait for further research before committing to targets—is unnecessary and unproductive (see Chapter 7).[67]

Policy, particularly in an area such as bushfire safety, needs to be periodically reviewed and evaluated for a number of reasons:

- Circumstances can change in areas such as building standards and communications. For example, new technologies and improved products can mean that current approaches are no longer effective or no longer represent the best way of achieving the policy's objectives.
- Communities change. Their demographics and profiles change with time, and approaches need to be monitored to ensure that they still offer the best way of improving community safety.

- The way policies and programs are implemented can have unexpected or unintended consequences. This needs to be monitored to ensure that, in practice, the policies and programs are achieving their original objectives.
- New information can come to light that should be used to further develop or refine a policy, procedure, program or standard. This Commission is one example of a catalyst for change: evidence has been rigorously tested and conclusions reached that can be used by government and fire agencies to effect improvement.

A final consideration for effective evaluation and policy development is the need to ensure that the results of an evaluation are communicated to those who are responsible for a particular policy, program, procedure or standard and its implementation.

During its hearings the Commission heard, from practitioners of land and fuel management and experts in research and elsewhere in academia, of difficulties in the resourcing and support of bushfire research in Australia. The Commission proposes a dedicated national research body, a strengthening of the internal research capacity of fire agencies, and continued improvement in policy development and evaluation. Related to this is the discussion in Chapter 12, which deals with monitoring the effectiveness of implementation of the Commission's recommendations.

1 Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0018

2 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [48]; Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0007

3 Exhibit 885 – Problems, Paradoxes, Paradigms: Triangulating Fire Research (TEN.261.001.0001) at 0002

4 Exhibit 885 – Problems, Paradoxes, Paradigms: Triangulating Fire Research (TEN.261.001.0001) at 0002

5 Exhibit 886 – Statement of Roush (WIT.7544.001.0001) at 0005

6 Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0014; Exhibit 815 – Bushfire CRC – Annual Report 2008–09 (CRC.306.001.0001) at 0003

7 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [41]; Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0007; Adams T18519:15–T18519:19

8 Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0015

9 Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0008

10 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [49]

11 Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0123

12 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [49]

13 Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0010

14 Exhibit 890 – Australian Bushfire Research: Gaps in Knowledge (WIT.7548.001.0001) at 0006; Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0010

15 Exhibit 886 – Statement of Roush (WIT.7544.001.0001) at 0004

16 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [47]

17 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [21]

18 Exhibit 890 – Statement of Adams (WIT.7548.001.0001) at 0005

19 Clarke T15343:21–T15343:25

20 Exhibit 888 – Bushfire CRC – Australian Fire Research – (WIT.7542.001.0001) at 0016

21 Exhibit 888 – Bushfire CRC – Australian Fire Research – (WIT.7542.001.0001) at 0016

22 Exhibit 886 – Statement of Roush (WIT.7544.001.0001) at 0003; Exhibit 142 – 2004 COAG Report (TEN.049.001.0001) at 0120

23 Exhibit 868 – Statement of Lloyd, Annexure 4 (WIT3028.001.0059) at 0067; Powell T18159:4–T18159:18

24 Land and Fuel Expert Forum T15247:11–T15248:14

25 Exhibit 382 – Statement of Ogloff (WIT.106.001.0001_R) [36]; Exhibit 383 – Statement of Muller, Attachment 2 (WIT.077.001.0008) at 0015; Exhibit 715 – Letter from Victorian Government Solicitor's Office, Dated 24 December 2009 (CORR.1001.0033) at 0033–0034

26 Exhibit 535 – McFarlane Report (EXP.007.002.0005) [35], [148]

27 Handmer T18567:5–T18568:21

28 Exhibit 894 – Review of fatalities in the February 7, 2009, Bushfires – Final Report (Amended Version without mark up) (EXP.029.003.0001) at 0036

29 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [49]–[53]

30 Exhibit 886 – Statement of Roush (WIT.7544.001.0001) at 0004

31 Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0011

32 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [48]; Exhibit 885 – Problems, Paradoxes, Paradigms: Triangulating Fire Research (TEN.261.001.0001) at 0005

33 Exhibit 890 – Australian Bushfire Research: Gaps in Knowledge (WIT.7548.001.0001) at 0002

34 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [44]; Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0010

35 Exhibit 885 – Problems, Paradoxes, Paradigms: Triangulating Fire Research (TEN.261.001.0001) at 0005

36 Exhibit 892 – Statement of Bradstock (WIT.7549.001.0001) at 0001

37 Exhibit 892 – Statement of Bradstock (WIT.7549.001.0001) at 0003

38 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [43]

39 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [48] – [49]

40 Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0008; Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [49]

41 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [48]

42 Exhibit 892 – Statement of Bradstock (WIT.7549.001.0001) at 0003

43 Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0008

44 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [33]

45 Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0013

46 Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0008

47 Exhibit 887 – Statement of Gould (WIT.7545.001.0001) [51], [53]; Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0009

48 Exhibit 892 – Statement of Bradstock (WIT.7549.001.0001) at 0003

49 Sneeuwjagt T14999:28–T15000:26

50 Exhibit 725 – Statement of Sneeuwjagt (WIT.135.001.0001_R) at 0008_R

51 Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0011

52 Tolhurst T15360:29–T15361:10, T15361:26–T15361:30

53 Exhibit 892 – Statement of Bradstock (WIT.7549.001.0001) at 0004; Exhibit 888 – Bushfire CRC – Australian Fire Research (WIT.7542.001.0001) at 0008–0009

54 Exhibit 891 – Statement of Kanowski (WIT.7543.001.0001); Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0011; Adams T18526:16–T18527:1

55 Exhibit 886 – Statement of Roush (WIT.7544.001.0001) at 0004

56 Exhibit 886 – Statement of Roush (WIT.7544.001.0001) at 0005

57 Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0011

58 Adams T18526:23–T18526:29

59 Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0011

60 Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0013

61 Exhibit 886 – Statement of Roush (WIT.7544.001.0001) at 0003

62 Exhibit 890 – Australian Bushfire Research: A Way Forward (WIT.7548.001.0009) at 0011

63 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [171.2 (b)]

64 Exhibit 931 – Statement of Armytage (WIT.3003.002.0001) [171.2 (b)]

65 Exhibit 887 – Statement of Gould (WIT.7545.001.0001); Exhibit 886 – Statement of Roush (WIT.7544.001.0001) at 0004

66 Bradstock T15178:26–T15179:5

67 Wilson T15075:19–T15076:16

APPENDIXES, SHORTENED FORMS AND GLOSSARY

APPENDIX A

GOVERNMENT POLICY CHANGES SINCE 7 FEBRUARY 2009

The Commission acknowledges that since 7 February 2009, the Commonwealth, the State and a number of Victorian municipalities have developed policies and initiatives targeted at improving bushfire preparedness, response and recovery. In the course of the Commission's hearings and in the period between their conclusion and the final report going to print, the Commission received and considered evidence regarding the implementation of those policies and initiatives. The tables which comprise this Appendix draw on that body of evidence to provide a description of Commonwealth, state and local government initiatives since 7 February. While some policies and initiatives were due to be implemented prior to the final report going to print, this Appendix does not record those policies and initiatives as having been implemented unless the Commission received evidence confirming this to be the case. Similarly, some of the fields in these tables are left blank because the Commission did not receive information relevant to them.

Commonwealth policies and initiatives since 7 February 2009*

Policy/initiative	Implementation	Responsible department	Description	Evidence
Preparedness				
Commonwealth pre-season operational briefing	A national briefing was held in Canberra on 25 September 2009. Briefings also occurred with the State between 30 October and 3 December.	Commonwealth Attorney-General's Department	The AGD convened pre-season operational briefings to improve bushfire and seasonal hazard preparedness and planning between Commonwealth agencies and the states. The briefings included presentations from Emergency Management Australia, the BoM, the Commonwealth Department of Human Services and other departments and agencies.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0016–0017 Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0010–0012
Development of major activation procedures for Emergency Management Australia's incident management facility	Procedures were endorsed in October 2009 and training commenced in November.	AGD	The AGD has finalised formal procedures to activate EMA's IMF and has implemented a training program to ensure readiness in the event of activation.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0018
Foreign states immunities amendments	Regulations applying to US firefighters came into effect on 1 October 2009.	AGD	Through amendment to the *Foreign States Immunities Act 1985* (Cth) the Commonwealth conferred immunity from tort proceedings on US firefighters helping Australian authorities to prepare for, or respond to, bushfires. This enabled a bushfire exchange agreement to be finalised. The agreement was negotiated by the Victorian Government (on behalf of all Australian states and territories), and provides for similar reciprocal immunity for Australian firefighters.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0020
Revised arrangements for bushfire advice and alerts	Arrangements put in place in October 2009.	BoM	In response to recommendation 5.1 of the Commission's interim report, the BoM has designed a new fire danger severity scale with two additional categories at the top end of the scale. The BoM has restructured its fire weather warnings to reflect these changes and incorporate action statements agreed upon by state and territory fire agencies.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0037–0038 Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0008

Policy/initiative	Implementation	Responsible department	Description	Evidence
Inclusion of Forest Fire Danger Index and Grass Fire Danger Index in the BoM's weather forecasts	January 2010.	BoM	The BoM now incorporates the FFDI and GFDI in its district and township forecasts, and on its website. In late January 2010 the BoM consulted with the CFA and the Victorian Department of Sustainability and Environment, and agreed to link the Forecast District Fire Danger Index to the main fuel type in the district to avoid any confusion caused by differing indices.	Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0008–0009
Satellite phone subsidy scheme	Subsidy will run until June 2013.	Department of Broadband Communications and the Digital Economy	The Commonwealth will subsidise access to satellite phones for individuals, small businesses, educational institutions, Indigenous corporations, community groups, and health and emergency services organisations. The Commonwealth has extended the scheme until June 2013, and is conducting a public awareness campaign about the scheme and mobile coverage options.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0040–0041
Australian climate change science program	Final report to be made in September 2010.	Commonwealth Department of Climate Change in conjunction with the BoM, CSIRO and selected universities	DCC has funded research into fundamental climate change science to identify likely changes in extreme events. This research will underpin Australia's planning and preparedness for extreme events such as fires. The project will develop priority data and projections of climate extremes, such as temperatures, fire-weather, rainfall and tropical cyclones to allow the development of consistent projections across multiple variables.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0042
Climate change vulnerability assessments	DCC commenced the assessment in June 2009 and will deliver the final report in June 2010.	DCC	DCC is assessing climate change and regional fire management in Australia. It will examine: ■ the potential impacts of climate change on the determinants of fire regimes in different regions of Australia ■ how fire regimes and other drivers such as cyclones, drought and the spread of exotic species may interact as a consequence of climate change ■ the regional sensitivity of fire regimes to management inputs, including prescribed burning ■ the extent to which adaptive management of fire regimes in the face of climate change, especially the use of prescribed burning, may mitigate risk to multiple landscape values.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0043
Review of incident management response and communication protocols	Ongoing.	Department of Education, Employment and Workplace Relations	DEEWR is developing and enhancing its stakeholder response and communication plans to support emergency, business continuity and pandemic planning, and help deliver recovery responses. DEEWR's review of its emergency responsiveness is focused on determining the information it will need to communicate to its stakeholders in the event of an emergency.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0048

Policy/initiative	Implementation	Responsible department	Description	Evidence
Cooperative research centres program—Bushfire Cooperative Research Centre	Additional funding provided from 2010 to 2013.	The Department of Innovation, Industry, Science and Research	The Bushfire CRC is a collaboration between publicly funded researchers, industry and government to address challenges associated with bushfires. The Commonwealth announced in the 2009–10 budget that it would provide the Bushfire CRC with an additional $15 million from 2010–13 to undertake specific research about the 2009 bushfires.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0088
Ban on supply of 'sky lanterns'	The 18 month ban took effect on 24 September 2009 (a permanent ban may be implemented).	Australian Competition and Consumer Commission	The Commonwealth has imposed a ban on the use of sky lanterns due to the associated risk of uncontrolled fire.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0093
Consumer product safety standards for reduced-fire-risk cigarettes	Standard to become enforceable on new stock from 23 March 2010 and on all stock from 23 September 2010.	ACCC	The Commonwealth has developed a safety standard requiring all cigarettes to self-extinguish when no air is drawn through them.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0094
Attorney-General's Department Coordination Centre fire weather report and bushfire incident brief	The AGDCC has distributed the fire weather report and the bushfire incident brief since October 2009.	AGD	The fire weather report and bushfire incident brief provides information about bushfire threat and bushfire activity to Commonwealth agencies and state and territory governments. The fire weather report provides a visual and written description of bushfire threat across Australia. The bushfire incident brief contains information to help maintain situational awareness. The AGDCC produces and distributes the report twice daily when there is significant bushfire activity anywhere in Australia.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0014
Mapping and imagery forum	Forum was scheduled to be held on 25–26 March 2010.	AGD	Emergency Management Australia facilitated a mapping and imagery forum for relevant Commonwealth, state and territory agencies. The forum aimed to: ■ identify and improve understanding of current mapping and imagery capabilities ■ identify potential mapping and imagery requirements for the bushfire season to facilitate timely requests/deployment ■ agree on the next steps and develop a schedule to progress this work ■ prepare options for consideration by the Australian Emergency Management Committee ■ confirm the arrangements for jurisdictions to request information from the Commonwealth potentially using the COMDISPLAN.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0022–0023 Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0031

Policy/initiative	Implementation	Responsible department	Description	Evidence
National work plan to reduce bushfire arson in Australia	A joint working group will provide an interim report to the ministerial councils by the end of April 2010.	AGD	The AGD has developed the national work plan to ensure greater cooperation between fire and police agencies; local, state and territory governments; and between policy makers, social services and the criminal justice system. The national work plan considers a range of measures to ensure the strongest possible action is taken to prevent and deter arson. The AGD has developed new offences and penalties for bushfire arson and arson causing death or serious harm, and aims to strengthen the legislative response to bushfire arson causing death.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0027–0028 Exhibit 559 – National Work Plan to Reduce Bushfire Arson in Australia (AGD.914.0001)
Digital regions initiative	Projects to begin in the first half of 2010.	Department of Broadband Communications and the Digital Economy	The Commonwealth will co-fund digital projects (in partnership with state, territory and local governments) to improve services in health, education and emergency services in regional, rural and remote communities. Two projects have been announced: ■ bushfire spotting and response technologies in north-east Victoria ■ bushfire prediction technology in Western Australia.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0039
Building Regulation—Bushfire Bunkers and Review of AS3959-2009	Bushfire standard finalised by 24 March 2010 and publicly available by 30 April 2010.	The Department of Innovation, Industry, Science and Research, in collaboration with the Australian Building Codes Board	The ABCB developed a new standard for bushfire bunkers for private use and is reviewing the Australian Standard for Building in Bushfire Prone Areas (AS 3959-2009).	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0086–0087 Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0025–0026 Exhibit 313 – National Standards for Bushfire Bunkers (BDC.001.001.0203) Exhibit 313 – 2009 Victorian Bushfires Royal Commission – Bushfire Bunkers (BDC.001.001.0199)
Development of a national resilience strategy	Implementation of the strategy by the end of 2010.	AGD and Department of Prime Minister and Cabinet	In December 2009 COAG agreed to implement a national resilience strategy to guide natural disaster policy and programs. The AGD and DPMC are developing a strategy which will incorporate the principle of disaster resilience into all aspects of natural disaster arrangements, including preventing, preparing, responding to, and recovery from disasters. The strategy will include measures to strengthen communities, individuals, businesses and institutions to minimise the adverse effects of disasters on Australia.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0019

Policy/initiative	Implementation	Responsible department	Description	Evidence
Response				
Streamlining the declaration of a disaster for tax purposes	Amendment took effect on 26 March 2009.	The Treasury	Under tax law, taxpayers receive a tax deduction for gifts to Australian disaster relief funds. The Commonwealth amended the *Income Tax Assessment Act 1997* to allow the Federal Treasurer to declare an event a disaster for the purposes of establishing Australian disaster relief funds. Previously only the relevant state or territory could declare an event a disaster for this purpose. The amendment may lead to more rapid establishment of Australian disaster relief funds.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0092
Common Alerting Protocol project	A multi-stage project. Stage one commenced in 2009–10. Implementation is ongoing.	AGD	The AGD has undertaken the CAP project in cooperation with the states and territories to establish if CAP is the most appropriate standard for all hazard emergency warning systems in Australia, and if so, to adopt that standard. The AGD is working with key stakeholders to analyse open standards developments in the international and national context, and options for progressing to a standard that suits the Australian context.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0015 Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0013–0014 Exhibit 45 – AFAC Information Exchange Standards Common Alerting Protocol and Inter-CAD Messaging (TEN.004.001.0228) Exhibit 45 – Common Alerting Protocol (CAP) (TEN.004.001.0019) Exhibit 45 – The Australian Government's position on the Common Alerting Protocol and where to from here? Meeting Minutes (TEN.004.003.0013)
National aerial firefighting arrangements	Funding increases from 19 February 2009 until the 2013 Budget.	AGD in conjunction with the National Aerial Firefighting Centre Ltd	In February and May 2009 the Commonwealth agreed to provide additional funding to the NAFC to assist jurisdictions and: ■ extend Australia's firefighting capability for the 2008–09 fire season ■ increase funding in the current and next three financial years ■ offer greater protection to Australian communities and essential infrastructure threatened by increasingly severe bushfires.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0024

Policy/initiative	Implementation	Responsible department	Description	Evidence
National telephone-based emergency warning capability	Emergency alert was officially launched on 4 December 2009.	AGD in conjunction with Department of Broadband Communications and the Digital Economy. The Commonwealth, states and territories are responsible for various elements of development and implementation.	The swift development of a national telephone-based emergency warning capability to enhance Australia's disaster management arrangements. This will enable the states and territories to deliver intrusive warnings to the community on a mass scale, 24 hours a day, seven days a week. On 30 April 2009 COAG agreed to take immediate steps to develop a telephone-based emergency warning capability that will enable participating states and territories (all except Western Australia) to deliver warnings to land lines and mobile telephones. Emergency alert was launched on 4 December 2009 and is able to run multiple warning message campaigns for all types of hazards that may arise simultaneously across jurisdictions. The actual warning content is based on the Common Alerting Protocol. The Commonwealth has prepared extensive public education material for TV, radio and print in 30 languages to alert the community about telephone-based warnings.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0025–0026 Exhibit 325 – 2009 VBRC Interim Report: Commonwealth Response (RESP.6000.001.0001) Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0005–0006 Exhibit 45 – Director General Emergency Management Australia – Brief for Victorian Bushfire Taskforce – Emergency Warning System (EWS.500.0346) Exhibit 45 – Attorney-General – Brief for Commonwealth Victorian Bushfires Task Force – Emergency Warning System (EWS.500.0349) Exhibit 45 – Press Release Rudd Government Implements COAG Agreement on Telephone Based Emergency Warning Systems (AGD.533.0211) Exhibit 45 – Prime Minister of Australia COAG agrees to Establish National Emergency Warning System (TEN.004.002.0561)
Trial of remote forest fire detection cameras	The trial will run until April 2010 with an option to extend, depending on the nature of the fire season.	AGD, in cooperation with the Victorian Office of the Emergency Services Commissioner, Forests NSW and the Bushfire CRC.	The AGD, in cooperation with the OESC, trialled remote forest fire detection cameras during the 2009–10 fire season. The Commonwealth will use the trial results to examine how information from remote forest fire detection cameras would assist with operational decisions by fire agencies, including firefighting and issuing warnings to the community.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0030
000 and emergency information lines surge capacity	Measures and assessments are being pursued for consideration by the Ministerial Council for Police and Emergency Management–Emergency Management in November 2010.	AGD in cooperation with the states, territories and Telstra.	The Commonwealth is considering three initiatives to improve the operation of 000 at state and territory answering points and emergency information lines during extreme events: ■ ensuring the provision of robust 000 and emergency information services in extreme events (including staff sharing and surge capacity arrangements) ■ developing a national protocol for the use of extreme event recorded voice announcements ■ raising public awareness about alternative information sources to reduce the demand on 000.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0031–0032 Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0020–0023

Policy/initiative	Implementation	Responsible department	Description	Evidence
Disaster response framework	Implemented.	Australian Taxation Office	In responding to disaster events, the ATO focuses on ensuring appropriate and timely arrangements to relax tax obligations, and providing tailored assistance to taxpayers, businesses and tax agents. The disaster response framework outlines key roles and activities the ATO will consider depending on the nature and scale of the disaster. The framework aims to ensure a targeted and effective response to future natural disasters. The ATO continues to provide rapid and authoritative advice to the Victorian bushfire appeal fund through a liaison function.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0034–0036
National Employment Standards—legislated entitlement to community services leave	Implemented in January 2010.	Fair Work Australia	From 1 January 2010 the National Employment Standards provide employees (including casual employees) with an entitlement to leave to carry out certain community services activities, such as voluntary emergency management activity.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0047
Centrelink emergency reserve force	Launched on 13 October 2009.	Centrelink	Centrelink has created a reserve force of volunteer staff who can be quickly deployed during an emergency. Centrelink has developed a database of volunteers, their experience, skills, location and availability to support this initiative, and will provide community recovery training to certain staff.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0053
Centrelink's emergency management guide	To be implemented by early 2010.	Centrelink	Centrelink has implemented a number of new initiatives in its emergency management guide, including improvements to national crisis coordination, and the development of an incident management framework. Under the new arrangements responsibility for strategic decision making rests within a national crisis coordination framework, activated in response to a significant incident.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0054
National emergency call centre surge capability project	Negotiations to be explored in early 2010.	Human Services Portfolio	The NECCSC leverages significant Commonwealth call centre resources for use by states, territories and relevant Commonwealth agencies in the event of an emergency or disaster that overwhelms local capacity.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0063
Residential aged care—risk management for emergency events	Intense activity since February 2009 to raise awareness for the 2009–10 bushfire season.	Department of Health and Ageing, Office of Aged Care Quality and Compliance	The Commonwealth Department of Health and Ageing has been working in collaboration with the Victorian Department of Health to develop and distribute resources to assist providers of residential aged care in Victoria to plan for and respond to significant emergency events. That collaboration has led to the: ■ development of a database of alternative accommodation for the elderly ■ identification of 25 homes for the elderly in 52 areas nominated as high risk, and preparation of those homes for emergency events ■ development of the residential aged care services bushfire resource.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0071–0072

Policy/initiative	Implementation	Responsible department	Description	Evidence
Participation in Commonwealth and inter-jurisdictional forums	Ongoing.	Geoscience Australia	Geoscience Australia participated in pre-season briefings about the Commonwealth's geospatial information capabilities that may lead to increased requests for support from the states and territories during major events.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0084
Rapid inventory collection system	Extension of an existing program.	Geoscience Australia	Geoscience Australia is making RICS available for natural hazard impact assessments for pre- and post-disaster situations. The RICS is able to collect information quickly about damaged or undamaged infrastructure following a natural disaster such as a major bushfire. This is a portable facility that can be rapidly deployed.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0085
National lineworker refresher training recognition protocol for emergency situations	The protocol was signed on 7 September 2009.	Department of Resources, Energy and Tourism	The protocol is an agreement between industry, government and unions for nationally consistent refresher training units to enable lineworkers to provide mutual aid to a natural disaster-affected electricity network. The protocol facilitates the deployment of distribution and transmission lineworkers to restore electricity supply following a natural disaster, such as a bushfire.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0089
Upgrade of wireless priority service system	Upgrade may require a staged approach to enhance capability in time for the 2010–11 summer bushfire season.	AGD	The WPSS provides authorised users, including key decision makers and emergency responders, with priority mobile phone connectivity throughout Australia during times of network congestion. The WPSS was activated on the Telstra 2G network in 2007 and is in place to continue until at least 30 June 2010. The AGD is seeking to upgrade the WPSS to 3G technology during 2010–11. The upgrade to 3G may require a staged approach and the Commonwealth may extend the contract for 2G WPSS for 12 months while the upgrade to 3G is being completed.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0033
Recovery				
Funding for community legal centres	25 February 2009 to 31 March 2010.	AGD	The AGD provided one off funding to nine Victorian community legal centres to offer legal assistance to Victorians affected by the bushfires. Some of the funding was used to prepare two information kits: practical information for affected community members; and a resource for lawyers. The AGD will prepare an integrated service delivery plan based on the identified needs of affected communities. This will also serve as a template to assist future disaster recovery planning for legal service delivery.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0021

Policy/initiative	Implementation	Responsible department	Description	Evidence
Revisions to natural disaster relief arrangements	Proposal endorsed on 7 December 2009 and implemented in the first half of 2010.	AGD	This extended the period within which the states and territories may incur partially-reimbursable costs for personal and financial counselling from 12 to 24 months.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0029
Employment strategy for bushfire-affected areas	Implemented and continued until June 2010.	DEEWR	DEEWR has developed an employment strategy for bushfire-affected areas. A DEEWR officer worked with the Victorian Bushfire Reconstruction and Recovery Authority and Centrelink until June 2010 to coordinate the strategy. It includes job creation activities and return to work for bushfire-affected jobseekers.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0044–0045
Special child care benefit	Longstanding benefit.	DEEWR	The benefit provides full child care fee relief for parents of children affected by a declared local state of emergency. The Commonwealth has provided the special child care benefit to some families affected by Victorian bushfires.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0049
Survey of employers in Victorian bushfire-affected areas	Results available for discussion mid-December 2009.	DEEWR	DEEWR conducted a survey in conjunction with VBRRA about how bushfires impacted employers and what type of assistance DEEWR should provide them. The survey also looked at employment in bushfire-affected regions, recruitment experiences since the bushfires and future recruitment expectations. The survey was conducted in October 2009.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0050
Caring for our country bushfire recovery program	Program announced in March 2009.	Department of the Environment, Water, Heritage and the Arts, and the Department of Agriculture, Fisheries and Forestry	The program will provide assistance to community, local government and non-government organisations, and landholders in bushfire-affected areas to undertake targeted natural resource management bushfire recovery works.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0051
Solar hot water rebate for rebuilt homes in bushfire-affected areas	Available until June 2012.	Department of the Environment, Water, Heritage and the Arts	The Commonwealth has extended the rebate to people rebuilding after the Victorian bushfires to help them save money and reduce greenhouse gas emissions. The rebate is not normally available for new homes, but the Commonwealth has made an exception for homes destroyed in the Victorian bushfires.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0052
Community service hubs	Implemented in the immediate aftermath of the bushfires.	DHS through Centrelink	In the immediate aftermath of the fires, community service hubs were located in 10 communities across Victoria. DHS was invited to co-locate with the Victorian DHS in order to make available a broad range of Commonwealth Government services through one point of contact. The initial focus was on bushfire-related programs, such as ex gratia payments and grants. The service was then expanded to include brokered services for other Commonwealth programs for bushfire-affected people.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0055

Policy/initiative	Implementation	Responsible department	Description	Evidence
Commonwealth DHS/ Victorian DSE MOU Enhancements for Call Centre Surge Capacity	Completed in October 2009.	DHS and Victorian DSE	DHS has worked with the Victorian DSE to integrate their operations in emergency situations more effectively. They have developed protocols for sharing information about call types and volumes, and predicted weather patterns, during the bushfire season in preparation for events which may require Commonwealth call surge capability. They have also developed new standby procedures for days of extreme danger.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0056 Exhibit 841 – Consolidated Commonwealth Delivery Report (RESP.6006.001.0001) at 0018–0019
Emergency management—technology infrastructure services and support	Trial ended in late March 2010.	Centrelink	Centrelink has trialled new technology to improve its ability to respond to emergencies and natural disasters, including: ■ laptops on standby specifically for emergency management use which can be quickly deployed 'on the ground' ■ mobile office functionality—Centrelink is testing new technology to enable it to place a point of presence at any location with similar response times to those in standard offices ■ Blackberry systems as a secondary communications channel.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0057
Identity management in a disaster	Generic templates available from November 2009.	National identity security coordination group	The NISCG has developed template forms suitable for use in all jurisdictions to facilitate the streamlined replacement of proof of identity documents following a disaster. In November 2009 the NISCG endorsed two templates that states and territories may adapt to suit their own arrangements.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0058
Improved Commonwealth payment capability for emergency relief payments	Real time gross settlement has been available since June 2009; reverse EFTPOS capabilities have been available from December 2009.	Centrelink	Centrelink is expanding the options available to deliver relief payments to those affected by emergency or disaster events and reduce reliance in urgent situations on cash, manual cheques and electronic benefits transfer cards. Centrelink is trialling the integration of Reverse EFTPOS to enable it to transfer funds directly to customers' accounts. Centrelink is also trialling integration of real time gross settlement, building on existing direct link facilities with the Reserve Bank, to process emergency payments more quickly.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0059
Improvements to the Commonwealth disaster recovery payment claim form	The form was first used in July 2009.	Centrelink and the Department of Families, Housing, Community Services and Indigenous Affairs.	The claim form has been streamlined and reduced to two pages. It now only captures the information required to determine eligibility for payment.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0060

Policy/initiative	Implementation	Responsible department	Description	Evidence
Joint service delivery in disaster recovery	COAG convened a working group in June 2009.	DHS in conjunction with the Disaster Recovery Sub-Committee of the Natural Disaster Arrangements Working Group.	In June 2009 COAG convened NDAWG to oversee a number of projects in relation to improving disaster arrangements for the forthcoming fire season. In October 2009 a number of Commonwealth human services portfolio agencies, together with the DRSC, submitted a report, *Commonwealth and State/Territory Joint Service Delivery in Disaster Recovery,* which included the joint service delivery working plan.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0061–0062
Victorian bushfire case management service	Implemented with Commonwealth staff and ceased on 18 December 2009.	Human Services Portfolio	The Commonwealth provided over 100 staff and made its social work network available to provide case management to affected individuals or families living outside Victoria.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0064
Financial assistance grants to local government bodies	2009–10.	Department of Infrastructure, Transport, Regional Development and Local Government	The department administers the Commonwealth financial assistance grants under the *Local Government (Financial Assistance) Act 1995.* In response to the 2009 bushfires (and the floods in Queensland) the Commonwealth provided $40.6 million in quarterly payments to 24 local governments directly affected by the fires. The funding was provided to assist councils deliver essential community services in the immediate aftermath of the bushfires at a time when greater demands would be placed on affected local governments, and when their capacity to raise revenue through rates was substantially reduced. While the Act allowed the Commonwealth to alter the timing of its payments to local governments within a financial year, it did not allow for the re-phasing of payments across financial years. Accordingly, the Commonwealth amended the Act in May 2009 to allow greater flexibility to respond to unforeseen events that affect a large number of local communities in any jurisdiction.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0065–0067
Mental health response to the Victorian bushfires	Parts of the response were implemented within a week of 7 February.	Department of Health and Ageing collaborating with professional organisations	The department implemented a mental health response to the bushfires comprising: ■ additional funding for psychological services under the access to allied psychological services program to immediately increase capacity to support people most impacted ■ training and support for professionals providing services to impacted people ■ funding for additional telephone based counselling services to increase capacity to immediately respond to broader levels of distress in the community ■ capacity building for affected communities to reconnect and recover from trauma over the long term, particularly targeting children, young people and community leaders.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0068 – 0070

Policy/initiative	Implementation	Responsible department	Description	Evidence
Additional funding—early childhood services in bushfire-affected communities	Additional funding announced in March 2009.	Department of Families, Housing, Community Services and Indigenous Affairs.	Commonwealth funding allowed Playgroup Victoria to deliver support to families with young children in Kinglake, Murrindindi, Bendigo, Wandong and Traralgon. The funding assisted 29 playgroups.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0073
Additional funding—emergency relief	Following 7 February.	DFHCSIA	The objective of emergency relief is to assist people in financial crisis to deal with their immediate situation in a way that maintains the dignity of the individual and encourages self-reliance. The Commonwealth provided $6 million of additional funding to 171 organisations to meet increased demand for emergency relief in Victorian bushfire-affected areas, and to link clients with other community supports.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0074
Additional funding—volunteer resource centres	Additional funding announced on 18 May 2009.	DFHCSIA	The Commonwealth provided $484,661 of additional funding to 13 volunteer resource centres that manage, train and coordinate volunteers and the organisations which use them. The funding was allocated to help manage the surge in demand for volunteer assistance following the Victorian bushfires and the increased offers of help from volunteers across the state.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0075
Australian Government disaster recovery payment	8 February to 7 August 2009.	DFHCSIA	The payment was payable to eligible Australian residents who were adversely affected by a declared major disaster. The assistance comprises a payment to the claimant and an additional amount for each child for whom they are the principal carer. From 8 February 2009 people were eligible for the payment if: ■ they were seriously injured ■ they were the immediate family member of a deceased Australian ■ they had lost their principal place of residence in the bushfires ■ their principal place of residence had sustained major damage ■ they were unable to return to their principal place of residence for a period of 24 hours or more as a direct result of the bushfires. On 14 February 2009 the Commonwealth amended the eligibility criteria to include people: ■ who had experienced psychological trauma ■ whose principal place of residence experienced a utility failure for a period of 48 hours or more ■ who were the principal carer of an adversely-affected child. The payment provided immediate financial assistance in the form of a one-off payment of $1,000 per adult and $400 per child. As of 30 November 2009, 57,089 claims had been granted, totalling $65.4 million.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0076

Policy/initiative	Implementation	Responsible department	Description	Evidence
Coordination for *Rebuilding Together: A Statewide Plan for Bushfire Reconstruction and Recovery*	Plan was launched on 16 October 2009.	DFHCSIA	The Commonwealth has committed $117 million to the Rebuilding Together Plan. It sets out priorities driven by local communities to rebuild essential town buildings and services, generate business growth and investment, and rehabilitate key local attractions central to future prosperity. VBRRA will manage the plan, administer funds, and continue to work with community recovery committees and local councils to refine and deliver the plan.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0077 Exhibit 843 – Rebuilding Together: A Statewide Plan for Bushfire Reconstruction and Recovery (WIT.3003.001.0257)
Ex gratia assistance—income recovery subsidy	Subsidy was available from 10 February to 10 November 2009.	DFHCSIA	The Commonwealth developed the income recovery subsidy in response to the Victorian bushfires to provide temporary income support to employees, small business operators and farmers who lost income as a direct result of the fires.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0078–0079
Ex gratia funeral assistance	Claims could be made until 28 February 2010.	DFHCSIA	The assistance comprised a one off funeral/memorial payment of $5,000 to the closest immediate family member of each person who lost their life or was declared missing as a direct result of the bushfires.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0080
Family relationship service	Funding announced on 20 February and 18 May 2009.	DFHCSIA	The Commonwealth provided $440,000 of additional funding to its family support program to facilitate counselling support services through community organisations in and near bushfire-affected areas.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0081
National partnership agreement on social housing	Announced on 8 November 2009.	DFHCSIA	The Commonwealth contributed $2.4 million towards the construction of 11 new affordable homes in Marysville and Kinglake to replace public housing properties destroyed in the bushfires. Those homes, identified by the Victorian Government as priority projects, will be funded under the social housing initiative, part of the national building and economic stimulus plan.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0082
Support for young people	Funding announced on 18 May 2009.	DFHCSIA	$900,000 of additional funding to provide counselling and various community development support services to young people affected by the bushfires.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0083

Policy/initiative	Implementation	Responsible department	Description	Evidence
Victorian bushfires tourism industry support package	March 2009 to June 2010.	Joint Commonwealth and Victorian Initiative. Responsible Commonwealth agency is the Department of Resources Energy and Tourism	The support package is administered through a taskforce jointly chaired by DRET and Tourism Victoria. It also includes representatives of Tourism Australia, Parks Australia, Parks Victoria and a regional tourism industry representative. The taskforce was established to ensure projects funded under the package: ■ support tourism businesses and regions adjoining fire-affected areas ■ align broadly with the objectives in Victoria's 10-year tourism and events industry strategy ■ promote environmentally sustainable outcomes ■ align with the objectives of National Landscapes. The package comprises: ■ cooperative marketing and brand rebuilding ■ events funding ■ visitor functions.	Exhibit 842 – Statement of Popple, Annexure 3 (WIT.6006.001.0013) at 0090–0091

*This table groups the initiatives the Commonwealth has implemented since 7 February 2009 on the basis of whether the Commonwealth has directed those initiatives at bushfire preparedness, response, or recovery. In some cases the Commonwealth initiatives are relevant to more than one of those categories. To avoid repetition, this table records each initiative only once. For example, an initiative directed at both bushfire preparedness and response will only appear in the preparedness section of this table.

State policies and initiatives since 7 February 2009

Policy	Period of implementation	Responsible department	Description	Evidence
Preparedness				
Community education and engagement				
Fire communications campaign	The CFA implemented key programs by mid-April 2010, and is conducting a post-bushfire season evaluation.	CFA	The CFA has developed a print, radio, television, online and outdoor advertising campaign to provide the community with information regarding bushfire preparedness and risk. Examples of key initiatives include fire action week activities and the use of key terms and slogans, such as 'Prepare. Act. Survive.' and 'FireReady'.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0006–0007 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0051–0059 For a table of key publications, media campaigns and educational programs see Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0056–0058 Exhibit 796 – Statement of Appleford (WIT.3024.005.0295)
Summer fire campaign/FireReady Victoria campaign	Commenced with fire action week from 11–18 October 2009. The CFA will complete an assessment of the effectiveness of the Household Bushfire Self-Assessment Tool by 30 June 2010. The campaign is part of a three to five-year FireReady awareness and planning strategy. The 2009–10 summer fire campaign was implemented throughout the fire season from October 2009 to the end of March 2010.	CFA, Department of Sustainability and Environment, Department of Justice	Includes the following CFA and DSE initiatives: ■ a FireReady kit, comprising information about bushfire risk and bushfire preparedness, and a Household Bushfire Self-Assessment Tool supported by a CFA helpline ■ FireReady Victoria preparedness meetings, community meetings and bushfire planning workshops ■ encouraging communities to form community fireguard groups ■ implementation of strategies to increase bushfire information accessibility. DSE also led an information campaign relating to fuel-reduction through planned burns. DOJ managed the 2009-10 summer fire campaign—part of a long-term behavioural change campaign—comprising public awareness, communications, and education campaigns such as: FireReady and Prepare. Act. Survive.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0007–0010 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0045–0048, 0064–0067 For a table of key publications, media campaigns and educational programs see Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0056–0058 Exhibit 79 – Summer Fire Readiness Warning Authorised by the Victorian Government (CFA.001.016.0091) Exhibit 831 – Summer Fire Campaign: Benchmark Research (RESP.3001.015.0076) Exhibit 831 – Summer Fire Campaign: Wave 1 Research (RESP.3001.018.0347) Exhibit 79 – FireReady Radio Ad: 3AW (CFA.001.016.0161) Exhibit 137 – DSE/CFA Community Meetings and FireReady Sessions (DSE.HDD.0016.0643) Exhibit 137 – DSE/CFA – FireReady Kits: Bushfire Information (FireReady) Kit (DSE.HDD.0016.0668) Exhibit 137 – DSE/CFA – FireReady Kits: Bushfire Information (FireReady) Kit (DSE.HDD.0016.0669)

Policy	Period of implementation	Responsible department	Description	Evidence
Summer fire campaign/FireReady Victoria campaign *continued*				Exhibit 753 – Making Victoria FireReady – Preparing for Bushfire (DSE.HDD.0052.1576) Exhibit 831 – Preparing your property: Make your Home Bushfire Ready (RESP.3001.001.0047) Exhibit 831 – FireReady: What You Need To Know For The Fire Season (RESP.3001.001.0330) Exhibit 831 – FireReady – Your Guide to Preparing for the Fire Season Ahead (RESP.3001.001.0351) Exhibit 831 – Residential Aged Care Services Bushfire Ready Resource (RESP.3001.014.0216) Exhibit 9 – FireReady: Bushfire Survival Plan (TEN.001.001.0068) Exhibit 828 – Brigade: Fire, Ready, Action – Helping Victorians Prepare (WIT.3004.041.0193) Exhibit 679 – Making Victoria FireReady: Vegetation Removal for Bushfire Protection (WIT.3018.001.0677) Exhibit 679 – Making Victoria FireReady: Managing Erosion and Landslip Risks (WIT.3018.001.0686) Exhibit 831 – Summer Fire Campaign Evaluation 2009–2010 (RESP.3001.025.0001) Exhibit 831 – Advice to the Community Before and During Bushfire (RESP.3001.025.0092) Exhibit 831 – Communications Strategy-Summer Fire Campaign 2009-2010 (RESP.3001.025.0115) Exhibit 831 – Fire Ready Campaign – Creative Rotation – Booked Media –Preparedness and NSP Schedules (RESP.3001.025.0153) Exhibit 831 – Fire Action Week (RESP.3001.025.0156) Exhibit 831 – Fire Ready-What You Need to Know for the Fire Season (RESP.3001.001.0330) Exhibit 831 – Fire Communications Task Force 2009/2010 Summary (RESP.3001.025.0197) Exhibit 831 – Online Campaign Analysis (RESP.3001.025.0198) Exhibit 831 – Online Campaign Analysis (RESP.3001.025.0199)

Policy	Period of implementation	Responsible department	Description	Evidence
Summer fire campaign/FireReady Victoria campaign *continued*				Exhibit 831 – October 2009-March 2010 Bushfire Season 'Fire Ready' Post Analysis (RESP.3001.025.0200) Exhibit 831 – Department of Justice Summer Fire Campaign Wave 2 Research (RESP.3001.025.0328) Exhibit 831 – Examples of 2009/2010 Campaign (RESP.3001.026.0001)
Fire safety officers (wildfire)	Officers commenced duties at the start of September 2009.	CFA	The CFA appointed 10 fire safety officers (wildfire) whose role is to assess the defendability of properties and advise property owners about bushfire risk.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0008 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0059–0060
Internal CFA communication campaign and facilitator training	The CFA conducted training and briefing sessions in the lead up to and during the 2009–10 bushfire season.	CFA	The CFA provided information to all its staff and volunteers about changes to its approach to community communications. The CFA: ■ provided its brigades with a summer information kit containing key messages for the community ■ conducted professional development workshops for staff whose role involves facilitating community FireReady and community fireguard meetings ■ revised a range of CFA publications to reflect changes to the 'stay or go' policy.	Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0060–0063 Exhibit 101 – Community Fireguard Facilitator Manual (WIT.3004.003.0448) Exhibit 831 – Community Fireguard: A Bushfire Safety Program (RESP.3001.001.0121) Exhibit 9 – CFA Website: Are you at risk? (TEN.001.001.0052) Exhibit 9 – CFA Website: Leave or Stay? (TEN.001.001.0053) Exhibit 9 – CFA Website: Make a Bushfire Plan (TEN.001.001.0055) Exhibit 9 – CFA Website: Protect Yourself (TEN.001.001.0057) Exhibit 9 – CFA Website: Protect Your Property (TEN.001.001.0060) Exhibit 9 – CFA Website: Essential Equipment (TEN.001.001.0063) Exhibit 9 – CFA Website: In the Event of Fire (TEN.001.001.0066) Exhibit 9 – FireReady: Bushfire Survival Plan (TEN.001.001.0068) Exhibit 908 – CFA Website: Neighbourhood Safer Places (TEN.275.001.0001)

Policy	Period of implementation	Responsible department	Description	Evidence
Emergency management and planning				
Township protection plans project	TPPs were in place prior to the 2009–10 bushfire season. The State is conducting a 2009–10 bushfire season review of this initiative.	CFA , Municipal Association of Victoria	The CFA and MAV have developed TPPs for 52 communities in high bushfire risk areas. The TPPs include guidance on the operational response to bushfires and (in some cases) fire mitigation measures, as well as information to improve community preparedness, planning and response to the threat of bushfires.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0011–0012 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0055–0056 Exhibit 617 – Statement of Armstrong (WIT.3004.033.0001); Armstrong T13318:1–T13332:5 Exhibit 831 – Township Protection Plan Status Report (RESP.3001.011.0001) Exhibit 831 – Township Protection Plans (RESP.3001.005.0001, RESP.3001.005.0017, RESP.3001.005.0144, RESP.3001.005.0160, RESP.3001.005.0176, RESP.3001.005.0207, RESP.3001.005.0223, RESP.3001.005.0246, RESP.3001.005.0264_R, RESP.3001.005.0280, RESP.3001.005.0192, RESP.3001.005.0311, RESP.3001.005.0327, RESP.3001.005.0343, RESP.3001.005.0365_R, RESP.3001.005.0381, RESP.3001.005.0397, RESP.3001.006.0001, RESP.3001.006.0170, RESP.3001.006.0187, RESP.3001.006.0219_R, RESP.3001.006.0235, RESP.3001.006.0320, RESP.3001.006.0339, RESP.3001.006.0355_R, RESP.3001.006.0371, RESP.3001.006.0391_R, RESP.3001.007.0001, RESP.3001.007.0041, RESP.3001.007.0060, RESP.3001.007.0076, RESP.3001.007.0093, RESP.3001.007.0111, RESP.3001.007.0127, RESP.3001.007.0143 RESP.3001.007.0167, RESP.3001.007.0189, RESP.3001.007.0203, RESP.3001.007.0221, RESP.3001.007.0237, RESP.3001.007.0252, RESP.3001.007.0283, RESP.3001.007.0297, RESP.3001.007.0330, RESP.3001.007.0359, RESP.3001.007.0391_R, RESP.3001.007.0407, RESP.3001.008.0001, RESP.3001.008.0017_R, RESP.3001.008.0037_R, RESP.3001.008.0053, RESP.3001.008.0069_R, RESP.3001.008.0085, RESP.3001.008.0126, RESP.3001.008.0141)

Policy	Period of implementation	Responsible department	Description	Evidence
Victorian Fire Risk Register	As at January 2010, 24 municipalities had completed the VFRR process, 11 municipalities were progressing the process and nine municipalities were about to commence the process.	CFA in collaboration with DSE, MFB and Municipal Committees	VFRR is a bushfire risk mapping tool which identifies people and assets at risk from bushfires and any measures which may mitigate those risks. The VFRR produces risk tables, treatment tables and maps which councils and emergency services will use to support bushfire management planning.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0012–0013 Exhibit 146 – State Fire Management Committee Information Paper: Victorian Fire Risk Registry (CFA.001.019.0235) Exhibit 146 – State Fire Management Committee Decision Paper: Implementation of the Victorian Fire Risk Register (CFA.001.019.0249) Exhibit 831 – Victorian Fire Risk Register: Supports and Informs Your Plan (Handout) (RESP.3001.017.0077_R) Exhibit 831 – Victorian Fire Risk Register: Supports and Informs Your Plan (Reference Guide) (RESP.3001.017.0087_R) Exhibit 831 – Victorian Fire Risk Register: Supports and Informs Your Plan (Vegetation Guide) (RESP.3001.017.0146_R) Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0067–0070
Bushfire At-Risk Register	The Department of Education and Early Childhood Development last updated the Bushfire At-Risk Register on 17 December 2009	DEECD	A register of schools and children's services which are at high risk from bushfire.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0013

Policy	Period of implementation	Responsible department	Description	Evidence
Revision of emergency management procedures for schools		DEECD	DEECD has implemented new arrangements to improve the ability of schools and children's services to respond to a bushfire emergency, including: ■ developing and distributing a bushfire risk self-assessment tool to Victorian schools and children's services ■ developing guidelines for the mandatory closure of schools and children's services on the Bushfire At-Risk Register on code red days ■ revising, in conjunction with the Department of Transport, school bus transport arrangements ■ providing training to school principals and directors of children's services in high risk areas ■ revising the department's children's services emergency management policy, including developing a Bushfire Resources Kit for children's services ■ introducing revised emergency management arrangements for school camps and off-site activities ■ overhauling the incident control systems ■ developing a new geo-mapping tool that maps all schools, school bus routes and centre based early childhood services in Victoria. DEECD has commissioned an audit program for 250 high risk schools and children's facilities. It is also developing a new compliance and review system for emergency management plans in schools and children's services for implementation in 2010.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0013–0015 Exhibit 148 – Statement of Cook (WIT.3029.001.0001) Exhibit 831 – Bushfire Resources Kit: Schools (RESP.3001.004.0122)
Bushfire response: clients and services policy 2009–10		Department of Health, Department of Human Services	The policy provides an overarching framework for bushfire response, and contains specific DHS program guidelines. DH and DHS have also developed: ■ an online summer preparedness self-assessment tool ■ a residential aged care services BushfireReady resource.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0015–0016 Exhibit 831 – Bushfire Reponse: Client and Services Policy 2009-10 (RESP.3001.014.0333)
Management of the natural and built environment				
Building Amendment (Bushfire Construction) Interim Regulations 2009	The Regulations came into operation on 11 March 2009 (except for Regulations 8, 9 and 10, which came into operation on 9 March 2010).	Department of Planning and Community Development	The Interim Regulations require new homes built after 7 February 2009 to be constructed to improved safety standards. The State has implemented a range of training and information initiatives to educate industry and consumers about the Interim Regulations and building related matters. The Building Commission has implemented a range of projects relating to the Interim Regulations, including working with industry to develop windows that will meet the new building standard.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0017–0018 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [150]–[153]

Policy	Period of implementation	Responsible department	Description	Evidence
Reconstruction initiatives—Victoria Planning Provision amendments	The amendment was made on 14 May 2009.	DPCD	The Minister for Planning introduced clause 52.39 into the VPPs to ensure that homes destroyed in the 2009 bushfires were reconstructed in a manner that reduced bushfire hazard. The new clause requires local councils to approve a site plan before reconstruction can commence that shows vehicle access, water supply and the siting of the reconstructed home.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0018 Exhibit 678 – Clause 52.39 2009 Bushfire Replacement Buildings (TEN.111.001.0054)
Reconstruction initiatives—building amendment (Bushfire Construction) Further Interim Regulations 2009	Introduced on 1 September 2009.	DPCD	The Further Interim Regulations provide that the reconstruction of homes destroyed in the 2009 bushfires must only occur once the site has an adequate water supply and access for emergency vehicles if it is subject to a Wildfire Management Overlay.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0018
Building and planning initiatives	Direction took effect on 1 February 2010.	DPCD	The Minister for Planning issued a direction under section 30 of the *Project Development and Construction Management Act 1994* to strengthen bushfire safety requirements for government-funded public-use buildings from 1 February 2010. The direction requires public-use buildings to undergo a bushfire attack level assessment and improve use of bushfire resistant designs. The Minister also approved a streamlined planning scheme amendment process for Wildfire Management Overlays.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0018–0019
DSE vegetation management	The State expects to complete strategic fuel breaks in the first half of 2010.	DSE	DSE will continue to conduct native vegetation clearing and fuel reduction burning as part of its preparations for each bushfire season. It is also constructing strategic fuel breaks to help protect Melbourne water catchments and Otways communities from the effects of bushfire.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0019–0020 Exhibit 716 – Supplementary Statement of Fogarty (WIT.3024.005.0143) Exhibit 719 – Supplementary Statement of Tainsh (WIT.3024.005.0182) Exhibit 721 – Supplementary Statement of Lawlor (WIT.3024.005.0199) Exhibit 729 – Statement of Wilson (WIT.3024.005.0265) Exhibit 753 – Statement of Miezis (WIT.3024.004.0315) Exhibit 749 – Statement of Dripps (WIT.3024.005.0124) Exhibit 761 – Statement of Fogarty (WIT.3024.004.0331) [12]–[31]

Policy	Period of implementation	Responsible department	Description	Evidence
Managing native vegetation on roadsides: a guideline for implementing agreements under the local government public road exemption	As at 18 February 2010, 37 councils had entered into agreements with DSE.	DSE, Department of Transport, VicRoads, councils	DSE has entered into agreements with the Department of Transport and local councils regarding roadside clearing. The State has developed guidelines to assist VicRoads and councils understand their obligations when removing native vegetation on roadsides. The guidelines apply to all councils that have entered into a formal agreement with DSE.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0020 Exhibit 745 – Statement of Liddle (WIT.3027.001.0001) Exhibit 746 – Statement of Brown (WIT.3027.001.0070) Exhibit 749 – Statement of Dripps, Attachment 4 (DSE.HDD.0052.1867)
Vegetation management—VPPs amendments	Gazetted 10 September 2009. The State made clarifying amendments on 22 January 2010.	DPCD	The Minister for Planning introduced a new clause 52.43 into the VPPs to simplify residents' ability to clear native vegetation around their homes. Amendment VC65 to the VPPs (gazetted 22 January 2010) amended Clause 52.43 and further clarified the permit exemptions for vegetation removal. DSE has published information and updated its website to educate residents about their entitlements under the VPPs.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0020 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) Exhibit 682 – Statement of Sturzenegger (WIT.3004.028.0166) Exhibit 684 – Statement of Fox (WIT.3004.028.0202) Exhibit 685 – Statement of Dripps (WIT.3024.005.0081) Exhibit 678 – Clause 52.43 Interim Measures for Bushfire Protection (TEN.077.001.0005)
Enhancement of CFA advisory role in relation to vegetation management		CFA	The State has provided the CFA with funding to enhance its advisory and assistance roles for vegetation management on private land, roadsides and rail corridors.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0021 Exhibit 759 – Statement of Strickland (WIT.3004.034.0025) Exhibit 748 – Witness Statement of Leslie (WIT.3004.028.0001) [24]–[27], [28]–[33], [54]–[58]

Policy	Period of implementation	Responsible department	Description	Evidence
Community information and warnings				
Memorandum of Understanding between the CFA, DSE and BoM regarding the National Fire Danger Ratings System	12 December 2009.	CFA, DSE	The BoM, the CFA and DSE have entered into a MOU about the operation of FDRs and the determination of FDR levels.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0021–0022 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0034–0039 Exhibit 847 – Second Supplementary Statement of Haynes (WIT.3004.035.0200) Exhibit 324 – Australia's Revised Arrangements for Bushfire Advice and Alerts – 2009/2010 Fire Season (RESP.7500.001.0001) Exhibit 324 – Australia's Revised Arrangements for Bushfire Advice and Alerts – 2009/2010 Fire Season (Appendix 1 – Participants) (RESP.7500.001.0014) Exhibit 324 – Australia's Revised Arrangements for Bushfire Advice and Alerts – 2009/2010 Fire Season (Appendix 2 – National Framework for Scaled Advice and Warning to the Community) (RESP.7500.001.0016) Exhibit 324 – Australia's Revised Arrangements for Bushfire Advice and Alerts – 2009/2010 Fire Season (Appendix 3 – Forecast Fire Danger) (RESP.7500.001.0017) Exhibit 324 – Australia's Revised Arrangements for Bushfire Advice and Alerts – 2009/2010 Fire Season (Appendix 4 – Messaging the Community) (RESP.7500.001.0020) Exhibit 831 – New Fire Danger Ratings. Look for Them, Act on Them (RESP.3001.014.0190) Exhibit 831 – Understanding Fire Danger Ratings (RESP.3001.001.0119) Exhibit 705 – CFA Website: Fire Danger Ratings (EXP.019.001.0215)
National Framework for Scaled Advice and Warnings to the Community	The Framework was agreed to by the Australasian Emergency Management Committee on 4 September 2009.	AEMC, representing all states and territories	The Framework includes a three-stage warning model and links the new fire danger ratings with trigger points for issuing messages to the community. The framework comprises the alert messages: 'advice', 'watch', 'act' and 'emergency' predicated on the estimated time before impact, the fire danger rating, and severity of the fire.	Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0025–0026 Exhibit 11 – Statement of Esplin (WIT.005.001.0001)

Policy	Period of implementation	Responsible department	Description	Evidence
Country Fire Authority Act (1958) amendments	The *Emergency Services Legislation Amendment Act 2009,* which inserted a new Part IIIA in the CFA Act, commenced on 2 December 2009.	CFA, DSE, MFB, Office of the Emergency Services Commissioner, Victoria Police, DOJ	The amendments provide that the CFA Chief Officer will be responsible for issuing warnings and providing information to the community about bushfire risks. On 24 December 2009 the Chief Officer delegated that responsibility to the Chief Fire Officer, DSE, and the Chief Officer, MFB, in circumstances where the delegate's agency is the control agency for the fire.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0022 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0101–0103 Exhibit 614 – CFA Act Part IIIA – Improving Community Safety (WIT.3004.032.0164)
CFA/DSE joint standard operating procedure on incident information and warnings	The State issued the SOP on 3 February 2010.	CFA, DSE	The CFA and DSE have developed the SOP regarding warnings to the community and relocation recommendations. It requires Incident Controllers and others in IMTs to issue warnings to the community in appropriate circumstances. The CFA and DSE have also revised processes and procedures to ensure that where a level 3 Incident Controller or officer of equivalent ranking is satisfied that a bushfire warning is required, then they are authorised to release a warning where the designated Incident Controller is temporarily unavailable.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0022–0023 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0048–0049, 0100 Exhibit 701 – CFA and DSE Joint SOP (J4.01): Incident Information Unit Management (DSE.HDD.0012.1341)
Common Alerting Protocol	In use since October 2009. CAP templates were to be reviewed after the 2009–10 bushfire season.	CFA, DSE	The CAP provides the CFA and DSE with template warning messages to the community regarding fire danger and recommended actions.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0023 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0021–0022 Exhibit 828 – Common Alerting Protocol (Bushfire Messages) Victoria (RESP.3001.021.0003) Exhibit 45 – Common Alerting Protocol Presentation (TEN.004.001.0019)

Policy	Period of implementation	Responsible department	Description	Evidence
One Source–One Message software tool	Phase 1 of OSOM has been in use since October 2009. Phase 2 is scheduled for mid-2010.	CFA, DSE	OSOM enables warnings (including CAP warnings) to be delivered from incident control centres to a variety of outlets simultaneously, including CFA and DSE websites, Victorian Bushfire Information Line operators and media outlets. Approved information officers upload specific information about a fire and OSOM will generate a message using a standard template. Under phase 1 of OSOM, only the CFA and DSE have the capacity to upload information. Once phase 2 is implemented, MFB will also gain access to the system. CFA/DSE joint SOP 4.01 provides that the OSOM tool should be the primary method of warning message distribution. CFA and DSE have also issued a joint OSOM reference guide and have revised their guidelines for the Australasian Inter-Service Incident Management System.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0023 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0021–0022, 0039–0041 Exhibit 831 – One Source One Message Reference Guide (RESP.3001.017.0180)
Bushfire severity scale project	DSE and the Bushfire CRC commenced work on the project in January 2010. Research is to be completed by July 2010.	DSE	This project aims to identify options for the development of a severity scale that denotes a 'going' bushfire's risk. The research will describe the power of bushfires and their potential impact on communities and the services on which those communities rely.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0023–0024 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0023–0024 Exhibit 831 – Bushfire Severity Scale Project (RESP.3001.017.0174)
Memorandum of Understanding—broadcasters and the State	Some of the MOUs were in place prior to the 2009–10 bushfire season. The State's negotiations with other broadcasters are ongoing.	Office of the Emergency Services Commissioner	The State has entered into a revised MOU with the ABC in relation to the broadcast of bushfire warnings and information. The State has also entered into MOUs with Commercial Radio Australia (on behalf of commercial radio operators) and radio broadcaster 3UZ. The MOUs: ■ contain the undertaking of both parties to support timely and accurate emergency warnings to the community ■ commit the relevant radio operators to interrupt programming and broadcast emergency messages in an agreed form ■ make provision for continuous coverage during major emergencies and the use of standard emergency warning signals in accordance with the guidelines. The State has finalised a similar MOU with Sky-TV news, and is in negotiation with SBS, community radio broadcasters and free-to-air television operators. The OESC has developed a practice note that outlines procedures for implementing the MOUs.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0024 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0028–0029 Exhibit 831 – Letters to various emergency services agencies who participated in MOU development with broadcasters (RESP.3001.014.0016, RESP.3001.014.0018, RESP.3001.014.0020, RESP.3001.014.0022, RESP.3001.014.0024, RESP.3001.014.0026, RESP.3001.014.0028)

Policy	Period of implementation	Responsible department	Description	Evidence
Emergency Alert (formerly NEWS)	The State implemented phase 1 of Emergency Alert in December 2009. Work on phase 2 is ongoing.	OESC	Emergency Alert allows warning messages to be delivered to the fixed and mobile phones of residents under threat from a bushfire. The second phase of Emergency Alert proposes the delivery of warning messages to mobile phones based on the user's location (currently warnings are delivered based on the user's billing address).	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0024–0025 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0022, 0032–0033 Exhibit 828 – Emergency Alert: Quick Reference Guide (WIT.3004.041.0137)
Standard Emergency Warning Signal Guidelines	The State Emergency Response Plan was amended to include specific reference to the SEWS in October 2009.	Victoria Police	The State has developed revised guidelines on the use of the SEWS which specify the purpose of the signal, the circumstances when it is to be used (and not used), the duration, and processes and administrative arrangements surrounding its use. The State's new MOUs with emergency broadcasters require the emergency broadcasters to follow the SEWS guidelines.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0025–0026 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0027–0028 Exhibit 831 – The Standard Emergency Warning Signal and Guidelines for its Use in Victoria (RESP.3001.002.0179)
Guidelines for the use of CFA and community sirens	The CFA will review its sirens policy on 30 October 2012. The OESC guidelines are interim guidelines until March 2010, but will be extended until 30 October 2012 to coincide with the CFA's review of its sirens policy.	OESC, CFA	The OESC developed guidelines to assist communities and local brigades in the use of existing brigade sirens (or community sponsored and run sirens) to alert the community to a bushfire threat. The CFA has issued a complementary policy (included in an appendix to the OESC guidelines) which details the CFA position on the use of existing sirens and other types of community alert sirens. The CFA and OESC guidelines identify the steps to be taken, the parties that should take them, and the issues to be addressed to obtain or use a siren as a community alert.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0026 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0030–0032
Victorian Bushfire Information Line Service Extension Project	2009–10 bushfire season.	DSE	DSE has made improvements to the VBIL including: ■ increasing phone line and on-hold message capacity ■ improving 'triage' arrangements to ensure that the most urgent calls are given priority ■ increasing the casual operator pool and call centre seating ■ enhancing existing overflow arrangements with Centrelink and discussing new overflow arrangements with the State Revenue Office and VicRoads ■ ensuring that information from operational sources is provided directly to the VBIL at the same time as other agencies (through OSOM) ■ developing new FAQ templates and investigating their automation with OSOM warnings.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0026 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0041–0043

Policy	Period of implementation	Responsible department	Description	Evidence
Health and Human Services Fire Communications Strategy	Implemented prior to the 2009–10 bushfire season.	DH, DHS	The State developed the Health and Human Services Fire Communications Strategy to ensure human services providers receive timely, comprehensive and consistent fire information through: ■ a weekly or bi-weekly newsletter ■ messages targeted at vulnerable groups.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0026–0027
Social media initiatives	Launched in mid-March 2010.	CFA	The State plans to use social media to assist the community to gauge its level of fire readiness and to communicate important information on fire danger ratings, total fire ban status and fire warnings. The State has invested in the development of customised Facebook and free official FireReady iPhone applications, which will extract relevant information from the CFA's website.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0027 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0055
Shelter options				
Private shelters—Building Amendment (Private Bushfire Shelter Construction) Interim Regulations 2009 (Interim Shelter Regulations)	The State introduced the Interim Shelter Regulations as a temporary measure pending the development of national standards, expected to be introduced in 2010. The Regulations came into operation on 11 November 2009 (except for Regulations 9 and 10, which come into operation on 9 November 2010).	Department of Planning and Community Development	The State has introduced the Interim Shelter Regulations to regulate construction and installation of private bushfire shelters. The Interim Shelter Regulations make private bushfire shelters a new class of building under the Victorian Building Code.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0027–0028 Exhibit 169 – Supplementary Statement of Arnel (WIT.3000.002.0220_R) Exhibit 313 – Bushfire Bunkers (BDC.001.001.0199) Exhibit 500 – Fire refuges: Implementation Plan (EXH.500.0003)

Policy	Period of implementation	Responsible department	Description	Evidence
Neighbourhood Safer Places	The *Emergency Services Legislation Amendment Act 2009* amended the CFA Act to include provisions relating to NSPs. It came into operation on 2 December 2009. As at 7 November 2009, all 52 towns identified as most at risk from bushfires had potential NSP sites considered and 50 of those sites met CFA criteria. As at 16 March 2010, 62 NSPs had been designated. The State conducted a post 2009–10 bushfire season review of the NSP initiative.	CFA	The Victorian Parliament has enacted legislation requiring local councils to designate NSPs in existing buildings or spaces that can be accessed as a last resort to provide some protection from bushfire. Amendments to the CFA Act in 2009 introduced the following process for establishing a site as an NSP: ■ identification of potential sites by local councils ■ certification of sites satisfying the criteria in the CFA's Guidelines (see below) ■ formal designation of the site as an NSP by a local council. When designating a site as an NSP, councils may: ■ develop a Municipal NSP Plan, which relates to the identification, suitability and designation of NSPs and the inspection, maintenance and decommissioning of designated NSPs ■ develop a specific management plan for the site ■ conduct a separate assessment of the site for access, egress and capacity. Where the NSP is not situated on council controlled land, local councils must obtain the consent of the land occupier/controller to use the site as an NSP. Where a site is on Crown land, the Minister for Environment and Climate Change has consented to the use of identified Crown land reserves as NSPs by notifications contained in Special Government Gazettes. DSE is working with MAV to develop a consistent statewide process for managing consent and maintenance arrangements for these NSPs. For the 2009–10 bushfire season the State and local councils gave priority to the identification and designation of NSPs in the 52 communities facing the highest risk of bushfire. The CFA analysed the community outcomes resulting from the implementation of township protection plans and NSPs. It found: there appears to be a good understanding that NSPs are a place of last resort; there is considerable misunderstanding about the role of NSPs and the introduction of NSPs has not been accompanied by increased household planning.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0028–0030 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0074–0077, 0086 Exhibit 617 – Statement of Armstrong (WIT.3004.033.0001) Exhibit 614 – Statement of Hayes (WIT.3004.032.0147) Exhibit 831 – *Emergency Services Legislation Amendment Bill 2009* (Vic) Explanatory Memorandum (RESP.3001.002.0001) Exhibit 831 – 'Neighbourhood Safe Places: Places of Last Resort' Interim Assessment Guideline (RESP.3001.001.0127) Exhibit 831 – Statewide NSP Location Spreadsheet (RESP.3001.014.0158) Exhibit 831 – Signage guidelines for NSPs (RESP.3001.011.0262) Exhibit 620 – Municipal Council Neighbourhood Safer Places Plan (TEN.168.001.0001) Exhibit 831 – Township Protection Plans CFA Progress Report (RESP.3001.026.0012)

Policy	Period of implementation	Responsible department	Description	Evidence
NSP Guidelines	The CFA published interim NSP assessment guidelines in October 2009. Guidelines issued under the CFA Act (as amended by the ESA Act) were published in the Government Gazette and placed on the CFA website on 11 February 2010.	CFA , MAV, OESC	The CFA has issued guidelines specifying criteria and other considerations relating to the assessment of NSPs, and has trained 20 CFA personnel on the assessment methodology. The MAV has developed a NSP plan template to assist councils with the NSP designation process. The OESC has published guidelines to assist councils to fulfil their obligations to ensure designated NSPs are identified with appropriate signs.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0028 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0074–0076
Uniform NSP signage	The State endorsed the signs and their accompanying guidelines on 9 December 2009. As at 16 March 2010, state approved signage had been installed at all 62 approved NSPs.	OESC	The OESC, in consultation with the CFA and MAV, have developed a standard sign identifying NSPs. The signs were: designed in accordance with AS 2341-1992, use an internationally recognised symbol for fire assembly points, and clearly state that the NSPs are places of last resort and are specific to bushfires. In producing the NSP signage, the MAV added additional text on secondary signs to give readers information about: what to expect at an NSP, the risks associated with NSPs, and the limitations of NSPs in offering bushfire protection.	Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0082–0085 Exhibit 831 – Signage guidelines for NSPs (RESP.3001.011.0262)
Maintenance of NSP list	The CFA notified key agencies of the website listing in December 2009. The CFA sent a list of compliant NSP sites to DSE in December 2009 for inclusion in VicMap, and to the Emergency Services Telecommunications Authority for inclusion in its computer aided dispatch system. On 30 December 2009 the State requested the VBIL to update the NSP FAQs with the information provided on the CFA website in relation to new NSPs. On 23 February 2010 the State gave in principle endorsement of the draft guidelines for notifying agencies of newly designated NSPs.	CFA	ESA Act amendments to the CFA Act require the CFA to maintain a statewide list of NSPs on its website and provide the list to the Secretary to DSE, Chief Commissioner of Police, CEO of the SES, MAV and the VBIL. The CFA website lists the current NSPs, including those that are non-compliant or are yet to be assessed, and the single community fire refuge in Woods Point. The interim process for the maintenance of the list provides that MAV will inform the CFA of newly designated NSPs or NSPs to be removed, and the CFA will notify ESTA and DSE accordingly. The CFA will then update its website and notify all related parties. The State has developed draft guidelines for notifying agencies of newly designated NSPs, which clarify the responsibilities of councils, CFA, DSE and ESTA.	Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0085–0086

Policy	Period of implementation	Responsible department	Description	Evidence
Review of state fire refuges policy	The Office of the Emergency Services Commissioner presented an initial draft discussion paper to the State Coordination and Management Council on 8 December 2009, and a further draft on 2 February 2010. The review was ongoing as at 22 April 2010.	OESC	The OESC is undertaking its review of the State's current fire refuges policy in the context of other measures and policies the Commission considered, such as the use of NSPs, the role of relocation and bunkers, and consideration of stay or go.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0030 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0072–0074 Exhibit 902 – Supplementary Statement of Bruce Esplin (WIT.3007.001.0001)
Assessment and upgrade of school refuges	The Department of Education and Early Childhood Development has completed a review of all refuges in all schools in areas at risk of bushfire. As at 10 February 2010, upgrades had been completed on 20 schools with work continuing on at least five others.	DEECD	The Victorian Managed Insurance Authority assessed 36 school fire refuges to ensure they complied with the safety standards contained in various building regulations. Infrastructure consultants, GHD, reviewed the information and recommendations contained in the VMIA reports, scoped the necessary rectification works for each school, and developed a budget estimate for the completion of those works. The GHD reports covered a range of relevant considerations based on appropriate standards and documentation.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0030–0031 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0087–0090 Exhibit 831 – DEECD Schools Fire Refuge Program (RESP.3001.019.0005)
Review of bushfire protection measures in children's services facilities	DEECD completed the review on 31 March 2010.	DEECD	DEECD has developed a comprehensive improvement program to ensure that all Victorian schools and children's services, including kindergartens, child care centres, preschools and early learning centres, are well prepared for bushfires. This program has identified 30 projects that DEECD is currently progressing or participating in as a stakeholder. The process involved the development and distribution of a bushfire self-assessment tool for children's services and to all schools (including Catholic and independent) and early childhood facilities in Victoria. The purpose of the tool was to raise awareness of the need for facilities to consider bushfire risks, and allow them to get a better understanding of their risks and level of preparedness for all emergencies. DEECD has also issued schools and children's services with a Bushfire Resources Kit and is developing a mapping tool to enhance its emergency management capability by allowing users to speedily locate, identify and communicate with schools and children's facilities.	Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0091–0094 For a table containing an overview of the main issues identified by the self-assessment tool and audit process and the Department's responses. see Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0092 Exhibit 831 – Children's Services Bushfire Resource Kit – Children's Services – Version 1 (RESP.3001.004.0001) Exhibit 831 – Schools Bushfire Resource Kit – Children's Services – Version 1 (RESP.3001.004.0122) Exhibit 831 – Children's services Bushfire and Emergency Management Self-Assessment (RESP.3001.002.0044_R) Exhibit 831 – Schools Bushfire and Emergency Management Self-Assessment (RESP.3001.002.0088_R)

Policy	Period of implementation	Responsible department	Description	Evidence
Response				
Procedures and Guidelines				
Review of the State Emergency Response Plan	The review was complete as at 31 March 2010.	Victoria Police	In response to the Commission's interim report, the State amended the SERP to increase its emphasis on control, command and coordination principles and roles. These substantial amendments appear to address the matters raised in the interim report. In particular, the amended SERP provides that the control agency for a fire is responsible for issuing and communicating warnings. The revised SERP has been incorporated into the Emergency Management Manual Victoria.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0032 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0027, 0043–0045, 0103–0104, 0110–0112 Exhibit 443 – Statement of Overland (WIT.3010.009.0229) [8] Exhibit 443 – Statement of Overland, Annexure 1 (WIT.3010.009.0244)
Interim Command, Control and Coordination Arrangements	The interim arrangements were introduced for use by agencies during the 2009–10 bushfire season. Parliament amended the *Emergency Management Act 1986* (EMA Act) in 2009.	Victoria Police, DSE, CFA, MFB, VIC SES	The police Chief Commissioner introduced interim command, control and coordination arrangements for the 2009–10 bushfire season. The State amended the EMA Act to help implement the interim arrangements. In November 2009 the chief (fire) officers of the CFA, DSE and MFB signed the *Heads of Agreement, State Command and Control Arrangements for Bushfire in Victoria.* That document reflects the amendments to the EMA Act and the Emergency Management Manual. It also describes the agreed principles for establishing and exercising command and control.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0032 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0106–0110 Exhibit 443 – Statement of Overland (WIT.3010.009.0229) [9]–[16] Exhibit 547 – State Command and Control Arrangements for Bushfire in Victoria (CFA.001.032.0300)
Emergency Management Manual Victoria	The OESC released updates to the Manual in November and December 2009.	OESC	The State has revised the Manual to include: ■ interim command, control and coordination arrangements ■ revisions made to the State Emergency Response Plan ■ policy and procedural changes introduced for the 2009–10 bushfire season, particularly in relation to stay or go, warnings and relocations. OESC is currently working on a project with DOJ to develop an online version of the Manual. This version will provide enhanced navigation and search functionality for users.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0032 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0104–0106 For tables showing EMMV updates/revisions see Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0105–0106 Exhibit 831 – Emergency Management Manual Victoria (RESP.3001.003.0001_R)
Relocation—CFA and DSE joint SOP on incident information and warnings	Issued on 3 February 2010, the SOP was to be reviewed after the 2009–10 bushfire season.	CFA, DSE	DSE and the CFA have developed SOP J4.01. It includes procedures for disseminating warnings to the community and making relocation recommendations. The SOP indicates that the individual has the responsibility for making a decision to relocate, and that the Incident Controller's role is to provide advice to threatened communities on appropriate responses to an incident, which may include advice to relocate.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0022–0023 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0048–0049 Exhibit 701 – CFA and DSE Joint SOP (J4.01): Incident Information Unit Management (DSE.HDD.0012.1341)

Policy	Period of implementation	Responsible department	Description	Evidence
Revision and replacement of fire agency SOPs	SOP J3.03 was finalised on 3 February 2010.	CFA, DSE	The CFA and DSE have revised or replaced a number of SOPs including: ■ J2.03 on IMT preparedness arrangements, which identifies trigger points and default staffing preparedness levels for incident control centres and IMTs on days of predicted elevated fire danger ■ J3.03 on incident action planning, which provides that incident action plans must include strategies to enhance the protection of NSPs where they are likely to be threatened ■ J3.08 on the appointment of Incident Controllers which provides for their appointment and requires a joint CFA and DSE register to be maintained of personnel endorsed to perform the role ■ J3.10 on traffic management during bushfires, which provides that when an Incident Controller requests the establishment of a roadblock, he or she must consider whether simultaneous advice or warnings should be issued to the community.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0032–0034 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0116–0117 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011)
The revised Guidelines for roadblocks during wildfires	The TMP Guidelines were reviewed, and revised guidelines were introduced for the 2009–10 bushfire season.	Victoria Police, CFA, DSE	The TMP Guidelines: ■ establish access levels for various groups at roadblocks ■ provide for wristband identification of residents and others requiring access ■ adopt more flexible means of establishing identity. The State has allocated funding to educate the community about the new traffic management and access arrangements. Victoria Police has also distributed information cards regarding the revised TMP Guidelines to its members, published a TMP public information pack on its website, and issued 25,000 individually numbered wristbands to its regions, which are held in police stores and are distributed to local areas.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0034 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0113–0116 Exhibit 540 – Statement of Walshe (WIT.3010.009.0300) Exhibit 269 – Guidelines for the Operation of Traffic Management Point during Wildfires (WIT.3004.013.0299) Exhibit 540 – Guidelines for the Operation of Traffic Management Points during Wildfires (WIT.3010.009.0361)
Advance notice for Telstra and the Emergency Services Telecommunications Authority	9 November 2009.	Office of the Emergency Services Commissioner, CFA, ESTA, Telstra	The OESC, CFA, ESTA and Telstra 000 have developed arrangements so that ESTA and Telstra receive advance notice of severe weather events. This will allow them to anticipate high emergency call demands. In November 2009 the State amended the OESC Significant Incident–Severe Weather Notification SOP 2.199 to add a new section titled, 'Severe Weather Notification'. It sets out the key procedural steps in the event of the declaration of a severe, extreme or code red day. Those amendments are reflected in ESTA and CFA SOPs which came into effect in November and December 2009.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0034–0035 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0118–0120

Policy	Period of implementation	Responsible department	Description	Evidence
Revision of State Health Emergency Response Plan	The State revised the SHERP for the 2009–10 bushfire season. The State's remedial works for health facilities were due to be completed in April 2010.	DHS, DH	The revised SHERP provides coordinated support for communities and ensures access to essential services during an emergency. DH and DHS have inspected each of their facilities and provided them with a bushfire self-assessment tool to assist with their bushfire preparedness. Priority has been given to facilities located within the 52 high fire risk townships. The State has also provided $1.25 million to local government to assist vulnerable people. DHS, in conjunction with the State Emergency Service, has developed a State Coordination Agreement to better deliver services in relief centres. From April 2010 DHS will have state and regional responsibility for emergency relief.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0035 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0126 Exhibit 843 – State Health Emergency Response Plan (WIT.3003.001.0062)
Emergency Relief Centre Guidelines	Planned for completion before the 2009–10 bushfire season. An Interim Guidance Note was provided to councils on 30 October 2009.	Councils, with State support	To support municipal emergency planning, VIC SES, DHS, DOJ, Victoria Police and MAV are developing guidelines for the operation of emergency relief centres. Key elements to be addressed are: ■ standard processes, including location, capacity, activation, roles and facilities ■ geographic coverage ■ community education and expectations ■ management and scope of activities standardised operating procedures.	Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0050 Exhibit 831 – Local Government Emergency Relief Centre Guidance Note (RESP.3001.011.0003)
Personnel, infrastructure and resources				
Upgrade of State Control Centre facilities			The upgrade will improve the SCC's operational capacity, and includes: ■ an increased seating and media capacity that will allow all relevant emergency services organisations to station officers at the SCC ■ enhanced telephone and IT capabilities ■ a new layout to improve information flow ■ the revision and preparation of new SOPs for operation of the SCC ■ improved connectivity with incident control centres across Victoria.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0036 Exhibit 210 – Statement of Brown (WIT.3024.002.0280)

Policy	Period of implementation	Responsible department	Description	Evidence
Upgrade of DSE and CFA incident control centres	As at 30 October 2009 the State had earmarked an upgrade for the 43 level 3 incident control centres and: ■ completed upgrade works on 17 ■ scheduled completion of upgrade works for 24 by November 2009 ■ scheduled completion of the Geelong Incident Control Centre by January 2010 ■ scheduled completion of the Mt Gambier Incident Control Centre by June 2010. The State expects to complete the upgrade project in June 2010.	CFA, DSE	The CFA and DSE state duty officers have been given direct responsibility for ensuring pre-designated level 3 incident control centres within their control are properly staffed and equipped to enable immediate operation in the case of a fire on high fire risk days. Equipment—the focus has been on upgrading level 3 incident control centres to ensure that they comply with CFA and DSE agreed minimum standards. Upgrade works include increasing seating capacity, upgrading equipment, and enhancing telephone and IT facilities. Staffing—the State has retained overseas and interstate specialists to increase the number of qualified level 3 personnel available during the summer fire season. The CFA and DSE are also developing a long term strategy to attract, train and retain members with advanced skills and competencies required for level 3 IMT roles. Pre-formed IMTs—will be deployed to strategically located incident control centres based on forecast conditions and capability requirements. The CFA and DSE have determined that they can sustain 12 level 3 IMTs at any one time to the required capacity.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0036–0037 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0094–0097 See further Exhibit 831 – Level 3 ICCs – Upgrade Project of 15 September 2009 (RESP.3000.003.0060) Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [199]–[206]
Improvement and alignment of CFA and DSE IMT training	Joint training packages by 30 June 2011.	CFA, DSE	The State has taken steps to ensure that all CFA and DSE IMT personnel shall be endorsed to a standard as agreed between those agencies. DSE and the CFA have agreed to develop joint training packages for key IMT personnel, where they do not currently exist, by 30 June 2011.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0037 Exhibit 547 – Statement of Haynes (WIT.3004.023.0011) [158]–[169] Exhibit 202 – Statement of Slijepcevic (WIT.3024.001.0109) [47]–[53]
DH and DHS Incident Controller training programs		DH, DHS	DH and DHS have developed training programs to ensure that health and human services staff are trained to the same level as DSE and CFA Incident Controllers.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0037
Trial of new water bombing plane		National Aerial Firefighting Centre	The State allocated funding to trial a new water bombing plane, the Very Large Air Tanker, to boost the State's firefighting capacity during the 2009–10 fire season and assess its effectiveness in fighting fires in Victoria. NAFAC ran the procurement process.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0037–0038

Policy	Period of implementation	Responsible department	Description	Evidence
Funding for improvements to emergency services communications	The State's investment in enhanced radio communications, provision of ESTA services, and improved radio coverage will be made over four years. Installation of the satellite downlink system in the first aircraft has been completed and is underway in the second aircraft. The cross-training of police call takers was completed on 3 November 2009. An additional 15 workstations and related equipment were available on 11 November 2009.	Emergency Services Telecommunications Authority	The State has contributed $1.042 million toward improving ESTA surge capacity, including 15 additional work stations in Ballarat. The State has invested in: ■ enhanced radio communications between emergency services organisations and capacity to manage 000 calls ■ funding for emergency services organisations and ESTA for the ongoing provision of ESTA services ■ improved radio coverage in metropolitan and regional areas experiencing emergency communications 'black spots' ■ upgrading the connectivity of DSE's incident channels and office redundancy to provide an alternative communications link that can be used by incident control centres in a bushfire emergency ■ installing a satellite downlink system in two aircraft to allow data transfer from fire detection line scanners ■ greater call-taking capability through additional workstations at ESTA's Ballarat and Tally Ho communications centres and additional training in fire call taking for ESTA staff at its Ballarat centre. ESTA has also implemented a number of other initiatives, including the creation of a virtual queue, cross training of police call takers in fire call taking, and protocols with the VBIL.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0038–0039 Exhibit 840 – Statement of Comrie, Annexure 1 (WIT.3031.001.0004) at 0120–0122 Exhibit 62 – Statement of Foster (WIT.012.001.0001) Exhibit 868 – Statement of Lloyd (WIT.3028.001.0001)
Review of Emergency Services Communication Strategic Framework	Review is in progress.	The State	The State is currently reviewing the framework. It aims to strengthen and enhance emergency services communications by upgrading voice, alerting and data communications, and to further integrate call taking and dispatch into those systems.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0039 Exhibit 867 – Emergency Services Communications Strategic Framework (DOJ.001.005.0159)
Review and upgrade of emergency alerting pager system	Review is continuing.	ESTA	The first phase of this review, the message type review, has rationalised customer message protocols and reduced system congestion providing an improved message throughput.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0039 Exhibit 867 – Update on Emergency Alerting System (DOJ.001.004.0307_R) Exhibit 867 – Update on Emergency Alerting System (DOJ.001.004.0308)

Policy	Period of implementation	Responsible department	Description	Evidence
Funding to improve the capacity and capability of fire services	42 new ultra light tankers were due by June 2010, with 22 units previously delivered. The State will provide funding to assist the CFA to retire aged heavy tankers and replace its fleet of heavy pumpers in 2009–10. The State will provide funding to replace or upgrade rural fire stations over the next two years.	DSE, CFA	The State has invested in the following improvements: ■ upgrading fire service intelligence gathering, analysis, and alerting capability. In particular, DSE has trained additional staff as air observers, situation officers and fire behaviour analysts, and updated DSE and Networked Emergency Organisation staff in how to use the OSOM tool for the 2009–10 bushfire season. The CFA has purchased new portable field IT kits ■ training, briefings and communications exercises on the changes were introduced for the 2009–10 bushfire season ■ ordering 42 ultra light tankers and providing funding to enable CFA Brigades to acquire another 27 ■ constructing 18 new fire stations ■ upgrading or replacing over 60 rural fire stations.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0039–0040
Investigation of funding options for fire services	The State released its Green Paper on funding options for fire services in October 2009. The Victorian Parliament enacted legislation in December 2009 to enable a pilot study of those options. The State proposes to release a White Paper stating its final position within six months of the tabling of the Commission's final report.	The State	The State will conduct a pilot study to collect and analyse data relating to options for funding Victoria's fire services in a fair and sustainable manner.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0040–0041
Victoria's volunteering strategy	Released in May 2009.	The State	The strategy aims to support the growth of community volunteering. Key actions include: ■ a community awareness campaign to encourage volunteering ■ a new web portal to provide an easy access point for volunteering opportunities and information about organisations ■ tools, resources and strategies to encourage groups currently excluded from or under-represented in community volunteering ■ support to organisations to provide new volunteering opportunities to suit the way young people are able to donate their time ■ small grants to community organisations seeking to create new opportunities for diverse groups of volunteers.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0041–0042 Exhibit 843 – Victoria's Volunteering Strategy (WIT.3003.001.0240)

Policy	Period of implementation	Responsible department	Description	Evidence
Recovery				
Victorian Bushfire Reconstruction and Recovery Authority	The State and Commonwealth established VBRRA on 10 February 2009.	The State in partnership with the Commonwealth	VBRRA will oversee and coordinate the recovery and rebuilding program.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0042 Exhibit 837 – Victorian Bushfire Reconstruction and Recovery Authority Report (VBRA.300.001.0001)
Bushfire Appeal Fund	Established within 24 hours of 7 February. Closed in April 2009.	The State, in partnership with the Commonwealth and the Australian Red Cross; DHS provided staffing support.	The Bushfire Appeal Fund was established to raise funds to support individuals and communities in towns and suburbs affected by the 2009 Victorian bushfires.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0042
Case management system		DHS	DHS established a case management system (including a call centre) to provide a case manager to every family affected by the 2009 bushfires.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0042–0043 Exhibit 137 – DHS Assistance: Victorian Bushfire Case Management Service (DSE.HDD.0016.0600)
Compassionate assistance funding		The State	State funding for assistance such as temporary housing, funeral expenses, emergency medical services, counselling services and emergency hardship grants.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0043 For psychosocial response / recovery see Exhibit 538 – Statement of Grigg (WIT.3001.001.0001)
Community Recovery Fund	February 2009.	DPCD in partnership with the Commonwealth	In the first six months after 7 February, the Community Recovery Fund made 26 sporting grants, 17 arts program grants, and a number of other grants for individual community events.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0043
Funding for clean-up of bushfire-affected areas		The State	The State provided funding to help with the clean-up of bushfire-affected areas and allow rebuilding and reconstruction works to start.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0043
Recovery, reconstruction and clean-up activities—amendments to the Victoria Planning Provisions.	The amendments came into effect on 23 February and 12 March 2009 respectively.	DPCD	The Minister introduced clause 52.38 of Amendment VC53, and Amendment VC54 into the VPPs. Taken together, the amendments support recovery and reconstruction operations by clarifying that a planning permit is not needed for activities directly associated with bushfire recovery, including site clean-up and safety, demolition and temporary accommodation, and for the reconstruction of a home destroyed by the 2009 bushfires.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0043 Exhibit 678 – Clause 52.38 Bushfire Recovery (TEN.111.001.0052)
Restoration of health and education services		The State	The State has replaced destroyed health centres, ambulance services and schools.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0044

Policy	Period of implementation	Responsible department	Description	Evidence
Business assistance packages		The State	The State has developed packages to help small businesses and primary producers affected by the bushfires. Assistance is provided in the form of business assistance grants, low-interest loans and business restart mentors.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0044
Business information line		Small Business Victoria, Rural Finance Corporation	The information line provides information on the types of assistance available, such as counselling and mentoring services.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0044
Architects Bushfire Homes Service		Office of the Victorian Government Architect, VBRRA, Victorian Chapter of the Australian Institute of Architects, Building Commission	The service provides a range of bushfire-safe home designs for those seeking to rebuild.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0044
Environmental regeneration and rehabilitation activities			These activities include protection of endangered species, re-seeding forests with mountain and alpine ash eucalypts, weed control, replacement of fencing and the rehabilitation of fire control lines.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0044
Rebuilding Together: A Statewide Plan for Bushfire Reconstruction and Recovery	Plan released on 16 October 2009.	The State	This plan outlines the progress of the recovery and reconstruction effort since the bushfires and announces additional state funding, including insurance money and departmental reprioritisation, to carry out the medium to long-term reconstruction and recovery effort, including funding to: ■ rebuild public infrastructure and re-establish core services ■ regenerate the environment ■ restore local economies.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0044–0045 Exhibit 843 – Rebuilding Together: A Statewide Plan For Bushfire Reconstruction and Recovery (WIT.3003.001.0257)
Update of Emergency Coordination Centre arrangements	Ongoing.	DH, DHS	The update aims to improve cross-agency integration and documentation triggers for the activation of recovery services. New SOPs have been developed to reflect new recovery services and coordination. This work has included the development of an operations manual for community service hubs to provide guidance on long-term recovery and assistance.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0045
Reissue of State Recovery Operation Plan	The Plan was reissued prior to the 2009–10 bushfire season.	DH, DHS	The Plan reflects new and changed recovery initiatives introduced for the 2009–10 bushfire season.	Exhibit 843 – Statement of Robertson (WIT.3003.001.0001) at 0045

Municipal Association of Victoria and local government policies and initiatives since 7 February 2009**

Organisation	Description	Evidence
Preparedness and response		
Municipal Association of Victoria	MAV participated in the following reviews: ■ Part 3 Emergency Management Manual Victoria—State Emergency Response Plan Review ■ emergency relief arrangements ■ fire refuges.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0004
MAV	MAV participated in a DEECD working group to address the emergency preparedness of schools and early childhood facilities. The working group sought to clarify agency and local government responsibilities, and improve agency coordination and communication in the event of a bushfire.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV supported DEECD with bushfire preparedness for Victorian children's services and consulted with councils to ensure compliance with requests for information.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV provided advice to DSE and DPCD about potential issues and the implications of changes to planning schemes for vegetation management.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV organised a briefing and provided additional guidance materials for councils on the new planning scheme exemptions for vegetation management.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV surveyed councils about local laws that might conflict with the 10/30 planning scheme exemptions.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	In consultation with DSE and DPCD, MAV developed The Bushfire Protection—Vegetation Removal on Public Land Guidance Note.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV participated in a working group with VicRoads, the CFA and DSE to develop a Roadside Standard for Clearing for removal of high risk vegetation on priority roads identified in township protection plans.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV provided input to VicRoads on the roadside firewood collection guidelines.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV provided new fire danger rating signs to municipal fire prevention officers in each municipality where the former signs currently exist.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV hosted eight regional and two metropolitan bushfire information sessions for councils during September and October 2009 to address recent government reforms to bushfire management. This included township protection plans, NSPs, vegetation clearance regimes and local government responsibilities.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV, in conjunction with the OESC and the CFA, facilitated education briefings about the 2009–10 fire season program.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003

Organisation	Description	Evidence
MAV	MAV reported to the OESC, DOJ and the CFA about the outstanding issues and concerns of councils in relation to NSPs, township protection plans, community engagement in fire preparedness, native vegetation and other matters.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV surveyed local government human services directors to determine existing local government initiatives regarding bushfire and heatwave preparation for vulnerable groups, and identified where additional assistance was required.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV, having liaised with the CFA, provided councils with a summary of the process for determining fire danger ratings and total fire ban days.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV worked with the Municipal Emergency Management Enhancement Group to enhance municipal capacity in emergency management and replicate the MEMEG model regionally, with the establishment of regional MEMEGs.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003
MAV	MAV consulted with the CFA, DSE and Victoria Police to assist the OESC to review and improve practices for rapid impact assessment and coordination in an emergency.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
Alpine Shire Council	The Alpine Shire Council: ■ distributed newsletters to all residences about fire preparedness ■ increased slashing of roadside vegetation ■ trained staff in the use of municipal emergency coordination centres and the MECC emergency computer system.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0005
Banyule City Council	The Banyule City Council: ■ increased slashing of reserve trails, embankments and escarpments throughout Darebin Creek, Plenty River and Yarra River corridors ■ appointed additional deputy municipal recovery managers ■ reviewed and updated the disaster plan for animal management ■ conducted risk assessments of council reserves with the CFA ■ developed the Plenty Gorge Fire Management Plan with Banyule, Nillumbik and Whittlesea Councils, the CFA and Parks Victoria.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0005
Bass Coast Shire Council	The Bass Coast Shire Council: ■ increased slashing of roadsides ■ developed MECC SOPs ■ developed relief centre operating procedures ■ conducted MECC and relief centre exercise and debriefs.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0005

Organisation	Description	Evidence
Baw Baw Shire Council	The Baw Baw Shire Council: ■ supported fire prevention awareness activities in conjunction with Landcare and the CFA. ■ appointed an environmental management officer to assist the public in preparing applications for vegetation removal ■ reviewed bushfire-prone area boundaries. In terms of emergency response preparedness the Baw Baw Shire Council: ■ upgraded potential emergency relief centres, including the Longwarry Public Hall, Neerim South; Longwarry Bells Stadium, Rawson; and Exhibition Hall, Warragul ■ entered into a MOU with facility owners to increase the range of services that can be delivered for emergency relief centres ■ reviewed MECC facilities including prioritising improvements and sourcing funding ■ reviewed the staff structure for emergency events response and recovery and allocated additional staff to these roles and developed a training program for new staff ■ established an internal 2009–10 Bushfire Coordination Group to meet weekly ■ liaised with DHS and aged care facilities to develop emergency management plans ■ attended monthly meetings with the Gippsland Emergency Recovery Committee to discuss recovery and preparation for future emergencies ■ participated in MECC exercises with the Bass Coast Shire Council ■ conducted a MECC exercise with emergency response agencies ■ arranged for environmental health officers to attend an EMA five day emergency management course. In terms of roadside vegetation management, the Baw Baw Shire Council: ■ applied the 10/30 rule. This involved the clearing of vegetation on public land adjoining dwellings and fence lines ■ allocated an additional $160,000 to complete roadside vegetation clearance for secondary fuel breaks, and conducted further assessments of reported dangerous trees in fire-affected areas ■ identified areas for roadside fuel-reduction burns and notified the CFA. In terms of public information the Baw Baw Shire Council: ■ publicised FireReady brochures, information about fire danger ratings, the fire hazard inspections program, the 10/30 rule and Red Cross REDiPlans ■ developed a database of council contacts to distribute fire information from the CFA, police and other agencies in the MECC, to be passed on to communities ■ supported the Labertouche website with information about fire preparedness and recovery ■ distributed cards displaying the emergency hotline and bushfire information numbers.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0005

Organisation	Description	Evidence
Benalla Rural City Council	The Benalla Rural City Council: ■ publicised information regarding the clearing of fire hazards and provided early clearing of hazards ■ provided free green waste disposal to residents ■ established systems to address the 10/30 rule ■ liaised with the CFA to prepare vegetation and dwelling maps for risk assessment purposes ■ provided water to all remote CFA water storage tanks and placed additional tanks and CFA fittings at all emergency drought water supply points ■ improved telecommunications infrastructure in the MECC ■ reviewed plant and associated funding requirements.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0006
Boroondara City Council	The Boroondara City Council: ■ conducted a FireReady session, targeting residents that live near Yarra Bend Park ■ published an article in the Boroondara Bulletin covering fire preparedness ■ improved and tested the MECC ■ prepared emergency relief centres for activation ■ worked with other councils to develop regional responses to fire. Staff were trained in relief and recovery in conjunction with other councils ■ liaised with the MFB and Parks Victoria concerning fire risks in the Yarra Bend Park ■ reviewed team structures under the Emergency Management Group. This was done to ensure that there are appropriately trained staff and adequate resources to respond to emergencies ■ developed plans for heatwaves and pandemics ■ developed processes to contact vulnerable people on the Home and Community Care Register ■ reviewed the thermal working conditions risk management policy for delivering meals on wheels on hot days ■ reviewed a report regarding the adoption of the MAV protocol for inter–council emergency management resource sharing.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0006 – 0007

Organisation	Description	Evidence
Buloke Shire Council	The Buloke Shire Council: ■ published fire preparedness notices in local newspapers ■ circulated fire preparedness information at community 'fireshed' meetings as part of the 'Now Planning Ahead' program ■ revised the draft of the Roadside Management Plan and placed the draft revised Plan on public exhibition ■ increased slashing of roadside vegetation ■ acted on recommendations arising from an audit of the MECC ■ established administrative arrangements for plant and staff resources required to be on standby for code red days.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0007
Campaspe Shire Council	The Campaspe Shire Council: ■ formed a Community Fire Plan for Rushworth ■ published information concerning emergency management in local newspapers ■ consulted with the Rotary Club on emergency management ■ reviewed Wildfire Management Overlay areas in consultation with the CFA, implemented changes via a Planning Scheme Amendment, and aligned the Bushfire-prone Areas under the Building Code of Australia with the WMOs under the Campaspe Planning Scheme ■ implemented the land developer fire prevention program ■ trialled and improved the MECC ■ developed an Extreme Temperature Plan ■ participated in DPI's 'Operation DIVA' exercise and MAV forums on emergency management.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0007
Cardinia Shire Council	The Cardinia Shire Council: ■ appointed a bushfire community engagement consultant ■ developed a policy about wildfire preparation and vegetation management on private property ■ reviewed the Roadside Management Plan ■ trained staff for emergency relief centres ■ updated the training plan for operational staff on bushfire awareness and integrated environmental management.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0007
Casey City Council	The Casey City Council: ■ increased slashing of roadside vegetation ■ provided free green waste disposal to residents ■ installed extra telephone lines and wireless internet connections at the MECC.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0007

Organisation	Description	Evidence
Central Goldfields Shire Council	The Central Goldfields Shire Council: ■ published information on bushfire preparedness, CFA information and brochures ■ implemented the Victorian Fire Risk Register ■ conducted MECC awareness training for emergency and services agencies ■ trained staff in bushfire awareness ■ developed a new MECC and had a MECC set up for the entire bushfire season ■ conducted sub-committee meeting of the Municipal Emergency Management Planning Committee to address the Maryborough Education Centre Emergency Management Plan ■ attended the Advancing Emergency Management in Local Government forum ■ attended the Central Highlands Mayors and CEOs meeting with DSE and the CFA on fire preparedness.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0007 – 0008
Colac Otway Shire Council	The Colac Otway Shire Council: ■ worked with community groups to develop a Community Fire Plan to ensure consistency of council information, messages and position ■ consulted with the community of Forrest and Gellibrand, in partnership with DSE and the CFA, to create a Community Fire Plan ■ publicised information about fire management and bushfire survival plans ■ sourced funds for a back up generator for the MECC ■ in collaboration with the CFA, established water supply points ■ increased slashing of roadside vegetation ■ developed a relief centre SOP, updating standards to meet new SES guidelines, training staff and central relief agencies ■ along with other emergency services agencies, activated the MECC for a training exercise ■ established a sub-committee of the Municipal Emergency Management Plan Committee to allow middle level members of key agencies to discuss issues at a municipal level ■ attended forums with state and regional DHS officers regarding relocation and community engagement strategies in the recovery plan ■ developed Community Emergency Management Plans and Community Fire Plans ■ created a senior municipal emergency management coordinator role to oversee fire prevention processes, strategic fire planning and emergency management planning.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0008

Organisation	Description	Evidence
Corangamite Shire Council	The Corangamite Shire Council: ■ distributed newsletters and other media to residents and consulted with the CFA in developing locations for fire meetings ■ adjusted policy so that new vegetation controls can be implemented on council land ■ sourced funding for a new fire access track ■ established MECC training and procedures, planning rosters for key MECC staff and identified staff for emergencies on code red days ■ created a dedicated fire position role to implement findings from the Commission.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0008
East Gippsland Shire Council	The East Gippsland Shire Council: ■ encouraged the establishment of Local Incident Management Plans ■ revised WMOs, in consultation with the CFA, DSE and Parks Victoria ■ implemented the Victorian Fire Risk Register ■ in conjunction with the CFA, established the roadside heavy timber reduction strategy ■ increased the slashing of roadsides ■ implemented fuel-reduction burns in conjunction with DSE, the CFA and Parks Victoria ■ provided pagers to emergency management staff ■ trained staff in the Australasian Inter-Service Incident Management System, Incident Control System, emergency management and ERC courses ■ agreed to MOUs with neighbouring councils for resources and staffing ■ installed information screens at tourist information centres. The East Gippsland Shire Council is auditing emergency relief centres and identifying those which require hardwiring for back up power. It is also considering the implementation of video conferencing screens between the incident control centre and the MECC.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0008 – 0009
Frankston City Council	The Frankston City Council: ■ published FireReady information in local newspapers and distributed emergency management booklets to all residents ■ provided free green waste disposal to residents ■ conducted FireReady Victoria sessions ■ implemented the 10/30 rule and prepared FAQs ■ increased the slashing of roadside vegetation ■ tested the MECC ■ increased the number of Municipal Fire Prevention Committee meetings ■ conducted fortnightly fire coordination meetings ■ conducted patrols on council-managed reserves.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0009

Organisation	Description	Evidence
Gannawarra Shire Council	The Gannawarra Shire Council: ■ distributed notices relating to the 10/30 rule ■ set up the MECC on all days rated catastrophic.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0009
Glenelg Shire Council	The Glenelg Shire Council: ■ distributed newsletters concerning FireReady preparation and personal safety ■ coordinated information sessions in conjunction with the CFA and Tourism Victoria for high risk areas ■ published Guidelines for the preparation of land management plans to protect and enhance natural resources ■ conducted risk assessments for farming and rural living, interface living, industry and state infrastructure, bush and parks.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0009
Golden Plains Shire Council	The Golden Plains Shire Council: ■ distributed fire management FAQs ■ increased slashing of roadside vegetation ■ appointed a municipal emergency manager ■ identified extra staff for emergency management ■ conducted internal risk management assessments.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0009
Greater Bendigo City Council	The Greater Bendigo City Council: ■ communicated with residents regarding bushfire awareness, FireReady and CFA messages, the 10/30 rule and open air burning ■ promoted and attended CFA community FireReady meetings ■ replanted vegetation on fire-affected land as a part of the Community Recovery Plan and implemented weed control ■ trained additional staff for the MECC; reviewed the Emergency Management Operations Manual; and purchased additional electronic resources for use in the MECC ■ trained and appointed staff members as deputy municipal emergency response officers ■ trained staff in fireground safety and assisting firefighting operations ■ participated in a Victoria Police MECC exercise in preparation for the bushfire season.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0009 – 0010

Organisation	Description	Evidence
Greater Geelong City Council	The Greater Geelong City Council: ■ published articles produced by the municipal fire prevention officer ■ installed 'In an Emergency Tune to 774AM' boundary signs on the main roads ■ adopted amendment C172 aligning WMOs with Bushfire-prone Areas ■ reviewed strategic fire management roads and fire access tracks ■ appointed an emergency management officer ■ installed electronic equipment in the MECC ■ trained staff about emergency management liaison officers, MECC administration support, emergency recovery and wildfire ■ circulated an information kit for emergency management liaison officers and a communication strategy for emergency events ■ appointed temporary full time positions to accelerate the Fire Prevention Unit hazard inspection program ■ developed a community awareness program focusing on emergency management ■ held an extraordinary MEMPC meeting about the Commission's interim report recommendations and agency preparedness ■ liaised with local volunteer resource centres about spontaneous volunteering.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0010
Hepburn Shire Council	The Hepburn Shire Council: ■ publicised Fire Action Week, FireReady meeting dates, the 'Time to Clean Up' brochure, and issued bushfire awareness keyrings to tourist accommodation providers ■ co-hosted Tourism Victoria bushfire information awareness sessions ■ assisted aged and disability services staff to identify vulnerable residents and to develop bushfire plans ■ funded Hepburn Relocalisation Network community bushfire awareness meetings ■ reviewed the Municipal Strategic Statement proposed for 2010 ■ provided free green waste disposal to residents ■ increased slashing in townships ■ investigated emergency power requirements for the MECC and improved phone systems at the alternative MECC ■ commenced staff training in SES emergency management and attended emergency simulations ■ attended SES-led local emergency management meetings ■ appointed coordinators, deputy recovery managers, emergency relief centre staff, a post impact assessment coordinator and assessors ■ implemented a policy about code red warnings and employees in relation to all council offices and worksites on code red days ■ resolved to conduct weekly cross-portfolio fire preparedness staff meetings.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0010 – 0011

Organisation	Description	Evidence
Horsham Rural City Council	The Horsham Rural City Council: ■ conducted a 'Living with Fire' Expo in partnership with the CFA and other agencies ■ increased slashing of roadsides ■ participated in a training exercise—'Operation Relationship'—in which the incident control centre, MECC and relief centre were opened.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0011
Hume City Council	The Hume City Council: ■ published articles in the Leader Newspaper and the Hume Pride Magazine ■ conducted community awareness meetings ■ increased slashing on roadsides ■ hosted IEM training courses through the SES ■ reviewed emergency relief centres in light of guidance notes ■ liaised with other councils to conduct shared emergency relief centre training ■ revised relief centre SOPs. The Hume City Council attended the: ■ DHS bushfire preparedness workshop ■ Fawkner Divisional Emergency Response Planning Committee meeting ■ Gisborne incident control centre workshop ■ emergency management awareness sessions ■ DEECD regarding pre-emptive closure of schools and early childhood services.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0011
Indigo Shire Council	The Indigo Shire Council: ■ developed and distributed a bushfire information pack to all residents ■ held green waste disposal days ■ published information in the Indigo Informer Newsletter ■ introduced a WMO ■ increased the slashing of roadside vegetation ■ implemented a community strengthening project ■ inspected township areas for roadside fuel-reduction burning.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0011

Organisation	Description	Evidence
Knox City Council	The Knox City Council: ■ developed a communications strategy in line with the CFA's key messages ■ published information on bushfire preparedness ■ developed a heatwave strategy campaign ■ developed bushland signage to be displayed during fire prevention works ■ reduced fees for removal permits ■ reviewed Bushfire-prone Area boundaries ■ distributed a letter to residents providing advice about the removal of the need for a permit to burn off on appropriate days, and distributed letters regarding residents' responsibilities ■ increased slashing of roadsides and reserves ■ trained staff for the MECC and operated a mock MECC ■ created a Bushfire Preparedness Project Working Group that meets fortnightly ■ developed processes that enable the deployment of staff to neighbouring councils ■ conducted a Knox City Council Emergency Management Awareness Day ■ developed a policy regarding extreme and severe fire danger rating days ■ participated in the DHS review of at risk community members ■ convened an extraordinary bushfire preparedness meeting of MEMPC.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0011 – 0012
Macedon Ranges Shire Council	The Macedon Ranges Shire Council: ■ in partnership with the CFA, published bushfire preparedness information in council newsletters and local newspapers ■ audited at risk Home and Community Care clients to assist in developing and recording emergency plans ■ provided bushfire vehicle safety kits to HACC direct care workers ■ trained HACC staff in bushfire awareness ■ used the Australian Red Cross REDiPlan to aid seniors in making plans and established a seniors forum for bushfire preparedness and emergency planning ■ met with schools and aged care providers to present information about emergency planning and preparedness. This was done in partnership with the CFA, Victoria Police and other agencies where relevant. The Council also conducted a forum for business and tourism operators in conjunction with Tourism Victoria and the CFA ■ distributed information regarding emergency management to parents and carers using REDiPlan. Fire danger ratings are displayed in council children's services facilities ■ upgraded fire access tracks under the fire access road subsidy scheme ■ installed generator power outlets at the Gisborne MECC ■ trained staff in relief centre exercises, MECC exercises, and emergency management ■ consulted with local disability services regarding the needs of disabled people and considered an additional relief centre	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0012

Organisation	Description	Evidence
Macedon Ranges Shire Council *continued*	■ redirected resources into a dedicated bushfire planning and preparation team ■ developed a policy to close various council facilities and services on code red days ■ formed the Business Continuity Committee, Macedon Ranges Shire Council Organisational Plan for Fire Danger Days and considered staff availability for code red or extreme days ■ developed detailed procedures for emergency relief centres in relation to staffing and roles ■ developed 'hot day out centres'—venues opened on code red and extreme days for people with limited options for relocation when leaving early (in partnership with the Victorian Council of Churches) ■ liaised with DEECD regarding potential school closures in high risk areas.	
Manningham City Council	The Manningham City Council: ■ prepared and implemented a bushfire strategic communications plan ■ attended the Warrandyte Fire Expo to provide information on fire prevention and the 10/30 rule ■ commenced publication of a bi-monthly newsletter and articles in the local newspaper regarding bushfire preparedness ■ distributed 'Bushfire Checklist and Tips for Preparing your Property' to 300 high risk properties ■ conducted a public seminar on 'Improving Urban Design for Bushfire Defence' ■ conducted a geographical information system fire mapping project with the CSIRO and reviewed WMO boundaries and local planning policy ■ produced a geographical information system map to define exemptions to the 10/30 rule ■ consulted with Parks Victoria to install a 100,000 litre water tank at Haslams Track ■ increased the slashing of roadside vegetation ■ implemented the Wildfire Prevention Preparedness Plan for major reserves ■ consulted with the CFA about improved access during bushfires, vegetation clearance and turning areas ■ identified an additional emergency relief centre ■ reviewed MECC operation and recruiting, and investigated an emergency power supply for the MECC ■ created a municipal emergency management coordinator role to expedite emergency planning and preparedness and strengthen resourcing and recovery roles ■ considered the operation of community facilities on code red days and developed a human resources policy to limit council activities in high bushfire risk areas on code red days ■ implemented the Victorian Fire Risk Register ■ provided free green waste disposal to residents ■ expedited a 24-hour turn-around of complaints regarding fire hazards on private land ■ consulted with Victoria Police regarding improved Yarra River access in emergencies.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0012 – 0013

Organisation	Description	Evidence
Mansfield Shire Council	The Mansfield Shire Council: ■ published flyers and fire notices ■ introduced a WMO ■ produced a draft Roadside Conservation Plan ■ upgraded the power supply of the MECC and council offices ■ increased the slashing of roadside vegetation ■ practiced MECC operations and appointed new officers to the MECC ■ provided free green waste disposal to residents ■ waived the requirement for a permit to burn in built up areas ■ installed a fire indicator sign in conjunction with MAV.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0013
Melton Shire Council	The Melton Shire Council: ■ developed a communications plan to educate about early warnings and alerts, distributed Prepare. Act. Survive. literature and stickers, and published feature articles in the council newsletter ■ upgraded fire access tracks ■ hosted emergency management training and awareness campaigns ■ established minimum requirements associated with various levels of the fire danger ratings ■ appointed a full time emergency management officer ■ upgraded the MECC, including improvements to IT, phones and layout, and resolved to conduct MECC training exercises.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0013 – 0014
Mitchell Shire Council	The Mitchell Shire Council: ■ implemented the 10/30 rule and the 4 metre rule ■ installed static water tanks, upgraded fire plugs and replaced/built bridges to improve access to fire tracks ■ increased slashing of roadside vegetation ■ improved communications at the MECC.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0014
Moira Shire Council	The Moira Shire Council: ■ provided emergency management officers to the community, schools and other interested groups for fire preparedness and planning ■ implemented a scheme to provide information to tourists. This campaign involved emphasising FireReady principles, publishing flyers and a visitors' book to encourage tourists to register their location and details of intended stay ■ built strategic CFA water filling points ■ increased slashing of roadside vegetation and the grading of roads ■ trained approximately 40 additional staff in emergency management ■ provided accommodation at the council's offices for a CFA liaison officer.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0014

Organisation	Description	Evidence
Moorabool Shire Council	The Moorabool Shire Council: ■ published information on bushfire preparedness in community newsletters, FireReady kits and fire danger rating barometer brochures. The council has also established a fire preparedness page on its website ■ attended FireReady community meetings and made presentations ■ reviewed WMOs, with the mapping placed on public exhibition ■ provided additional funding for 40 new council fire access tracks ■ resolved to open respite centres on severe, extreme and catastrophic days.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0014
Mount Alexander Shire Council	The Mount Alexander Shire Council: ■ trained staff and direct care workers to ensure consistent distribution of information about bushfire preparedness and personal emergency management plans ■ published bushfire information in public spaces and via local radio ■ hosted forums on preparing personal emergency management plans ■ reduced roadside fire fuel, enhancing township protection and improving access/egress roads ■ increased slashing of roadside vegetation ■ trained HACC staff in conjunction with the Red Cross for operations on code red days ■ appointed focused community development officers ■ audited possible relief centres.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0014 – 0015
Moyne Shire Council	The Moyne Shire Council: ■ published FireReady information in brochures and local newspapers ■ installed new water tanks at waste facilities ■ established water supply dams ■ increased slashing of roadside vegetation ■ developed a draft SOP for the MECC and produced a roster ■ implemented the Victorian Fire Risk Register ■ developed draft procedures for council activities on code red days ■ upgraded fire hazard inspection equipment and software ■ developed a fire management program for waste facilities.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0015

Organisation	Description	Evidence
Murrindindi Shire Council	The Murrindindi Shire Council: ■ appointed a municipal recovery manager, deputy manager and deputy MERO ■ improved amenities and administrative procedures in the MECC ■ installed 35,000 litre static water tanks ■ reviewed the recovery manual and development handbook for managers of the emergency relief centre ■ implemented regular meetings with neighbouring councils.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0015
Nillumbik Shire Council	The Nillumbik Shire Council: ■ mailed residents regarding the Township Protection Plan, including fridge magnets ■ provided information to residents regarding land owners' responsibilities and distributed the FireReady kit ■ conducted tours with residents in high fire danger areas in the Plenty Gorge ■ installed new fire danger rating signage supplied by the OESC ■ distributed packages communicating works on roadsides, including the issuing of 4,200 new permits for the removal of roadside logs and branches ■ participated in a multi-agency exercise in Plenty Gorge ■ assessed the ability to deploy staff into rural parts of the shire on days of high fire risk ■ participated in sub-committees chaired by DSE focusing on water, sub-catchment and vegetation, and participated in the National Environment Regional Taskforce ■ engaged fire behaviour specialists to assess reserves ■ recruited and trained additional MECC staff.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0015 – 0016
Northern Grampians Shire Council	The Northern Grampians Shire Council: ■ distributed information packs about amendments to vegetation legislation ■ conducted meetings for at risk members of the community by the HACC coordinator ■ increased the slashing and spraying of roadside vegetation.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0016
Pyrenees Shire Council	The Pyrenees Shire Council: ■ made available Prepare. Act. Survive. booklets at council outlets ■ published bushfire preparedness articles in local newspapers ■ assessed risks as part of the Victorian Fire Risk Register rollout ■ implemented the community emergency management champions.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0016

Organisation	Description	Evidence
Queenscliffe Borough Council	The Queenscliffe Borough Council: ■ distributed fire prevention brochures ■ facilitated the creation of Personal Emergency Plans for vulnerable persons ■ removed vegetation around Point Lonsdale to provide for 4x4 clearance ■ appointed a project officer to review MECC procedures and emergency relief centres.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0016
South Gippsland Shire Council	The South Gippsland Shire Council: ■ distributed information brochures ■ conducted a Bushfire Awareness Expo and a Wellbeing Expo focusing on fire preparedness ■ installed static water supply tanks ■ committed to work on Baths Road Reserve, Mirboo North, to improve access/egress ■ purchased new furniture for the MECC, upgraded electronic communications and developed portable kits containing equipment required to establish an emergency relief centre ■ trained staff in IEM, relief and recovery, incident control and fireground access ■ implemented the Victorian Fire Risk Register ■ appointed a municipal emergency manager ■ resolved to increase the frequency of MEMPC meetings.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0016
Southern Grampians Shire Council	The Southern Grampians Shire Council: ■ prepared emergency plans for HACC clients ■ provided free green waste disposal to residents ■ increased slashing of roadside vegetation ■ introduced a WMO ■ implemented tanks of the Rocklands to Cavendish, and Casterton to Coleraine, Pipelines.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0016
Stonnington City Council	The Stonnington City Council has published information about bushfire preparedness via its website. It is targeted at residents owning properties within other municipalities more likely to be affected by bushfires.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0017
Strathbogie Shire Council	The Strathbogie Shire Council: ■ distributed a fire preparedness sheet to all households and businesses, together with an information card with fire ratings, contact numbers, website and radio stations, and fridge magnets. It was available in large format for older citizens ■ conducted MECC exercises.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0017

Organisation	Description	Evidence
Surf Coast Shire Council	The Surf Coast Shire Council: ■ distributed the Prepare. Act. Survive. brochure to all ratepayers and to Melbourne municipalities where holiday homeowners reside ■ conducted 'Fire Jam', a music, environment and bushfire awareness event as part of FireReady Week ■ introduced the MAV Application to Modify Vegetation on Council Reserves (10/30 rule and 4 metre boundary rule) and advised residents ■ reviewed vegetation planting plans and programs ■ reviewed all emergency relief centres, made enhancements to access systems for centres, and nominated preferred centres with potential to accommodate pets and animals ■ reviewed the Great Ocean Road Traffic Management Plan and established a sub-committee of the MEMPC ■ installed 'In case of emergency tune to 774AM' and 'National Fire Danger Index' signs ■ implemented the Victorian Fire Risk Register ■ appointed assistant community fire safety and environment officers ■ implemented the Weeds to Mulch program ■ provided free green waste disposal to residents ■ provided HACC assistance to clients and developed plans for code red days ■ developed a Business Continuity Plan, Code Red Fire Danger Index Plan and Heatwave Plan. The Surf Coast Shire Council conducted additional meetings of the following bodies: ■ MEMPC ■ The Township Integrated Fire Management Planning Committee ■ The Region 2 Division 2 Victoria Police Divisional Emergency Management Planning Committee and the R2D2 Emergency Management Recovery Committee ■ The Community Safety and Inclusion Project Steering Committee.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0017
Swan Hill Rural City Council	The Swan Hill Rural City Council: ■ published newspaper articles and pamphlets with local CFA representatives ■ upgraded fire access roads under the fire access road subsidy scheme ■ relocated the MECC, in conjunction with Victoria Police, the SES and the CFA ■ trained extra staff as fire prevention officers.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0017

Organisation	Description	Evidence
Towong Shire Council	The Towong Shire Council: ■ conducted additional track work through the CFA fire access road subsidy scheme ■ upgraded the MECC, including installing hard wired auxiliary power, a generator and an overhead projector.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0017
Wangaratta Rural City Council	The Wangaratta Rural City Council: developed a relief centre plan.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0017 – 0018.
Wellington Shire Council	The Wellington Shire Council: ■ implemented a policy to make it easier for residents to comply with fire prevention notices ■ attended fire awareness days ■ increased the slashing of roadside vegetation ■ published a communication strategy for the 2009–10 bushfire season for the public and media.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0018
West Wimmera Shire Council	The West Wimmera Shire Council: ■ increased slashing and mulching ■ trained the recovery management team ■ reviewed relief centre locations ■ upgraded the MECC to provide for emergency back up power.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0018
Whittlesea City Council	The Whittlesea City Council: ■ increased the number of community fire information briefings ■ published fire information at the Whittlesea Show and in weekly articles in local newspapers ■ formed a roadside risk assessment team ■ trained staff in road management, general emergency management, response, personal support and SES emergency management ■ upgraded and dedicated response teams to the MECC and relief centres ■ participated in the multi-agency exercise for the Plenty Gorge Parkland. The exercise also involved the Shire of Nillumbik, the CFA, Victoria Police, Parks Victoria and DSE ■ appointed a municipal emergency management coordinator and made other appointments for specific tasks.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0018
Wodonga City Council	The Wodonga City Council: ■ formed a list of vulnerable persons/groups ■ reviewed operation of the Wodonga Retained Environment Networks to balance native vegetation law and fire prevention requirements ■ implemented new fire/fuel-reduction requirements for stock use.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0018

Organisation	Description	Evidence
Wyndham City Council	The Wyndham City Council: ■ distributed Prepare. Act. Survive. brochures and stickers ■ identified vulnerable groups and supported fire preparedness with these groups ■ coordinated bush/grass fire awareness sessions ■ implemented exemptions from the need for a permit to remove vegetation in close proximity to a dwelling ■ conducted flora and fauna studies to determine whether existing vegetation should be preserved or removed once development takes place ■ implemented projects to enhance the emergency relief centre activation plan and management plan, and provided detailed resource kits to each potential centre ■ audited potential relief centre sites in line with the Guidance Note ■ enhanced the MECC with new phones and laptops.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0018
Yarra Ranges Shire Council	The Yarra Ranges Shire Council: ■ conducted an Emergency Safety Expo ■ installed new 'Fire and Safety' signage ■ developed a bushfire preparedness communications strategy ■ developed a strategy for firewood collection from roadsides ■ installed and upgraded a fire hydrant, tanks and emergency fire access roads ■ supported early warning systems ■ reviewed the roadside slashing and fuel-reduction program. This included allocating additional funds for the roadside fuel-reduction program and fuel-reduction on roadsides within Township Protection Areas ■ reviewed the use and operation of fire access roads ■ developed a new regional model for emergency relief centre arrangements ■ trained staff in AIIMS and ERC ■ conducted emergency exercises to test MECC operation ■ implemented a restructure of the MECC, including IT infrastructure ■ established operational field staff in key emergency management roles in relief centres ■ developed a key strategy for activation of relief centres on high fire risk days and total fire ban days ■ recruited staff to key emergency management roles in relief centres ■ reviewed protocols and policies relating to arrangements and response activities ■ dedicated a senior and administrative team to bushfire preparedness activities.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0019

Organisation	Description	Evidence
Yarriambiack Shire Council	The Yarriambiack Shire Council: ■ promoted awareness about vegetation removal around dwellings and fence lines ■ installed 60, 25,000 litre water tanks for firefighting purposes ■ increased slashing and spraying of roadside vegetation ■ trained staff in emergency relief centre management.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0019
Recovery		
MAV	MAV conducted research on response, clean-up and rebuilding in respect of previous bushfires in Victoria and other Australian states to inform its response. This included advocating for a comprehensive clean-up response coordinated by the State.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV developed a spreadsheet that listed common issues and concerns for all bushfire-affected councils as well as those specific to individual councils.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV consulted with VBRRA and other relevant government agencies on issues for councils.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV enhanced the MAV Inter-Council Emergency Management Resource Sharing Protocol.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV established a resource register of about 1,000 local government staff and resources and coordinated the deployment of more than 250 staff to bushfire-affected councils.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV provided operational support to councils following the fires.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	The MAV Local Government Bushfire Recovery Fund was established to assist critically affected councils with their recovery.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV worked with DPCD to coordinate and centralise data collection about bushfire-affected properties.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV assisted the Australian Defence Force, DHS, the Office of Housing, DSE, Victoria Police, the CFA and the OESC to develop a risk assessment for emergency staff, volunteers and members of the public in bushfire-affected areas, and to address issues related to safe site access.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV assisted councils and key stakeholders to ensure that site inspections are coordinated to include environmental, arborist and building representation.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV advised councils in relation to Emergency Orders and accessing the State's coordinated clean-up program.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV worked with DHS to ensure integration of community service hubs with established response activities, including council operated centres.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001

Organisation	Description	Evidence
MAV	MAV worked with DPCD and councils regarding the development of amendments to Victoria's Planning Scheme to exempt various activities in bushfire-affected areas from the requirement to obtain a permit.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0001
MAV	MAV established the Bushfire Affected Councils Planning Directors' Forum to identify common planning or building issues arising in recovery or rebuilding, and develop a consistent approach.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV participated in the Built Environment Bushfire Support Roundtable to coordinate an effective response across industry groups and governments.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV coordinated queries from councils about clearing and disposing rubble from damaged buildings. This included managing the volume of inspections required, legal access to the sites, requirements for handling potentially hazardous materials, access to technical expertise, and information and guidance to support safe return to a site and the likely approval process.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV worked with the Building Commission, the Plumbing Industry Commission, DPCD and the Office of Housing to develop a Guide for Safe Return to Your Property for bushfire-affected property owners and occupiers.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV worked with the Building Commission, the building industry and local government to address various issues arising from amendments to the Building Regulations 2006.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV participated in a meeting of the Victorian Municipal Building Surveyors Group, the Australian Institute of Building Surveyors, the Building Commission and others to provide advice to municipal building surveyors about building safety and rebuilding issues.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV consulted with DHS and participated in the Victorian Psychosocial Recovery Plan Advisory Group and the Victorian Bushfire Case Management Coordination Committee regarding state recovery planning, psychosocial planning, case management, community service hubs and the community development officer program.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV convened a Bushfire Affected Councils Workshop in July 2009 for the mayors and CEOs of bushfire-affected councils.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002
MAV	MAV coordinated a relief centre debrief session in May 2009 with DHS, SES and bushfire affected councils to share learnings. It participated in the subsequent working group and steering committee with DHS, SES, the MEMEG, Victoria Police and the Red Cross, concerning emergency relief centre management.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0002

Organisation	Description	Evidence
MAV	MAV participated in the following committees and working groups: ■ Fire Affected Councils Planning Directors' meetings ■ Victorian Bushfire Case Management Coordination Committee ■ VBRRA Statewide Plan Implementation Group ■ VBRRA Inter-Agency Taskforce (ceased) ■ VBRRA Expert Reference Group ■ Bushfire Data Inter-Departmental Committee ■ Community Recovery Fund—working group ■ Community Recovery Fund—panel ■ Joint Logistics Group ■ Bereaved Community Recovery and Memorials Projects Committee ■ Victorian Emergency Management Council Coordination Group ■ State Emergency Management Team ■ State Coordination and Management Council ■ State Natural and Built Recovery Planning Sub-Committee ■ vegetation removal on strategic roadsides ■ CFA Household Assessment Tool ■ Bushfire preparedness week—working group (ceased) ■ Bushfires Royal Commission Implementation Tracking Working Group ■ Schools and early childhood services bushfire preparedness.	Exhibit 987 – Schedule One MAV Initiatives (DOC.MAV.003.0001) at 0003–0004
Alpine Shire Council	The Alpine Shire Council managed recovery in the Mudgegonga, Barwidgee, Dederang and Rosewhite areas. This included holding community meetings, dealing with fence replacement, silting of dams, dangerous tree removal, social matters and producing community newsletters.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0005
Corangamite Shire Council	The Corangamite Shire Council developed plans to aid recovery in relation to the Pomborneit fire.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0008
Golden Plains Shire Council	The Golden Plains Shire Council established a Municipal Recovery Planning Committee and a Post Impact Assessment Committee.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0009

Organisation	Description	Evidence
Greater Bendigo City Council	The Greater Bendigo City Council has: ■ formed the Community Recovery Committee and developed a strategic framework for fire recovery. The Committee comprises the City of Greater Bendigo, DHS, and Centrelink ■ established an Assistance Centre in Long Gully for counselling services ■ formed a Community Reference Group to determine direction for recovery ■ developed a Community Recovery Plan to identify needs and ideas ■ conducted community forums in relation to recovery, rebuilding and fire preparation. The State has also appointed a DHS community development officer as a fire recovery coordinator to assist the Community Recovery Committee in the recovery process.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0009 – 0010
Horsham Rural City Council	The Horsham Rural City Council has: ■ reviewed post impact assessments and MOUs ■ appointed an emergency recovery planning officer ■ mapped emergency fire tank locations and ground bore positions for distribution to agencies.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0011
Indigo Shire Council	The Indigo Shire Council has developed community recovery plans for Bruarong and Stanley.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0011
Knox City Council	The Knox City Council has: ■ reviewed emergency relief centres, in partnership with neighbouring councils under the SES Relief Centre Guidelines ■ developed relocation arrangements to complement the relief and recovery arrangements ■ supported residents affected by the Quarry Road fire in Ferntree Gully. This included site management after the fire, felling of dangerous trees and inspecting fire-affected homes.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0012
Mitchell Shire Council	The Mitchell Shire Council has: ■ appointed bushfire recovery officers and a bushfire volunteer support community development officer ■ arranged supplies for recovery and relief centres ■ formed community advisory groups and a community recovery committee.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0014
Mount Alexander Shire Council	The Mount Alexander Shire Council has: ■ developed a community recovery committee and four sub-committees ■ commenced publication of a bi-weekly community newsletter for the recovery effort ■ evaluated the response to Black Saturday, relief centres and the recovery process ■ liaised with state government agencies about the Redesdale fire recovery ■ trained staff in emergency response and recovery responsibilities, MECC operation and emergency management.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0014 – 0015

Organisation	Description	Evidence
Murrindindi Shire Council	The Murrindindi Shire Council has: ■ audited relief centre venues ■ appointed new recovery and relief team members ■ liaised with state government agencies about community recovery and reconstruction.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0015
Nillumbik Shire Council	The Nillumbik Shire Council has: ■ implemented a SMS service for use by the Community Recovery Committees ■ hosted community fireguard forums to share experiences from Black Saturday ■ published: weekly and fortnightly community bulletins about the rebuilding process, community events and Community Recovery Committees; VBRRA news; fact sheets regarding legislative change to vegetation removal; and Getting Ready ■ adopted standard operating procedures for relief centres, completed an audit of relief centres, and consulted with other councils about sharing resources.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0015
South Gippsland Shire Council	The South Gippsland Shire Council has participated in various forums for recovery and response, and the recovery committee with Parks Victoria, DPCD, VBRRA and Regional Development Victoria.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0016
Southern Grampians Shire Council	The Southern Grampians Shire Council has: ■ established a community recovery committee to oversee the recovery of the Coleraine fires ■ liaised with the Coleraine RSL and re-established the avenue of honour that was destroyed in the Coleraine fire.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0016
Wellington Shire Council	The Wellington Shire Council has: ■ established community recovery committees ■ trained additional staff in relief centre operation ■ audited relief centre facilities ■ provided housing recovery teams and case workers ■ provided a training venue for relief centre staff ■ recruited emergency staff.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0018
Whittlesea City Council	The Whittlesea City Council has: ■ assisted residents to fast track recovery by obtaining planning and building permits ■ restored bridges destroyed in the Black Saturday fires ■ inspected Fire Access Tracks, carried out remedial works and replaced burnt signage ■ installed additional and replacement water tanks.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0018
Yarra Ranges Shire Council	The Yarra Ranges Shire Council published a bushfire recovery newsletter and weekly press release on bushfire preparedness.	Exhibit 988 – Schedule Two Council Initiatives (DOC.MAV.003.0005) at 0019

** This table groups the initiatives that the Municipal Association of Victoria and local governments have implemented since 7 February 2009 on the basis of whether those initiatives are directed at bushfire preparedness, response, or recovery. In some cases the MAV and local government initiatives are relevant to more than one of those categories. To avoid repetition bushfire preparedness and response have been grouped together.

APPENDIX B

PLANNING AND BUILDING REGULATORY FRAMEWORKS

PLANNING

The Planning and Environment Act

In accordance with the *Planning and Environment Act 1987,* the Minister for Planning prepares and amends the Victoria Planning Provisions and may prepare and amend a planning scheme for any area of Victoria. A municipal council maintains, administers and enforces the planning scheme in force in its municipality. It may prepare an amendment to its planning scheme with the authorisation of the Minister and, as the responsible authority, decides on applications for permits for the use and development of land in its municipal district, within the strategic framework established by the planning scheme.[1]

The Victoria Planning Provisions

The Minister must prepare and approve standard planning provisions—the Victoria Planning Provisions—to 'assist in providing a consistent and co-ordinated framework for planning schemes in Victoria'.[2] Mr Jeffrey Gilmore, Executive Director of Planning Policy and Reform in the Department of Planning and Community Development, described the VPPs as:

> … a document containing a comprehensive suite of standard planning provisions for Victoria. It is not a planning scheme and does not of itself apply to any land. It is a state-wide reference used, as required, to construct or amend planning schemes in accordance with the Ministerial Direction. It is a statutory device to ensure that consistent provisions for various matters apply across Victoria, and that the construction and layout of planning schemes is always uniform.[3]

The VPPs are made up of the State Planning Policy Framework, a set of zones and overlays from which each council can construct its planning scheme, and particular provisions, general provisions, definitions and incorporated documents that apply consistently across all planning schemes.[4]

The State Planning Policy Framework

The SPPF includes general principles for land use and development and specific policies dealing with metropolitan development, settlement, environment, housing, economic development, infrastructure and some particular uses and developments. It informs councils of relevant policies and gives context to their planning and decision making so that they can 'endeavour to integrate the range of policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development'.[5]

Parts of the SPPF environment policy are relevant to bushfire risk management—in particular, clause 15.07, Protection against Wildfire, and clause 15.09, Conservation of Native Flora and Fauna. These are discussed in Sections 6.4.1 and 6.5.1.

Zones

The VPPs contain a set of standard zones that councils may apply to determine how particular land may and may not be used and developed. Within each zone there are 'as of right' uses, uses that require a permit and prohibited uses.[6]

The zones are grouped as residential, industrial, business, rural, public land and special purpose. The rural zones—Rural Living Zone, Green Wedge Zone, Green Wedge A Zone, Rural Conservation Zone, Farming Zone and Rural Activity Zone—are most relevant to the Commission's inquiry.[7]

Overlays

Overlays are a further layer of planning controls that councils may apply to land. The standard overlays contained in the VPPs focus more on requirements for the development of land than on the uses to which land may be put, and more than one overlay may be applied to a given parcel of land. The overlays in the VPPs are grouped as environment and landscape, heritage and built form, land management and other overlays.[8]

The principal planning tool for managing bushfire risk, the Wildfire Management Overlay, is a land management overlay. The purposes of the WMO are as follows:

- To identify areas where the intensity of wildfire is significant and likely to pose a threat to life and property
- To ensure that development which is likely to increase the number of people in the overlay area:
  - Satisfies the specified fire protection objectives.
  - Does not significantly increase the threat to life and surrounding property from wildfire.
- To detail the minimum fire protection outcomes that will assist to protect life and property from the threat of wildfire.[9]

The content and implementation of the WMO are discussed in detail in Section 6.4.3. The environment and landscape overlays all contain controls on the removal of vegetation; they are discussed in Section 6.5.4.

Particular and general provisions

The VPPs contain provisions that apply across planning schemes to particular uses and developments, in addition to the requirements of a zone or an overlay.

Two particular provisions are relevant to reducing bushfire risk:

- clause 52.17, Native Vegetation, which provides for the protection and conservation of native vegetation—in particular, by requiring a permit for the removal of native vegetation
- clause 52.43, Interim Measures for Bushfire Protection, which enables some removal of vegetation for bushfire protection without a permit.[10]

Two new provisions were introduced into the VPPs following the 2009 bushfires:

- clause 52.38, Bushfire Recovery, which removes permit requirements for particular bushfire recovery activities such as demolition and removal of buildings and construction of temporary buildings. This is an interim control that applies until 31 March 2011
- clause 52.39, 2009 Bushfire Replacement Buildings, which removes permit requirements for the rebuilding and use of dwellings damaged or destroyed in the 2009 bushfires.

The VPPs also contain a set of general, largely administrative provisions that apply across planning schemes. These include clause 65, Decision Guidelines, and clause 66, Referrals and Notice Provisions. The general provisions are followed in the VPPs by lists of definitions and documents incorporated in the VPPs. The incorporated documents include Victoria's Native Vegetation Management—a framework for action.[11]

Planning Schemes

Each council must construct a planning scheme using the VPPs. The planning scheme must include state standard provisions selected from the VPPs—the SPPF, zones, overlays, the particular provisions and the general provisions—and local provisions developed by the council, primarily through its Local Planning Policy Framework and local schedules to zones and overlays and other provisions.[12]

The Local Planning Policy Framework

A council must prepare a Municipal Strategic Statement, which forms part of its LPPF. The MSS contains the council's strategic planning, land-use and development objectives, its strategies for achieving those objectives, and an explanation of the relationship between those objectives and strategies and the controls on the use and development of land in the planning scheme.[13]

Although the LPPF provides the local policy context for a planning scheme, councils are not completely free to set their own local policies. They are given detailed guidance about the content, structure and language of local planning policies, which emphasises the performance-based approach of the Victorian planning system. The LPPF must not operate inconsistently with the SPPF, and any amendment proposed by a council to its planning scheme, including the LPPF, requires the authorisation of the Minister.[14]

Review and amendment of planning schemes by councils

The Act requires a council to review its planning scheme in line with council elections, effectively once every four years. Amending a planning scheme can be a long and involved process. A council must first obtain authorisation from the Minister to prepare a proposed amendment. It must then prepare the proposed amendment and a detailed explanatory report and publicly exhibit both documents. Submissions received by the council within a month of the exhibition period must be considered by the council and may be referred to a panel.[15]

The panel may conduct a hearing, consider the submissions and any other relevant material, and report its findings and any recommendations. The council must consider the panel's report and must make it available to the public. If the council decides not to accept a recommendation made by the panel, it must give the Minister reasons for its decision. The council may then adopt the amendment, perhaps with some changes to the original proposal. In most instances the amendment must be approved by the Minister before it takes effect in the planning scheme.[16]

The Act also allows for a 'fast track' alternative to this process. The Minister can amend a planning scheme with limited or no notice of the proposed amendment if it is considered that compliance is not warranted or not in the interests of Victoria or any part of it.[17]

Planning permit applications

If a planning scheme requires a permit for the use or development of land, an application for a permit may be made to the responsible authority—in most cases the council. The council must generally make a decision on the application within 60 days.[18]

Notice of the application may be required to be given to a range of people and bodies, usually including the owners and occupiers of adjoining land and any other person whom the council considers may be caused material detriment by the grant of the permit. Anyone who might be affected by the grant of a permit may object. The council must also refer the application to any relevant referral authority.[19]

In deciding on a permit application, the council must consider the relevant planning scheme, the objectives of planning in Victoria, all objections and other submissions received by the council, any decision and comments of a referral authority, and any significant environmental effects. Having considered those matters, the council may decide to issue the permit, issue the permit with conditions (including any conditions required by the referral authority) or refuse to grant the permit.[20]

A decision of a council may be appealed to the Victorian Civil and Administrative Tribunal by the permit applicant or third parties in some instances.[21]

BUILDING

The Building Act and Regulations

Building in bushfire-prone areas of Victoria is regulated by the following:

- the *Building Act 1993* and the Building Regulations 2006
- the Building Code of Australia, which includes specific bushfire provisions and is adopted in the Building Regulations
- an Australian standard adopted in the Building Code of Australia—AS 3959, Construction of Buildings in Bushfire-prone Areas.

The Act regulates building work and building standards. Building work, defined as 'work for or in connection with the construction, demolition or removal of a building', is controlled by a system of building and occupancy permits issued by municipal or private building surveyors, in accordance with the Act and the Regulations. Building standards are established by Regulations made under the Act and may incorporate by reference the Building Code of Australia or any other document.[22]

The Building Code of Australia

The BCA is 'a uniform set of technical provisions for the design and construction of all new buildings, other structures and new building work throughout Australia'. The states and territories are committed to achieving national consistency in building regulations through this national code.[23]

The Australian Building Codes Board develops and maintains the BCA. The board is established by agreement between the Commonwealth and state and territory governments; it also includes the Australian Local Government Association, and there are four industry representatives and an independent chairperson. The board reports to the Building Ministers Forum, which is made up of Commonwealth and state and territory Ministers responsible for building regulation.[24]

The BCA is a 'performance-based' code, setting out the performance requirements buildings in Australia must meet and ways in which the requirements can be met. The BCA has a hierarchy: each facet starts with an objective, which is underpinned by functional statements, performance requirements and building solutions. Two types of building solutions meet the performance requirements:

- Deemed-to-satisfy, or DTS, provisions detail technical descriptions (often contained in an Australian standard) of how a building is to be constructed and equipped to meet the performance requirements. The provisions are prescriptive: although they can include options for building materials or forms of construction, the choices are limited to the options included in the deemed-to-satisfy provisions.
- Alternative solutions are specially designed solutions. An applicant must demonstrate that they meet the performance requirements.[25]

Legislation in each state and territory gives effect to the BCA. In Victoria the BCA is 'called up' by r. 109 of the Building Regulations. The BCA is amended annually, in about February or March, and in most cases the revised BCA is automatically adopted by the legislation in each jurisdiction on 1 May of each year. BCA 2008 applied on 7 February 2009, although when the Commission heard evidence about building regulation BCA 2009 applied, and BCA 2010 has since been adopted in Victoria.[26]

The BCA classifies buildings into a number of classes, which in general terms are as follows:

- Class 1a—a house
- Class 1b—a small boarding house, guest house, hostel or similar
- Class 2—an apartment building or block of flats
- Class 3—a hotel, motel or other residential building in which numbers of unrelated persons are accommodated; for example, the residential part of a school, aged care facility or prison
- Class 4—a single dwelling (such as a caretaker's flat) in a Class 5, 6, 7, 8 or 9 building
- Class 5—an office or other commercial building
- Class 6—a shop, restaurant or showroom
- Class 7—a car park or warehouse
- Class 8—a factory or other industrial building
- Class 9a—a health care building
- Class 9b—an assembly building, including a school or a hospital
- Class 9c—an aged care building
- Class 10a—a shed, garage, or similar
- Class 10b—a structure such as a fence or swimming pool.[27]

The BCA makes specific provision for the construction of Class 1, 2 and 3 buildings, but not the other classes of buildings, in designated Bushfire-prone Areas. The relevant provisions for houses, apartments and other residential buildings in the 2009 edition of the BCA are as follows:

- The objective is to safeguard the occupants from injury and protect a building from the effects of a bushfire. Class 1 buildings have the additional objectives of safeguarding occupants from illness and avoiding the spread of fire.
- The functional statement is that a building constructed in a designated Bushfire-prone Area is to provide resistance to bushfires to reduce the danger to life and reduce the risk of the loss of the building.
- The performance requirement is that a building constructed in a designated Bushfire-prone Area must be designed and constructed to reduce the risk of ignition from a bushfire while the firefront passes.
- The deemed-to-satisfy solution to meet the performance requirement is construction in accordance with AS 3959, Construction of Buildings in Bushfire-prone Areas.[28]

Australian Standards adopted by the Building Code of Australia

AS 3959 is one of 7,000 technical standards developed by Standards Australia and one of many referred to in the BCA.[29]

Standards Australia is a not-for-profit public company limited by guarantee. Its main activity is preparing and maintaining national and international standards and promoting their adoption, and its membership is drawn from Commonwealth and state and territory government departments and statutory bodies, professional, trade and industry associations, consumer organisations, trade unions, research organisations, and educational institutions. Although the company is independent of government, the Commonwealth Government recognises it as the peak standards body in Australia through a memorandum of understanding.[30]

The content of a standard is the responsibility of a voluntary technical committee. The annual value of the committees' in-kind contribution to the activities of Standards Australia has been estimated at $80 million.[31]

Standards Australia chooses the members of technical committees with a view to ensuring balanced participation of the interests that will be particularly affected by the standard.[32] In 2009 the FP020 Committee—the committee responsible for AS 3959—was made up of representatives of the Australasian Fire and Emergency Service Authorities Council, the Australian Building Codes Board, the Australian Institute of Architects, the Australian Institute of Building Surveyors, the Australian Steel Institute, the Australian Window Association, CSIRO, Engineers Australia, the Fire Protection Association Australia, the Housing Industry Association, Master Builders Australia, the Plastics and Chemicals Industries Association, the Property Council Australia, Think Brick Australia, the Timber Preservers Association of Australia, the Wood Council Australia, and Bodycote Warringtonfire (testing interests).[33]

Technical committees develop standards under the oversight of the Standards Development Committee, which makes the ultimate decision to publish a standard and is responsible for arbitrating when consensus cannot be achieved by a technical committee because of sustained objection by a major sector.[34]

Standards Australia develops standards based on the principles of transparency and consensus. Consensus involves interested parties coming together, expressing their views, discussing their differences, and seeking to find a workable agreement they are committed to implement.[35]

In practice, the consensus process involves the responsible technical committee approving the content of a standard through a formal ballot of committee members, in accordance with the following procedure:

- All negative votes must be accompanied by technical reasons for the vote.
- The committee must give thorough consideration to the reasons for the negative vote and try to find a resolution that is acceptable to the committee as a whole.
- Consensus is achieved when the majority of members have collectively accepted the content of a document and have voted affirmatively and there is no major interest group that has collectively maintained a negative stance.[36]

1 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [1.17]; *Planning and Environment Act 1987*, ss. 8, 8A, 8A(2), 11, 13–14, Part 1A, Part 4, Division 1

2 *Planning and Environment Act 1987*, s. 4A

3 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.29]

4 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.8]–[2.13], [2.32]–[2.35], [2.44]–[2.49]

5 Exhibit 678 – VPP Clause 11 – Introduction, Goal and Principles (TEN.114.001.0016) at 0016; Exhibit 678 – VPP Contents (TEN.114.001.0001) at 0001–0002; Exhibit 678 – Clause 12 – Metropolitan Development (TEN.114.001.0019); Exhibit 678 – Clause 14 – Settlement (TEN.114.001.0040); Exhibit 678 – Clause 15 – Environment (TEN.115.001.0001)

6 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.10], [2.44], Attachment 5 (WIT.3018.001.0117)

7 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.10], [2.45], Attachment 6 (WIT.3018.001.0119), Attachment 16 (WIT.3018.001.0267), (WIT.3018.001.0273), (WIT.3018.001.0281), (WIT.3018.001.0289), (WIT.3018.001.0296), (WIT.3018.001.0303)

8 Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.11], [2.46], Attachment 7 (WIT.3018.001.0125)

9 Exhibit 678 – VPP Clause 44.06 – Wildfire Management Overlay (TEN.111.001.0036) at 0036

10 Exhibit 678 – VPP Clause 52.17 – Native vegetation (TEN.111.001.0041); Exhibit 678 – VPP Clause 52.43 – Interim measures for bushfire protection (TEN.111.001.0057)

11 Exhibit 678 – VPP Clause 65 – Decision guidelines (TEN.111.001.0062); Exhibit 678 – VPP Clause 66 – Referrals and notice provisions (TEN.111.001.0064); Exhibit 678 – VPP Clause 72 – General terms (TEN.114.001.0085); Exhibit 678 – Clause 74 – Land use terms (TEN.114.001.0089); Exhibit 678 – Clause 81 – Documents incorporated in this scheme (TEN.114.001.0112), (TEN.114.001.0113) at 0114; Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.12]–[2.13], [2.48]–[2.49]

12 *Planning and Environment Act 1987*, s. 7

13 *Planning and Environment Act 1987,* ss. 6(1)(aa), 12A(3); Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.37]–[2.38]; Exhibit 689 – Statement of Abbey (WIT.4016.001.0001) [12], [22]–[26]

14 *Planning and Environment Act 1987,* ss. 7(4), 8A(2)–(6); Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.36]; Exhibit 689 – Statement of Abbey (WIT.4016.001.0001) [17]–[18]; Exhibit 678 – VPP Practice Note – Writing a Local Planning Policy (TEN.209.001.0094) at 0096–0098

15 *Planning and Environment Act 1987,* s. 12B, Part 3, Part 8; Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.62], [4.1]–[4.27]; Gilmore T13853:3–T13853:14, T13862:6–T13863:9

16 *Planning and Environment Act 1987,* ss. 26(1), 27(1), 29(1), 31, 35; Planning and Environment Regulations 2005, r. 10

17 *Planning and Environment Act 1987,* s. 20(4); Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [4.11]; Gilmore T13863:10–T13863:20

18 *Planning and Environment Act 1987,* Part 4, s. 79; Planning and Environment Regulations, r. 31; Exhibit 679 – Statement of Gilmore (WIT.3018.001.0001) [2.70]–[2.117]; Gilmore T13853:15–T13855:7

19 *Planning and Environment Act 1987,* ss. 52, 55

20 *Planning and Environment Act 1987,* ss. 60(1), 61(1)

21 *Planning and Environment Act 1987,* s. 84B; Gilmore T13849:31–T13850:9

22 *Building Act 1993* ss. 1, 3, 7, 9, Parts 3 and 5; Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [11]–[15]

23 Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [25], Annexure 4 (WIT.6001.002.0229) at 0233–0234

24 Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [1]; Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [7]–[9], [12], [15], [17], Annexure 4 (WIT.6001.002.0229), Annexure 7 (WIT.6001.002.0365); Arnel T5170:30–T5171:4

25 Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [30]–[31]; Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [26]–[30]

26 Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [32]–[33]

27 Exhibit 179 – Statement Harding, Attachment 1 (WIT.7503.001.0025); Arnel T5165:20–T5166:29

28 Exhibit 177 – Statement of Donaldson (WIT.6001.002.0001) [38], Annexure 13 (WIT.6001.002.0417), Annexure 16 (WIT.6001.002.0455)

29 Exhibit 168 – Statement of Arnel (WIT.3000.002.0001) [31]; Exhibit 177 – Statement of Donaldson, Annexure 12 (WIT.6001.002.0416), Volume Two Part 1.4 pp. 39–48; Tucker T5303:14–T5303:22

30 Exhibit 171 – Statement of Tucker (WIT.7501.001.0001) [7]–[9], 'Exhibit' 2 (WIT.7501.001.0031) at 0033, 0036, 'Exhibit' 4 (WIT.7501.001.0080), 'Exhibit' 5 (WIT.7501.001.0083)

31 Tucker T5282:6–T5282:10

32 Exhibit 171 – Statement of Tucker, 'Exhibit' 15 (WIT.7501.001.0112) at 0115–0116; Tucker T5273:28–T5274:23; Eadie T5370:5–T5371:5

33 Exhibit 172 – Statement of Eadie (WIT.7502.001.0001_R) [134]

34 Exhibit 171 – Statement of Tucker, 'Exhibit' 15 (WIT.7501.001.0112) at 0115–0116; Tucker T5271:30–T5272:11

35 Exhibit 171 – Statement of Tucker, 'Exhibit' 15 (WIT.7501.001.0112); Tucker T5271:4–T5271:12, T5272:26–T5272:29

36 Exhibit 171 – Statement of Tucker, 'Exhibit' 15 (WIT.7501.001.0112) at 0120–0121; Tucker T5271:13–T5271:29

APPENDIX C

THE MUNICIPAL FRAMEWORK

THE FRAMEWORK GENERALLY

Municipal councils play an important role in developing and implementing plans designed to prevent, respond to and recover from emergencies at the local level.

The framework underpinning councils' obligations is complex. Key requirements considered by the Commission are located in more than 12 Acts, which are set out in Table C.1.

There are four main areas covered by the framework:

- emergency management planning (including fire management planning and emergency prevention, response and recovery)
- vegetation and land management
- road management
- planning and building.

As well as the legislation and applicable regulations there are guidelines, codes of practice, practice notes and other instruments that direct or assist councils in complying with their obligations.

This appendix is not intended to provide an exhaustive description of the obligations of councils in relation to emergency management planning, and fire management planning in particular. Instead, it provides guidance on their broad obligations and highlights where they are addressed in more detail in the final report.

Emergency management planning

Emergency management planning, as discussed in this appendix, incorporates councils' prevention of, response to and recovery from emergencies.

Councils must undertake certain emergency management preparations, including preparing key emergency management planning documents, appointing people to particular positions and committees and implementing risk reduction and prevention actions.

Councils should (and in some cases must) prepare:

- a municipal emergency management plan, to be audited by the Victoria State Emergency Service every three years
- a municipal fire prevention plan, to be audited by the CFA every three years (this will be progressively replaced by a municipal fire management plan—a sub-plan to the MEMP).

Councils should (and again in some cases must) establish and appoint persons to the following committees and roles:

- a municipal emergency planning committee, also referred to as a municipal emergency management planning committee. A member of Victoria Police must sit on the MEMPC in the role of municipal emergency response coordinator
- a municipal fire prevention committee (this will be progressively replaced by a municipal fire management committee—a sub-committee to the MEMPC)
- a municipal emergency response officer
- a fire prevention officer
- municipal recovery managers.

Where required, councils must also:

- comply with the guidelines for local government set out in the Emergency Management Manual Victoria
- identify and maintain any identified 'neighbourhood safer places'
- establish and manage emergency relief centres.

Vegetation and land management

Councils have obligations in relation to land and vegetation management, which may at times conflict.

Councils are required to prevent and minimise fires, or the spread of fires, on land or roads under their control or management. This entails appropriate cutting and clearing of vegetation on council land and roadsides to ensure that fire risk is kept to a minimum.

Councils are required to observe complex requirements to preserve and protect vegetation and wildlife, under both Victorian and Commonwealth laws.

Councils have obligations in relation to keeping electric power lines in their urban areas clear from contact with vegetation, in accordance with the Victorian *Electricity Safety Act 1998,* associated Regulations and Code of Practice for Electric Line Clearance.

The tension between these obligations is discussed in more detail in Chapters 4, 6 and 7 of Volume II.

Road management

In addition to roadside clearing, councils have obligations to maintain and repair municipal roads and certain other roads in their jurisdiction.

Councils must manage the use of roads and traffic on roads; design, construct, inspect, repair and maintain roads and infrastructure; and minimise adverse impacts on the provision of utility services.

Councils may develop and publish a road management plan and, if they do, they must review it periodically.

Planning and building

Finally, councils administer and enforce planning schemes, using the Victoria Planning Provisions (which incorporate Victoria's Native Vegetation Framework and bushfire management provisions), and administer and enforce the issuing of building permits and occupancy permits, inspection of building work and enforcement of safety and building standards.

Relevant overlays having implications for fire management and prevention are:

- Wildfire Management Overlay (to become Bushfire-prone Overlay, in accordance with the Commission's recommendations)
- Environmental Significance Overlay
- Vegetation Protection Overlay
- Significant Landscape Overlay.

Councils may make local laws with respect to building matters, including fire prevention, firefighting equipment and precautions and other emergency installations, services and equipment.

Table C.1 Legislation applicable to councils

Legislation	Topics covered
Emergency Management Act 1986 (Vic)	Emergency management planning
Country Fire Authority Act 1958 (Vic)	Emergency management planning Vegetation and land management Road management
Metropolitan Fire Brigades Act 1958 (Vic)	Emergency management planning Vegetation and land management Road management Planning and building
Victoria State Emergency Service Act 2005 (Vic)	Emergency management planning
Conservation, Forests and Lands Act 1987 (Vic)	Vegetation and land management
National Parks Act 1975 (Vic)	Vegetation and land management
Planning and Environment Act 1987 (Vic)	Vegetation and land management Planning and building
Electricity Safety Act 1998 (Vic)	Vegetation and land management
Flora and Fauna Guarantee Act 1988 (Vic)	Vegetation and land management
Road Management Act 2004 (Vic)	Road management
Local Government Act 1989 (Vic)	Road management Planning and building
Building Act 1993 (Vic)	Planning and building
Environment Protection and Biodiversity Conservation Act 1999 (Cth)	Vegetation and land management

Note: This is not an exhaustive list of all laws applicable to councils.

GUIDE TO THIS REPORT

The obligations of councils are addressed in more detail in the following sections of this report:

- Emergency management planning:
  - Chapter 1 in Volume II
  - Chapter 2 in Volume II
  - Chapter 7 in Volume II
  - Chapter 8 in Volume II
- Vegetation and land management:
  - Chapter 14 in Volume I
  - Chapter 4 in Volume II
  - Chapter 7 in Volume II
- Road management:
  - Chapter 7 in Volume II
- Planning and building:
  - Chapter 6 in Volume II

SHORTENED FORMS

ABC	aerial bundled cable; Australian Broadcasting Corporation
ABCB	Australian Building Codes Board
ACR	automatic circuit recloser
ADF	Australian Defence Force
AER	Australian Energy Regulator
AFAC	Australasian Fire and Emergency Service Authorities Council
AFP	Australian Federal Police
AIIMS	Australasian Inter-service Incident Management System
ASIC	Australian Securities and Investments Commission
BAL	Bushfire Attack Level
BAL–FZ	Bushfire Attack Level for the Flame Zone
BCA	Building Code of Australia
BPA	Bushfire-prone Area
Bushfire CRC	Bushfire Cooperative Research Centre
CAL FIRE	California Department of Forestry and Fire Protection
CFA	Country Fire Authority
COAG	Council of Australian Governments
COMDISPLAN	Commonwealth Disaster Response Plan
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DACC	Defence Assistance to the Civil Community
DEECD	Department of Education and Early Childhood Development
DH	Department of Health
DHS	Department of Human Services
DPCD	Department of Planning and Community Development
DPI	Department of Primary Industries
DSE	Department of Sustainability and Environment
EAS	Emergency Alerting System
ECC	emergency coordination centre
EIMS	Emergency Information Management System
EMA	Emergency Management Australia
ENRC	Environment and Natural Resources Committee (Victorian Parliament)
ESC	Essential Services Commission
ESMS	Electricity Safety Management Scheme
ESO	Environmental Significance Overlay
ESTA	Emergency Services Telecommunications Authority
ESV	Energy Safe Victoria
FFDI	Forest Fire Danger Index
Forensicare	Victorian Institute of Forensic Mental Health
FP–020	Standards Australia Technical Committee FP–020
FPAA	Fire Protection Association of Australia
GIS	geographic information system
HIA	Housing Industry Association

HVP	Hancock Victorian Plantations
ICC	incident control centre
iECC	Integrated Emergency Coordination Centre
IMC	incident management channel
IMS	Incident Management System
IMT	incident management team
IRIS	Incident Resource Information System
LPPF	Local Planning Policy Framework
MAV	Municipal Association of Victoria
MECC	municipal emergency coordination centre
MEMP	municipal emergency management plan
MEMPC	municipal emergency management plan committee
MERC	municipal emergency response coordinator
MERO	municipal emergency resource officer
MFB	Metropolitan Fire and Emergency Services Board
MFPO	municipal fire prevention officer
MFPP	municipal fire prevention plan
MMR	Metropolitan Mobile Radio
MODIS	moderate resolution imaging spectroradiometer
MRM	municipal recovery manager
MSS	Municipal Strategic Statement
NAFC	National Aerial Firefighting Centre
NAFI	National Association of Forest Industries
NEO	Networked Emergency Organisation
NER	neutral earth resistor
NRIS	National Registration and Inquiry System
NSP	neighbourhood safer place
OCR	oil circuit recloser
OESC	Office of the Emergency Services Commissioner
OSOM	One Source One Message
PIO	public information officer
POC	police operations centre
RCM	reliability-centred maintenance
RCMP	roadside conservation management plan
RFS	Rural Fire Service
RMIT	Royal Melbourne Institute of Technology
RTO	registered training organisation
RVMP	road vegetation management plan
SECV	State Electricity Commission of Victoria
SERCC	State Emergency Response Coordination Centre
SERP	State Emergency Response Plan
SIPSaCS	Statewide Integrated Public Safety and Communications Strategy

SLO	Significant Landscape Overlay
SMR	StateNet Mobile Radio
SOP	standard operating procedure
SPPF	State Planning Policy Framework
SWER	single-wire earth return
TMP	traffic management point
UAM	utility asset management
USFS	United States Forest Service
VAFI	Victorian Association of Forest Industries
VBRRA	Victorian Bushfire Reconstruction and Recovery Authority
VFF	Victorian Farmers Federation
VICSES	Victoria State Emergency Service
VPO	Vegetation Protection Overlay
VPPs	Victoria Planning Provisions
WMO	Wildlife Management Overlay

GLOSSARY

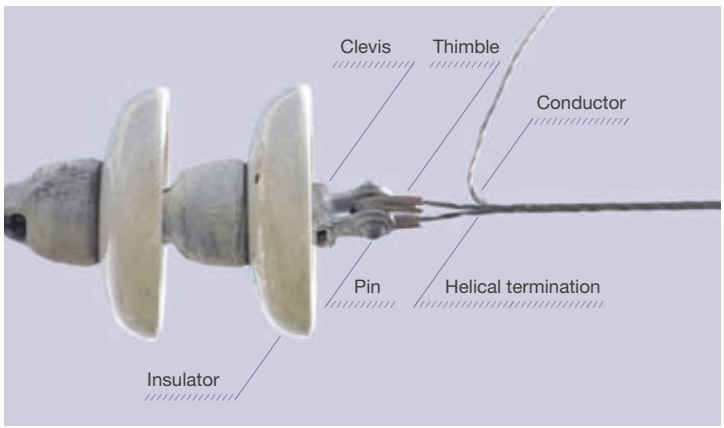
This glossary defines key terms used in this report.[1]

Aerial bundled cable	A type of conductor comprising three single phase cables, each surrounded by insulation. The cables are twisted together around a bare support cable to form a bundle. All electrical connections between an ABC and devices such as switches or transformers are via underground cable joints.
Aerial line scan	See line scan.
Air attack supervisor	The person responsible for the safe and efficient tactical coordination and direction of aircraft operating at a fire.
Appliance	A generic term used to describe any firefighting vehicle or specialist vehicle used by fire services during fires or other emergencies.
Arcing	When high voltage objects come sufficiently close without contact, electrical energy will make a connection between the objects through the air, forming an arc. The arc will continue until the objects move far enough apart to break the connection. The magnitude of the arc depends on current flow.
Australasian Fire and Emergency Service Authorities Council	A body representing urban and rural fire services and land management agencies in Australia and New Zealand with responsibility for the protection of life and property from fire and other emergencies.
Australasian Inter-service Incident Management System (AIIMS)	An incident control system that centres on the management functions associated with dealing with a fire or other incident. The principles of AIIMS are as follows: ■ management of incidents by objective—a process whereby the Incident Controller, in consultation with the incident management team, determines the desired outcomes of the incident ■ one controller of the incident ■ delegation of functions according to the complexity of the incident ■ span of control—generally one person is directly responsible for no more than five reporting points at any time ■ development of a plan outlining the strategies and tactics to deal with the incident.
Automatic circuit recloser	A type of circuit breaker installed on power lines to minimise the risk of injury and damage from an electrical fault and the interruption of supply. When a fault occurs the ACR opens to break the circuit, then automatically recloses the circuit after a specified period, re-energising the line.
Automatic weather station	A station, often situated in an isolated location, at which meteorological measurements are made by automatic methods that do not require local human supervision and control.
Back-burn	A fire started intentionally from a prepared line or other barrier to burn an area of flammable material in the path of an advancing fire in order to control that fire.
Blacking out	The process of ensuring that all stumps, branches and burning items are extinguished.
Bunker	Purpose-built structure for private use that is intended to provide temporary shelter for people from a bushfire during the passage of a firefront.
Burning out	See back-burn.
Burnover	A section of fire that overruns personnel and/or equipment.
Bushfire mitigation plan	*The Electricity Safety Act 1998* requires electrical distribution businesses to submit bushfire mitigation plans to Energy Safe Victoria annually for approval. The plans outline the steps that the businesses will take to mitigate bushfire risk for the following year.
Bushfire shelter	See neighbourhood safer places.
Cable stay	The cable stay or stay wire is a cable used to support the weight of a pole (which is under tension from the weight of the conductor).
Campaign fire	A fire of a size and/or complexity that requires substantial firefighting resources, generally requiring several days, or possibly weeks, to suppress.
Chief Officer	The Department of Sustainability and Environment and the Metropolitan Fire and Emergency Services Board each have a Chief Fire Officer as their senior operational head. The Country Fire Authority's senior operational head is a Chief Officer. During a fire these officers are responsible for the command of all their firefighting resources, permanent career staff and volunteers.
Circuit breaker	A protection device that opens when a fault is detected, breaking the electrical circuit and stopping power flowing into the fault.

Circuit length kilometre	As opposed to a route length kilometre, a circuit length kilometre is the length travelled by electricity along its circuit. With the exception of single wire earth return lines (which have only one overhead conductor and return through the earth) this will be longer than the route length kilometres of a network, because of the circuit's return path.
Clashing	Clashing occurs when high voltage objects (such as two high voltage conductors) come into contact, causing them to emit molten metal particles (sparks).
Clevis	See helical assembly.
Coarse fuel	Dead woody material, greater than 25 millimetres in diameter, in contact with the soil surface (fallen trees and branches).
Community fireguard	A CFA community development program that assists residents to develop local bushfire survival strategies that correlate with their lifestyle, values and the local environment. See also phone tree.
Community refuge	A place that provides people with short-term shelter during the passage of a fire, which is identified, constructed or refurbished by the State and maintained by municipal councils.
Conductor	A metal line that electrical current flows along in an electrical distribution network. Conductors are made up of several strands of wire wound around each other and have a very low electrical resistance. Conductor sizes and types vary according to voltage and mechanical requirements.
Contained	A fire is contained when its spread has been halted, but it may still be burning freely within the perimeter or fire control lines.
Control agency	The agency designated to control the response activities to a specified type of emergency.
Control line	A natural or constructed barrier, or treated fire edge, used in fire suppression and prescribed burning to limit the spread of fire.
Controlled	The time at which the complete perimeter of a fire is secured and no breakaway is expected.
Controlled burning	See prescribed burning.
Convection column	The rising column of smoke, ash, burning embers and other particle matter generated by a fire.
Coordinator in Chief of Emergency	The Minister for Police and Emergency Services, whose role is to ensure that government agencies take adequate emergency management measures and coordinate the activities of government agencies carrying out their statutory functions, powers, duties and responsibilities in relation to emergency management.
Country Area of Victoria	Any area of Victoria that is outside the metropolitan fire district, excluding areas of forest, national park and protected public land.
Cross-arm	Cross-arms sit near the top of a power pole and are used to support the insulators that hold conductors. They can be made of wood or steel.
Crown fire	A fire burning in the higher branches and foliage of a tree.
Crown land	Land which is the property of the Commonwealth, a state or a territory.
Crowning	Occurs when the fire reaches the canopies of the trees; the fire may then jump, or run, from one crown to the next.
D24	The Victoria Police communications network.
Defence Assistance to the Civil Community	Assistance to the community provided by Department of Defence personnel in the event of natural disaster or civil emergency.
Direct attack	A method of fire attack where wet or dry firefighting techniques are used. It involves suppression action right on the fire edge which then becomes the fire line.
DISPLAN	See State Emergency Response Plan.
Distribution feeder	Conductors that carry small to medium amounts of power, for example, 22 kilovolts. Each feeder starts at a distribution zone substation and includes the three phase sections, the single phase sections and any single-wire earth return systems.
Division	A portion of the fire perimeter comprising two or more sectors. The number of sectors grouped in a division should be such as to ensure effective direction and control of operations.
Divisional emergency coordination centre	The location where emergency response coordinators and liaison officers of the relevant agencies coordinate the provision of resources; receive, collate, analyse and disseminate intelligence; and conduct operations ancillary to those of an emergency operations centre.

Divisional emergency response coordinator	A senior police officer responsible for the coordination of resources or services in a division and for providing situation reports to the state emergency response coordinator in the event of an emergency.
Drought factor	A broad measure of fuel availability as determined by the drought index and recent rainfall.
Drought index	A numerical value, such as the Byram-Keetch Drought Index, reflecting the dryness of soils, deep forest litter, logs and living vegetation.
Dry firefighting	The suppression of a fire without the use of water. This is normally achieved by removing fuel with the use of hand tools or machinery.
Ecological burning	A form of prescribed burning. The treatment of vegetation with fire in nominated areas to achieve specified ecological objectives.
Embers	Glowing particles cast from the fire.
Emergency Management Australia	An agency within the Commonwealth Attorney-General's Department with the responsibility of reducing the impact of natural and man-made disasters on the Australian community. Also the lead federal agency responsible for disaster response.
Emergency Management Manual Victoria	A manual that guides implementation of aspects of the *Emergency Management Act 1986*. The manual integrates the main policy and planning documents for emergency management in Victoria. It provides information and guidance on Victorian emergency management arrangements, outlines the roles of various organisations, and details the planning and management arrangements that bring all the different elements together.
Emergency relief centre	A place established in a safe area, away from the emergency, to support people affected by, or involved in the management of, an emergency. Such centres can provide first aid, catering and counselling services, as well as information and temporary accommodation.
Emergency Services Telecommunications Authority	The Victorian authority with the legislative responsibility for handling 000 calls and providing and managing operational communications for the Country Fire Authority and Victoria State Emergency Service statewide, and for Victoria Police, Ambulance Victoria and the Metropolitan Fire and Emergency Services Board in the greater Melbourne and Geelong metropolitan area.
Evacuation	A planned strategy when the risk of impact from an emergency is highly likely, usually involving direct assistance from emergency agencies. See Chapter 1 of Volume II for definitions of 'assisted evacuation' and 'emergency evacuation'.
Fault current	Occurs when one or more electrical conductors contact ground and/or each other, or something else provides a connection between them, creating a short circuit.
Fine fuel	Grass, leaves, twigs and other small pieces of vegetation under 6 millimetres in diameter.
Finger	Long narrow finger of rapidly advancing fire that extends beyond the head or flanks of a fire.
Fire agencies	Three agencies are responsible for preventing and suppressing fires in Victoria: the Country Fire Authority, the Department of Sustainability and Environment, and the Metropolitan Fire and Emergency Services Board.
Fire behaviour	The manner in which a fire reacts to the variables of fuel, weather and topography. Common measures of fire behaviour are rate of spread, flame height, fire spotting distance and intensity.
Fire break	See fuel break.
Fire control line	See control line.
Fire danger index	A relative number denoting an evaluation of rate of spread, or suppression difficulty for specific combinations of fuel, fuel moisture and wind speed.
Fire danger rating	A relative phrase denoting an evaluation of rate of spread, or suppression difficulty for specific combinations of fuel, fuel moisture and wind speed.
Fire line	See control line.
Fire perimeter	The entire outer boundary of a fire area.
Fire tower	A lookout tower strategically located and staffed to detect and report the occurrence and location of fires.
Fire-bombing	The technique of dropping a suppressant or retardant from specialist aircraft to suppress a fire.
Firebrand	A piece of burning material, commonly bark from eucalypts.
Firefront	See head.

Fireground	The area declared by the senior member of the attending fire agency as the 'fireground'. As a guide, it includes the area involved in the actual fire, the area where firefighters, appliances, hoses and hydrants are located, and can extend to adjoining properties threatened by the fire.
First attack	Initial activity undertaken to contain a bushfire swiftly and minimise the risk to life and property.
Flanks	Those parts of a fire perimeter that are roughly parallel to the main direction of the fire's spread.
Forest Fire Danger Index	A relative number used by fire services to denote the difficulty of controlling or suppressing a bushfire. It is calculated by reference to temperature, relative humidity, wind speed and both long- and short-term drought effects in a forest.
Forest Industry Brigade	A brigade formed by a private forestry company under the *Country Fire Authority Act 1958*.
Forward looking infrared	A helicopter mounted infrared camera capable of detecting sources of heat or hot spots in fire areas so that ground crews can be more effective in their suppression and mop up activities.
Fuel break	Any piece of land where fuel has been physically removed to create a gap in an area of uninterrupted fuel.
Fuel load	The oven-dry weight of fuel per unit area. Commonly expressed as tonnes per hectare.
Fuel management	Modification of fuels by prescribed burning or other means.
Fuel reduction	The process of removing a fire hazard to reduce its chance of ignition, such as prescribed burning.
Fuel-reduction burning	See prescribed burning.
Fuse	A type of circuit breaker comprising a metal strip or wire that melts and interrupts the circuit when too much current flows.
Going	Any fire expanding in a certain direction or directions.
Grass Fire Danger Index	A relative number used by fire services to denote the difficulty of controlling or suppressing a bushfire. It is calculated by reference to curing or fuel moisture, temperature, relative humidity and wind speed.
Grassland curing	A proportion of dead material in grasslands—usually increasing over summer as tillers die off and dry out, increasing the risk of grassland fire.
Head	Also called the firefront; where the fire is making greatest progress (usually downwind), as measured by its forward rate of spread. Flames are tallest and the intensity of the fire is greatest at this point. The head of the fire is affected by wind direction, fuel and topography, and can change as these factors change.
Helical assembly (also known as pre-form, make-off or wrap-on)	A helical assembly consists of wires pre-formed in a spiral helix. When installed they are wrapped around a conductor, creating a tension that tightly grips the end of the conductor. A thimble and clevis are used to attach the helical termination and the conductor to the insulator, which is in turn attached to the pole (see diagram below). The thimble is a horseshoe-shaped device that pivots around a pin, held in place by the clevis, a device with two arms in which the pin sits.



Source: Drawn from Exhibit 524 – VFSD 2 x Simulation – S/C Hugyen (VPO.001.038.0218).

Hot spot	A particularly active part of a fire.
Incident	An event, accidentally or deliberately caused, which requires a response from one or more of the statutory emergency response agencies.
Incident action plan	A statement of objectives and strategies to control or suppress an incident, approved by the Incident Controller.
Incident control centre	The location where the Incident Controller and, where established, members of the incident management team direct response activities in an emergency situation.
Incident Controller	The senior member of an incident management team responsible for all action taken to control an incident and for managing relationships with organisations and personnel outside the AIIMS structure and with organisations, communities and individuals affected or likely to be affected by the incident.
Incident management team	A team comprising the Incident Controller and personnel responsible for functions, operations, planning and logistics during an incident.
Indirect attack	The use of back-burning as a method of suppression to confine the fire within a defined area bounded by existing or prepared control lines.
Initial attack	See first attack.
In-service failure	An asset failure reported through the network operator's outage management system; usually leading to a power outage.
Insulator	A component that resists the flow of electricity. Insulators support or separate conductors and prevent electricity escaping the conductor.
integrated Emergency Coordination Centre	The centre from which bushfires are managed at the state level. Now known as the State Control Centre.
Integrated Fire Agency Coordination Centre	A centre where strategic preparedness, management of incident responses and the allocation of agency resources are resolved and agreed in accordance with the partnership arrangements between the CFA and DSE. The objective of the IFACC is to support integrated coordination and responses between the CFA and DSE. The location of such a centre is determined by the Chief Officers of the CFA and DSE on the basis of the requirements of the fire area in question.
Level 1 incident	A small fire in area, attended by one or two trucks, which is of short duration and is dealt with at the incident.
Level 2 incident	A developing fire incident or one that requires more than the initial responding resources.
Level 3 incident	A large complex fire, which may run for days.
Line Clearance Code	The Line Clearance Code sets out the distances around power lines that 'responsible persons' must keep free from vegetation under the Electricity Safety (Electric Line Clearance) Regulations.
Line scan	An infrared picture is taken from an aircraft of the fire, analysed for differences in the heat rising from the earth's surface to determine the fire edge. The electronic image can then be transposed onto a map.
Logistics officer	An officer appointed by the Incident Controller and responsible for obtaining and maintaining resources, facilities, services and materials to support control of the incident.
Metropolitan Fire District	An area which includes all areas within 16.09 kilometres of the Melbourne GPO.
Mineral earth	A term used to describe the ideal condition of a constructed firebreak, being completely free of any vegetation or other combustible material.
Municipal emergency coordination centre	A facility that brings together key agencies to coordinate the provision of municipal council and community resources during an emergency for the response and recovery effort. It facilitates the activities of key personnel from local and state government agencies, emergency services and others, as required.
Municipal emergency management plans	Plans prepared and maintained by all municipal councils pursuant to the *Emergency Management Act 1986*. These plans must be prepared in accordance with guidelines published in the Emergency Management Manual Victoria and must identify the resources available in the municipality that can be used for emergency prevention, response and recovery, and specify how those resources are to be used.
Municipal emergency resource officer	Provides access to municipal resources and, with the municipal emergency response coordinator, advises the divisional emergency response coordinator on the potential outcome of the emergency.

Municipal emergency response coordinator	A local police officer who coordinates support resources by attending the municipal emergency coordination centre and ensures that the municipal emergency resource officer is in a position to provide access to municipal resources. Reports to the divisional emergency response coordinator.
Municipal recovery manager	A municipal appointee responsible to the council for ensuring the coordination of municipal resources to be used in recovery.
Neighbourhood safer places	A space which is a place of last resort for individuals to access and remain in during the passage of fire through their neighbourhood, without the need to take a high risk journey. They are intended to provide a place of relative safety.
Networked Emergency Organisation	An organisation that provides resources to help DSE in its fire prevention and suppression role. NEO consists of staff from agencies such as Parks Victoria, the Department of Primary Industries, VicForests, Melbourne Water and the Department of Planning and Community Development.
Neutral earth resistor	A NER's principal function is to reduce the risk that high fault currents will damage equipment between the fault and the zone substation, by increasing the resistance in the fault circuit.
Operations officer	An officer appointed by the Incident Controller who is responsible for directing and supervising all work on the fireground under the direction of the Incident Controller.
Operations point	A location from which the overall field operations are commanded by the operations officer.
Permanent fault	A fault that remains after attempts to re-energise the line, for example, a tree resting against a conductor.
Phone tree	A community information system where one caller rings several others, who, in turn, ring several more according to an agreed list. Commonly used within CFA community fireguard groups.
Planning officer	An officer appointed by the Incident Controller who is responsible for information management and planning at an incident.
Prescribed burning	The controlled application of fire under specified environmental conditions to a predetermined area at the time, intensity and rate of spread required to attain planned resource management objectives.
Private bushfire shelters	See bunker.
Private units	Units that are generally operated by farmers or landowners and usually consist of a multi-purpose small farm utility that has a portable tank and pump mounted on the rear. Operators may be members of the CFA but often this is not the case.
Protection devices	Protection devices operate to stop excessive electrical current flowing down the line to the point of a fault and permit normal current to flow up to the point of the protection device. The simplest protection device is a fuse.
Pumper	A firefighting vehicle equipped with a large capacity pump, water tank and hose. Generally intended to be operated when stationary from reticulated or static water supplies.
Rate of spread	The forward progress per unit time of the head fire or another specified part of the fire perimeter.
Recovery centre	A building in which a coordinated process of support is provided to affected communities to restore their emotional, social, economic and physical wellbeing.
Red flag warning	A warning issued to firefighters when there is a major change to critical information that might affect the safety of personnel.
Refuge	See community refuge.
Regeneration burning	The controlled burning of bushland to encourage new growth.
Regional emergency coordination centres	Centres that monitor and support incident management teams and incident control centres in their management of incidents, obtain and coordinate resources for incidents in the region and support others in the state, liaise with other agencies as necessary, and provide information and updates to the integrated Emergency Coordination Centre.
Regulated or regulatory life	Refers to the age set by a network operator when it will replace a network component regardless of whether that component has failed. The regulated life of a component should be based on data recording the age at which that component's failure rate begins to increase. Ideally the network operator will set the regulated life of a component at an age that is just before the statistical failure rate increases.

Relative humidity	The amount of water vapour in a given volume of air, expressed as a percentage of the maximum amount of water vapour the air can hold at that temperature.
Reliability-centred maintenance	RCM is a systematic approach to managing the maintenance of engineering assets to achieve desired asset service and safety levels. RCM was developed in the aircraft industry in the 1960s. Many industries have since adopted the principles of RCM, including the electricity distribution industry. RCM identifies the system functions and actual potential failure modes before considering the effects of failures and specifying suitable inspection, maintenance or replacement tasks, or design changes.
Relocation	Action undertaken by individuals and households who independently decide to leave a threatened or potentially threatened area.
Retardant	A substance or treatment which, under specified conditions, suppresses or delays the combustion of a material.
Roadblock	Established to regulate the flow of road traffic into an area where fire has occurred, is presently occurring, or has the potential to occur. Such regulation is done by Victoria Police in consideration of the needs of people to access an area and also the relative safety of doing so.
Route-length-kilometre	The distance covered by the route along which a conductor delivers electricity, for example, if poles are 1 kilometre apart, the line between poles covers 1 route-length-kilometre, regardless of the distribution infrastructure used.
Safety adviser	An adviser to the Incident Controller on all aspects of potential and current safety and risk management issues present at the incident.
Safety officer	See safety adviser.
Sectionalisers	A protection device that operates to cut power to the network only in the area near the fault.
Sector	A specific area of a fire which is under the control of a sector commander who is supervising a number of crews.
Sensitive earth fault protection	For sensitive earth fault protection, a protection device will open and break the circuit if it calculates current greater than the minimum operating current (which is very low, usually between 5 and 10 amperes) flowing to ground for an extended period of time (usually one to two seconds). Sensitive earth fault protection operates with the same speed regardless of the amount of the fault current.
Single-wire earth return line	A high voltage distribution system run at a nominal voltage of 12.7 kilovolts that carries small amounts of power over long distances to sparsely populated areas. SWER systems are characterised by a single overhead wire, with the return electrical current flowing back to the isolation transformer via the earth (ground). SWER systems transport very low electrical currents up to a typical maximum of 8 amperes, whereas a three phase network may carry up to 400 amperes.
Slip-on unit	A tank, a live hose reel or tray, a small capacity pump, and an engine combined into a single one-piece assembly that can be slipped onto a truck bed or trailer and used for spraying water and/or foam on bushfires.
Spot fire	Isolated fire started ahead of the main fire by sparks, embers or other ignited material, sometimes to a distance of several kilometres.
Spot over	See spot fire.
Spotting	The ignition of spot fires from sparks and embers.
Staging area	A prearranged, strategically placed area where support response personnel, vehicles and other equipment can be held in readiness for use during an emergency.
Standard Emergency Warning Signal	A sound designed to alert the community to the need to listen to an announcement concerning an actual or imminent emergency.
State Control Centre	See integrated Emergency Control Centre.
State Emergency Recovery Arrangements	Arrangements that plan for the coordination of agencies involved in recovery; describe the management principles for recovery planning, outline the services which may be required in recovery situations, and provide information on the considerations involved in operational recovery. They also establish a framework within which recovery agencies, regions and municipal councils can prepare their own recovery plans.

State Emergency Response Coordination Centre	A centre activated when an emergency affects more than one police region and operates from the Victoria Police Centre. From within the SERCC, police and liaison officers of control and support agencies receive, collate, analyse and disseminate intelligence to other emergency response agencies, the general public and the media.
State Emergency Response Coordinator	The Chief Commissioner of Police, responsible for coordinating the activities of all agencies that have a role in responding to an emergency.
State Emergency Response Plan	A plan which describes the organisational arrangements for coordinating the response to any emergency affecting, or with the potential to affect, Victoria. Its response-management arrangements operate on the basis of three principal management tasks: command, control and coordination. The SERP identifies the agencies primarily responsible for managing specific types of emergencies and describes how the activities of agencies supporting that primary agency will be coordinated in an emergency.
State of disaster	A state of disaster may be declared in accordance with the *Emergency Management Act 1986*. If a state of disaster is declared, the Coordinator in Chief assumes responsibility for directing and coordinating the activities of all government agencies and for the allocation of all available resources of government that he or she considers necessary or desirable to respond to the disaster.
Strike team	A set number of resources of the same type that have an established minimum number of personnel. Strike teams always have a leader (usually in a separate vehicle) and a common communications system. Strike teams are usually made up of five resources of the same type such as: vehicles, crews, earth moving machinery, etc.
Tanker	A mobile firefighting vehicle equipped with a water tank, pump, and the necessary equipment for spraying water and/or foam on bushfires.
Thimble	See helical assembly.
Three-phase	Three-phase networks have electrical current flowing along three conductors.
Tie wire	A tie wire is a thin wire wound around a conductor to hold the conductor to an insulator.
Tongue	See finger.
Total fire ban	Declarations applied for days of very high fire risk in regions of the state: prohibits the lighting of any fires in the open air.
Township protection plan	Plans originally developed by the CFA as operational response plans to prepare for firefighting operations, identify local access routes and vulnerabilities such as schools, nursing homes and hospitals. Revised in the wake of the 2009 bushfires to include more detailed consideration of the actions community members could take when fire threatens their town. These plans have three parts that cover community information, township planning factors (focused on initial operational response) and fire prevention works.
Traffic management point	See roadblock.
Transformer	A device that converts or transforms high voltages of electricity; used to carry large amounts of power across long distances to low voltages, which are more useful at the point of supply to a customer.
Transient fault	A fault that clears by itself, for example, bark or other airborne debris coming into passing contact with the line.
Transmission lines	Lines that carry extra high voltages of electricity long distances from power stations and interstate connection points to terminal stations where the voltage is lowered for local distribution companies to deliver electricity to homes and businesses.
VicFire	The receipt and dispatch agency for fire-related emergency information; operated by the Emergency Services Telecommunications Authority.
Victoria Emergency Management Council	A council comprising representatives of government and non-government agencies, chaired by the Coordinator in Chief, which advises on all emergency management matters, including the coordination of the activities of government and non-government agencies.
Victorian Bushfire Reconstruction and Recovery Authority	An authority established by the Commonwealth and Victorian Governments to oversee and coordinate recovery and rebuilding programs in communities affected by the 2009 Victorian bushfires.

Victorian Fire Risk Register	A tool that systematically identifies people and assets at risk from bushfire, assesses the level of risk and provides a range of treatments to mitigate the risk. Treatments may include activities such as fuel reduction, community education programs and safety audits.
Water bombing	See fire-bombing.
Zone substation	The 66-kilovolt distribution sub-transmission network feeds into distribution zone substations and switching stations where the electricity is transformed down to 22 kilovolts. As many as 12 distribution feeders can exit from a distribution zone substation.

1 All definitions in this appendix are drawn from within the report or Exhibit 1002 – Emergency Management Australia – Manual 03 – Australian Emergency Management Glossary (TEN.316.001.0001); Exhibit 142 – Appendix G – Bushfire and Land Management Terminology (TEN.049.001.0411); Exhibit 831 – Emergency Management Manual Victoria (RESP.3001.003.0001_R); Exhibit 11 – Statement of Esplin, Attachment 11 (WIT.005.001.0951); Exhibit 475 – The Australasian Inter-Service Incident Management System – A Management System for Any Emergency (TEN.121.001.0001) at 0103; Exhibit 831 – Guidelines for the Operation of Traffic Management Points During Wildfires (RESP.3001.001.0320); Exhibit 701 – Standard Operating Procedure – Safety Advisor (DSE.USB9.0035.1614); Williamson T4453:31–T4454:8; *Lands Acquisition Act 1989* (Cth)