



GOVERNMENT OF
WESTERN AUSTRALIA

APPRECIATING THE RISK
REPORT OF THE
SPECIAL INQUIRY INTO
THE NOVEMBER 2011
MARGARET RIVER BUSHFIRE

ACKNOWLEDGEMENTS

This Report has been made possible through the invaluable assistance and contributions made by four officers of the Department of the Premier and Cabinet, Western Australia: Ms Courtney Barron, Ms Helen Gladstones, Mr Jeremy Martin and Mr Cole Thurley. Mr Robert Cock QC afforded significant assistance by way of legal advice which is appreciated. The Shire of Augusta Margaret River is acknowledged for allowing the Special Inquiry team to use their premises to conduct the majority of the hearings. The residents of the Margaret River area are also gratefully acknowledged, for allowing us personal access during a difficult and challenging time.

Cover photograph: Burnt coastal heath near Gnarabup Road, Gnarabup.

Inset photograph (back cover): View of Wallcliffe House, Margaret River.

Photographs supplied by Ms Courtney Barron



Margaret River Bushfire Special Inquiry

Mr Mal Wauchope
Public Sector Commissioner
Locked Bag 3002
WEST PERTH WA 6872

Dear *Mal*

Margaret River Bushfire Special Inquiry

I am pleased to submit to you the report of the Margaret River Bushfire Special Inquiry.

I have called the Report 'Appreciating the Risk', reflecting the need to consider, and appropriately manage, the full range of risks associated with fuel management to prevent bushfire both from a government agency and community perspective.

The Report recognises the specific Terms of Reference and timeframe in which to complete the Special Inquiry given that at the time of writing, it is the middle of the traditional bushfire season for Western Australia. The Report also recognises the links to the body of work currently being undertaken and coordinated by the Department of the Premier and Cabinet as a result of the Perth Hills Bushfire Review in February 2011.

The Report lists a series of findings and focuses heavily on the Department of Environment and Conservation (DEC), its risk management practices and its policies governing the undertaking of prescribed burns. The Report notes that the Director General of the DEC made public statements on 28 November 2011 accepting his Department's responsibility for the damage caused by the fires.

The Margaret River Bushfire Special Inquiry, referred to in the Report as the 'Special Inquiry', was established by the State Government under the provisions of s24H(2) of the *Public Sector Management Act 1994 (WA)*.

The Special Inquiry applied the provisions of s24J(3) of the *Public Sector Management Act 1994* to conduct 38 hearings involving 38 witnesses. A community meeting and numerous interviews provided the Special Inquiry with personal interactions to ensure that the Special Inquiry was informed of all relevant information. I have made a recommendation for your consideration regarding future Special Inquiries of this nature but can say that on this occasion, the powers provided to me were more than adequate for the task.

Almost all of the hearings were conducted at the offices of the Shire of Augusta-Margaret River at Wallcliffe Road, Margaret River. The use of the facilities in the Shire offices was provided by the Shire President, Ray Colyer and the Shire CEO, Gary Evershed. Without their valuable contribution and that of their staff, the Special Inquiry would have been more difficult to undertake given the need to operate between Perth and Margaret River.

The remainder of the hearings were conducted at the State Coordination Centre in West Leederville.

While there was no call for public submissions, the Special Inquiry received a total of around 80 pieces of correspondence by letter or email. Much of the correspondence received was outside the Terms of Reference and as such, was not fully considered and will be referred to the relevant agencies to address.

The Special Inquiry has formed ten recommendations for your consideration. In line with the Terms of Reference, the cause(s) of the bushfires were a series of judgements made by a range of people in the DEC rather than any single cause or event. Therefore the recommendations are more focussed on policy guidance and review rather than major reforms.

An important recommendation relates to the operational response to the Margaret River Bushfires. I have recommended that the agencies who are conducting their own internal reviews of the matter have some objective oversight because there were significant issues in the response brought to the attention of the Special Inquiry by members of the community.

The Special Inquiry took just under two months to complete and is reporting on time.

Much of the credit for the timely completion of this report is due to the level of support afforded me by staff of the Department of the Premier and Cabinet namely: Mr Cole Thurley, Mr Jeremy Martin and Ms Courtney Barron. These three officers worked through their end of year break from both West Leederville and Margaret River and were professional and committed to the task at hand.

I was impressed with the candour and commitment of the officers of the DEC. I have raised some questions about the current practices and policies used by the Department which I recommend be addressed. There was never a need to summons documents as the Special Inquiry received excellent cooperation from the DEC. Witnesses from the DEC were made readily available on every occasion despite the fact that they had some large operational considerations during the time the Special Inquiry was underway.

Through you, I would like to pass on my appreciation to the Director General and staff of the DEC for the level of cooperation and assistance provided to the Special Inquiry.

Yours sincerely



M J Keelty AO

27 January 2012

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
CHAPTER 1: CONTEXT FOR PRESCRIBED BURNING.....	11
1.1. INTRODUCTION.....	11
1.2. THE CONTEXT.....	12
1.3. EFFECT ON DEC STAFF	19
1.4. LEGISLATION AND POLICY.....	20
CHAPTER 2: BACKGROUND AND PLANNING	25
2.1. MASTER BURN PLANNING	25
2.2. PLANNING FOR BS520	29
CHAPTER 3: IMPLEMENTATION	39
3.1. APPROVALS TO IGNITE	39
3.2. WEATHER CONDITIONS	40
3.3. RESOURCING OF THE BURN	43
3.4. IGNITIONS	44
3.5. BURN SECURITY.....	46
3.6. ESCAPE AND INITIAL RESPONSE	51
3.7. CONSISTENCY WITH GUIDELINES AND POLICIES.....	55
CHAPTER 4: THE FUTURE.....	63
4.1. RISK MANAGEMENT.....	63
4.2. RESEARCH.....	67
4.3. ASPECTS ABOUT THE RESPONSE	68
4.4. RECOMMENDATIONS	71
ANNEXURE 1: TERMS OF REFERENCE	73
ANNEXURE 2: APPOINTMENT TO CARRY OUT SPECIAL INQUIRY	74
ANNEXURE 3: RATING SYSTEM FOR BS520 AND BS255.....	75
ANNEXURE 4: BS520 OPERATIONS MAP (ANNOTATED BY G. EIKELBOOM)..	79
ANNEXURE 5: DEC ROUTINE FORECASTS, 17 – 24 NOVEMBER 2011.....	80
ANNEXURE 6: ROLES UNDERTAKEN BY DEC OFFICERS	89
ANNEXURE 7: PUBLIC CONSULTATION MAPS FOR BS520 AND BS255.....	90
ANNEXURE 8: DAILY WEATHER OBSERVATIONS FROM WITCHCLIFFE.....	92
ANNEXURE 9: ‘RED FLAG BURN’ NOTIFICATION FOR BS520	94
ANNEXURE 10: TOTAL FIRE BOUNDARY.....	95
ANNEXURE 11: LIST OF HEARINGS.....	96

EXECUTIVE SUMMARY

Between September and November 2011 what is known as a ‘prescribed burn’ was undertaken by the Department of Environment and Conservation (DEC) on a parcel of land at Ellenbrook located within the Leeuwin-Naturaliste National Park about 1 kilometre south of Gracetown and approximately 13 kilometres north west of the township of Margaret River. This prescribed burn was known as BS520 and was first ignited on 6 September 2011.

The Terms of Reference for the Special Inquiry (Annexure 1) only expressly refer to the Ellenbrook prescribed burn BS520, however, a second prescribed burn at the neighbouring town of Prevelly, BS255, was ignited around the same time. The Special Inquiry considers that the planning and conduct of BS255 falls within the scope of the Terms of Reference for this Report, as it forms part of the context within which decisions relating to BS520 were made. Furthermore, BS255 ultimately formed part of the ‘Margaret River Bushfires’, and in the community’s mind the two burns are inextricably linked. As such, it would not be accurate or fair to look at the causes of the bushfire, or the circumstances leading up to BS520 without some consideration of BS255.

Sometime between Tuesday 22 November 2011 and Wednesday 23 November 2011, the Ellenbrook burn escaped its boundary and became a wildfire, running south along the coast to Redgate, some 20 kilometres away. At the Prevelly burn on 23 November 2011 there were significant flare-ups and spotting causing fires in Gnarabup. It is more than likely that the main fire at Ellenbrook commenced soon after 7:00 am on 23 November¹. The fires destroyed 32 homes, nine chalets and four sheds and burnt out more than 3,400 hectares of mainly Crown land.

To the credit of all those involved – residents, volunteer bushfire brigades, DEC staff and emergency services personnel alike – no lives were lost. The area of the fires at Margaret River contains both residential and holiday homes. It is not appropriate to compare the loss of a family home to the loss of an unoccupied holiday home. Each will hold a particular place in the hearts and minds of the owners and occupiers.

That said, the loss of a home is a loss in every sense of the word. A home contains many lifelong memories as well as people’s treasured possessions. The fires occurred only four weeks before Christmas at a time when those affected, especially children, were entitled to be looking forward to one of the most important family occasions of the year. The fire and evacuations meant that 139 people were displaced and had to be accommodated elsewhere.

The Special Inquiry observed that an emotional impact not measured in ‘losses’ has been felt by all those involved in these fires.

Establishment and Conduct of Inquiry

The Special Inquiry was established by the State Government under Section 24H(2) of the *Public Sector Management Act 1994* (WA). Under that Act, the Special Inquirer is provided with a range of powers to obtain evidence, and may inform itself to matters as it sees fit. The powers afforded to a Special Inquiry are akin to a Royal Commission, and persons

¹ McCaw, L., Hearing 16 January 2012.

summoned or appearing as witnesses are treated in the same way, and have the same protections, as a witness tried in the Supreme Court of Western Australia.

The Special Inquiry noted a public statement by the Director General of the DEC, Mr Keiran McNamara, in an interview on ABC Radio where he said, *inter alia*, “*it was our prescribed burn and it got away and it has caused terrible damage. We accept that. we accept responsibility for that*”².

Given the circumstances surrounding the ignition of this fire, it is important to independently assess the facts as soon as possible so that decisions can be made about individuals’ circumstances. Equally important are the planning decisions about future prescribed burns. For these reasons, the Special Inquiry did not consider any issues outside the Terms of Reference despite the expectation of many that the response by agencies to the fires would be examined in detail. That said, the Special Inquiry was made aware of some matters in the fire response that are considered so important as to warrant mention in this Report.

More than 80 items of correspondence were also received by the Special Inquiry. Much of the correspondence received fell outside the Terms of Reference and has not been specifically addressed. There was no general call for public submissions as it was considered more important to focus on the cause(s) of this fire given the fact that the Special Inquiry was being undertaken during the most critical time of the year in terms of bushfires.

That said, some of the correspondence received relates to issues that are already under consideration following the Report into the Perth Hills Bushfires from February 2011³. These issues form part of a major body of work that is being actively addressed and coordinated by the Department of the Premier and Cabinet.

The area affected is part of the Shire of Augusta-Margaret River in the south west of the State. The Shire President, its Chief Executive Officer and its staff have been an integral part of the response and recovery from this fire. Without their support, the Special Inquiry would have been much more difficult to conduct.

The offices of the Shire of Augusta-Margaret River were made available to the Special Inquiry and it is from there that the bulk of the work was undertaken. A public meeting with the Special Inquiry was advertised and conducted at the Shire’s Recreation Centre on Wallcliffe Road on Sunday 11 December 2011.

The Special Inquiry received outstanding cooperation from all witnesses appearing before it. The assistance and support of residents, staff of the DEC, other government agencies and emergency services personnel expedited the ability of the Special Inquiry to complete its tasks and report to government on time.

The Special Inquiry recognises those members of the community who supported their fellow citizens in providing accommodation, food and support during the crisis and in the weeks following.

² McNamara, K., interview on 720 ABC Perth, 28 November 2011.

³ Government of Western Australia, *A Shared Responsibility: the Report of the Perth Hills Bushfires February 2011 Review* (2011).

In all, 38 witnesses appeared before the Special Inquiry in 38 hearings. The proceedings were conducted in a formal atmosphere, akin to a parliamentary inquiry, and were recorded by Auscript. In addition, a large number of informal interviews were conducted with residents, staff of the DEC and persons offering assistance to the Special Inquiry.



Mr Robert Klok gives evidence before the Special Inquiry on 16 January 2012⁴

General Findings

It is the opinion of the Special Inquiry that, while some progress has been made in regard to better coordination at the State level emergency management and coordination committees since the Perth Hills Bushfires in February 2011, major improvements still need to occur around response operations. This is especially the case in regard to local knowledge and engagement with the volunteer bushfire brigades. That the fires escaped from Ellenbrook and Prevelly and managed to continue to Redgate warrants an independent opinion about their management. Some shortcomings in the response form part of this Report because they contributed to the ‘cause’ of the fires. The community members consulted in the course of the Special Inquiry made it clear that they will not accept ‘in house’ reviews to the response that are not openly scrutinised.

The emotional impact and losses resulting from these fires are significant. Also affected are the businesses of the Margaret River area which is a national and international tourism destination generating jobs and income. The Special Inquiry is concerned that the latter of these issues was not actively considered in the risk management process undertaken by the DEC, which is addressed in greater detail in the body of this Report. This was the busiest time of the year for people engaged in tourism whether as employers or employees and this should have been factored into any consideration of risk.

⁴ Photograph courtesy of Courtney Barron.

These businesses were already facing the pressures of the external environment such as alternate holiday destinations at equal or lower cost such as Bali. Some businesses were also affected by the fluctuations in the Australian dollar placing pressure on the domestic holiday market and export revenue from industries such as the renowned Margaret River wines.

In all, six burns were undertaken in what the DEC calls its Blackwood District during the week preceding the Margaret River Bushfires that are the subject of this Special Inquiry⁵. Blackwood District is one of two districts in the Department's South West Region, the other being Wellington District.

It is acknowledged that prescribed burns are a complex undertaking. Prescribed burns in the rural urban landscape are the most difficult and complex of all because of the need to burn in close proximity to homes while dealing with the usual prescribed burn variables such as wind, rain, soil and fuel moisture content and other factors such as vegetation types. The DEC has an annual indicative burn target of 200,000 hectares for the south west forest regions of the State. Much of the target area consists of forests and as such, does not attract attention because it is not proximate to residential areas and many burns are completed successfully.

Importantly, one of the reasons prescribed burns are undertaken by the DEC is to protect the community from wildfires. The people conducting these prescribed burns are the very same people who work to protect the community from wildfires when they occur.

Therefore, there is a need to keep a sense of balance. The prescribed burn BS520 was planned around the protection of assets which in this case were Gracetown town site, historic Ellensbrook House and the immediate surrounds. A successful burn would have gone some way to achieving a protection strategy. Had the prescribed burn not proceeded, a wildfire could have occurred, igniting fuel that on average is around thirty years old in Ellenbrook and slightly less for Prevelly. Had a wildfire hit the area it would have had the potential to be worse given the age of fuels in the area.

This is by no means justification for some parts of the process that went wrong, but any area filled with fuel loads built up over 30 years is a major risk to the community. Evidence was provided to the Special Inquiry about the build-up of those fuel loads and there is no doubt that the DEC was caught between taking preventative action through a prescribed burn for which they have been criticised, or potentially ignoring the challenge of managing the fuel load because it was too difficult a task. Either way, the DEC will be criticised.

A sense of balance is also required to understand that *everyone* feels the losses, including the staff of the Department. Witness after witness from the DEC appeared before the Special Inquiry, clearly deeply affected by what had gone wrong and clearly also carrying the burden of the impact upon the very towns they were trying to protect and in which some of them live. These people are also part of the community and no evidence received by the Special Inquiry gave rise to any concern that the staff of the DEC were doing anything other than what they believed to be right. To ostracise or denigrate these people will simply amplify the losses felt by everyone and do little to make improvements for the future.

⁵ Ellenbrook, Prevelly, Abba, Boranup, Donnybrook and Milyeannup Sollya.

It is worth repeating that the Special Inquiry was impressed with the candour and commitment of the witnesses appearing before it. Everybody was trying to do what they believed to be right. The Special Inquiry was given access to people at a time when they were most vulnerable, whether through the loss of their homes or stressed by the decisions they believed had to be taken. This was a privileged position for those involved in the Special Inquiry and one not taken lightly.

Together, we can learn from these events and build on the knowledge and understanding of what happened to better prepare for the future. It is hoped that this Report is the first step along the way.

Before turning to the findings, it is worthwhile considering what this Report does not address. The Special Inquiry did not look at the efficacy of prescribed burning. This was not a Term of Reference. That notwithstanding, evidence was provided reinforcing the approach taken with prescribed burns. Prescribed burning was also addressed in the Report into the Perth Hills Bushfires⁶ from February 2011.

It is also worth dispelling some popular theories that were raised during the Special Inquiry.

Firstly, there is a mistaken belief in some sections of the community that wildfires are not caused by lightning in coastal heath. Coastal heath can burn of its own accord with a lightning strike under the right conditions or it can also be ignited by other means. In any event, it can be collaterally part of a wildfire in an adjacent forest. This is a fact that is often forgotten in the criticism of a prescribed burn in coastal heath.

Further, during proceedings the Special Inquiry conducted a site inspection at the DEC's operations centre located at Kirup. Kirup is about 85 kilometres north east of Margaret River and it was from here that the Ellenbrook escape was initially managed. The inspection was conducted on 5 January 2012. At the time of the inspection the DEC was managing multiple fires caused by 34 lightning strikes after a storm front had hit the south west coast of the State⁷.

Secondly, it is wrong to think that when people decide that they want the lifestyle of a location such as the Margaret River area surrounded by national parks and forests, that they do so at their own risk with little or no regard to managing the vegetation (and ecosystems) that surround them. While it was not a Term of Reference to establish the cause of the loss of each individual home, the Special Inquiry met with some residents who had lost their homes. The Special Inquiry was impressed by the strategies employed by many people to manage their own risks, both in the building products used for their homes and the work undertaken to clear around their blocks.

The local residents coming into contact with the Special Inquiry were very aware of the risks associated with living in their environment. It follows that they are also very savvy about weather conditions and forecasts because their lifestyles – and in many cases, their livelihoods – depend upon it.

⁶ Government of Western Australia, *A Shared Responsibility: the Report of the Perth Hills Bushfires February 2011 Review* (2011).

⁷ Department of Environment and Conservation (DEC), *Report provided on measurements taken from Blackwood Lightning Strike Complex: 4-6th January 2012* (2012).

That said, the Special Inquiry observed some residences where there had been no attempt to clear vegetation around the house, even to the point that the house(s) became indistinguishable having been surrounded by coastal heath.

Thirdly, some mention was made informally as well as in evidence about the prescribed burn program being delayed because of the Commonwealth Heads of Government Meeting (CHOGM) that took place in Perth during October 2011. The Special Inquiry did not address the issue of whether or not smoke from a prescribed burn of this size in Margaret River could indeed impact upon the CHOGM venues. In any event, evidence was provided to the Special Inquiry that clearly indicated the delays in undertaking prescribed burn BS520 (and BS255) were caused by unsuitable weather – principally the days of rain during September and October 2011 which slowed the process of the fuel becoming dry enough to burn.

Key Findings

Before expressing the key findings of the Special Inquiry it needs to be understood that all of the findings were discovered through the prism of hindsight. The findings do not reflect the atmosphere or conditions under which faithful decisions were being made.

Cause(s) of the Margaret River Bushfires

As with most disasters or catastrophic events there was no single element that caused the 2011 Margaret River Bushfires. Instead, the causes of the Margaret River Bushfires were a series of judgments by the DEC that, with the benefit of hindsight, proved sub-optimal in the circumstances. The findings are that:

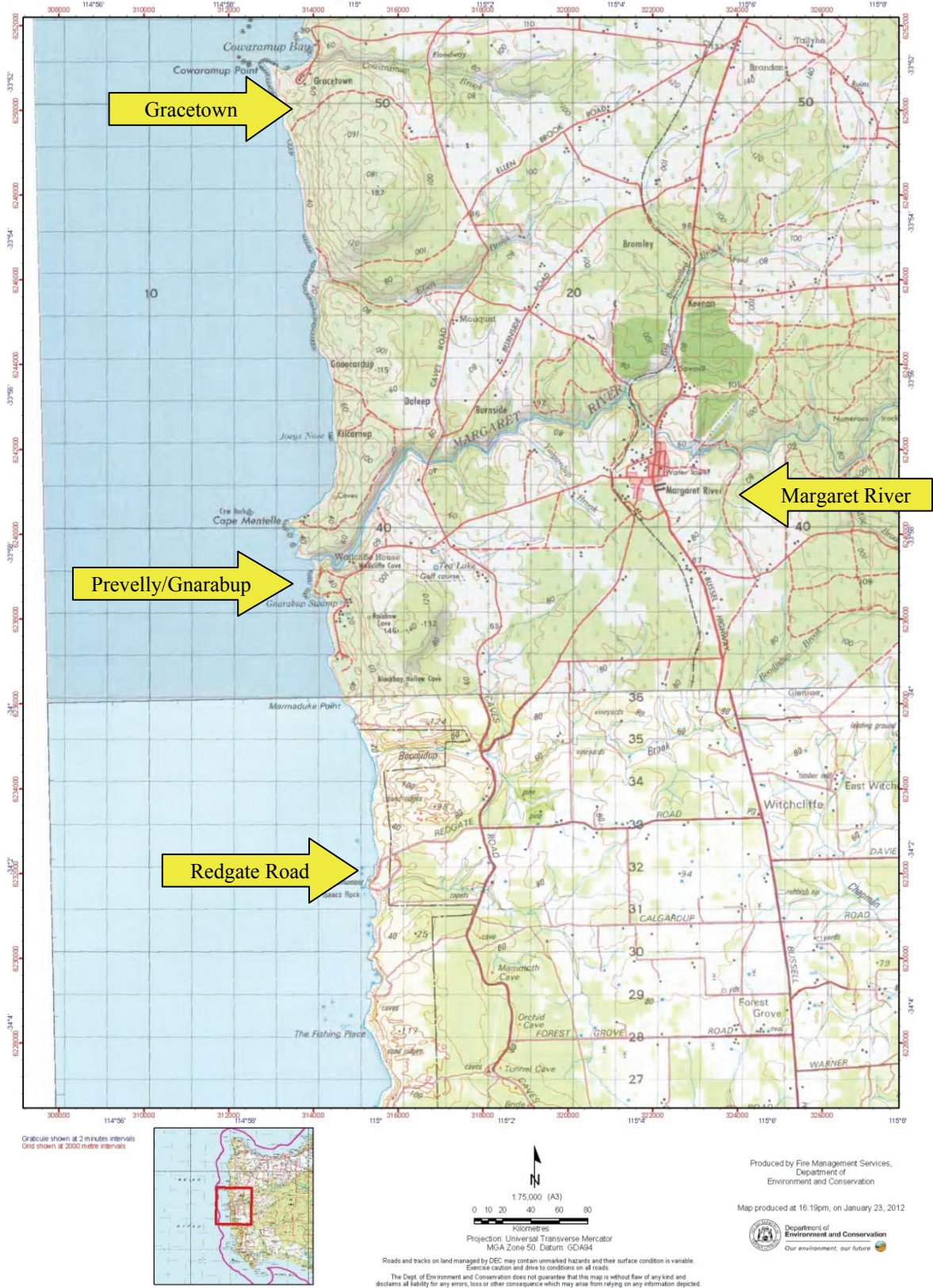
- Prescribed burning is a complex task made more complex by the limited windows of opportunity nature presents for it to be undertaken successfully and safely and this was a critical factor in the timing of prescribed burn BS520 (and BS255).
- Despite exhaustive processes and planning, the implementation of the prescribed burn did not fully take into account the risks associated with re-ignition through a flare-up and ‘escape’ of the fire.
- The planning process for prescribed burn BS520 identified the operation as a ‘Red Flag Burn’, however this did not seem to make a difference as to how the burn was undertaken, raising questions about the efficacy of the ‘Red Flag’ notification and existing risk assessments.
- Prescribed burn BS520 was not a recent initiative, planning for it began in 2006.
- The fuel assessments undertaken in 2006 were based upon a smaller burn area than the actual burn area ignited in 2011(375.9 hectares compared with 721.3 hectares) but the evidence was divided as to the impact this may or may not have had on undertaking the prescribed burn.
- The first fire introduced into the Ellenbrook Block by the DEC took place on 6 September 2011 to begin the process of creating a burnt edge around the perimeter of the area identified in the prescription.

- There were several further attempts to complete a burnt edge over the following weeks with the intention of ultimately burning the core of the Ellenbrook Block, these attempts were met with mixed success.
- The DEC made a judgement that the risk of doing nothing exceeded the risks associated with proceeding with the prescribed burns BS520 and BS255.
- On 20 November 2011, prescribed burn BS255 at Prevelly was commenced using the application of gel that is ignited and dropped from a helicopter using a 'drip torch'.
- On 21 November 2011, a major ignition of BS520 was attempted using the same methodology.
- Proceeding with these burns was done with the full knowledge of the forecast weather conditions for 23 November 2011, therefore a judgement was made that the burns could be completed and made safe in less than three days.
- On 21 November 2011, more than 200 litres of ignited gel was dropped onto the Ellenbrook Block and about 90 litres of ignited gel was dropped onto the Prevelly burn area.
- While no determination was made of the impact if any, on the size the fire, it was noted that the Incendiary Operations Supervisor from the DEC had limited experience in using the 'drip torch' in the rural urban fringe, this being the third burn he had undertaken and only the first in an area like Prevelly.
- Aerial ignitions are supposed to be endorsed by a representative of the DEC's Fire Management Services Branch and while the Ellenbrook prescribed burn had such an endorsement, the Prevelly prescribed burn did not.
- The planning for prescribed burn BS520 was predicated on the best possible conditions that included burning in a north easterly direction with the assistance of a south westerly wind but the observed winds for 23 November 2011 were northerly to north easterly.
- Despite several attempts, a completed perimeter or burnt edge around the entire Ellenbrook Block was not achieved: the south western boundary of the prescribed burn was left exposed for a distance of approximately 1.5 kilometres, making the burn vulnerable to an escape into that direction should the fire reignite and be fanned by northerly or north easterly winds.
- No 'spot forecasts' in relation to prescribed burn BS520 were sought by the DEC from the Bureau of Meteorology (BOM) on either 21 or 22 November.
- The weather conditions observed on 23 November 2011 were more extreme than the forecast with 37 km/h northerly winds observed as opposed to 27 km/h forecast although witnesses on the ground provided evidence that from experience the wind speeds were much stronger.

- With the benefit of hindsight, planning and operational decisions did not adequately take into account the forecast weather conditions for 23 November 2011.
- The level of service and products provided by the BOM to the DEC was appropriate in these events and is critical to decision making.
- A visual inspection from the ground of the BS520 burn area on the afternoon of 22 November 2011 did detect smouldering but did not detect that the fire had the potential to fully reignite.
- A communication breakdown occurred on 22 November 2011 when a spotter pilot who saw smoke in the south western corner of the Ellenbrook Block reported it at 2:55 pm as a matter of ‘high concern’ but it was interpreted and recorded as ‘no concerns’ and no one was subsequently deployed to check the report on the ground.
- No resources remained at the Ellenbrook Block after 4:00 pm on 22 November 2011 to monitor the area as it was mistakenly thought not to be a problem and despite the assessment of the Incendiary Operations Supervisor that approximately 180 hectares of land within the burn area remained unburnt.
- The DEC’s *Fire Operations Guideline 24 – Prescribed Burn and Bushfire Security* does not provide sufficient guidance to decision makers as to whether to monitor burns overnight.
- The DEC’s *Fire Protection Instruction 40 – Edging* lacks clarity and is not consistent with Burn Implementation Plans.
- The area left unburned within the Ellenbrook Block on Tuesday 22 November 2011 is larger in size than the entire burn area of Prevelly prescribed burn BS255 – some 180 hectares compared with 130 hectares for Prevelly.
- By not leaving resources at the Ellenbrook Block overnight on Tuesday 22 November 2011 a significant delay occurred in the DEC becoming aware that the fire had reignited and become a wildfire in the early hours of Wednesday 23 November 2011.
- Leaving resources at a fire was problematic: the DEC did not allocate resources to monitor BS520 and BS255 after hours but they also perceived difficulties involved in asking volunteers to sit through the night at a fire ground if ‘nothing happens’ as the volunteers may not be motivated to assist in the same way in the future.
- A delay in recognising the seriousness of the problem caused a delay in the engagement of the resources to deal with it, including the local bushfire brigades, many of whom attended the fire of their own accord.
- It is likely that members of the community had become very aware of the prescribed burns at both Ellenbrook and Prevelly and possibly did not alert authorities of the wildfire at Ellenbrook on 23 November as they thought resources were already at the fires given the high profile DEC presence in the days preceding the fire.

- The delay in applying resources to the situation on the morning of 23 November 2011 was exacerbated by similar problems faced at the Prevelly prescribed burn BS255.
- The fire fighters and police who initially responded to the Prevelly wildfire appear not to have known about the extent of the Ellenbrook wildfire which could have easily had catastrophic consequences had evacuees from one fire been caught up in the path of the other fire.
- The Prevelly fire behaviour was changed when it reached an area that had been previously burnt helping bring it under control demonstrating the value of prescribed burns.
- The volunteer bushfire brigades were instrumental in preventing the loss of further houses with some of the view that more homes could have been saved if the response to the fires had been better managed and resourced.
- Some local volunteer bushfire brigades appear to only have been engaged in responding to the fires by self-initiation having heard the DEC conversations on their two way radios as opposed to the formal call out procedures.
- The wildfires took more than two days to get under control which was largely attributable to the delays in understanding the seriousness of the situation at the beginning together with a lack of engagement of local knowledge.
- The conduct of the prescribed burns undertaken during the period of the Margaret River Bushfires raises questions about the attraction and retention of experienced staff in the DEC.
- The processes applied to the planning and implementation of prescribed burns BS520 and BS255 were cumbersome and not efficient; e.g. many DEC staff signed an 'Endorsement' and 'Approval' for prescribed burn BS520 to proceed a week after the burn actually commenced which was properly explained but brings into question the utility of that part of the process.
- The risk considerations used in the planning process for prescribed burns BS520 and BS255 were too narrow and the DEC is yet to upgrade its processes to take into account the current Australian and International Standard ISO31000:2009.
- The constant turnover of DEC staff, the need to work long hours and drive long distances between centres and areas of operation during prescribed burns may have a detrimental effect on the judgment and performance of some DEC staff.

Vicinity of Gracetown to Redgate Road



Map showing the vicinity of Gracetown to Redgate Road⁸

⁸ DEC, *Vicinity of Gracetown to Redgate Road*, Map produced 23 January 2012.

CHAPTER 1: CONTEXT FOR PRESCRIBED BURNING

1.1. INTRODUCTION

The role and function of the DEC is central in gaining an understanding of the cause(s) of the Margaret River Bushfires in November 2011. Judgements made by key staff in the DEC were pivotal to the events that took place.

The DEC is an amalgamation of the former Department of Environment and the Department of Conservation and Land Management. The Department comprises some 2,100 staff across Western Australia, with a diverse range of roles and responsibilities. DEC staff include permanent full time employees, contractors, casual and seasonal workers, and trainees.

The DEC is responsible for protecting and conserving the environment on behalf of the people of Western Australia. This includes managing the State's national parks, marine parks, conservation parks, State forests and timber reserves, nature reserves, marine nature reserves and marine management areas. In fulfilling these responsibilities, the DEC has a number of objectives, including conserving and protecting biodiversity, regulating the use of the State's natural resources, and facilitating public recreation. The Department contributes to the development of environmental protection policies, the management of environmental impact assessment processes and the carrying out of regulatory functions to achieve improved environmental outcomes. It is also responsible for management of contaminated sites and coordination of pollution incident responses⁹.

Fire management is one of the many roles of the Department. In 2010 Mr Euan Ferguson, then Chief Officer of the South Australian Country Fire Service, conducted a review of the DEC's ability to manage major fires¹⁰ (the Ferguson Review). A number of the Ferguson Review findings resonated with the Special Inquiry, in particular the following:

*DEC should emphasise the principle of foresight by adopting an appreciation and decision making process and training staff in that process*¹¹.

The Special Inquiry sought to inform itself of the progress of implementing the findings of the Ferguson Review. It appears that there has not been sufficient progress towards implementation, and that this is possibly due to resourcing constraints. The Director General of the DEC, Mr McNamara, provided the following view in relation to the implementation of the Ferguson Review:

*And my sense is that we have implemented what we can of Ferguson within existing capacity...*¹²

⁹ DEC, *About us*, <http://www.dec.wa.gov.au/content/section/29/2035/>, accessed 21 January 2012.

¹⁰ Ferguson, E., *A Review of the Ability of the Department of Environment and Conservation Western Australia to Manage Major Fires* (2010).

¹¹ Ibid.

¹² McNamara, K., Hearing 12 January 2012.

The Special Inquiry sees merit in the Ferguson Review and experienced similar observations, in relation to deficiencies both in the risk consideration process and the operations of the Incident Management Team in responding to the fires.

1.2. THE CONTEXT

Importance of Prescribed Burns

The DEC has responsibility for managing almost 27 million hectares of land and water in Western Australia, including those vested in either the Conservation Commission or the Marine Parks and Reserves Authority, as well other lands acquired for conservation. In addition, the DEC is also partially responsible for managing almost 90 million hectares of unallocated Crown land and unmanaged reserves outside the metropolitan area and town sites¹³. As mentioned above and later in this Chapter the management of these natural assets brings with it both moral and legal obligations.

In order to effectively manage land in accordance with environmental objectives, the DEC engages in fuel management operations known as prescribed burns. The process of fuel management through prescribed burning was thoroughly examined in a recent decision of the Supreme Court of Western Australia¹⁴. In that matter, the Court accepted expert evidence that the use of prescribed burning to achieve broadscale fuel reduction is the most effective and strategic way to reduce the risk of severe wildfire damage¹⁵.

In 2010-11, the DEC conducted prescribed burning on 3.2 million hectares of land across the State. While the target that year for the south west forest regions (encompassing the DEC's South West, Swan and Warren regions) was 200,000 hectares, only 137,000 hectares of prescribed burning was achieved due to a limited number of suitable burning days¹⁶.

In addition to planning and conducting prescribed burns during this period, the DEC attended and monitored 629 bushfires that burnt across 645,505 hectares of land. Over 50 per cent of these fires were deliberately lit, 11 per cent caused by lightning and 2 per cent were escapes from prescribed burns ignited by the DEC. The other causes were accidental fires, escapes from private burns or unknown¹⁷. Since 1991-92 the DEC has undertaken 3,559 prescribed burns of which 197 or 5.5 per cent have escaped¹⁸.

The sheer scale of prescribed burns, and the small proportion of escapes, indicate that the DEC takes its prescribed burning program very seriously in trying to protect the community from wildfire commencing within the land it manages or from elsewhere. This is reinforced by experiences that indicate that the effectiveness of prescribed burn boundaries limited the spread of wildfires. For instance, the Prevelly prescribed burn BS255 was slowed and even stopped when it reached areas that had been previously burnt as either a prescribed burn or a

¹³ DEC, *Lands and Waters Managed by the Department of Environment and Conservation* (date unknown).

¹⁴ *Southern Properties (WA) Pty Ltd v. Executive Director of the Department of Environment and Conservation* [2010] WASC 45.

¹⁵ Ibid.

¹⁶ DEC, *Annual Report 2010 – 2011* (2011), p. 5.

¹⁷ Ibid.

¹⁸ Data compiled by the DEC for the purposes of the Special Inquiry and provided on 5 January 2012.

wildfire in the recent past. The Perth Hills Bushfires in February 2011 were affected in a similar way when they reached the Banyowla Regional Park¹⁹.

Conducting Prescribed Burns

Prescribed burns have several stages. After the initial planning and the Prescribed Fire Plan or ‘prescription’ is developed, strategies as to how best to approach the burn are then determined. Natural perimeters for the burn are identified such as roads and tracks and then decisions are made about how to undertake the burn.

Generally speaking, an edge is created by burning around the perimeter of the area identified in the prescription. Flash fuels such as xanthorrhoea (grass tree) are removed first so that there is more chance to control the burning undertaken to create the edge. There are prescribed distances to be achieved for the edge depending upon the vegetation type of both the edge and the core. This can take any number of days or weeks depending on the total area to be burned and the ‘take’ of the introduced fire to the vegetation.



Xanthorrhoea (grass tree)

Once the edge is burned and is considered to be evenly achieved around the perimeter of the burn, the core ignition can begin. The core ignition can take many forms. A common approach is to burn parallel lines ignited by hand or from the air so that the fire can burn back to the completed edge or to the next burnt line in the parallel sequence. This methodology is simple in design, however much more difficult in implementation, as discussed in Chapter 3.

Window of Opportunity

As will be discussed further in this Report, successful prescribed burning is heavily dependent upon factors outside the control of the DEC. Effective prescribed burning can really only be contemplated in the margins between weather extremes and there are only a few months each year during which prescribed burns can be safely undertaken. Nonetheless, the DEC must identify its targets for burning and set about reaching the targets in the safest but most efficient way. As previously discussed, only 68.5 per cent of the

¹⁹ Government of Western Australia, *A Shared Responsibility: the Report of the Perth Hills Bushfires February 2011 Review* (2011).

prescribed burn target for the south west forest regions was achieved during 2010-11. The main reasons for this were difficulties posed by weather.

Weather can impact the prescribed burn in a number of ways. Firstly, if the weather is too dry or the fuel load itself is too dry, ignition can be very dangerous. Secondly, if the wind speed is too strong and the wind direction is not consistent with the prescription, it may not be suitable to introduce fire to the area.

In the Supreme Court of Western Australia matter referred to earlier²⁰, particular mention was made about the impact upon winds caused by a low pressure trough on the western coast of Australia. Of particular relevance to the Special Inquiry were comments and observations made by the Court about the association between northerly winds and dangerous fire conditions. Importantly, the Court observed:

*Given the well-recognised association between northerly winds and dangerous fire weather conditions, and the fact that the transition from north-east to north-west winds often takes place abruptly and in the space of a few hours, the Department avoids commencing prescribed burns when such conditions are likely to occur before the burn is completed and mopped up.*²¹

This observation by the Supreme Court is very relevant to the Margaret River Bushfires in particular, the judgements made by the DEC to continue with the Ellenbrook prescribed burn and commence the Prevelly prescribed burn and have them both mopped up ahead of a forecast change in wind speed and direction.

The effect of rain on the burn is complex, as vegetation can dry at differing rates, depending on the type of vegetation and its exposure to the wind and sun. Not all vegetation will be evenly exposed to the wind and sun, thereby creating a variable in the suitability of the fuel to burn. In relation to BS520, it has been identified that the moisture content of the surface fuel layer needed to be 18 per cent of oven dry weight or less in order for successful ignition and fire spread²², however, higher levels of dryness would have impacted negatively upon the ability to control the prescribed burn.

Most prescribed burns rely on surface layer fuel to ignite, but coastal heath is very different as it has little surface fuel. The coastal heath fuel load is instead suspended above the ground requiring it to be burnt through the foliage with the wind behind it, carrying the flame from shrub to shrub. Winds that are either too strong or too light are both problematic, and it is preferable for the vegetation to be at its optimal dryness.

Where there is a mix of vegetation types, such as that in the Ellenbrook Block, the task requires the alignment of all the variables in order for the burn to proceed. Therefore, when compared to an area containing a homogenous vegetation type, the window of opportunity for BS520 was small which is reflected in the multiple attempts to ignite the block as described in Chapter 3.

²⁰ *Southern Properties (WA) Pty Ltd v. Executive Director of the Department of Environment and Conservation* [2010] WASC 45.

²¹ *Ibid* at [82].

²² Data compiled by Dr L. McCaw for the purposes of the Special Inquiry, and provided on 20 December 2011.

Given these complexities, the Special Inquiry was keen to learn if methodologies other than burning can be used to create an edge when dealing with coastal heath. In his evidence, Dr Lachlan McCaw, a Principal Research Scientist with the DEC, indicated that ‘scrub rolling’ or pulling down the vegetation using chains to create an edge that is subsequently burnt can be effective²³.

Dr McCaw further indicated that there is no specific guideline for burning coastal health and there is a gap in the research in this area. While there is research available pertaining to mallee-heath, which has some similar properties to coastal health, those similarities are not sufficient to necessarily warrant identical treatment.

The Special Inquiry asked DEC officers why so many prescribed burns were being undertaken simultaneously in the one area. This had created anxiety among residents and ultimately had an impact on resourcing the response to the bushfires. It was explained that the narrow window of opportunity which exists to undertake prescribed burns will often mean that more than one block of land in the same area is experiencing the same weather conditions. This therefore presents an optimal window of opportunity to undertake multiple burns if adequate resources are available.

Consequences of Not Completing Burns

The 2010-11 figures mentioned above for prescribed burns demonstrate the variable success of achieving the burn program target in light of weather, fuel dryness and other factors. Prescribed burns carry over into subsequent years which, in the case of BS520, was more than four years after the first prescription was signed off.

The carryover of prescribed burns adds to the age of the fuel load as well as the total area to be burned in the Master Burn Plan.

This in turn can add to the risk presented to a particular area should a wildfire occur or a prescribed burn escape. That risk is important in the decision as to whether to proceed with or defer a prescribed burn. Clearly, the more prescribed burns in an area that are deferred, the more complex and dangerous is the task when it is ultimately undertaken.

The need to complete prescribed burns within a given time frame adds pressure to decision making and upon decision makers themselves, who are managing those targets. It became evident to the Special Inquiry that a number of DEC staff who appeared at hearings felt pressure of decision making. They were trying to balance the needs of protecting the community from wildfire by proceeding and attempting a successful burn, with deferring the burn until an optimal time in the next available season. A decision to defer will add to the gravity of the decision for the next occasion.

Community Support

As outlined above, the decision makers for prescribed burns are dealing with a highly dynamic environment. Decisions must be made one way or the other to prevent the situation from getting worse. The Special Inquiry believes that it is important to avoid creating a culture where officers are paralysed into indecision, for fear of a mistake being uncovered in reviews with the benefit of hindsight.

²³ Ibid.

While the Government policy of prescribed burns is outside the scope of the Special Inquiry, many members of the community expressed an understanding of and support for prescribed burns. Rather than question the Government's broader policy position, the community members observed by the Special Inquiry were more concerned about the 'Why?' in this particular scenario.

Of the questions raised by members of the community, the following themes were identified:

- Why was a burn conducted at the end of the Spring season, with summer approaching?
- Why were simultaneous burns undertaken in the same area?
- Why did the burns commence when there was a forecast change in weather for northerly winds?
- Why conduct prescribed burns so close to the peak of the tourist season?

These questions are very relevant for a number of reasons. Firstly, the community is the key stakeholder in what happens to the area that surrounds their home. Further, anyone who lives in or has visited the district will be familiar with the constant reminders and road signs pointing to the dangers of fire, especially in the period from November to April every year. The Special Inquiry also found that the local community was generally very experienced in reading weather patterns, and community members access a number of sources in addition to the BOM website to obtain information pertaining to weather.

Finally, the community is required to maintain their blocks in compliance with firebreak notices and expect government owners to do the same. The Special Inquiry obtained statistics from the Shire of Augusta-Margaret River pertaining to the number of infringements issued for non compliance with fire break notices. During 2010-11 a total of 198 infringement notices and 492 warnings were issued by Shire staff. Of the 198 infringement notices, 18 were issued to residents of Prevelly/Gnarabup²⁴.



Fire risk signage in the Margaret River area²⁵

²⁴ Data compiled by the Shire of Augusta-Margaret River for the purposes of the Special Inquiry, and provided on 19 December 2011.

²⁵ Photograph courtesy of Courtney Barron.



Fire prevention signage in the Margaret River area²⁶

While most of the factors considered in planning a prescribed burn amount to common sense, there is a gap between the community's expectations and the DEC's activities. Some of the rationale about the timing and science around these prescribed burns is not well understood by the community and many may feel marginalised by the decisions made by the DEC. When it is all said and done, both the community and the DEC have to learn how to live with risk. Closing the gap and facing the community will be an important step in winning back community support for the DEC's activities in Margaret River.

The volunteer bushfire brigades are also very important stakeholders. When a wildfire occurs or a prescribed burn escapes, it is their local knowledge and resources that are essential to minimising the impact. As discussed in Chapter 4, the experience of the volunteers was not sufficiently utilised in the Margaret River Bushfires of November 2011.

Development and Demographics

Evidence was received by the Special Inquiry regarding the dangers posed by prescribed burning given the changes to settlement and development in the Margaret River area. The Special Inquiry did not examine this in any great detail but made the observation that the complexities of prescribed burning outlined in the previous sections are likely to be exacerbated by developments in this area.

The most recent available census data indicated the population of Margaret River as 10,353²⁷ but studies undertaken by the Western Australian Planning Commission forecast a population by 2016 of between 14,900 and 16,000²⁸. These projections will mean that there will be more pressure placed on the DEC to ensure the security of its prescribed burns and protection of

²⁶ Photograph courtesy of Courtney Barron.

²⁷ Australian Bureau of Statistics, *2006 Census QuickStats: Augusta-Margaret River (S) (Local Government Area)* (2007), www.censusdata.abs.gov.au, accessed 24 January 2012.

²⁸ Western Australian Planning Commission, *Margaret River Enquiry-by-Design Workshop Outcomes Report* (2003).

the community. It is likely that population growth and urban sprawl will mean that more people are living in close proximity to areas managed by the DEC. The Special Inquiry did not look at this issue beyond Margaret River, but it is a reasonable assumption that other regional centres in Western Australia will be facing similar population changes.

Figures show that Margaret River receives around 500,000 visitors each year²⁹. The wine industry is a major source of employment and economic value to Western Australia. The industry contributes \$380 million to the State's economy, and Margaret River wines are responsible for more than half of the value of the wine produced in the State³⁰.

The Special Inquiry requested confidential details of losses incurred by businesses engaged in tourism in Margaret River. The Special Inquiry was interested to learn whether the local economy and industry form part of the risk assessment undertaken by the DEC in the course of prescribed burn planning processes. The data was collected and compared with the bookings for similar periods in 2010. As of January 2012, many tourist businesses reported up to a 50 per cent drop in bookings and income³¹.

In this respect, the Special Inquiry is indebted to a member of the Margaret River Marketing Co-operative, Mr John Bradbury, for gathering important data. Mr Bradbury and his family lost their home in the fires but despite this, Mr Bradbury readily provided the Special Inquiry with considerable assistance which is appreciated.

The Special Inquiry is of the view that the risk planning for prescribed burn BS520 gave little or no consideration to these issues. It is suggested that these economic impacts should be included in the risk matrix inputs used by the DEC. Further, a risk register should not only contain risks which commonly occur each year. Dynamic thinking needs to be applied to the process. As will be discussed in later chapters, risk assessments need to be continually updated through tools such as environmental scans.

Location of Resources

DEC offices are dispersed throughout the South West Region. The major DEC south west centres are in Bunbury, Busselton and Collie, and an operations centre located at Kirup, from where the Margaret River Bushfires were initially managed.

The Special Inquiry observed that the operational processes in place at Kirup are largely paper-based, and could not avoid the conclusion that many would expect the operational processes to be fully automated and taking advantage of current technologies.

Significant distances are travelled each day by DEC officers when they become involved in prescribed burns. This is particularly so where officers rotate between management and operational roles, as occurred during the prescribed burns BS520 and BS255.

In the high pressure environment of managing a prescribed burn or escape, the toll of travelling long distances should not be taken lightly. The DEC has a responsibility for the

²⁹ Ibid.

³⁰ Department of State Development, *Winemaking*, http://www.dsd.wa.gov.au/thinkbig/agriculture_food-winemaking.aspx, accessed 21 January 2012.

³¹ Information compiled by the Travel Management Group for the purposes of the Special Inquiry, and provided on 10 January 2012.

safety and welfare of its staff, which no doubt it takes very seriously. Tiredness and stress will adversely impact upon decision makers and needs to be closely monitored.

Several Duty Officers with the DEC shared their 'on call rosters' and 'duty rosters' with the Special Inquiry. While the Special Inquiry was impressed with the commitment of DEC staff, it was apparent that many of them are emotionally and physically exhausted. Many officers are required to make decisions affecting the lives and livelihood of the community which, on the face of it, do not match their pay scale. Equally, the location of resources appears on the face of it, unsuitable to the demands of the work undertaken in an area such as Margaret River.

These human resourcing and organisational matters, while not a Term of Reference for the Special Inquiry, stood out as the evidence unfolded. Attracting and retaining good staff is a major challenge for any organisation, but particularly so in the competitive job market in Western Australia. The Special Inquiry was informed about the difficulty in attracting staff to some small country areas where schools, hospitals and other essential services are some distance away. This undoubtedly impacts upon the DEC's ability to rotate people around the State.

The Special Inquiry noted that the terms and conditions for staff employed by the Fire and Emergency Services Authority (FESA) were comparatively more attractive to some DEC staff, some of whom possess skills that are transferrable to that agency and that there has been some movement of DEC staff to FESA. In one sense, the multi discipline nature of fighting fires means that this could be good for fighting fires, but from another perspective, the DEC can ill afford a drain on knowledge and experience.

1.3. EFFECT ON DEC STAFF

Impact on the People Who Protect Us

The DEC officers who were involved in conducting the prescribed burns were the very same people called upon to assist when it escaped, and will continue to be called upon in the bushfire seasons ahead. Further, it is generally accepted that as our climate changes over the long term, bushfire seasons will become longer and more intensive. Although errors of judgment can happen in any occupation and at any time, in the context of fire management these errors of judgment can have significant impact on everyday lives. Organisations that experience a high operational tempo, such as the DEC, will inevitably be prone to having errors of judgment become the focal point for media and community attention.

Shortly after the fires, the Special Inquiry noted the reaction from certain sections of the media and the community towards particular DEC officers. At worst, this reaction included ridiculing individuals. While it is understandable that people will be affected by these events in various ways, little can be gained by singling out an individual as being responsible for causing the bushfires in this way.

As will be discussed in this Report, the planning processes for both BS520 and BS255 were considerable, and the Special Inquiry found the DEC officers to be committed to their work. Further, it was apparent that all the DEC officers involved were primarily aware of the need to protect Gracetown in the Ellenbrook Prescribed Fire Plan and Prevelly and Gnarabup in the Prevelly Prescribed Fire Plan.

The challenge is to understand that we want, and need, experienced and able people to become involved in protecting the community. Our reactions to their decisions will determine the quality of people who are willing to undertake these important roles, and how long they remain committed to those roles.

Conservation versus Burning

Some DEC officers appearing before the Special Inquiry possessed a high standard of academic qualifications. From an ecological perspective the DEC is at the forefront of managing land, and conservation is an important element of their role. The DEC therefore attracts staff who are highly committed to the values of good conservation practices. The same staff are also required to participate in fire management activities.

Some of the DEC witnesses appearing before the Special Inquiry were demotivated by the events that formed the basis of the Special Inquiry, and expressed a desire to have less involvement in fire management activities which is understandable. It is possible that some DEC officers are struggling with the diversity of their conservation and fire management objectives and in some cases, the physical dangers faced when undertaking the fire management role. This issue reinforces the notion that good people in these organisations need to be supported.

1.4. LEGISLATION AND POLICY

When planning and undertaking prescribed burns, the DEC works within a complex framework of legislation and policies. An overview of this framework is essential in understanding decision-making and events which occurred during the planning and implementation of BS520 and BS255.

Given the sheer volume of legislative provisions and policies which relate to activities undertaken by the DEC, the following outline focuses only on those documents which the Special Inquiry regards as being central to the planning and conduct of prescribed burns.

Conservation and Land Management Act

Despite being termed a ‘prescribed burn’, there is no statutory prescription in Western Australia for the use of fire for the purpose of bushfire prevention.

Nonetheless, the *Conservation and Land Management Act 1984* (WA) (the CALM Act) enables the DEC to undertake prescribed burns. The area within which prescribed burn BS520 was undertaken is in the Leeuwin-Naturaliste National Park, and is a ‘national park’ within the meaning of s 3 of the Act. It is land vested in the Conservation Commission under section 7(3) of the Act, and is ‘land to which the Act applies’ under section 5(1)(c).

Section 33 of the Act sets out the powers of the CEO of the DEC, subject to the direction and control of the Minister. The ability to undertake prescribed burns falls within the function of the CEO to manage land to which the Act applies, and the associated forest produce, fauna and flora, as provided in section 33(1)(a). In addition, the following two provisions further enable DEC to undertake prescribed burns:

- Section 33 (1)(d), which vests responsibility for the conservation and protection of flora and fauna throughout the State in the CEO of the DEC; and

- Section 33(1)(da), which provides that the CEO of the DEC is responsible for promoting and facilitating public recreation, in accordance with the Act, on land to which the Act applies.

Where there is a management plan in place for the relevant land, section 33(3)(a) provides that the management of the land under section 33(1)(a) must be in accordance with the plan.

Section 55 of the Act outlines the contents of management plans, which include:

- (1) *A management plan for any land shall contain –*
- A statement of the policies or guidelines proposed to be followed; and*
 - A summary of the operations proposed to be undertaken.*

In the absence of a management plan, section 33(3)(b) outlines how the management of land for the purposes of section 33(1)(a) should be undertaken.

Management Plan

At the time of undertaking the prescribed burn BS520, there was no management plan in place specific to the Leeuwin-Naturaliste National Park. The last applicable management plan for the Region, the Leeuwin-Naturaliste National Park Management Plan 1989-1999, expired in 1999. A 2010 management plan for the Leeuwin-Naturaliste Capes Area Parks and Reserves has been prepared by the DEC, on behalf of the Conservation Commission Western Australia, however it remains in draft form.

This means that the relevant management plan was the Forest Management Plan 2004 – 2013 (the FMP), prepared by the DEC on behalf of the Conservation Commission.

The FMP applies to all land vested in the Conservation Commission, within the DEC's Swan, South West and Warren Regions.

The FMP outlines a number of key performance indicators for each of the seven criteria for sustainability developed in the Montreal Process³², including biological diversity, productive capacity and ecosystem health and vitality.

Code of Practice

The DEC's *Code of Practice for Fire Management*³³ (the Code) provides a framework for fire management procedure and practice. It sets out principles, standards and guidelines that apply to the management of fire on DEC land.

The planning and conduct of fire operations is to be consistent with the Code:

*Any plan, instruction, prescription or guideline developed for activities on Department-managed land will be prepared to be consistent with this code. Compliance with the code is a requirement for all fire-related activities on Department-managed land*³⁴.

³² Conservation Commission of Western Australia, *Forest Management Plan 2004 – 2013*, p. 6.

³³ DEC, *Code of Practice for Fire Management* (2008).

³⁴ *Ibid*, p. 6.

Compliance with the Code is monitored by the Director of Regional Services, and reported on in accordance with Departmental instructions.

In relation to planning prescribed burns, the Code requires each area designated for a prescribed burn has a Prescribed Fire Plan, and that all prescribed burns to be undertaken on Department-managed lands are represented in the Regional indicative burning plan. The Code also requires the Department to produce an annual prescribed burn program, as specified in the Master Burn Planning Manual.

The Code also outlines requirements for the conduct of prescribed burns, including recording and monitoring. Further, the Code outlines the principles to be adopted in wild fire management, including risk management processes and wild fire prevention.

Master Burn Planning Manual

The Master Burn Planning Manual³⁵ is developed by the Fire Management Services Branch (FMS), and sets out the processes to be followed in planning prescribed burns. The Manual also sets out the principles for fire management. This Manual will be discussed in greater detail in Chapter 2.

Fire Management Policy

Policy Statement No 19, entitled *Fire Management Policy* (the Policy) is developed by the Director of Regional Services, and approved by the Director General of the DEC. The Policy provides for the following objective:

The Department will manage prescribed fire and wildfires on lands managed by the Department to protect and promote the conservation of biodiversity and natural values whilst also providing for protection of human life and community assets.

The Policy then articulates the approach of the Department in the following areas:

- Safety and Risk;
- Use of Fire;
- Fire Suppression;
- Wildfire Prevention;
- Liaison; and
- Research.

Guidelines

The Policy provides that a comprehensive set of standards, procedures and prescriptions are to be incorporated in the Department's Fire Operations Manual³⁶. Included in these set of documents are Fire Operations Guidelines (FOGs) and Fire Management Guidelines (FMGs). The production of these documents is further provided for in the Code, which provides that the Department will produce appropriate guidelines to support the Code³⁷. The FMS is responsible for approving the development and publication of FOGs and FMGs.

³⁵ DEC, *Master Burn Planning Manual 2011* (2011).

³⁶ Department of Conservation and Land Management, *Policy Statement No. 19 – Fire Management Policy*, p. 1.

³⁷ DEC, *Code of Practice for Fire Management* (2008), p. 6.

Fire Operations Guideline 00 *Preparation and Publication of Fire Operational Guidelines* specifies the standard, procedure and specifications for FOGs. It provides that FOGs are developed in order to inform, direct and guide fire managers in their decision making during fire management operations.

There are currently 70 published FOGs. DEC is undertaking a review of the FOGs, with a view of incorporating all updated FOGs into a bound volume which can be carried by personnel. The November 2011 volume contains 35 FOGs.

Fire Operations Guideline 19 *Preparation and Publication of Fire Management Guidelines*, is aimed at facilitating the development and maintenance of FMGs. Similar to FOG 00, FOG 19 stipulates that FMGs are intended to provide information to decision makers concerning a particular fire management issue, and are not intended to be instructional documents. FMGs can either provide information on the fire management of particular ecosystems (Ecosystem FMG), a particular species of biota (Species FMG), or can be of a more general nature (General FMG). There are currently 25 published FMGs.

Common Law

In undertaking responsibilities other than prescribed burns, the DEC can be subject to a duty to take reasonable care imposed by the Common Law. Whether such a duty, and what would be required to fulfil the duty, exists in relation to undertaking prescribed burns is outside the scope of this Report. As such, this Report focuses upon the legislative and policy framework within which prescribed burning takes place.

CHAPTER 2: BACKGROUND AND PLANNING

2.1. MASTER BURN PLANNING

Overview

Master Burn Planning is a process used by the DEC to plan for its prescribed burning program. Master Burn Planning draws upon “*scientific principles, spatial and historical data, and rigorous analysis and review processes to ensure that the application of fire on DEC managed lands is based on sound objectives for biodiversity conservation, strategic protection, and multiple land uses*”³⁸.

The process is utilised to achieve the objectives set out in Regional Fire Management Plans, which bring together land use, nature conservation, strategic fire protection and community engagement issues to form the basis for Master Burn Planning within a region. Regional Fire Management Plans establish a five year planning horizon with landscape scale objectives, strategies and success criteria. Master Burn Planning is the bi-annual process used to develop a continuous program of prescribed burning to achieve these regional objectives³⁹. The process is undertaken by each of the DEC’s regions.

A principle guiding the DEC’s approach to fire management on DEC-controlled lands is that diversity and variability in fire regime promotes biodiversity, and that this outcome can be achieved via the application of “*ecologically based fire regimes that provide for an interwoven mosaic of vegetation and habitats representing a range of fire intervals, fire intensities, seasons and scales*”⁴⁰.

Master Burn Planning is fundamental to achieving this outcome. The process is used to “*design a strategically-managed fuel age and vegetation/habitat mosaic across the land managed by the Department. The mosaic is developed and managed by a process of recording the historical prescribed and wildfire events, and integrating these with information on the fuel accumulation rates, the known fire responses of vegetation and fauna, the silvicultural requirements of forest stands, and the Department's fire suppression capabilities*”⁴¹.

The Master Burn Planning process begins with Regional Fire Management Plans and employs Geographic Information Systems (GIS) technology in an interactive approach to develop best fit options for achieving biodiversity and strategic protection outcomes⁴². GIS technology allows the manipulation of large spatial data sets to undertake ‘what if’ analyses of different scenarios and conditions. These analyses inform decision making regarding the most appropriate time for future prescribed burns to be undertaken in each area in order to achieve the desired outcomes⁴³.

³⁸ DEC, *Master Burn Planning Manual 2011* (2011), p. i.

³⁹ *Ibid*, p. 2.

⁴⁰ Department of Conservation and Land Management, *Policy Statement No. 19 Fire Management Policy*, p. 2.

⁴¹ *Southern Properties (WA) Pty Ltd v Executive Director of the Department of Conservation and Land Management [No 2]* [2010] WASC 45.

⁴² DEC, *Master Burn Planning Manual 2011* (2011), p. 27.

⁴³ *Southern Properties (WA) Pty Ltd v Executive Director of the Department of Conservation and Land Management [No 2]* [2010] WASC 45.

The approach first identifies the prescribed burning required to meet the needs of biodiversity conservation. The obligatory prescribed burning that needs to be undertaken for land management purposes such as vegetation rehabilitation, water production, silviculture or research are then added to the program. This proposed program is then analysed using the Wildfire Threat Analysis approach to determine if the requirements for strategic protection from wildfire have been satisfied. If necessary, the program is amended to ensure that strategic protection outcomes – such as community and asset protection from wildfire – are achieved⁴⁴.

In the south west forest regions of Western Australia (encompassing the DEC's South West, Swan and Warren regions), the output of the Master Burn Planning process is a rolling three year indicative burn program (covering six burning seasons) and an annual burn program (covering two burning seasons). In other regions of the State, the planning horizon is generally one year in advance; therefore only the annual burn program is prepared. Longer term planning in these areas is difficult for a range of factors, including the frequency of wildfires and the occurrence of irregular rainfall events that impact considerably upon fuel loads and flammability⁴⁵.

This rolling plan is reviewed following the completion of each burning season (twice per year) to account for the progress of the previous season's prescribed burning program and the occurrence of any wildfires. Public consultation forms part of the Master Burn Planning process⁴⁶.

Developing the prescribed burning program

The District Fire Coordinator is responsible for developing a proposed prescribed burning program for their district, in accordance with the Regional Fire Management Plan. The proposed program will include burning necessary over the next six burning seasons. In developing the draft program, the District Fire Coordinator works closely with District Leaders for Nature Conservation, Parks and Visitor Services, and Sustainable Forest Management, as well as the Regional Fire Coordinator and District Fire Coordinators from adjacent districts⁴⁷.

The development of the district burning program involves several steps, including:

- reviewing the achievements of the previous season's burning program and any wildfires, and determining which planned, but not completed burns will be carried forward to future seasons;
- identifying Conditional Burning Areas, which are to have fire excluded from them;
- comparing the existing spatial/temporal arrangement of fire history (i.e. fuel age) to the desired situation required to achieve biodiversity outcomes, and targeting areas for burning accordingly;

⁴⁴ DEC, *Master Burn Planning Manual 2011* (2011), p. 27; DEC, *Planning for prescribed burning*, <http://www.dec.wa.gov.au/content/view/128/1870/1/1>.

⁴⁵ Ibid; Ibid.

⁴⁶ DEC, *Master Burn Planning Manual 2011* (2011), p. 27.

⁴⁷ Ibid, p. 32.

- determining proposed Logical Burn Unit boundaries that include areas of targeted fuel ages (a Logical Burn Unit is a spatial element within the landscape that represents a mapped management boundary of the area within which a prescribed burn is to be undertaken);
- identifying burns required for land management purposes; and
- developing Burn Purpose statements for each burn⁴⁸.

The Regional Fire Coordinator is responsible for developing a consolidated burning program for their region, incorporating each of the proposed district programs. This proposed regional program is analysed to determine if strategic protection outcomes are achieved, and any necessary adjustments are made. The proposed program is also reviewed to ensure biodiversity conservation outcomes can still be achieved⁴⁹.

The program is finalised at the Regional Program Finalisation Meeting, which brings together the Regional Manager, Regional Fire Coordinator, Regional Leaders for Nature Conservation, Parks and Visitor Services, and Sustainable Forest Management, as well as District Managers, District Fire Coordinators and a Fire Management Services representative. The rationale for the burning program is outlined with justification as to why each Logical Burn Unit has been proposed and how it will contribute to the achievement of the objectives set out in the Regional Fire Management Plan. The priority of each Logical Burn Unit is confirmed at this meeting. The Regional Manager is responsible for approving the regional program⁵⁰.

The Fire Management Services Branch is responsible for consolidating all of the regional burning programs into a State program, to be presented to Corporate Executive for endorsement⁵¹.

Prescribed Fire Plans

The annual (2 season) burn program is used by District staff to prepare a Prescribed Fire Plan for each burn area for the next burning season. The Prescribed Fire Plan (informally, the ‘burn prescription’) is the instrument that “*specifies the burn objectives, the weather and fuel conditions to meet these objectives, the lighting sequences and patterns to be adopted to achieve the fire behaviour, burn coverage standards and smoke management requirements. [It] includes a pre-burn checklist, which identifies potential risks and impacts of the burn operations, including smoke impacts, on the values and activities within the burn and on neighbouring lands. The purpose of the checklist is to provide the burn managers with an early opportunity to identify the risks and consequences and to take steps to modify, postpone or cancel the burn if these risks and consequences are significant*”⁵².

For example, the Prescribed Fire Plan for BS520 identified smoke as an environmental issue to be considered, noting that Gracetown town site was situated 1 kilometre north of the burn area and Margaret River was situated 8 kilometres to the south east. Accordingly, it was

⁴⁸ Ibid, pp. 10, 29.

⁴⁹ Ibid, pp. 29, 32.

⁵⁰ Ibid, pp. 33, 52.

⁵¹ Ibid, p. 33.

⁵² *Southern Properties (WA) Pty Ltd v Executive Director of the Department of Conservation and Land Management [No 2]* [2010] WASC 45.

specified to “*burn on easterly winds if possible*” and that on the day(s) of the burn, smoke management activity be undertaken and radio notifications be disseminated⁵³.

In addition, the Prescribed Fire Plan contains resources such as operational and aerial maps, plans for traffic signs and sign management, approvals and endorsements, documentation relating to community consultation and stakeholder notifications, supporting documentation that has been prepared and collated in support of the Prescribed Fire Plan, and information and documentation of post-burn assessments.

The Prescribed Fire Plan also includes an analysis of the complexity of the planned burn using the ‘Rating System for Prescribed Burning’. The utility of this system is discussed further in Chapter 4.

Quality versus Quantity

As mentioned in Chapter 1, the DEC has an annual indicative burn target of 200,000 hectares for the south west forest regions (encompassing the DEC’s South West, Swan and Warren regions). The 2009 *Review of Western Australia’s Bushfire Preparedness*, commissioned by the Premier following the February 2009 Victorian bushfires, noted that there is general agreement that this target “*provides an appropriate level of protection against the risk of major destructive bush fires occurring on DEC managed land*”⁵⁴. That notwithstanding, there is a clear need to distinguish between quality and quantity in prescribed burning programs.

The Special Inquiry supports the finding of the 2009 Review, however with the caveat that the quality of prescribed burning is more important than the quantity. Community safety should be paramount in considerations around which prescribed burns to undertake, and there is a need to target burns in areas that will have the greatest impact on community safety. The Special Inquiry notes that the primary purpose for undertaking the Ellenbrook prescribed burn BS520 included the enhancement of community safety, with particular regard to the community of Gracetown.

Prioritisation of Prescribed Burns

As discussed in Chapter 1, successful prescribed burning is heavily reliant upon external factors over which the DEC has no control, such as weather. The DEC has a limited window of opportunity to undertake prescribed burns. The number of burns prepared for ignition each burning season is greater than the DEC could conceivably undertake within existing resources, or otherwise greater than the burning opportunities that typically arise. This guarantees the burn program is flexible and that burning opportunities can be capitalised upon when they arise⁵⁵. This was reiterated in evidence to the Special Inquiry:

*I think the annual program, or the seasonal program, is much bigger than we can do anyway. We build in choice for exactly that reason that you may have some conditions pertaining here that is not there so you pick and choose. Like, I think, this year – this season we had 64. Now, we can’t – there’s no way we can do 64. But it allows you those kinds of choices and that kind of fluidity and dynamism in the choice*⁵⁶.

⁵³ DEC, *Prescribed Fire Plan – Ellenbrook BS520*, p. 13.

⁵⁴ Government of Western Australia, *Review of Western Australia’s Bushfire Preparedness* (2009), p. 22.

⁵⁵ DEC, *Master Burn Planning Manual 2011* (2011), p. 22.

⁵⁶ Chandler, R., Hearing 11 January 2012.

The Special Inquiry heard that, for the Spring 2011 burning season, the Fire Management Services Branch of the DEC submitted between 200 and 250 burns for approval, and that the Branch:

*generally put up about 240 burns up for approval to give us flexibility across conditions and climatic variability*⁵⁷.

While having a large number of proposed burns prepared for ignition does provide flexibility, it may also increase the complexity of coordinating the prescribed burning program. This task is aided by having an indication of the significance of each burn in relation to other burns, in terms of achieving Departmental objectives. The DEC has developed a standard approach to burn prioritisation to assist in this regard. The approach considers standard criteria for each of the standard burn purposes and ensures that the rationale for priority selection is documented. These criteria are used to determine an overall priority for each burn, which allows for comparison of burns with different purposes, which can assist with decision making⁵⁸.

In practice, however, the assistance afforded by the prioritisation process in decision making around which burns to undertake is less clear. The Special Inquiry heard from several witnesses regarding the complexities of coordinating the prescribed burning program. This complexity was perhaps best expressed by Mr Robert Chandler, Regional Manager of DEC's South West region, who after being asked how decisions are made as to which burns to undertake, provided the following response:

I sometimes wonder myself. ... It's a complex mix of factors that come into play. I don't think there's actually a rule set or a set of guidelines which says how do you do that. I think it's a kind of – well, it's like a wisdom of experience and also the weather interplay. ... So they make a choice based on – there is a kind of a prioritisation system actually in the prescription. I don't think it actually has a great deal of influence. It is there.

*The district people probably do take some cognisance of it. But they are making choices, I think, based on trying to balance the program so they will be trying to do some very large strategic burns. They will be trying to do some protection burns around particular assets like towns and then they will be trying to do some burns that are funded by FPC [Forest Products Commission] and they would also be trying to do burns that are for particular environmental purposes. So they're trying to get a bit of a balance. They wouldn't want to end up with the season with all one kind of burn or the other so it's a little bit of an art-form and I don't know that there's actually a very good – there's no simple way of describing how it's done, I don't think*⁵⁹.

2.2. PLANNING FOR BS520

Overview

The area of land subject to prescribed burn BS520 is located within the Ellenbrook Block in the Leeuwin-Naturaliste National Park and Unallocated Crown Land, approximately 1 kilometre south of Gracetown. The proposed burn area, as endorsed in September 2011, was

⁵⁷ Carter, M., Hearing 12 January 2012.

⁵⁸ DEC, *Master Burn Planning Manual 2011* (2011), p. 22.

⁵⁹ Chandler, R., Hearing 11 January 2012.

722 hectares and had a perimeter of 11.9 kilometres. The proposed burn area was bounded by Lefthanders Road and unnamed tracks to the north, Ellen Brook Road to the south, private property and unnamed tracks to the east, and the Cape to Cape Walk Track to the west. The area was last burnt prior to 1982, however, the DEC provided evidence to the Special Inquiry indicating that it is largely unknown when some areas within the burn were actually last burnt. The burn area consisted of a wide variety of fuels, ranging from heavy karri forest, to mixed jarrah and peppermint woodland, and dense coastal heath⁶⁰.

Planning for BS520 commenced in 2006, and the burn was first endorsed in Autumn 2007. By Spring 2011, the burning season during which BS520 was eventually undertaken, the burn had been proposed and endorsed a total of six times. The endorsements are discussed later in this chapter.

As discussed elsewhere in this Report, the primary purpose of BS520 was Strategic Protection, in particular to “*minimise the potential size and intensity of bushfires and/or the risk of damage from bushfire to the Gracetown town site, Ellensbrook House infrastructure, other recreational facilities within the Leeuwin-Naturaliste National Park, Collins Tower, endangered fauna and Threatened Ecological Communities in Ellenbrook, and adjacent private property by the application of fire under prescribed conditions to reduce the quantity of combustible material*”⁶¹. The following success criteria were established for the Strategic Protection objective:

- *At least 60% of the burn treatment area has been burnt.*
- *Ensure the burn meets the Security Standards outlined in the Fire Operations Guideline 24 (FOG 24)*⁶².

Biodiversity Management was the secondary purpose of BS520, specifically to “*protect, maintain and enhance biodiversity values and ecological processes within the Leeuwin-Naturaliste National Park by applying fire under prescribed conditions to achieve a mosaic of fire intensities and burnt and unburnt areas at both a landscape and a local scale*”⁶³.

The Prescribed Fire Plan for BS520 provides an “*Operational Summery*” [sic], which states that “*it is intended early in Spring to edge burn along the Cape to Cape trail and later in the season finish hand edging the burn, then burn out the core by aerial ignition with a moderate burn*”⁶⁴.

Burn Areas: Autumn 2007 versus Spring 2011

An important aspect of the design of the prescribed burn BS520 discussed during the hearings of the Special Inquiry relates to the difference between the burn area endorsed for the Autumn 2007 burning season, and the updated burn area as endorsed for burning in

⁶⁰ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

⁶¹ DEC, *Ellenbrook Block – Leeuwin-Naturaliste National Park – Strategic Protection Burn BS_520*, Public Consultation Map produced 21 September 2011.

⁶² DEC, *Prescribed Fire Plan – Ellenbrook BS520*, p. 3.

⁶³ DEC, *Ellenbrook Block – Leeuwin-Naturaliste National Park – Strategic Protection Burn BS_520*, Public Consultation Map produced 21 September 2011.

⁶⁴ DEC, *Prescribed Fire Plan – Ellenbrook BS520*, p. 2.

Spring 2011. The Special Inquiry noted that the burn area endorsed in 2007, being 375.9 hectares⁶⁵, was significantly different to that endorsed in 2011, which totalled 722 hectares⁶⁶.

Some observations regarding the differences between the two burn areas are as follows⁶⁷:

- the updated burn area was located approximately 1 kilometre south of Gracetown, being around 1 kilometre closer to the town site than the area previously proposed;
- the western boundary of the updated area was formed by the Cape to Cape Walk Track, and was generally approximately 1 kilometre west of the original western boundary;
- the northern boundary of the updated area extended approximately 1 kilometre north west towards Gracetown town site, before heading south west on Lefthanders Road for approximately 1 kilometre and meeting the western boundary;
- the southern boundary of the updated burn area extended approximately 500 metres further west towards Ellensbrook House, before heading north west on Ellen Brook Road and meeting the western boundary;
- the updated burn area had a perimeter of around 12 kilometres, as compared to 8.4 kilometres, meaning that an additional 3.6 kilometres of edging was required to be undertaken in order to secure the burn. The vegetation type in a significant proportion of the additional area to be edged was coastal heath, including along the western boundary along the Cape to Cape Walk Track, and the south western corner of the burn, from which the prescribed burn would ultimately escape on 23 November 2011;
- the additional area to be burnt was to the west and north west of the original planned burn; and
- while the original planned burn area was last burnt in 1980 and 1982, the updated burn area was last burnt prior to 1982, however “*it is largely unknown when some areas within the burn were actually last burnt*”⁶⁸.

The Special Inquiry questioned witnesses regarding how the total burn area was identified, and whether it would have been pertinent to break the area down into smaller plots, particularly in light of the proximity to residential settlements. The Special Inquiry was told that it would have been too difficult to break up the coastal heath. The track forming part of the north-south boundary to the 2007 burn area was not regarded as being sufficiently formed for practical use and was even described as “*virtually non-existent*”⁶⁹. That said, the Burn Implementation Plan for BS520 did warn about the dangers posed by the karst systems within, and surrounding the burn area. For that reason, heavy machinery may not have been an option to better form up the track⁷⁰.

A DEC officer had in fact looked at the Ellenbrook Block in 2006 as part of the preparation work for the prescribed burn BS520 at that time. To assess the age and type of fuel to be

⁶⁵ DEC, *Ellenbrook Block – Leeuwin-Naturaliste National Park – Protection Burn BS_520*, Public Consultation Map produced 3 April 2007.

⁶⁶ DEC *Ellenbrook Block – Leeuwin-Naturaliste National Park – Protection Burn BS_520*, Public Consultation Map produced 21 September 2011.

⁶⁷ DEC, *Ellenbrook Block – Leeuwin-Naturaliste National Park – Protection Burn BS_520*, Public Consultation Map produced 3 April 2007; DEC *Ellenbrook Block – Leeuwin-Naturaliste National Park – Protection Burn BS_520*, Public Consultation Map produced 21 September 2011.

⁶⁸ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

⁶⁹ Commins, B., Hearing 11 January 2012.

⁷⁰ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

burned, a field visit was undertaken and samples of vegetation tested. This data informed the prescription process. The Special Inquiry found that no additional fuel sampling and assessment was undertaken for BS520, despite the increase in the burn area.

The Special Inquiry asked a number of DEC officers whether, in their opinion, the fact that the fuel sampling was only taken from the burn area endorsed in 2007, rather than that endorsed in 2011, would have impacted on the outcome of the prescribed burn. The officers were satisfied that the fuel age would be roughly the same and that the fuel type would not have changed between the two dates.

There was, however, a divergence of opinion as to the significance of the increased burn area. One officer thought there was “*insignificant change*” to the area to be burned⁷¹, while another thought that the difference would amount to a “*significantly different burn*”⁷².

The Special Inquiry understands that there may be differences of opinion about this issue but accepts the evidence of Dr Lachlan McCaw:

*... it's not a great deal of difference between that and the jarrah woodland type in terms of the total amount of fuel. But it does have a different wind ratio identified: a ratio of three to one instead of four to one, which would mean that it's more exposed to wind and that you would expect faster moving fires on any given burning conditions because, you know, the wind has a greater effect in that heath*⁷³.

Burn Implementation Plan

The Burn Implementation Plan for BS520 contains a description of high values and risks adjacent to the burn area, which is reproduced in the table below⁷⁴.

Fuels	Very old fuels to the south, other fuels surrounding the burn are relatively light.
Nature Conservation Values	Western Ringtail Possum habitat (<i>Agonis flexuosa</i>). <i>Caladenia excels</i> (DRF), Cape Leeuwin Snail, and Tufa TEC are all adjacent to the burn.
Community Assets	Gracetown town site, Ellenbrook House and Meekadarabee Falls, coastal infrastructure at Big Rock, Lefthanders, and Ellenbrook Beach, adjacent PP, and the Cape to Cape Walk Track.
Industry Assets	Western Power above ground and underground cables, underground Telst[r]a cables and elevated joints along Ellenbrook Road, and a large sand pit in PP to the east.
Access Limitations	Western boundary (Cape to Cape Walk Track) is totally untrafficable to vehicles.
Smoke Impacts	Gracetown town site and Caves Road.
Other	Collins Tower within the burn.

Table 1: High values and risk adjacent to BS520

⁷¹ Commins, B., Hearing 11 January 2012.

⁷² Mitchell, M., Hearing 6 January 2012.

⁷³ McCaw, L., Hearing 16 January 2012.

⁷⁴ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

BS520 was identified as having a complexity rating of 155 using the ‘Rating System for Prescribed Burning’. This is discussed in further detail in Chapter 4.

The edging plan for BS520 detailed the strategies for each edge of the burn as “*aim for minimum 100m complete burnt edge with no unburnt pockets*”. The desirable wind direction and speed was listed as “*Any suitable <16kph*”⁷⁵.

The lighting sequence includes a description of the fuel type, the lighting strategy, preferred Fire Danger Index (FDI) range, preferred Rate of Spread (ROS) range, and the resources required. The lighting strategy for the “*Jarrah/Peppy Woodland and Coastal Heath*” fuel was to “*light on any suitable wind direction (preferably easterly) @ <16kph*”⁷⁶.

A number of pre-determined suppression strategies were listed in the Burn Implementation Plan. This is discussed with reference to risk considerations, in Chapter 4.

Red Flag Burn

BS520 was identified by the DEC as a ‘Red Flag Burn’. A sheet on the inside cover of the Prescribed Fire Plan for BS520 (see Annexure 9) provides notification of this, stating that:

This burn has high potential and/or high consequence for loss. The following must be considered:

- *Resource levels – check that adequate resourcing exists including additional units in reserve. Utilise experienced IMT members and Sector Commanders only*
- *Ensure high level of burn security – confirm depth of downwind edge and mop up to standard. Take every opportunity to mitigate risk of escape*⁷⁷.

The ‘Red Flag Burn’ notification was developed by Mr Chandler as a way of indicating that some prescribed burns require particular attention, and have been identified as such by those involved in overseeing the burn prescription process.

The Special Inquiry was interested in how this notification is communicated to those involved with the implementation of a ‘Red Flag Burn’, and any influence it may have upon considerations of risk:

*I think that is done through the normal briefing processes that – the people in charge of the burn have a responsibility to do those kinds of briefings. They might not mention this. ... They don’t have to mention this. This wouldn’t mean anything to most people.*⁷⁸

Evidence provided to the Special Inquiry indicated that the ‘Red Flag Burn’ notification serves only to identify some prescribed burns as being particularly important; it is not part of any policy, guideline or any other formal administrative instrument, nor does it necessarily have any impact upon decision making or risk assessment. It has not been implemented by the DEC outside of the South West region. While the Special Inquiry acknowledges that there

⁷⁵ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

⁷⁶ Ibid.

⁷⁷ Ibid.

⁷⁸ Chandler, R., Hearing 11 January 2012.

are differing levels of risk and strategic importance between prescribed burns, and notes the need for cognisance of such information among those involved with planning and implementing prescribed burns, it is of the opinion that the utility of the ‘Red Flag Burn’ notification need be reviewed.

Endorsements and Approvals

The Prescribed Fire Plan for BS520 contains authorising documentation in the form of sheets for:

- Endorsements – whereby:
 - District Leaders for Nature Conservation, Parks and Visitor Services, and Sustainable Forest Management certify that they have “*studied PART A & B of the Prescribed Fire Plan. Each officer will endorsed [sic] the content of the Prescribed Fire Plan once issues and the requirements of their portfolio have been met*”;
 - the District Fire Coordinator, Regional Fire Coordinator and a Fire Management Services representative certify that they have “*studied the Prescribed Fire Plan and endorse its content for technical feasibility in terms of fire management considerations*”; and
- Approvals – whereby the District Manager and Regional Manager certify that they have “*studied the Prescribed Fire Plan and approve its content for implementation*”⁷⁹.

The first proposal for BS520 was first endorsed by Mr John Tillman, the former Regional Fire Coordinator, in Autumn 2007, based on a burn area of 375.9 hectares and burn perimeter of 8.4 kilometres. The DEC had proposed to undertake the burn that same season. The proposed burn was located approximately 2 kilometres south of the Gracetown town site, was bounded by unnamed forest tracks to the north and west, Ellen Brook Road to the south, and private property to the east. At that time, the DEC stated that areas within the burn last been burnt in 1980 and 1982. The public consultation map for BS520, as at April 2007, indicates that the western boundary of the burn area was situated approximately 1 kilometre from the coast, running in a generally north-south direction. There was no ignition of BS520 in Autumn 2007⁸⁰.

The DEC’s chronology of BS520 does not include any entries specifically relating to BS520 between Autumn 2007 and Spring 2009, and the Special Inquiry was not provided with any evidence of planning activity for BS520 that occurred during this time. This was of concern to the Special Inquiry.

That the DEC approved BS520 for implementation in Autumn 2007 indicates that it was seen at that time as being of significant strategic value. Why, then, was no further work undertaken to plan for the burn until the second proposal in Spring 2009? The Special Inquiry is of the view that the value of the burn in achieving strategic protection outcomes would have been increasing with time, as the age of the fuels in the burn area increased. The fact that no further work on BS520 was undertaken during this time brings into question the effectiveness of the DEC’s process for prioritising planned prescribed burns.

⁷⁹ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

⁸⁰ DEC, *Chronology and Background Report for the Prescribed Burn BS 520* (2011); DEC, *Ellenbrook Block – Leeuwin-Naturaliste National Park – Protection Burn BS_520*, Public Consultation Map produced 3 April 2007.

Evidence submitted by the DEC stated that:

...commentary explaining why planned burns are not carried out in the season for which they were listed is generally not maintained. In the case of the Ellenbrook burn which had been planned but not undertaken in the period between Autumn 2007 and Autumn 2011, the likely reasons would include the balancing of the annual program (with other planned burns), suitability of fuel moisture conditions, suitability of weather, available resources and consideration of the commitment to other existing burns⁸¹.

The Special Inquiry notes this explanation, however is of the view that such records need to be maintained.

In Spring 2009, the second proposal for BS520 was endorsed by Mr Greg Mair, District Manager, Mr Tillman, the former Regional Fire Coordinator and Mr Chandler, Regional Manager. The burn area was significantly larger than that endorsed in Autumn 2007, being 722 hectares – almost double the previously endorsed area. No ignition of BS520 took place in Spring 2009⁸².

The third proposal for BS520 was endorsed in Autumn 2010 by Mr Mair and Mr Chandler based on a burn area of 722 hectares and with a burn perimeter of 12.2 kilometres. Again, the burn was not commenced that season⁸³.

In Spring 2010, the fourth proposal for BS520, based on a burn area of 722 hectares and having a burn perimeter of 12.3 kilometres, was endorsed by District Leaders for Nature Conservation (Ms Caitlin Lee Steere), Parks and Visitor Services (Mr Brian O’Hehir) and Sustainable Forest Management (Mr Jeremy Chick), District Fire Coordinator Mr Don Boothey, Regional Fire Coordinator Mr Peter Gibson, and Fire Management Services representative Mr Terry Maher.

Evidence provided to the Special Inquiry confirmed that District Leaders have only recently become involved in endorsing Prescribed Fire Plans⁸⁴.

The proposal for BS520 was approved by Mr Mair and Mr Peter Gibson (for Bob Chandler, Regional Manager). When signing off on the proposal, Mr Mair, Mr Boothey and Mr O’Hehir each commented on the need to provide the community with information regarding the burn. Mr Mair also noted on the approval page that BS520 was an “*important protection burn for Ellensbrook and Gracetown*”. There was no ignition of BS520 in Spring 2010⁸⁵.

The fifth proposal for BS520 was signed off on 23 March 2011, for the Autumn 2011 burning season. The proposed burn area was 722 hectares, with a burn perimeter of 12.1 kilometres. The proposal was endorsed by District Leaders for Nature Conservation (Mr John Carter), and Parks and Visitor Services (Mr O’Hehir), District Fire Coordinator Mr Boothey, Regional Fire Coordinator Mr Gibson, and Fire Management Services representative

⁸¹ DEC, *Chronology and Background Report for the Prescribed Burn BS 520* (2011).

⁸² Ibid.

⁸³ Ibid.

⁸⁴ Henderson, P., Hearing 9 January 2012

⁸⁵ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

Mr Maher. The proposal was not endorsed by the District Leader for Sustainable Forest Management; the reason for this is unknown to the Special Inquiry.

BS520 was approved by the District Manager, Mr Brad Commins and Mr Gibson (for Bob Chandler, Regional Manager). Mr Commins noted on the approval page that BS520 was a “*very high priority burn*”⁸⁶. BS520 was not commenced during the Autumn 2011 burning season⁸⁷.

On 13 September 2011, the sixth proposal for BS520 was signed off, based on a burn area of 722 hectares and having a burn perimeter of 11.9 or 12 kilometres⁸⁸. Endorsement was provided by District Leaders for Parks and Visitor Services (Mr Stephen Mills), and Sustainable Forest Management (Ms Melissa Manns), District Fire Coordinator Mr John Carter, Regional Fire Coordinator Mr Gibson, and Fire Management Services representative Mr Maher. The Special Inquiry is not aware why the proposal was not endorsed by the District Leader for Nature Conservation. Approval was provided by the District Manager, Mr Commins, and the Regional Manager, Mr Chandler. Mr Commins commented that BS520 was a “*priority burn for protection of Gracetown & Ellensbrook*”⁸⁹.

As can be seen from the above, the actual consideration given to prescribed burns is a complex process and is worthy of review to ensure that all parts of the process are relevant and adding value.

The implementation of BS520 will be discussed in detail in Chapter 3. The Special Inquiry noted that the first ignition of BS520 was undertaken on 6 September 2011, one week prior to the burn being endorsed for the Spring 2011 season. This raised concerns regarding DEC’s processes for the approval and endorsement of proposed prescribed burns. Evidence provided to the Special Inquiry indicated that a previous season’s endorsement can be carried over to a subsequent season:

*... they can actually use the preceding signoff, the carryover burn that was signed off for the previous year, without any consultation with the district output leaders.*⁹⁰

*... we don’t have, from what I know, a specified cut-off date that endorsements are current for*⁹¹.

In this instance, the endorsement and approval of the Prescribed Fire Plan for BS520 on 23 March 2011 provided authorisation to commence the burn on 6 September 2011, in Spring 2011, despite the respective sheets specifying that these endorsements and approvals were current for Autumn 2011.

This led the Special Inquiry to ask “What is the purpose of going through the endorsement and approval process if the previous season’s plan and sign-offs can be used?” Questions

⁸⁶ Ibid.

⁸⁷ DEC, *Chronology and Background Report for the Prescribed Burn BS 520* (2011).

⁸⁸ The Special Inquiry noted that the BS520 Burn Implementation Plan specified a burn perimeter of 11.9 kilometres, while the Public Consultation Map produced on 21 September 2011 refers to 12 kilometres.

⁸⁹ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

⁹⁰ Manns, M., Hearing 20 December 2011.

⁹¹ Gibson, P., Hearing 9 January 2012.

regarding the legitimacy of this practice were met with varied response, with some witnesses comfortable –

*It was endorsed the season prior to as well, so it's an already endorsed burn being re-endorsed. So, no, I don't see a particular issue with that*⁹².

– while others had openly questioned the practice in the workplace:

*Well, that was my opinion as well ... I was actually surprised that that had occurred ... But yes, when I questioned it, it basically – it was a system that everyone understood*⁹³
...

The Special Inquiry noted with interest that the Regional Manager, Mr Chandler, did not approve the Prevelly prescribed burn when it was initially presented to him⁹⁴. When questioned about his decision, Mr Chandler said it was due to a number of factors, including vegetation type consisting almost entirely of coastal heath, weather influences, and a sloping landscape, all of which created a narrow band of highly flammable fuels.

Most importantly residential subdivision were located at the bottom and top of the proposed area and Mr Chandler stated:

The intimate connection with the assets at risk. That's what worried me.

Mr Chandler went on to add:

*I am not happy if we are simply applying jarrah forest type prescriptive processes to this burn*⁹⁵.

The prescription having been rejected by Mr Chandler was redeveloped and subsequently approved.

Staff Turnover

The history of endorsements and approvals for BS520 raise some questions regarding the continuity of staff in the DEC, particularly in the Blackwood District. As outlined in the previous section, the endorsement and approval sheets within the Prescribed Fire Plan are used to record sign off by DEC officers that occupy certain positions.

Based on the evidence provided to the Special Inquiry, it appears that there is only one position that was involved in the endorsement and approval process for BS520 that had continuity of service over the period from Autumn 2007 to Spring 2011 – the position of Regional Manager, held by Mr Chandler. The Special Inquiry notes that the same Fire Management Services Branch representative, Mr Maher, endorsed the Prescribed Fire Plan for the three seasons from Spring 2010 – Spring 2011 (inclusive), however the Special Inquiry is not aware whether a Fire Management Services Branch representative was involved in endorsing any of the first three proposals for BS520. All other positions involved

⁹² Ibid.

⁹³ Manns, M., Hearing 20 December 2011.

⁹⁴ Chandler, R., Hearing 11 January 2012.

⁹⁵ Ibid.

in the endorsement and approval process were held by more than one officer over the period from Autumn 2007 to Spring 2011.

This gives rise to concerns regarding the level of understanding endorsing and authorising officers had of BS520 at the time they signed the Prescribed Fire Plan. The Special Inquiry is of the opinion that such concerns cannot be adequately considered without first considering the processes for endorsement discussed earlier in this Chapter – namely, that a previous season’s sign off can be carried over to a subsequent season, and that there is no requirement for District Leaders to be consulted and to endorse a Prescribed Fire Plan.

The Special Inquiry heard from several witnesses⁹⁶ regarding the lack of staff with experience in managerial and fire management roles in the Blackwood District, and the way in which this issue is compounded by the movement of staff in and out of roles within the DEC and elsewhere.

⁹⁶ Henderson, P., Hearing 9 January 2012; Chick, J., Hearing 20 December 2011.

CHAPTER 3: IMPLEMENTATION

3.1. APPROVALS TO IGNITE

Once a prescription is endorsed the responsibility for identifying an appropriate opportunity to commence a burn rests with the relevant District.

There is a formal process undertaken daily by DEC staff to approve and coordinate the ignition of any prescribed burns. During the fire season, telephone conference calls are held twice daily at 8:30 am and 4:15 pm with the aim of sharing priority information regarding current and planned fire activities with key people.

DEC guidelines⁹⁷ state that the following personnel are required to participate in the teleconferences:

- State Operations Coordinator (Principal Fire Operations Officer or nominee) as Host;
- State Duty Officer;
- Regional Duty Officers and/or Regional Fire Coordinators;
- Aviation Section representative; and
- Incident Controller or nominee for current major incidents.

The daily teleconferences include a discussion of the forecast weather conditions, wildfire and prescribed burn activity by region and the identification of daily priorities to assist in the coordination of resources and smoke management⁹⁸.

Each District seeking to undertake a prescribed burn completes a *Daily Proposed Aerial/Hand Prescribed Burning Program Request* form that is faxed to Fire Management Services Branch in Perth. The requests are collated and following the morning teleconference a burn program for the day is agreed and a summary of those burns that have been approved is signed by a representative of the Fire Management Services Branch and faxed back to all relevant stakeholders.

The Special Inquiry listened to digital recordings of some of the teleconferences conducted between 19 and 21 November 2011 and was particularly interested in the information provided regarding the forecast weather conditions for 23 November 2011 and the impact it had on decision making. It was clear the DEC was working with information provided by the BOM. It is the view of the Special Inquiry that the impending change to the weather was not given sufficient consideration in these teleconferences and that decisions regarding burning programs had already been made and were not sufficiently scrutinised.

Evidence provided to the Special Inquiry indicates that it is rare for a burn request not to be approved and that the daily request and teleconference process was primarily a mechanism for coordination.

The Special Inquiry found that where ignitions of the Ellenbrook and Prevelly prescribed burns were planned, the required approvals were obtained. There were two occasions where

⁹⁷ DEC, *Fire Operations Guideline 82 – Procedures for Daily Fire Season Teleconferencing 2010-11* (2010).

⁹⁸ *Ibid.*

fire was introduced (19 November for Ellenbrook and 22 November for Prevelly) in an attempt to strengthen weak edges that were not anticipated and therefore not requested or approved through the standard daily process. These ignitions were undertaken with the approval of the District Duty Officer.

3.2. WEATHER CONDITIONS

The DEC and the BOM have an established record of effective liaison and collaboration in relation to fire weather services. The format and content of DEC-specific weather products are decided through liaison between the two agencies. The BOM provides the DEC with a range of forecast products and services to assist the DEC with both bushfire mitigation and response. In addition to publicly available weather services, the DEC has access to forecast services delivered to fire agencies and services delivered specifically in support of prescribed burning activities⁹⁹.

Emergency Services Weather Briefing

The BOM provides the DEC with early notification of impending widespread adverse fire weather conditions (and other weather conditions significant to emergency services), through what is called the *Emergency Services Weather Briefings*.

In relation to fire weather, an *Emergency Services Weather Briefing* is issued if it is anticipated that conditions in the following 48 hours could result in Severe, Extreme or Catastrophic fire weather conditions over a significant area of the South West Land Division.

Spot Forecasts

Spot forecasts are site-specific forecasts issued in response to a request from a fire agency. They may be requested to assist with tactical decision making in operations for either an uncontrolled fire or for prescribed burns. Spot forecasts are only provided on request to designated fire agencies and are only provided for fire operations.

DEC-specific Routine Forecasts

Throughout the year the BOM provides twice daily forecasts to the DEC in support of their prescribed burning program. At the DEC's request, forecasts are produced during the southern fire season for up to eight sites.

Two different forecast products are issued each day for the nominated sites. The forecast issued in the morning has detailed forecasts for the current day with an outlook for the next day. The forecast issued in the afternoon is more general in nature and contains a forecast outlook for the next four days.

Immediately following the issue of the routine forecasts, the DEC is able to contact a forecaster to ask questions about the forecast, seek additional information regarding areas of particular interest and discuss forecast uncertainty and possible alternative scenarios.

The BOM provides the DEC with a registered users' web page, tailored to its requirements.

⁹⁹ Bureau of Meteorology (BOM), *Meteorological aspects of the Margaret River Fires* (2011).

The Special Inquiry considered the level of service and products provided by the BOM to the DEC to be appropriate. It was also noted how critical the weather information is to undertaking prescribed burns successfully and safely.

Advice of Weather Conditions for 23 November 2011

The closest official BOM weather observing station to the Ellenbrook and Prevelly prescribed burn areas is Witchcliffe, located 9.3 kilometres south south east of Margaret River, approximately 9 kilometres from the coast and 16 kilometres from the southern boundary of the Ellenbrook prescribed burn¹⁰⁰.

The first mention of conditions relevant to the Margaret River area on 23 November 2011 was included in the *Emergency Services Weather Briefing* issued on 17 November 2011.

EMERGENCY SERVICES WEATHER BRIEFING

Issued at 9:10 am WST on Thursday, 17 November 2011

Routine issue

Wednesday: At this lead time it is not possible to be certain about the specifics but the early guidance indicates Very High to Severe FDRs are possible over parts of the SWLD and the Gascoyne. It is also possible that we will see thunderstorms near the west coast but there's a lot of uncertainty associated with that.

On 19 November 2011 the conditions expected on 23 November 2011 were discussed in a verbal briefing given to the DEC by the BOM. It was noted at this briefing that the only weather of concern in the South West Land Division over the coming week was the hot and gusty northerly winds on 23 and 24 November 2011 with the potential of 55 km/h to 65 km/h of wind 'mixing down'¹⁰¹.

The series of DEC-specific products for the period 17 to 24 November 2011 is reproduced in Annexure 4.

The first forecast to include outlook information for Witchcliffe for 23 November 2011 was issued at 15:45 WST on 19 November 2011. Table 2 below shows the evolution of the outlooks for Witchcliffe for 23 November during the days leading up to the fire.

Forecast issued		19 November	20 November	21 November	22 November
Forecast conditions at Witchcliffe for 23 November 2011	MAX TEMP (°C)	T 30	T 30	T 30	T 31
	AM WINDS (km/h)	NNE 29	NNE 29	NNE 27	NNE 30
	PM WINDS (km/h)	NNE 23	NNE 13	N 27	N 30

Table 2: Conditions at Witchcliffe derived from forecasts in the routine afternoon DEC briefing product for the four days leading up to the day of the fire.

The Special Inquiry found that the DEC did not request a spot forecast for either the Ellenbrook or Prevelly area until 10:48 WST on 23 November 2011 after the fire had escaped.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

The Special Inquiry received evidence from key DEC officers involved the implementation of the Ellenbrook and Prevelly prescribed burns regarding their knowledge of the forecast change in weather conditions for 23 November 2011. The Special Inquiry was satisfied that DEC officers were well aware of the forecast weather conditions and that they had a narrow window of opportunity to undertake prescribed burning activity and make any active burns safe. Judgements made in this regard are pivotal to the events that subsequently took place.

Observed Weather Conditions for Wednesday 23 November 2011

The average observed wind speed at Witchcliffe between 07:00 to 12:00 WST 23 November 2011 was 33 km/h, and the average between 12:00 to 17:00 WST was 31 km/h. The maximum average wind speed over a one hour period during these time frames was 43 km/h and the highest 10-minute wind speed was 45 km/h. The maximum temperature for the day was 32.2°C.

The first detailed forecast for the Witchcliffe site for 23 November 2011 was issued at 07:50 WST 23 November 2011. Forecast values are reproduced in Table 3 together with observed values from Witchcliffe (in parentheses).

Time (WST)	Wind Direction (degrees)	Wind Speed (km/h)		
1100	N (360)	27 (35)	Max. Temp. (°C)	31 (32)
1300	N (360)	27 (37)	Dew Point Temp. (°C)	7 (6)
1500	N (350)	22 (30)	Relative Humidity (%)	22 (24)
1700	NNW (310)	13 (15)	LAL	0 (0)
0300	NE (60)	15 (7)		

Table 3: Forecast values for Witchcliffe issued at 07:50 WST 23 November 2011. Observed values from Witchcliffe are in parentheses.

The Special Inquiry found that the observed wind speeds 23 November 2011 were greater than forecast by between 2 km/h and 10 km/h¹⁰².

The Special Inquiry received evidence from witnesses who believe the wind speeds on the ground were much stronger than the official observed records. High resolution data provided by the BOM shows gust of up to 61 km/h occurred during the morning of 23 November 2011.

As stated above, the Witchcliffe weather observing station is approximately 9 kilometres from the coast and 16 kilometres from the southern boundary of the Ellenbrook prescribed burn. In evidence provided to the Special Inquiry the BOM noted that weather conditions at the fire ground may vary from the observations at Witchcliffe on account of the variable topography, vegetation height and proximity to the coast¹⁰³.

The BOM compared the observed conditions at Witchcliffe with those observed at the coastal locations of Cape Leeuwin and Cape Naturaliste. The most significant variation was that the winds remained significantly stronger overnight at the coastal locations than they did at

¹⁰² Ibid.

¹⁰³ Ibid.

Witchcliffe¹⁰⁴. The Special Inquiry noted that this may account for the variation between the eyewitness accounts and the official BOM observations.

3.3. RESOURCING OF THE BURN

The DEC have a Duty Officer roster system in place at the District, Region and State level to ensure the Department is able to respond in an effective and timely manner to any unplanned fire event. Duty Officers also direct and coordinate prescribed burning activities¹⁰⁵.

While on duty, the Duty Officer is the relevant Manager's representative and has the Manager's delegated authority to plan and implement a suitable standard of fire preparedness and response.

FOG 80 states that the Duty Officer role is only active outside normal business hours, the Special Inquiry found that this was not the case in the Blackwood District with the District Duty Officer performing the role at all times during their seven day roster.

The Special Inquiry found the District Duty Officer, in conjunction with the District Fire Coordinator and District Manager, plays a crucial role in prescribed burning activities, particularly with regard to the decision to commence burns, allocation and coordination of resources and the response to escapes.

In the Blackwood District the District Duty Officer is based at the DEC offices in Kirup.

Typically the 'on-ground' operational responsibility for a prescribed burn rests with an Operations Officer. Depending on its size, a burn area may be divided into divisions and then further into sectors. Each division and/or sector will have a Commander. Sector Commanders will typically be allocated a number of fire trucks with crew.

The Operations Officer maintains close liaison with, and takes direction from, the District Duty Officer.

Annexure 6 provides a summary of which DEC officer was performing which role during the period of investigation.

At the operational level, the Special Inquiry found that the DEC was in a position to allocate a reasonable level of resources to the prescribed burning activities on the dates in question.

The Special Inquiry heard from numerous DEC officers who were involved in the Ellenbrook and Prevelly prescribed burns, many whom were very experienced in prescribed burning having participated in hundreds of burns. While most had some experience burning coastal heath vegetation it was clear that the predominant skill base was in the burning of forest fuels such as jarrah and karri.

The Special Inquiry also found that some of the DEC officers interviewed had limited experience with prescribed burning in the rural urban fringe, particularly burns involving the helicopter 'drip torch'. By way of example, and noting that it cannot be determined about the

¹⁰⁴ Ibid.

¹⁰⁵ DEC, *Fire Operations Guideline 80 – Roles and Responsibilities of Rostered Officers 2010-11* (2010).

impact on the fire, if any, the Incendiary Operations Supervisor who operated the ‘drip torch’ in the Ellenbrook and Prevelly prescribed burns, apart from his training course, had only used it on two other occasions and neither were in close proximity to houses¹⁰⁶.

The Special Inquiry received evidence from a number of volunteer bushfire officers and was impressed by their dedication, experience and knowledge of the local area. Evidence received indicates that the DEC regularly invites volunteer bushfire brigades to assist with their prescribed burns. Although it is not always possible for them to attend as they are often conducting their own prescribed burns for the Shire and the community, the Special Inquiry considers this an important opportunity for collaboration and skill development.

3.4. IGNITIONS

As discussed in Chapter 1, the implementation of a prescribed burn can be complex and may require several attempts, often over a period of weeks or months. Based on evidence provided to the Special Inquiry Tables 4 and 5 provide a summary of each ignition undertaken at the Ellenbrook and Prevelly prescribed burns.

Date	Description
6 September 2011	On-ground ignition to remove ‘flash fuels’ along the northern boundary of the burn area.
10 November 2011	On-ground ignition to continue the removal of ‘flash fuels’ and create a burnt edge along the northern and eastern boundaries. Around 500 metres of edging was completed along Lefthanders Road.
11 November 2011	On-ground ignition to consolidate the northern edge and continue along eastern boundary.
15 November 2011	Aerial and on-ground ignition to deepen edges on the northern and eastern boundaries. A vehicle mounted flame thrower was used to assist on-ground ignition of edges along the north eastern boundary. A helicopter was used to introduce lines of fire parallel to the edges, initially dropping incendiary capsules but due to unsatisfactory ignition a decision was taken to switch to a suspended drip-torch dropping flammable gel. Fire escaped across the northern boundary but was contained. The entire northern, eastern and southern boundaries were edged, with mixed success. An aerial edge was attempted 200 metres east of the Cape to Cape walk track. Resources were left to patrol overnight and Ellen Brook Road was closed.
16 November 2011	Aerial and on-ground ignition to strengthen the edges on Ellen Brook Road and the eastern boundary. Ignition of the core of the burn by helicopter was attempted in the afternoon, with mixed success. The helicopter reported several unburnt pockets within the burn and incomplete edging in some places.

¹⁰⁶ Eikelboom, G., Hearing 19 December 2011.

Date	Description
19 November 2011	On-ground ignition was conducted to strengthen the edges on the north eastern boundary following a report of a flare-up within the burn.
21 November 2011	Aerial and on-ground ignition to deepen the northern boundary and attempt to complete the core ignition. The helicopter used a 'drip torch' with flammable gel after completing the Prevelly burn. The helicopter reported large unburnt areas and very poor edging in some areas.

Table 4: Ignition summary for Ellenbrook prescribed burn BS520.

Date	Description
20 November 2011	Burn area divided into four cells. Aerial and on-ground ignition conducted. Helicopter used incendiary capsules.
21 November 2011	Aerial and on-ground ignition conducted. Helicopter used a 'drip torch' with flammable gel before proceeding to the Ellenbrook burn.
22 November 2011	Some on-ground ignition to strengthen a weak edge on the north western boundary.

Table 5: Ignition summary for Prevelly prescribed burn BS255.

As summarised above, the Ellenbrook prescribed burn was first ignited on 6 September 2011 with the second ignition not undertaken until 10 November 2011.

Successful ignition and fire spread requires the vegetation to be below a particular moisture level and the drying time to reach that level can vary across different vegetation types. In general terms, coastal heathlands may be dry enough within one or two days after rain while woodlands and open forests may take three to five rainless days and tall open forests may take several weeks¹⁰⁷.

The Special Inquiry found that the diversity in vegetation throughout the Ellenbrook prescribed burn area resulted in differing drying rates and presented a challenge in identifying an appropriate window of opportunity to progress the burn.

Following the first ignition on 6 September 2011, Witchcliffe received 109.4 millimetres of rain on 16 rain days in September, 58.4 millimetres of rain on 18 rain days in October and 28.8 millimetres of rain on five rain days between 1 and 9 November¹⁰⁸. A table at Annexure 8 details the weather observations from Witchcliffe from 1 September to 30 November.

¹⁰⁷ McCaw, L., *Weather Conditions Influencing Implementation of DEC Prescribed Burn BS520 and Outbreak of Bushfire in the Ellenbrook Area on 23 November 2011* (2011).

¹⁰⁸ McCaw, L., *Weather Conditions Influencing Implementation of DEC Prescribed Burn BS520 and Outbreak of Bushfire in the Ellenbrook Area on 23 November 2011* (data amended by BOM) (2011).

Information provided by the BOM indicates that rainfall across the Southwest District during winter 2011 was generally near to or below average and during spring 2011 was near average¹⁰⁹.

The Special Inquiry noted that there were at least two periods of three or more consecutive rainless days between the first and second ignition¹¹⁰. It was also noted that some of the subsequent ignitions (10, 11, 15 and 16 November) were undertaken either on days where rain was recorded or immediately following them.

The Special Inquiry also noted that the DEC undertook a small prescribed burn (BS521) in the Kilcarnup area just south of Ellenbrook on 20 and 21 October 2011.

Based on evidence provided by the BOM and the DEC, the Special Inquiry was satisfied that opportunities during September and October to continue with the Ellenbrook prescribed burn were limited due to the high number of wet days.

3.5. BURN SECURITY

As discussed in Chapter 1, the typical approach to undertaking a prescribed burn is to define clear boundaries, create a burnt edge around the perimeter (starting with the downwind edge) and then ignite and burn out the core area. The burnt edge creates a buffer around the burn area designed to stop fire runs and prevent the fire from escaping.

The Burn Implementation Plan for both the Ellenbrook¹¹¹ and Prevelly¹¹² prescribed burns state that the aim should be for a minimum 100 metre depth complete burnt edge with no unburnt pockets. This is consistent with the DEC's guideline for prescribed burn security which is discussed in more detail in Section 3.7.

As illustrated in Table 4 above, priority was given to establishing a burnt edge at the Ellenbrook prescribed burn. The initial effort was focused along the northern and eastern boundaries to protect Gracetown to the north, working on the presumption that the prevailing winds would be from the south west. Edging work continued with the assistance of a helicopter on 15 and 16 November 2011.

The Special Inquiry heard numerous reports from DEC officers involved in prescribed burn BS520 regarding the difficulty of getting the vegetation to burn and create a burnt edge of sufficient depth, particularly in the areas of coastal heath.

The Special Inquiry received evidence from Mr Stephen Mills who performed the role of Sector Commander in the southern sector of the Ellenbrook prescribed burn on 16 November 2011. Mr Mills was tasked with establishing a burnt edge of around 100 meters depth. Mr Mills gave the following account of their efforts¹¹³:

¹⁰⁹ BOM, *Meteorological aspects of the Margaret River Fires* (2011).

¹¹⁰ McCaw, L., *Weather Conditions Influencing Implementation of DEC Prescribed Burn BS520 and Outbreak of Bushfire in the Ellenbrook Area on 23 November 2011* (2011).

¹¹¹ DEC, *Prescribed Fire Plan – Ellenbrook BS520* (2011).

¹¹² DEC, *Prescribed Fire Plan – Prevelly BS255* (2011).

¹¹³ Mills, S., Hearing 20 December 2011.

MR MILLS: We really tried – we had two and three crew guys going in there putting lines of fire in there but the only way we could get it to burn was to burn with the wind and even then it was really struggling and it got – once we got down into the heath it was too thick for the guys to try and walk. We actually got the helicopter in later in the afternoon.

Q: This is still on the 16th?

MR MILLS: This is still on the same day. I've got in with the heli-torch at – just referring to my notes – at 1620 got in with the heli-torch and he put continuous lines along that sou'-west corner here to try and get it to ignite and light with the wind but it would not go.

Despite the weak edging, an attempt was made to burn out the core of the Ellenbrook prescribed burn during the afternoon of 16 November 2011. At completion the helicopter reported several unburnt pockets within the burn, incomplete edging on the eastern boundary and very poor ignition from the concentrated incendiary work in the south west corner¹¹⁴.

The Special Inquiry received evidence from Ms Melissa Manns who undertook the role of Sector Commander at the Ellenbrook burn on 17 November 2011 and was allocated two fire trucks and crew. Ms Manns was tasked with patrolling the entire burn boundary and ensuring all burning objects within 20 metres of the boundary were extinguished. Ms Manns gave the following evidence regarding the quality of the edging¹¹⁵:

MS MANNs: ... I was concerned with the south-west corner. Basically there was no edge along the very southern part of the west boundary and it was very patchy along the southern boundary up until where the larger forested area started. So I have written there “no edge” and “patchy edge to no edge” in the coastal heath section.

Q: Just for the purposes of the transcript, the witness has identified to me on her copy of the map the south-western corner of the area marked for the prescribed burn BS520.

MS MANNs: I was also concerned with the northern – north-east edge, which had a poor edge, approximately five metres, and it was impenetrable heath. And then further north, again poor edge to five metres. There was a section of that north-east boundary that had a better edge which was approximately 20 metres.

Q: And you reported the poor edging to your - - -

MS MANNs: I did, I reported that to the duty officer, Murray Mitchell, over the phone.

¹¹⁴ DEC, *Chronology and Background Report for the Prescribed Burn BS 520* (2011).

¹¹⁵ Manns, M., Hearing 20 December 2011.

Ms Manns also stated¹¹⁶:

MS MANNNS: ... the next morning I was tasked with actually going around to check the burn again and I was travelling over to Kirup with Operations Officer Jeremy Chick. And I showed him the edges that I was concerned with and he also said he was concerned with the south-west edge.

And he said the northern – the northern section that I was concerned with, he said they had flown that the day before and done a line in behind the northern end, so he said that was okay. And then we basically – we – on our way over to Kirup, which is about an hour drive, we called the Duty Officer and we spoke basically about the burn and the burn status. So we said “the edge is basically blacked out but the edge isn’t of standard”.

...

MS MANNNS: And then basically when we arrived to Kirup ... and then I caught up with Murray Mitchell after that, and it’s my understanding that Jeremy Chick had already spoken to Murray Mitchell. And I said to Murray “are you clear about the edge status” and he said “yes”.

Q: And that was on what date?

MS MANNNS: That was on the 18th of the 11th.

The Special Inquiry received other evidence that suggested one of the reasons for not completing the edging in the west corner of the Ellenbrook burn may have been due to visual amenity issues from the Ellensbrook Beach carpark and along the Cape to Cape walk track. The Incendiary Operations Supervisor, Mr Grant Eikelboom, discussed the matter with Mr Jeremy Chick, Operations Officer while flying over the Ellenbrook burn on 21 November 2011. He made the following note in his flight log:

Mr Eikelboom to Mr Chick - No edge on Ellensbrook Beach carpark or Road back out to Ellensbrook Rd??

Mr Chick to Mr Eikelboom – No, not sure if it will be done due to visual amenity issues...

At hearing, Mr Eikelboom clarified his note and stated that the area Mr Chick was referring to was outside of the burn area from the carpark to the beach. The Special Inquiry questioned a number of DEC witnesses on the matter and was satisfied that priority was given to completing the burnt edge over any consideration of visual amenity.

Further attempts to strengthen the edges and complete the core ignition of the Ellenbrook prescribed burn were undertaken late in the afternoon on 21 November 2011. Continuous lines were established in the western and southern sections of the burn area in the hope of a

¹¹⁶ Ibid.

more complete burn out¹¹⁷. More than 200 litres of ignited gel was dropped into the Ellenbrook prescribed burn area.

The Special Inquiry considered at length, the decision to undertake such a significant ignition on 21 November 2011 in light of the forecast weather conditions for 23 November 2011. Evidence received from the DEC officers involved in the decision indicates that they were clearly mindful of, and concerned about the potential for, flare-ups resulting in an uncontrolled fire during the coming week.

The Special Inquiry found that the decision to attempt to burn out the large unburnt pockets within the Ellenbrook burn area on 21 November 2011 was based on a judgement that the risk associated with doing nothing exceeded the risk of proceeding. The intention of those involved was to reduce the risk of a major fire.

Reporting from the helicopter by the Incendiary Operations Supervisor, Mr Grant Eikelboom, at the completion of lighting on 21 November 2011 states that there was a very poor result in the central third of the Ellenbrook prescribed burn area, especially in the southern half which was largely unburnt¹¹⁸. This report was acknowledged by the officers on the ground and the Operations Officer who was located at the Prevelly prescribed burn.

The Special Inquiry received from the DEC a copy of the *BS520 Ellenbrook Operations Map* that had been annotated by Mr Eikelboom to indicate areas that remained unburnt at the completion of lighting on 21 November 2011. A copy of the map is at Annexure 4. At hearing Mr Eikelboom stated that he had prepared the map approximately three weeks after the fire¹¹⁹.

The annotated map shows a large unburnt section in the centre and south western corner of the burn area. Mr Eikelboom's map indicates there was very poor edge depth on the southern boundary and notes that there is "no edge at all" on the south western corner of the burn area along the road to the car park at Ellensbrook Beach. The map also notes that the eastern third of the burn area was "burnt very mildly under karri"¹²⁰.

The Special Inquiry found that the unburnt area was approximately 180 hectares which is larger in size than the entire Prevelly prescribed burn.

The Special Inquiry received evidence from Mr Robert Klok, a recently retired Senior Ranger with the DEC which confirms the poor edging on the southern boundary of the Ellenbrook prescribed burn area. Mr Klok travelled on Ellen Brook Road on the morning of 22 November 2011 and gave the following observation while referring to a map of the Ellenbrook prescribed burn area¹²¹:

On the Tuesday I was there about 6.15. I went down with John, the other ranger, for a dive that morning. We observed the plumes of smoke and – yes – also that the northern edge of the Ellen Brook Road hadn't been consolidated for about the last kilometre and a half from the karri forest right down to the car park at the northern beach area at Ellenbrook.

¹¹⁷ DEC, *Chronology and Background Report for the Prescribed Burn BS 520* (2011).

¹¹⁸ Eikelboom, G., Incendiary Operations Flight Log 21/11/11 (2011).

¹¹⁹ Eikelboom, G., Hearing 13 January 2012.

¹²⁰ Eikelboom, G., Annotated BS520 Ellenbrook Operations Map (2011).

¹²¹ Klok, R., Hearing 16 January 2011.

Okay, so from about there to the car park there. That whole edge was pretty well unconsolidated. You can see that someone had made an attempt to light it up. There was a couple of little scorched areas but nothing really.

The Special Inquiry found that despite repeated attempts using both on-ground and aerial ignition, a complete burnt edge around the entire Ellenbrook prescribed burn area was not achieved.

The Special Inquiry received evidence from Mr Murray Mitchell who was the rostered District Duty Officer from 16 to 22 November 2011. When questioned on his decision not to allocate resources to monitor the Ellenbrook prescribed burn on the evening of 22 November 2011 Mr Mitchell said¹²²:

... I knew we had the southwest corner was weak. It had been clearly – whilst I haven't seen the map that the last air attack had been over, he had portrayed it to me. I verbally – I had a picture in my mind that we had some unburnt pockets and that southwest corner was still weak. That was Grant Eikelboom's map.

The Special Inquiry found that key DEC officers responsible for the security of the Ellenbrook prescribed burn were well aware that there was very poor edging along the southern boundary particularly the south western corner.

On 22 November 2011, Mr Ben Lullfitz was assigned the role of Sector Commander for the Ellenbrook prescribed burn and allocated two trucks with crew. Mr Lullfitz was tasked with patrolling and creating a 20 metre black-out around the whole boundary. When questioned on what a 20 metre black-out meant, Mr Lullfitz provided the following explanation¹²³:

... Basically, it means from the burn boundary, 20 metres into the burn you blackout everything that's hot or burning so you have a cold edge. So, yes, anything that's likely to reignite on the edge you put water on it.

Through the course of the day Mr Lullfitz observed a number of small smokes within the burn area that in his opinion were not significant. Mr Lullfitz also spoke with the spotter pilot on two occasions (11:20 am and 2:55 pm) who was tasked with investigating the smokes.

Based on information from the morning spotter pilot Mr Lullfitz reported “no issues” to the District Duty Officer. When questioned on this report Mr Lullfitz stated¹²⁴:

Well, at that time there was no issues within the burn. There was no running fire. I had got the spotter to look at some of the smokes that I could see and they reported back to me that none of those were going to be causing any issues at that time, most of them very mild fire and burning into burnt ground.

The Special Inquiry received evidence from Mr John Nguyen, the spotter pilot for the afternoon circuit. When questioned on his observations of the Ellenbrook prescribed burn Mr Nguyen gave the following statement¹²⁵:

¹²² Mitchell, M., Hearing 6 January 2012.

¹²³ Lullfitz, B., Hearing 19 December 2011.

¹²⁴ Ibid.

¹²⁵ Nguyen, J., Hearing 17 January 2012.

MR NGUYEN: Well, BS520, that was all within the confines of the burn. I did identify an area that was of high concern and gave – relayed that information to the ground crew.

Q: What did you mean by “high concern?”

MR NGUYEN: Because it mostly had been burnt out and BS520 in this whole area was pretty much burnt out, there was no fuel load left, but at the bottom corner, near the road, there was more dense smoke. There was no fire that I was able to see from the air, but I did say, “You have an area of high concern. This is the coordinate for it. It’s right near the road,” and then asked if I could be of any other assistance.

During the hearing Mr Nguyen indicated that his area of concern was in the south western corner of the Ellenbrook prescribed burn area, very close to Ellen Brook Road. The Special Inquiry is of the view that this was the general area near the south west corner of the Ellenbrook Block. Despite describing it as an area of high concern, Mr Nguyen did not make a record of it in the *Aerial Fire Surveillance Smoke Reporting Log*¹²⁶.

Following the discussion with the afternoon spotter pilot Mr Lullfitz made a diary note “*No concern at this time*”. He reported to the District Duty Officer at 3:00 pm and then left the site.

The Special Inquiry was not able to determine if the smoke identified by Mr Nguyen contributed to the fire the following day but the apparent communication breakdown is concerning.

The Special Inquiry found that despite knowledge of the incomplete edging and the forecast change in weather conditions, no resources were left to monitor the Ellenbrook prescribed burn after Mr Lullfitz left the area at 3:00 pm on 22 November 2011. As discussed below the next DEC officer to attend the burn was at approximately 9:30 am the following morning.

The Special Inquiry cross examined witnesses on the decision not to leave resources to monitor the prescribed burn. The majority of witnesses could understand and justify the decision based on the moderate fire behaviour observed on previous days. A major flare up overnight or early in the morning was not expected.

With the benefit of hindsight, this decision was flawed but equally, as discussed later in this Chapter, the guidelines about leaving resources to monitor fires are ambiguous.

3.6. ESCAPE AND INITIAL RESPONSE

The Special Inquiry heard that the Blackwood District Duty Officer roster changes over each Wednesday morning. In the afternoon of 22 November 2011, the outgoing District Duty Officer, Mr Mitchell, working from the DEC operations centre at Kirup, assigned resources and made the required arrangements for crews to commence work on the Wednesday morning. Mr Mitchell prepared a handover note for the incoming District Duty Officer, Mr

¹²⁶ Ibid.

Chick. The note was emailed to Mr Chick and a hard copy left on the Duty Officer desk at Kirup.

Mr Mitchell had a commitment in Narrogin about three hours drive east of Kirup on the morning of 23 November 2011 and did not provide a face to face handover briefing to Mr Chick. Instead he provided a verbal briefing over the phone as Mr Chick was travelling to work¹²⁷.

The Special Inquiry looked at this handover briefing not being face to face given the subsequent events but it appears that in the circumstances the handover briefing was adequate.

In relation to the Ellenbrook prescribed burn, Mr Mitchell had assigned two trucks departing from Busselton at the normal start time of 8:00 am¹²⁸.

The Special Inquiry received evidence from a number of witnesses who saw smoke emanating from the Ellenbrook prescribed burn area as early as 5:00 am on 23 November 2011. The Special Inquiry found that the community was well aware of the prescribed burning activity having seen signage, helicopter ignitions and smoke on previous days and as a result may not have alerted authorities to the potential fire as the thought resources were already there.



Photograph of the Ellenbrook prescribed burn area taken at 8:24 am on 23 November 2011¹²⁹

At approximately 8:30 am Mr Brett Trunfull, Wallcliffe Volunteer Bushfire Brigade Captain, who was checking on the status of the Prevelly prescribed burn, noticed smoke from Ellenbrook and immediately reported it to the DEC District Duty Officer, Mr Chick¹³⁰. This

¹²⁷ Mitchell, M., Hearing 6 January 2012.

¹²⁸ Ibid.

¹²⁹ Photograph taken from Old Ellen Brook Road, courtesy of John Harrison.

¹³⁰ Trunfull, B., Hearing 6 January 2012.

was the first report the DEC received relating to the fire in the Ellenbrook prescribed burn area.

The Special Inquiry found that by not monitoring the Ellenbrook prescribed burn overnight on 22 November 2011 or early on 23 November 2011, a significant delay occurred in the DEC becoming aware that the fire had reignited and become a wildfire.

Following the report of smoke, Mr Chick dispatched an additional truck from Margaret River to the Ellenbrook prescribed burn area and was aware that two trucks were on route from Busselton¹³¹.

The Special Inquiry found that Mr Chick made a request for water bombers but they were not immediately available due to the summer contract having not yet commenced. An urgent request was made to the contractor which was met¹³². The Special Inquiry was not able to determine what impact this delay had on the fire but was concerned that water bombers were not on standby given the number of prescribed burns being undertaken in the District and the forecast change in weather conditions.

At 8:50 am Mr Chick telephoned Ms Manns and requested she attend the Ellenbrook fire. Ms Manns had checked the Prevelly prescribed burn and was located at the Wallcliffe Volunteer Bushfire Brigade shed at the time of the telephone conversation. Ms Manns returned to Margaret River to get fuel before proceeding to the fire¹³³.

At 9:00 am Mr Chick called Mr Stephen Mills, Fire Operations Officer and requested he also attend the fire and take over from Ms Manns as Operations Officer¹³⁴.

At 9:20 am DEC fire crews reported that there was fire in the surfers car park near Ellensbrook Beach¹³⁵. Based on this evidence the Special Inquiry found that fire originating from within the prescribed burn area crossed the boundary of the prescribed burn in the south west corner.

Ms Manns arrived at the fire at 9:25 am¹³⁶. Priority was given to the protection of people and assets, particularly the protection of Ellensbrook House and the location and evacuation of people parked in the car park or walkers on the Cape to Cape walk track¹³⁷.

Mr Mills arrived on site at 9:50 am. At 10:20 am he reported extreme fire behaviour with 20 metre-high flames. At 12:00 noon Mr Mills noted in his fire diary that the fire had jumped Ellen Brook Road in numerous locations¹³⁸.

¹³¹ Chick, J., Hearing 17 January 2012.

¹³² DEC, *Chronology and Background Report for the Prescribed Burn BS520* (2011).

¹³³ Manns, M., Hearing 20 December 2011.

¹³⁴ Mills, S., Hearing 20 December 2011.

¹³⁵ DEC, *Chronology and Background Report for the Prescribed Burn BS 520* (2011).

¹³⁶ Manns, M., Hearing 20 December 2011.

¹³⁷ DEC, *Chronology and Background Report for the Prescribed Burn BS520* (2011).

¹³⁸ Mills, S., *DEC Fire Diary* (2011).



Photograph of the fire taken at 1:00 pm on 23 November 2011¹³⁹

The Special Inquiry received evidence from a number of volunteer bushfire brigade representatives who were involved in the response to the fire on 23 November 2011. The majority of those spoken to responded to the fires by self-initiation having heard the DEC conversations on their two way radios as opposed to the formal call out procedures.

The Special Inquiry formed the view that what had occurred up until this point in time is that the DEC had identified problems with the burn at Ellenbrook but was attempting to manage it within its own resources.

The Special Inquiry received evidence that a separate significant fire also flared up within the Prevelly prescribed burn area on the morning of 23 November 2011. Given the Special Inquiry's timeframe this fire was not investigated to the same level of detail however it is worth noting that fire crews (mostly volunteers) worked hard through 23 November to protect houses primarily in Gnarabup from significant spot fires. To the credit of all those involved, no houses in Gnarabup were lost on the Wednesday.

The Special Inquiry received considerable evidence relating to fire activity and the response efforts over the following days the majority of which was beyond its Terms of Reference and not therefore closely examined.

¹³⁹ Photograph taken from Killarnup Road, courtesy of John Harrison.

3.7. CONSISTENCY WITH GUIDELINES AND POLICIES

The Terms of Reference specifically request that the Special Inquiry assess the extent to which BS520 was consistent with guidelines and policies. This part of this Report discusses where actual or perceived inconsistencies with provisions in the following documents may apply:

- Code of Practice for Fire Management
- Forest Management Plan 2004 – 2013
- Fire Policy Statement No 19: Fire Management Policy
- Fire Protection Instruction 40: Edging
- Fire Operations Guideline 24: Prescribed Burn and Bushfire Security
- Fire Protection Instruction 30: Liaison with the Bush Fires Service, Local Authorities and Volunteer Bush Fire Brigades
- Fire Operations Guideline 80: Roles and Responsibilities of Rostered Officers.

Code of Practice

Part 2.1.5 of the Code of Practice for Fire Management (Code of Practice) outlines the procedure to be followed during prescribed burning operations. Paragraph 82 provides as follows:

All Prescribed Fire Plan requirements will be met and authorisations obtained prior to lighting any fire¹⁴⁰.

As discussed in Chapter 2 of this Report, the Autumn 2011 approvals and endorsements for Ellenbrook BS520 were signed on 23 March 2011. The Spring 2011 approvals and endorsements for Ellenbrook BS520 were signed on 13 September 2011.

As raised earlier in this Chapter, the first ignition of BS520 was undertaken on 6 September 2011. Evidently BS520 had not received a more current approval or endorsement for the Spring 2011 season, prior to being lit.

DEC officers who were involved in the approval and endorsement process for BS520 were asked by the Special Inquiry why BS520 was ignited before being approved and endorsed for that season. Generally officers were of the view that the burn had been approved and endorsed during the previous season, and that repeating the process of approval and endorsement after the burn had commenced was not an issue of concern. Further, officers expressed a view that they were not aware of what date an approval and endorsement would expire.

The Special Inquiry does not necessarily share these views. Firstly, the approval and endorsements form expressly states that it is current for a particular season. There is no statement on the form, or elsewhere in DEC documentation, that an endorsement and approval for one season may carry over to the next. Further, it is conceivable that conditions may change in subsequent seasons, affecting whether or not approvals and endorsements will again be given.

¹⁴⁰ DEC, *Code of Practice for Fire Management* (2008), p. 9.

The Special Inquiry is of the view that commencing the Ellenbrook fire prior to obtaining the approvals and endorsements for the Spring 2011 season was not consistent with the Code of Practice. Furthermore, this conduct brings into question the utility of a process which allows approvals and endorsements to be given subsequent to the event.

An additional event that occurred at the Prevelly prescribed burn reinforces this view. A representative of the Fire Management Services Branch did not sign the Endorsements page for BS255. The Endorsements template indicates that FMS endorsement is required for “*aerial ignitions burns only*”. The Special Inquiry received evidence that while aerial ignitions were not initially intended for the Prevelly burn, they were introduced to the burn on the first day of ignitions, 20 November 2011.

While the Special Inquiry was informed that approval to undertake aerial ignitions was obtained by the officers, this is not reflected on the Endorsements form. It is not clear whether this was inconsistent with the Code of Practice, but it again raises questions as to the utility of the approval and endorsement process.

Throughout the Code of Practice, reference is made to the ‘Prescribed Fire Manual’. For example, paragraph 71 provides:

*The contents of the Prescribed Fire Plan will conform to the standards set by the Department as specified in the Prescribed Fire Manual*¹⁴¹.

Under the heading ‘Referenced Departmental Documents’ in the Code of Practice, the Prescribed Fire Manual is described as a draft document, and dated 2007.

The Special Inquiry was informed that the Prescribed Fire Manual did not progress beyond a draft, and that the DEC no longer intends to complete it. The Special Inquiry is therefore not able to assess whether conduct was consistent with those parts of the Code of Practice which require compliance with the Prescribed Fire Manual.

The Special Inquiry questions the value of referring to a document in the Code of Practice that never came into existence.

Forest Management Plan 2004 – 2013

As discussed in Chapter 1 of this Report, the CALM Act requires land to be managed in accordance with the management plan for that land, where such a plan exists¹⁴². The applicable plan for the burn area of BS520 was the Forest Management Plan 2004 - 2013¹⁴³ (FMP).

The FMP identifies a number of objectives and proposed actions related to fire. However as the FMP is applicable to a number of Regions, the objectives and actions contained therein are of a broad nature, relating to matters such as the annual prescribed burning program as a whole.

¹⁴¹ Ibid, p. 8.

¹⁴² *Conservation and Land Management Act 1984* (WA) ss 33(3)(a).

¹⁴³ Conservation Commission of Western Australia, *Forest Management Plan 2004-2013*.

As mentioned in Chapter 1, the last applicable management plan for the BS520 burn area, the Leeuwin-Naturaliste National Park Management Plan 1989 – 1999, expired in 1999.

The 2010 Draft Management plan contains far greater detail than the FMP in relation to fire management objectives and proposed actions. However, as this Plan remains in draft form, the DEC is not bound to manage land in accordance with its terms. Therefore the Special Inquiry did not seek to identify any inconsistencies between the draft plan and the conduct of BS520.

Fire Policy Statement No 19

Part 5 of the Fire Policy Statement No. 19: Fire Management Policy (the Policy Statement) outlines the policies of the Department in relation to a number of fire management areas. For prescribed burns, the following policy is entitled ‘Approvals’:

Every prescription will be reviewed and approved by the responsible manager prior to implementation¹⁴⁴.

As discussed above, BS520 was implemented prior to being approved and endorsed for the Spring 2011 season. Not only was this inconsistent with the Code of Practice, but also inconsistent with Fire Policy Statement No. 19.

Overview of Guidelines

As discussed in part 1.4 of this Report, the DEC has developed a series of FOGs and FMGs which are intended to inform decision makers. These guidelines should not be interpreted as requiring strict compliance, as guidelines by their nature are administrative tools to enable a flexible response to situations as needed.

The Special Inquiry observed that a number of FOGs are named ‘Fire Protection Instruction’ (FPI). The DEC advised the Special Inquiry that FPIs were older documents, and were planned to be updated and renamed as FOGs. In light of this, the Special Inquiry treated FPIs as FOGs.

The DEC needs to re-examine the content of FOGs and FPIs to make them more consistent. Further, it is noted that a 2011-12 Fire Operations Guidelines manual contains a limited number of guidelines indicating that the others are irrelevant or redundant.

Fire Protection Instruction 40

FPI 40 outlines the objectives for edging, and how this part of the prescribed burn process should be planned for and undertaken.

Relevantly, FPI 40 provides as follows:

Edging with unstable conditions ahead of lows and fronts associated with strong and gusty north westerly winds must be avoided¹⁴⁵.

¹⁴⁴ Ibid, p. 4.

¹⁴⁵ Ibid, p. 1.

The use of the term “*must be avoided*” indicates that whilst the direction of the wind is a predominant concern, there may be instances where edging in such situations cannot be avoided. This is reinforced by the following statement contained in the summary of FPI 40:

[d] Do not allow edging with N-NW winds or indications of such (except in very special circumstances)

It could be argued that the existence of a burn boundary which is incomplete ahead of forecast north-north westerly winds constitutes a ‘special circumstance’. Indeed, the attempts made to complete the edging at the Ellenbrook prescribed burn on 19 and 21 November in anticipation of the changing weather forecast may have not been merely unavoidable, but advisable. As such, the Special Inquiry is of the view that this conduct was not inconsistent with FPI 40.

By contrast, officers commenced edging at the Prevelly prescribed burn on 20 November 2011. It is the view of the Special Inquiry that the commencement of edging ahead of forecast northerly winds was avoidable, and that no special circumstance existed in order to warrant that conduct. As such, it is the view of the Special Inquiry that the conduct of officers at the Prevelly burn on 20 November 2011 was inconsistent with FPI 40.

FPI 40 contains the following provision relating to the acceptable level of the Fire Danger Index (FDI):

The FDI on edging days must not exceed the FDI for core lightings of individual fuel types¹⁴⁶.

This statement appears to contradict the references to the FDI in the Burn Implementation Plan for Ellenbrook, which sets out recommended ignition conditions for edging and core lighting, primarily based on vegetation type. The section of the plan entitled ‘Edging Plan’ lists the ‘Desired FDI’. Furthermore, the following statement is contained under the table outlining the recommended ignition conditions:

The equivalent FDI range is a preferred range to meet objectives. However, depending on local weather conditions and the status of the burn, the equivalent FDI ranges can be varied at D/O [Duty Officer] discretion as long as it falls within the FDI range of 15 – 40.

The Special Inquiry is of the view that the treatment of the acceptable level of FDI on edging days in FPI 40 is problematic in two respects:

1. It employs the use of mandatory language (e.g. “*must*”), despite the fact that a guideline is an administrative document to be used as decision making tool, and is not enforceable; and
2. It does not accurately reflect the flexibility which is built into the Burn Implementation Plan with respect to undertaking ignitions outside of specified FDI limits.

¹⁴⁶ DEC, *Fire Protection Instruction 40: Edging* (2002), p. 1.

Given the lack of clarity in FPI 40 in relation to this issue, the Special Inquiry is unable to conclude whether the Burn Implementation Plan for the Ellenbrook burn, and decisions made on ignition days, were consistent with the FPI.

The Special Inquiry is of the view that decision makers need to be able to readily distinguish between compliance requirements, and optional factors to be taken into account. In its present form, FPI 40 hampers the ability of decision makers to do so.

FPI 40 further provides that up-to-date and accurate records of edging are carried out, with particular emphasis on any weaknesses in the edge¹⁴⁷. The record keeping of Mr Grant Eikelboom, referred to earlier in this chapter, was largely consistent with FPI 40 in this respect. Further, the records kept by Mr Eikelboom were of great assistance to the Special Inquiry.

It should be noted however that records made contemporaneously are of the highest utility to both operations being undertaken, and any subsequent review of those operations. This is not made sufficiently clear in FPI 40.

Fire Operations Guideline 24

FOG 24, ‘Prescribed Burn and Bushfire Security’, is described as having the following aim:

To provide a standard for patrolling and mopping up at all prescribed burns and bushfires¹⁴⁸.

In relation to patrolling a burn while it is incomplete, the FOG notes that while the frequency and level of patrol will vary on the circumstances, at “*least one person should be maintaining a patrol at all times*”¹⁴⁹.

There are two possible interpretations of what is meant by the phrase “*at all times*”. This could refer to “*at all times*” during rostered duty hours, or alternatively, 24 hours a day for the duration of an incomplete burn.

It is the Special Inquiry’s view that the decision not to leave resources to monitor BS520 on the night of 22 November 2011 greatly impacted on the course of events which followed. It is unfortunate that given the lack of clarity as to the intention of FOG 24, it is not possible for the Special Inquiry to conclude whether this decision was inconsistent with this Guideline.

It is further noted by the Special Inquiry that FOG 24 does not refer to monitoring burns overnight at all. In particular, while the FOG provides guidance as to what potential sources of hopovers may be, it does not outline when the potential for a hopover, or any other factor, would be sufficient to warrant an overnight patrol. The Special Inquiry is of the view that FOG 24 does not provide sufficient guidance to Duty Officers who need to decide whether to leave resources to monitor incomplete burns.

¹⁴⁷ Ibid, p. 8.

¹⁴⁸ DEC, *Fire Operations Guideline 24: Prescribed Burn and Bushfire Security* (2010), p. 1.

¹⁴⁹ Ibid, p. 9.

In relation to mopping up and finalising a burn, FOG 24 outlines the techniques to be employed, and the standards required for burns to be regarded as complete. Those standards differ depending on the type of vegetation present in the burn area.

FOG 24 indicates that in coastal heath vegetation, a burn is not considered complete until there are no unburnt pockets within 100 metres of the perimeter boundary.¹⁵⁰ The Special Inquiry is of the view that the conduct of BS520 was consistent with this statement. As discussed earlier in this Chapter, the Special Inquiry received evidence that on 22 November 2011, when the south west boundary of the burn remained incomplete, resources were arranged to be sent to the burn the following day.

Fire Protection Instruction 30

FPI 30 does not expressly state its aim, but from its contents it appears to guide officers as to the frequency with which they should be liaising with the bush fire service, the local authorities, and attending the meetings of volunteer bushfire brigades.

This FPI is mainly in point form, and while it is dated 6 November 2011, it appears incomplete and the information contained therein outdated. The form of this FPI in itself does not accurately reflect the importance of communicating with these bodies to the decision making process.

In terms of liaising with volunteer bushfire brigades, the FPI provides the following:

District staff will attend brigade meetings on a needs basis¹⁵¹.

The Special Inquiry received evidence of three primary problems in the communication and information sharing between the DEC and the volunteer brigades:

1. Volunteers were only invited to participate in prescribed burns on an informal basis;
2. The DEC did not display knowledge of the resources which volunteer brigades had, which could be called upon in the event of an escaped prescribed burn; and
3. The DEC did not notify volunteers of the escaped fire in a formal or timely manner.

Despite the aim of this FPI being to guide liaison with, amongst other bodies, the volunteers, no guidance is provided to decision makers as to the issues listed above. Nor is detailed guidance provided in relation to liaising with Local Authorities. Whilst the FPI provides that the District annual prescribed burning program should be presented and endorsed at Bush Fire Advisory meetings, there is no further detail as to when or why DEC officers should engage with the Local Authorities.

Given the importance of communicating effectively with local authorities and volunteers, the Special Inquiry believes that this FPI is inadequate in its present form.

¹⁵⁰ Ibid.

¹⁵¹ DEC, *Fire Protection Instruction 30: Liaison with the Bushfire Service, Local Authorities and Volunteer Bush Fire Brigades* (2002), p. 2.

Fire Operations Guideline 80

The aim of FOG 80 is as follows:

To define the roles and responsibilities of State Duty Officer (SDO), Regional Duty Officer (RDO), District Duty Officer (DDO), Duty Officer in Training (DOIT) and Fire Service Availability Officers (FSA)¹⁵².

FOG 80 provides that the roles and responsibilities of a District Duty Officer are “*only active outside normal working hours*”¹⁵³. The Special Inquiry is of the view that this FOG does not accurately reflect current practice at the DEC.

As discussed earlier in this Chapter, the Special Inquiry found that District Duty Officers in the Blackwood District were fulfilling their duties at all times during the seven day roster, including during normal working hours.

¹⁵² DEC, *Fire Operations Guideline 80: Roles and Responsibilities of Rostered Officers* (2010), p. 1.

¹⁵³ *Ibid*, p. 5.

CHAPTER 4: THE FUTURE

4.1. RISK MANAGEMENT

As mentioned in previous sections, the DEC has not adopted the AS/NZS ISO 31000:2009 which is the current national and international standard on risk management. Evidence was given that the DEC uses the superseded standard and has adapted that to their risk planning strategies.

When asked about the issue Mr McNamara told the Special Inquiry:

... my sense is that what you would expect to be done to such a standard is inherent to a considerable degree in the guidelines, the planning, the procedures people follow, in the multi layered approvals, in the injections of particular expertises into the development of plans and the consultation and that that takes place in the minds and the judgment of highly experienced and I think knowledgeable people who are people like District Managers, Regional Managers, and the people in the Fire Management Services Branch centrally¹⁵⁴.

Mr McNamara pointed to an issue that the Special Inquiry thinks is important. The Special Inquiry asked several DEC witnesses about the use of AS/NZS ISO 31000:2009. It was considered a fundamental question to understand how the framework is developed for such a dangerous and risky practice such as a prescribed burn. But few witnesses were even aware that the previous Australian Standard AS/NZS 4360:2004 had been superseded and the Special Inquiry formed the view that there is a heavy reliance on the experience of some key officers in the DEC.

Such a reliance is not necessarily accountable should there be a review such as this Special Inquiry and as noted in the report of Mr Ferguson mentioned earlier in this Report:

Fire managers are being held more accountable. Greater accountability that brings with it higher expectations of fire manager performance and lower thresholds for failure. Bushfire management is often high profile, high risk and high consequence¹⁵⁵.

Is not using the current AS/NZS ISO 31000:2009 relevant? While the process for managing risk is identical to the previous standard, the preface to the new standard on risk management points out the differences between the two which, for copyright reasons, cannot be reproduced here. Suffice to say that the DEC needs to ensure that it is adopting current best practice in regard to risk identification and management.

Further, when considering the response from Mr McNamara at the commencement of this section, the reliance that the DEC places on its guidelines and procedures may be ill founded. For example, the Special Inquiry became aware that, despite descriptive guidelines and policies a large degree of flexibility is allowed when the rules are operationalised. This raises concerns about the application of those guidelines and policies. Several examples are referred

¹⁵⁴ McNamara, K., Hearing 12 January 2012.

¹⁵⁵ Ferguson, E., *A Review of the Ability of the Department of Environment and Conservation Western Australia to Manage Major Fires* (2010), p. 6.

to in this Report such as the carryover of endorsements to burn from one season to another. Burning outside the conditions stipulated in the prescription for a burn is another example particularly when referencing the wind speed and FDI recommendations as mentioned in Chapter 3.

This raised another cause for concern for the Special Inquiry where reliance tends to be placed more on the experience of some key staff rather than guidelines or policies. There are obvious problems with this practice because it is less accountable, it demonstrates the redundancy of some guidelines and it relies on the retention of key staff over time.

Again, this was an issue recognised by Mr Ferguson in his review in 2010 when he said:

DEC is facing a loss of people with specialist forest fire skills, experience and corporate fire knowledge¹⁵⁶.

The Special Inquiry considers that a succession planning model is developed and implemented designed to ensure the competency and skill level of officers is maintained.

If the risk is not fully comprehended then it can easily be understated. Generally speaking, the Special Inquiry became aware of the ‘bias for action’ culture within the DEC as set out in the discussion below with Mr Maher. This may or may not be a positive value for the organisation. If you had the risk depicted on a linear scale with ‘to do nothing’ at one extreme and at the other end ‘to do everything you can’, then the bias may cause action to be taken without necessarily considering all of the consequences. Such a bias for action culture also makes it more difficult for less stronger personalities in the organisation to question the actions of those in leadership positions.

The Special Inquiry reviewed the decision of the Supreme Court of the Australian Capital Territory in 2009 that looked at the findings of the Coroner following the devastating bushfires in Canberra (and NSW) in January 2003¹⁵⁷. The Coroner had been critical of the fire managers for possessing a level of optimism not based on objective facts and this, it must be said, is similar to the risk planning and understanding evident in this matter.

As the current standard points out, understanding and mitigating risk is an iterative process. The Special Inquiry formed a view that there is potential among middle managers in the DEC to transpose the paradigm of remote forest prescribed burns into the rural urban fringe and therefore not turn their mind to the changes in risk between locations. The change in vegetation is definitely considered but a broader consideration about the risks involved seems to be overlooked ahead of ‘getting on with the job’.

This excerpt of evidence provided by the Principal Fire Operations Officer for the DEC, Mr Maher sums up the issue¹⁵⁸:

Q: *But that goes back to the risk management. Aren't they predicating their decisions on the most favourable outcome?*

MR MAHER: *They are. Yes, they are setting goals, yes....*

¹⁵⁶ Ibid, p. 6.

¹⁵⁷ *Peter Lucas-Smith & Ors v. Coroner's Court of the ACT & Ors* (2009) ACT 40.

¹⁵⁸ Maher, T., Hearing 13 January 2012.

Q: *And we talked before about the consideration of risk if there is not enough being done about escapes.*

MR MAHER: *In this particular case we under-estimated the potential....No argument there. ...*

While that was an important concession from Mr Maher he went on to point out the difficulties associated with these operational decisions which are important in the context of the discussion about risk, saying that:

...And if you go too far down the risk of not proceeding, you might not achieve anything. So it is a line to walk. I have still got a larger number of burns down south of here, south of Manjimup, that still need to be finished. I mean, they are in this exact predicament¹⁵⁹.

As pointed out in Chapter 2, each prescribed burn prescription details a description of high value/risks adjacent to the burn. An inspection of the prescriptions provided to the Special Inquiry shows that the thinking on risk is limited to the immediate surrounds apart from smoke considerations. It is not an adopted practice to contemplate external factors such as impact upon the economic environment of the area under consideration to burn.

The second page of the Burn Implementation Plans for BS520 and BS255 identified ‘pre determined suppression strategies in the event of an escape’. Similar to the considerations for the risk of the burn, the suppression strategies are based on a best case scenario. For example, in BS520 there is specific mention of Ellensbrook House. When the fire escaped, resources were applied to Ellensbrook House and to everyone’s credit it was saved. But there was no mention of a fire escaping, crossing the Margaret River and destroying Wallcliffe House located several kilometres further south. An escape of that kind was never contemplated because the frame of reference for the risk consideration was the immediate surrounds.

The loss of Wallcliffe House was mentioned time and again during the Special Inquiry. Its value to the community cannot be overstated and yet it was never considered to be at risk which highlights the limit to scenario thinking. If northerly winds were predicted then a ‘hopover’ or ‘escape’ would have put at risk the vegetation south of the burn, further south of the burn were residential subdivisions and Wallcliffe House. But in the risk assessments nothing further south than Ellensbrook House was considered.

Striking a balance with risk is important as Mr Maher pointed out but limiting the thinking to a best case scenario almost guarantees that unforeseen consequences will occur. This is why risk management frameworks and policies must be current and must be considered a ‘living’ document which can be adjusted to the broader environmental factors impacting upon it.

These observations are made in hindsight and that has to be kept in mind but, equally, the DEC’s reputation relies on the thinking and planning it does around what is a very risky business.

¹⁵⁹ Ibid.

The Special Inquiry attempted to understand a 'Rating System for Prescribed Burning'¹⁶⁰. The process involves a complex number of inputs such as 'Fire Protection Values', 'Risk of Ignition' and 'Fuels/Fire Behaviour' as well as other factors. Each of the inputs is weighted and various witnesses gave account as to the value of the system. Some DEC witnesses told the Special Inquiry that the rating system determined the priority of the burns that were undertaken. Other DEC witnesses said that the rating system was a guide to the risks associated with the type of burn to be undertaken.

The Special Inquiry cross examined witnesses on the rating score for the Ellenbrook burn which scored a total rating of 155¹⁶¹ compared with the score for the Prevelly burn which scored a rating of 220¹⁶².

On the face of it, this would have meant that the Prevelly burn should have been dealt with ahead of the Ellenbrook burn if the rating system determined priorities. Another view was that the Prevelly burn understandably scored higher because it was adjacent to houses and was therefore a more critical burn to undertake.

Either way, the system did not add value to the operational outcome because as described in earlier Chapters, the Ellenbrook burn preceded the Prevelly burn.

Mr Murray Carter who is the Manager of the DEC's Fire Management Services Branch was asked about the current rating system and improvements for the future¹⁶³.

Q: The wildfire threat analysis for Ellenbrook that we just looked at had a total figure of 150. The wildfire threat analysis for the Prevelly burn has a total of 220.

MR CARTER: Yes.

Q: ... what that would indicate to me is we are taking on a more serious burn while we have got another larger burn underway.

MR CARTER: ... what the total figure indicates that if our resources ... were limited to doing one burn or the other in a season and we weren't able to do both the lower rate one would drop off the program. So the intention of that rating system is to put the higher valued strategic protection burns on the program. And in this program both - even though the Ellenbrook was the value, was still of significant value that that made it onto the program...

The problem with Mr Carter's answer is that the Ellenbrook burn could have dropped off the burn program at a point in time when the two burns were being compared with each other in terms of priority. But the Ellenbrook burn was started some 10 weeks before the Prevelly burn and was therefore given the priority instead.

¹⁶⁰ See Annexure 3.

¹⁶¹ DEC, *Prescribed Fire Plan – Ellenbrook BS520*.

¹⁶² DEC, *Prescribed Fire Plan – Prevelly BS255*.

¹⁶³ Carter, M., Hearing 12 January 2012.

The Special Inquiry believes that through their decisions and actions the DEC is devaluing the current 'Rating System for Prescribed Burning', especially if it is ignored and decisions are made to proceed regardless of any priorities.

Further questions were asked of Mr Carter about the current rating system:

MR CARTER: So it is really a comparative rating scale to see - to make sure the most - the burns that offer the highest level of community strategic protection are on the program.....

Q: The rating system for understanding the complexity of a burn, is it adequate?

MR CARTER: No. No, it is not. ... my planning staff have wanted to start on which they call a risk to resources model which is really about exactly that, resources: Matching resources to risk both in planned fire and a bushfire response sense. ... what is really needed is some more fine tuning of - I think what they basically call is a burn complexity model....

...So burns were - in setting up a risk to resources model they said well, if you got a burn here that is 1000 hectares, the modelling was assuming that a burn here of 1000 hectares takes the same amount effort. And of course that is not correct at all. Whereas without a proper complexity model to say 500 hectares at Ellenbrook or 500 hectares at Boyup Brook, you know, are chalk and cheese. So in that - getting a much better tool together, this risk to resources model, it became very evident that we need something in that complexity model space. And some early work was done and unfortunately it just has not been able to be pursued.

The exchanges on this point raise real questions about the DEC's current risk and prioritisation modelling. While credit is given that this has been recognised in the form of a new model, that model needs to be fully developed and implemented as soon as possible. In fairness to Mr Carter, he appeared as concerned about the current practice as was the Special Inquiry and he appeared keen to change it.

Failure to undertake more work in this area will prevent a full 'appreciation of the risk'.

4.2. RESEARCH

Research will not relieve the burden of having to make difficult decisions but it can assist by informing decision makers about how to reduce the risks. While there are some articles published on burning coastal heath it remains an area worthy of further research for Western Australia. The *Forest Fire Behaviour Tables for Western Australia 1998*¹⁶⁴, colloquially known as the 'Red Book', is widely used by DEC officers to assist in predicting fire behaviour and identifying burning opportunities in the south west of the State.

¹⁶⁴ Sneeuwjagt, R. and Peet, G., Department of Conservation and Land Management, *Forest Fire Behaviour Tables for Western Australia 1998* (1998).

The 'Red Book' does not cover coastal heath and advice was given to use the references to mallee-heath as a guide as discussed in the following excerpt of Dr McCaw's evidence:

I guess we don't have a similar fire operations guideline specifically for coastal heaths which arguably is a gap in our range of Fire Operations Guidelines. So I guess we fall back to using the mallee heath ones as being the next best thing¹⁶⁵.

It is not clear whether tables specifically referring to the burning of coastal heath would have made a difference on this occasion, but the inclusion of the area to be burned from the map prepared in 2006 to the 2011 version shows that the additional area was predominantly coastal heath. Dr McCaw's thesis for his PhD was on mallee heath in the Stirling Ranges so his recognition of the gap in research is considered important.

The Special Inquiry received evidence from many witnesses regarding the difficulty of burning coastal heath. It is a vegetation type that appears to require specific conditions to burn. The Special Inquiry heard of examples where coastal heath would not burn one day but not stop the next. This reinforces the need for research and accurate data to assist officers predict fire behaviour.

Another area of potential research was highlighted in the hearing with Mr Maher. Mr Maher asserted that more work needs to be done to understand the C-Haynes Index¹⁶⁶ which is already underway through work commissioned by the Bushfire Cooperative Research Council however, its relevance to weather patterns in south west of Western Australia may be worthy of further specific research.

During the Special Inquiry questions were asked about monitoring of the partly burned Ellenbrook Block, and whether or not a more accurate picture could be obtained technically rather than relying solely upon visual observations from the air or on the land. The Special Inquiry learned about a project involving thermal scanners that are fitted to aircraft and used to map burnt and unburnt patches of land¹⁶⁷.

The use of technology in this regard is to be supported and it is encouraging that the research on the C-Haines Index and the use of thermal scanners was already underway in the DEC and has been for some time.

4.3. ASPECTS ABOUT THE RESPONSE

Reviewing the response to the Margaret River Bushfires was not a Term of Reference but it is impossible to ignore some matters brought to the attention of the Special Inquiry. As noted in earlier chapters, while DEC officers did not see resourcing of the prescribed burn as an issue, others did. For example, the volunteer bushfire brigades spoken to by the Special Inquiry were adamant that under resourcing of the response had a significant impact on the final outcome of the fires.

¹⁶⁵ McCaw, L., Hearing 16 January 2012.

¹⁶⁶ The C-Haines Index is a research project undertaken by Dr L. McCaw and G. A. Mills on atmospheric stability and erratic fire behaviour.

¹⁶⁷ DEC, *Annual Report 2010 – 2011* (2011), p. 5.

When conducting a prescribed burn, the DEC must consider worse case scenarios as well as best case scenarios and in so doing involve more than just themselves in the operational considerations.

Equally, recognition needs to be given to the experience that already exists such as that possessed by volunteer bushfire brigade members who will be able to cover some of the gaps.

The Special Inquiry heard that in response to the fire, DEC and FESA officers were brought in from as far afield as Geraldton. Once on the scene, many of these officers found themselves unfamiliar with the area which caused delays in deployments. Once in place, however, they quickly got on with the job and made a difference but the issue of not using a model that employs local knowledge to supplement resources is worthy of consideration.

Placing a volunteer bushfire brigade officer in the Incident Management Team or with the Incident Controller will overcome local knowledge gaps but also signify a co-operative approach to the emergency situation.

Around the same time that the DEC was attempting to manage the Ellenbrook escape, volunteer bushfire brigades and emergency services had been sent to the fire at Gnarabup which was also being fanned by northerly winds and impacting on houses. While the Special Inquiry did not look in detail at the Gnarabup fire, anecdotally, it was discovered that residents evacuating from Orchid Ramble in Margaret River attempting to get to Gnarabup Beach to safety could only get as far as Wallcliffe Road at Prevelly before being turned around by the authorities. Those manning the roadblocks at Prevelly were apparently unaware of the status of the Ellenbrook fire.

By turning the evacuees around, there was a risk that they were being turned back into the path of the Ellenbrook fire which was advancing at considerable speed towards Wallcliffe Road. A major catastrophe could therefore have occurred because of an apparent lack of understanding about the totality of what was happening. This needs to be thoroughly investigated.

Equally, there was an attempt by the DEC Duty Officer to obtain access to water bombers to assist in suppressing the fires as discussed in Chapter 3 that needs to be properly investigated.

On this point, the Special Inquiry gave some consideration to the significant work that has already been undertaken in this State by Government agencies in reviewing bushfire events, and the legislation and policy that governs them. For example, during the past decade the following Reports have been published:

- Report of the Ministerial Working Group investigation the Darling Escarpment Fire Hazard (1994)
- Auditor-General's Performance Examination – Responding to Major Bushfires (2004)
- Community Development and Justice Standing Committee – Inquiry into Fire and Emergency Services legislation (2006)
- Department of the Premier and Cabinet – Review of Western Australia's Bushfire Preparedness (2009)
- Auditor General's Performance Examination – Coming Ready or Not: Preparing for Large-Scale Emergencies (2009)

- Review of the Ability of the Department of Environment and Conservation Western Australia to manage Major Fires (2010) – Mr Euan Ferguson
- Report of the Perth Hills Bushfire Review – A Shared Responsibility (February 2011)
- Community Development and Justice Standing Committee – Western Australia’s Readiness for the 2011-12 Bushfire Season (November 2011)

In addition, this Report has recommended that independent oversight be given to the ‘in house’ operational reviews undertaken by those agencies responding to the Margaret River Bushfires (Recommendation 9). Inevitably there will come a time when ‘in house’ reviews are accepted by both the Government and the community without the need of independent oversight each time. There is, however, still a need to think about how best to ensure that legislation, policy and practice are all combining to give Western Australia the best possible outcomes when it comes to bushfires.

A further factor increasing the likelihood of bushfire inquiries in the future are the ongoing changes to our climate, as provided in evidence to the 2011 Perth Hills Bushfires Review, which increase the likelihood of bushfires occurring¹⁶⁸.

The increasing likelihood of disasters and inquiries is not unique to Western Australia. The experience elsewhere in Australia and New Zealand over the past twelve months has been an increase in natural disasters in addition to bushfires. Almost without exception, each of these natural disasters has resulted in the conduct of an inquiry of some description.

It is within this context that the significant cost of these inquiries, and delay in establishment and reporting, cannot be ignored. Nor can the fact that a number of aspects about bushfire events remain unchanged, such as the structure and context of fighting bushfires in this State. Yet when a new person or body is appointed for each Inquiry, it must acquire this broad background knowledge prior to conducting the Inquiry.

A further issue that has come to the Special Inquiry’s attention is that while the provisions of the *Public Sector Management Act 1994* (WA) have provided an effective framework for conducting inquiries to date, the ability of the Act to provide powers to investigate an event involving non-government agencies may become an issue of significance in the future.

As such it may be timely for the Government to consider the introduction of legislation to underpin the review of all major events in the future.

¹⁶⁸ Government of Western Australia, *A Shared Responsibility: the Report of the Perth Hills Bushfires February 2011 Review* (2011).

4.4. RECOMMENDATIONS

Recommendation 1

The Department of Environment and Conservation review its current policies and operational guidelines in particular by:

- strengthening the governance of operations by ensuring the Guidelines are relevant and practical;
- ensuring the processes that are implemented for prescribed burns are:
 - (a) value adding to the decisions and approvals required
 - (b) informed by substantive input
 - (c) focussed on outcome rather than process;
- completing the draft management plan for the Leeuwin-Naturaliste Capes Area Parks and Reserves in accordance with the provisions of the *Conservation and Land Management Act 1989*;
- exploring the possibility of automating and streamlining the various processes for formulating a prescription for prescribed burns for ease of access and updating; and
- clarifying the guidance provided to decision makers as to the ‘edging’ and security of prescribed burns.

Recommendation 2

The Department of Environment and Conservation urgently undertake a review of its risk management practices as they relate to prescribed burns including but not limited to:

- reviewing risk management practices to ensure that they are in accordance with AS/NZS ISO 31000:2009;
- finalising and implementing the new complexity model developed in house by the DEC;
- considering a broader set of parameters of risk by conducting an environmental scan or similar tool for areas under consideration for a prescribed burn;
- updating the prescribed fire plans to reflect the broader risk considerations discovered through environmental scanning;
- better informing the risk considerations by updating the ‘Red Book’ to reflect current research on burning in coastal heath; and
- reconsidering the utility of the ‘Red Flag Burn’ notification on files and either adopting it as a policy across the State or removing it as a consideration.

Recommendation 3

The Department of Environment and Conservation review its implementation of the findings of the Ferguson Review conducted in 2010.

Recommendation 4

The Department of Environment and Conservation be supported to conduct further research into the fuel management of coastal heath in the south west of Western Australia exploring alternatives to burning as well as best practice for burning.

Recommendation 5

The Department of Environment and Conservation explore human resourcing models that:

- make succession planning a priority;
- look at options for the attraction and retention of staff; and
- review how the salary levels of staff matches the decision making required in major activities such as prescribed burns.

Recommendation 6

The Department of Environment and Conservation review its practices and procedures in the undertaking of prescribed burns so as to fully utilise the skills available to it in a seamless way including but not limited to:

- volunteer bushfire brigades, especially in regard to use as a source of local advice; and
- staff of the Fire and Emergency Services Authority of Western Australia.

Recommendation 7

The Department of Environment and Conservation review the utility of its current regional model in terms of the capability of operational centres such as Kirup to service major fire activity on land proximate to the rural urban area (this recommendation should also be considered in the context of Recommendation 5).

Recommendation 8

The Department of Environment and Conservation develop and implement a strategy to better inform the community about the complexities and decisions surrounding prescribed burns when they are undertaken in the rural urban area.

Recommendation 9

The response operation to the Margaret River bushfire in November 2011 be the subject of a review with independent oversight.

Recommendation 10

The Government consider enacting legislation to facilitate the review of all future major incidents, including but not limited to fire, earthquake, storm and marine inundation, and the emergency response to them.

ANNEXURE 1: TERMS OF REFERENCE

The inquiry will:

Examine and report on:

- a. the causes of the November 2011 Margaret River Bushfire
- b. the basis for and circumstances leading up to DEC prescribed burn BS520 within the Leeuwin-Naturaliste National Park
- c. the extent to which this prescribed burn was consistent with departmental policy and standard operating procedures.

Determine whether critical decisions regarding the prescribed burn, and its management, had sufficient regard for relevant risks, particularly the forecast weather conditions over the period of the burn.

Based on such examination, make such recommendations as considered necessary for the prudent management of future prescribed burns.

ANNEXURE 2: APPOINTMENT TO CARRY OUT SPECIAL INQUIRY

APPOINTMENT TO CARRY OUT SPECIAL INQUIRY made under s24H(5)(b) of the Public Sector Management Act 1994

Mr Michael Joseph Keelty APM

I, MALCOLM CHARLES WAUCHOPE, Public Sector Commissioner, having been directed on 5 December 2011 by Hon Colin Barnett MLA, Premier and Minister responsible for the administration of the *Public Sector Management Act 1994*, to arrange for the holding of a special inquiry pursuant to section 24H(2) of that Act into the organisation and management of the prescribed burn in the Margaret River area in November 2011, being a matter related to the public sector, HEREBY APPOINT Michael Joseph Keelty APM, to carry out the special inquiry.

I further require that you shall prepare a report, on or before 31 January 2012, on the conduct and findings, and any recommendations, of the special inquiry in accordance with the attached terms of reference and provide me with a copy of that report.

Dated this 5th day of December 2011.



M C Wauchope
PUBLIC SECTOR COMMISSIONER

ANNEXURE 3: RATING SYSTEM FOR BS520 AND BS255

As at 03/06/2011

Page 36 of 52

RATING SYSTEM FOR PRESCRIBED BURNING

DISTRICT: BLACKWOOD BURN NAME: ELLENBROOK BURN NUMBER: BS520

Enter the score for each factor in the space provided. Only one score may be given for each factor. Total score is entered at the bottom of the form.

VALUE	INDEX
-------	-------

1. Fire Protection Values

Factor 1.1: Values at or Near Sites *

A. Burn contains WTA value 1 zone	80
B. Burn contains WTA value 2 zone	50
C. Burn contains WTA value 3 zone, or within 3km of WTA Value 1 zone	30
D. Burn contains WTA value 4 zone, or within 3km of WTA value 2 zone	20
E. Burn contains WTA value 5 zone, or within 3 km of WTA value 3 zone	15
Factor Score:	30

Comments on Values:

Factor 1.2: Risk of Ignition (As per WTA maps)

A. High Risk areas within burn	30
B. Moderate Risk areas within burn	15
C. Low Risk areas within burn	5
Factor Score:	5

Factor 1.3: Suppression Response (As per WTA maps)

A. Within Poor Response zone	40
B. Within Slow Response zone	30
C. Within Moderate Response zone	20
D. Within Rapid Response zone	10
E. Within Immediate Response zone	0
Factor Score:	20

Factor 1.4: Fuels/Fire Behaviour (Refer WTA maps)

A. Category 1 – indirect attack unlikely to succeed	80
B. Category 2 – direct attack not possible	60
C. Category 3 – machine attack possible	30
D. Category 4 – hand attack feasible	10
E. Category 5 – low intensity/ROS	0
Factor Score:	60

* Site is defined as area proposed for prescribed burning

Factor 1.5: Strategic Value of Burn

To stop the run of major fires, strategic fuel reduction in forest fuels should be planned to be 3km wide. Small burns (hand-burns) would thus not normally rate under this factor.

When considering potential fire run, include all uncleared land, irrespective of tenure.

INDEX VALUE

A.	Burn forms part of a strategic buffer or will break up a major fire run of >15km (including private property) in fuels older than half rotation length.	60
B.	Burn will break up a fire run of 10-15km in fuels older than half rotation age.	30
C.	Burn will break up a fire run of <10km in fuels older than half rotation age.	10
D.	No strategic value	0
	Factor Score:	30

2. OTHER MANAGEMENT ISSUES**Factor 2.1: Dieback Impact on Site of Potential Fire Suppression Activities**

A.	High	20
B.	Moderate	10
C.	Low	0
	Factor Score:	10

Factor 2.2: Compliance with Other Departmental Objectives

Burn is required to meet objectives other than fire protection (eg: advance burn, Habitat management), or the timing of a fire protection burn affects another Operation. (eg: dieback photography program).

A.	Burn is a <u>critical</u> prerequisite for another operation	40
B.	Burn is an <u>important</u> prerequisite for other objectives	20
C.	Burn is a <u>desirable</u> prerequisite for other objectives	10
D.	Burn has <u>minor</u> significance for other operations	0
	Factor Score:	0

TOTAL POINTS FOR THIS BURN: 155

Comments:

NAME OF OFFICER COMPILING: John Tillman **DATE: 25/08/2006**

NAME OF OFFICER CHECKING: Don Boothey **DATE: 12/03/2011**

As at 15/08/2011

RATING SYSTEM FOR PRESCRIBED BURNING

DISTRICT: BLACKWOOD BURN NAME: PREVELLY BURN NUMBER: BS255

Enter the score for each factor in the space provided. Only one score may be given for each factor. Total score is entered at the bottom of the form.

VALUE **INDEX**

1. Fire Protection Values

Factor 1.1: Values at or Near Sites *

A.	Burn contains WTA value 1 zone	80
B.	Burn contains WTA value 2 zone	50
C.	Burn contains WTA value 3 zone, or within 3km of WTA Value 1 zone	30
D.	Burn contains WTA value 4 zone, or within 3km of WTA value 2 zone	20
E.	Burn contains WTA value 5 zone, or within 3 km of WTA value 3 zone	15
	Factor Score:	80

Comments on Values:

Factor 1.2: Risk of Ignition (As per WTA maps)

A.	High Risk areas within burn	30
B.	Moderate Risk areas within burn	15
C.	Low Risk areas within burn	5
	Factor Score:	30

Factor 1.3: Suppression Response (As per WTA maps)

A.	Within Poor Response zone	40
B.	Within Slow Response zone	30
C.	Within Moderate Response zone	20
D.	Within Rapid Response zone	10
E.	Within Immediate Response zone	0
	Factor Score:	10

Factor 1.4: Fuels/Fire Behaviour (Refer WTA maps)

A.	Category 1 – indirect attack unlikely to succeed	80
B.	Category 2 – direct attack not possible	60
C.	Category 3 – machine attack possible	30
D.	Category 4 – hand attack feasible	10
E.	Category 5 – low intensity/ROS	0
	Factor Score:	60

* Site is defined as area proposed for prescribed burning

As at 15/08/2011

Factor 1.5: Strategic Value of Burn

To stop the run of major fires, strategic fuel reduction in forest fuels should be planned to be 3km wide. Small burns (hand-burns) would thus not normally rate under this factor.

When considering potential fire run, include all uncleared land, irrespective of tenure.

		INDEX VALUE
A.	Burn forms part of a strategic buffer or will break up a major fire run of >15km (including private property) in fuels older than half rotation length.	60
B.	Burn will break up a fire run of 10-15km in fuels older than half rotation age.	30
C.	Burn will break up a fire run of <10km in fuels older than half rotation age.	10
D.	No strategic value	0
Factor Score:		30

2. OTHER MANAGEMENT ISSUES

Factor 2.1: Dieback Impact on Site of Potential Fire Suppression Activities

A.	High	20
B.	Moderate	10
C.	Low	0
Factor Score:		10

Factor 2.2: Compliance with Other Departmental Objectives

Burn is required to meet objectives other than fire protection (eg: advance burn, Habitat management), or the timing of a fire protection burn affects another Operation. (eg: dieback photography program).

A.	Burn is a <u>critical</u> prerequisite for another operation	40
B.	Burn is an <u>important</u> prerequisite for other objectives	20
C.	Burn is a <u>desirable</u> prerequisite for other objectives	10
D.	Burn has <u>minor</u> significance for other operations	0
Factor Score:		0

TOTAL POINTS FOR THIS BURN: 220

Comments:

NAME OF OFFICER COMPILING: John Tillman – 12/09/2008 for T Mennen's Prescription

NAME OF OFFICER CHECKING:

DATE:

ANNEXURE 4: BS520 OPERATIONS MAP (ANNOTATED BY G. EIKELBOOM)

NAVIGATORS MAP
G. EIKELBOOM 24/4/11

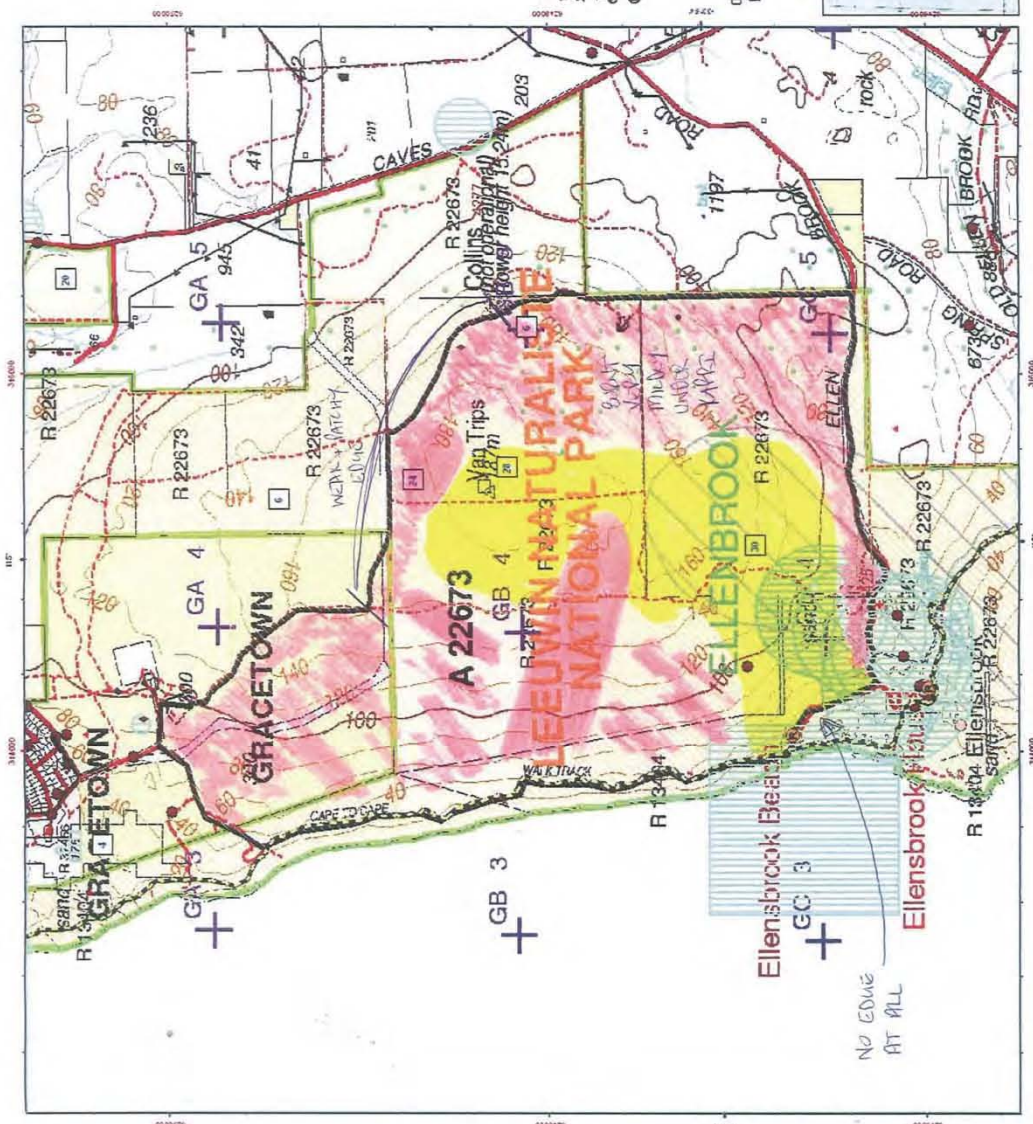
BS520 ELLENBROOK OPERATIONS MAP
AREA: 721.3ha - PERIMETER: 11.9km
JOB NUMBER: 401.785

DUL BUSHCROFT BUILDING OPERATIONS	
LEASING BOUNDARY	BLACK DASHED LINE
PERIMETER BOUNDARY	SOLID LINE
PROPOSED BOUNDARY	DOTTED LINE
200 METRE BOUNDARY	DOTTED LINE
DECLASSIFIED AIR PHOTOGRAPHY	SHADY TONES
THREATS TO AIR PHOTOGRAPHY	SHADY TONES
ADJUTANT GENERAL'S REGISTER	SHADY TONES
CULTURAL HERITAGE SITES	SHADY TONES
UNPAVED ROAD OR DRIVEWAY	SHADY TONES
PAVED ROAD	SHADY TONES
RAIL	SHADY TONES
WATER POINT	SHADY TONES
ABANDONED HOMESTEAD	SHADY TONES
TELESTATION	SHADY TONES
RECREATION SITES	SHADY TONES

ORANGE BUSH
 AREA AT
 24/4/11
 UNPAVED AREAS
 OF NOTE

0 0.2 0.4 0.8 1.2 1.6 2
 Kilometers
 1:20,000
 Projection: Universal Transverse Mercator
 MGA Zone 50, Datum: GDA94

Department of
 Environment and Conservation
 Div. Environment, and Nature
 Produced under the Direction of
 Karen McNamara
 Director General, Department of
 Environment and Conservation



Grids shown at 2 minute intervals
 Grid shown at 2000 metre intervals
 The Dept. of Environment and Conservation does not guarantee that this map is without flawed or any kind
 and declines all liability for any errors, loss or other consequences which may arise from relying on any information depicted

ANNEXURE 5: DEC ROUTINE FORECASTS, 17 – 24 NOVEMBER 2011

<i>Fire Weather for D.E.C. from the Weather Bureau, Perth</i>		Issued at 1545 WST on Thursday the 17th of November 2011							
LOCATION	FORECAST FOR FRIDAY	AM Dirn/Spd PM Dirn/Spd		OUTLOOK FOR SATURDAY	OUTLOOK FOR SUNDAY		OUTLOOK FOR MONDAY		
PEARCE	POSSIBLE MORNING SHOWER.	T 24 DP 7 RH 34	km/hr SSW 10 SW 21	SUNNY. SSW SEABREEZE 20 LATE AFTERNOON.	T 26 SE 16 SSE 13	SUNNY. SSW SEABREEZE 28 EARLY AFTERNOON.	T 28 E 21 SE 14	SUNNY. SSW SEABREEZE 20 MID-AFTERNOON.	T 28 ESE 20 ESE 15
BICKLEY	POSSIBLE MORNING SHOWER.	T 21 DP 7 RH 40	km/hr SW 11 SW 20	SUNNY. WSW SEABREEZE 18 LATE AFTERNOON.	T 23 SE 17 SE 14	SUNNY. WSW SEABREEZE 18 MID-AFTERNOON.	T 25 E 20 SE 14	SUNNY. WSW SEABREEZE 18 MID-AFTERNOON.	T 25 ESE 21 ESE 17
DWELLINGUP	POSSIBLE MORNING SHOWER.	T 21 DP 7 RH 40	km/hr SW 11 SW 20	MOSTLY SUNNY.	T 23 SE 16 SSE 14	SUNNY. WSW SEABREEZE 18 MID-AFTERNOON.	T 25 E 16 SE 10	SUNNY. WSW SEABREEZE 18 LATE AFTERNOON.	T 26 ESE 20 ESE 16
BRIDGETOWN	POSSIBLE MORNING SHOWER.	T 21 DP 6 RH 38	km/hr WSW 14 SW 19	PARTLY CLOUDY.	T 21 SSE 12 S 12	MOSTLY SUNNY.	T 24 ESE 8 S 16	SHOWER OR TWO.	T 23 ESE 11 ESE 7
WITCHCLIFFE	SHOWER OR TWO.	T 21 DP 7 RH 40	km/hr SW 15 SW 19	SHOWER OR TWO.	T 21 S 14 S 18	MOSTLY SUNNY.	T 22 SSE 11 S 19	SHOWER OR TWO.	T 23 SE 13 SSE 8
PEMBERTON	SHOWER OR TWO.	T 20 DP 6 RH 40	km/hr SW 16 SW 20	SHOWER OR TWO.	T 20 S 11 S 14	MOSTLY SUNNY.	T 22 SE 8 S 16	SHOWER OR TWO.	T 22 SE 10 WSW 8
WALPOLE	SHOWER OR TWO.	T 19 DP 5 RH 40	km/hr WSW 21 WSW 26	SHOWER OR TWO.	T 19 SSW 11 S 15	MOSTLY SUNNY.	T 21 WSW 9 SSW 15	SHOWER OR TWO.	T 21 S 13 WSW 14
ROCKY GULLY	SHOWER OR TWO.	T 20 DP 4 RH 35	km/hr WSW 17 WSW 21	SHOWER OR TWO.	T 20 S 11 S 12	MOSTLY SUNNY.	T 24 WSW 4 S 16	SHOWER OR TWO.	T 22 SE 8 W 8
COMMENTS:									

<i>Fire Weather for D.E.C. from the Weather Bureau, Perth</i>		Issued at 1545 WST on Friday the 18th of November 2011							
LOCATION	FORECAST FOR SATURDAY	AM Dirn/Spd PM Dirn/Spd		OUTLOOK FOR SUNDAY	OUTLOOK FOR MONDAY		OUTLOOK FOR TUESDAY		
PEARCE	SUNNY. SSW SEABREEZE 30 EARLY AFTERNOON.	T 26 DP 5 RH 26	km/hr ESE 20 SE 15	SUNNY. SSW SEABREEZE 30 EARLY AFTERNOON.	T 29 E 25 S 20	SUNNY. SSW SEABREEZE 20 MID-AFTERNOON.	T 29 ESE 20 SSE 15	SUNNY.	T 32 E 25 E 15
BICKLEY	SUNNY. WSW SEABREEZE 20 LATE AFTERNOON.	T 23 DP 6 RH 33	km/hr ESE 20 SE 15	SUNNY. WSW SEABREEZE 25 MID-AFTERNOON.	T 26 E 25 S 15	SUNNY. WSW SEABREEZE 20 MID-AFTERNOON.	T 26 ESE 20 SE 15	SUNNY.	T 29 E 25 E 15
DWELLINGUP	SUNNY.	T 24 DP 6 RH 31	km/hr SE 20 SE 15	SUNNY. WSW SEABREEZE 25 MID-AFTERNOON.	T 26 E 17 S 15	SUNNY. WSW SEABREEZE 20 LATE AFTERNOON.	T 27 ESE 20 SE 15	SUNNY.	T 29 E 25 E 15
BRIDGETOWN	PARTLY CLOUDY.	T 22 DP 6 RH 35	km/hr SSE 15 S 15	MOSTLY SUNNY.	T 24 E 10 S 20	CHANCE OF A SHOWER.	T 24 SE 15 SSE 20	SUNNY.	T 28 E 20 E 15
WITCHCLIFFE	POSSIBLE MORNING SHOWER.	T 21 DP 7 RH 40	km/hr SSE 15 S 20	MOSTLY SUNNY.	T 22 SSE 10 S 20	POSSIBLE SHOWER OR TWO.	T 24 SSE 20 SSE 25	SUNNY.	T 27 E 15 ESE 10
PEMBERTON	POSSIBLE MORNING SHOWER.	T 20 DP 7 RH 43	km/hr S 15 S 15	MOSTLY SUNNY.	T 22 SE 10 S 15	POSSIBLE SHOWER OR TWO.	T 23 SSE 15 SSE 20	SUNNY.	T 27 E 15 ENE 15
WALPOLE	MORNING SHOWER.	T 19 DP 6 RH 43	km/hr S 15 S 15	MOSTLY SUNNY.	T 21 W 10 S 20	SHOWER OR TWO.	T 21 SSE 15 SE 20	SUNNY.	T 24 E 20 E 31
ROCKY GULLY	POSSIBLE MORNING SHOWER.	T 21 DP 5 RH 35	km/hr S 10 SSE 15	MOSTLY SUNNY.	T 23 NE 10 S 20	CHANCE OF A SHOWER.	T 23 SSE 15 SSE 20	PARTLY CLOUDY.	T 26 E 20 E 20
COMMENTS:									

Fire Weather for D.E.C.									
from the Weather Bureau, Perth									
Issued at 1545 WST on Saturday the 19th of November 2011									
LOCATION	FORECAST FOR SUNDAY	AM Dirn/Spd PM Dirn/Spd		OUTLOOK FOR MONDAY		OUTLOOK FOR TUESDAY		OUTLOOK FOR WEDNESDAY	
PEARCE	SUNNY. SSW SEABREEZE 30 EARLY AFTERNOON.	T 29 DP 6 RH 23	km/hr E 25 S 20	SUNNY. SSW SEABREEZE 20 MID-AFTERNOON.	T 30 ESE 20 SSE 15	SUNNY.	T 32 E 25 E 15	SUNNY.	T 34 NE 21 NE 15
BICKLEY	SUNNY. WSW SEABREEZE 25 MID-AFTERNOON.	T 26 DP 6 RH 28	km/hr E 25 S 15	SUNNY. WSW SEABREEZE 20 MID-AFTERNOON.	T 27 ESE 20 SE 15	SUNNY.	T 29 E 25 E 15	SUNNY.	T 32 NE 21 NE 16
DWELLINGUP	SUNNY. WSW SEABREEZE 25 MID-AFTERNOON.	T 26 DP 8 RH 32	km/hr E 17 S 15	SUNNY. WSW SEABREEZE 20 LATE AFTERNOON.	T 27 ESE 20 SE 15	SUNNY.	T 29 E 25 E 15	SUNNY.	T 32 NE 20 NE 15
BRIDGETOWN	MOSTLY SUNNY.	T 24 DP 8 RH 36	km/hr E 10 S 20	CHANCE OF A SHOWER.	T 25 SE 15 SSE 20	SUNNY.	T 29 E 20 E 15	SUNNY.	T 33 NE 18 NNE 15
WITCHCLIFFE	POSSIBLE EVENING SHOWER.	T 23 DP 9 RH 41	km/hr SSE 10 S 20	POSSIBLE SHOWER OR TWO.	T 24 SSE 20 SSE 25	SUNNY.	T 27 E 15 ESE 10	SUNNY.	T 30 NNE 29 NNE 23
PEMBERTON	POSSIBLE EVENING SHOWER.	T 22 DP 9 RH 43	km/hr SE 10 S 15	SHOWER OR TWO.	T 24 SSE 15 SSE 20	SUNNY.	T 28 E 15 ENE 15	SUNNY.	T 33 NNE 25 NNE 16
WALPOLE	POSSIBLE EVENING SHOWER.	T 21 DP 9 RH 46	km/hr W 10 S 20	SHOWER OR TWO.	T 21 ESE 15 SE 20	PARTLY CLOUDY.	T 25 E 20 E 31	SUNNY.	T 31 NNE 28 ENE 23
ROCKY GULLY	POSSIBLE EVENING SHOWER.	T 24 DP 8 RH 36	km/hr NE 10 S 20	SHOWER OR TWO.	T 23 SSE 15 SSE 20	SUNNY.	T 28 E 20 E 20	SUNNY.	T 33 NNE 21 NE 18
COMMENTS:									

Fire Weather for D.E.C.
from the Weather Bureau, Perth

Issued at 0750 WST on Sunday the 20th of November 2011

LOCATION	DATA	WINDS (KM/HR)	TOMORROW'S WEATHER	TOMORROW'S OUTLOOK
PEARCE SUNNY. SSW SEABREEZE 20/30 EARLY AFTERNOON.	T 29 DP 6 RH 23 LAL 0	1100 ENE 25 1300 ESE 14 1500 S 20 1700 SSW 17 0300 ESE 15	SUNNY. SSW SEABREEZE 20 MID-AFTERNOON.	MAXT 30 WIND (KM/HR) AM ESE 20 PM SSE 15
BICKLEY SUNNY. SEABREEZE 20/25 MID-AFTERNOON.	T 26 DP 5 RH 26 LAL 0	1100 ENE 25 1300 ESE 12 1500 S 18 1700 S 12 0300 ESE 15	SUNNY. SEABREEZE 20 MID-AFTERNOON.	MAXT 27 WIND (KM/HR) AM ESE 20 PM SE 15
DWELLINGUP SUNNY. SEABREEZE 25 MID-AFTERNOON.	T 26 DP 8 RH 32 LAL 0	1100 E 17 1300 SSE 7 1500 S 15 1700 SSW 13 0300 ESE 15	SUNNY. SEABREEZE 20 LATE AFTERNOON.	MAXT 28 WIND (KM/HR) AM ESE 20 PM SE 15
BRIDGETOWN MOSTLY SUNNY.	T 24 DP 8 RH 36 LAL 0	1100 ESE 10 1300 SSE 5 1500 S 20 1700 S 17 0300 SE 9	CHANCE OF A SHOWER.	MAXT 25 WIND (KM/HR) AM SE 15 PM SSE 20
WITCHCLIFFE POSSIBLE EVENING SHOWER.	T 22 DP 10 RH 46 LAL 0	1100 SSE 10 1300 S 15 1500 S 20 1700 S 19 0300 SE 10	POSSIBLE SHOWER OR TWO.	MAXT 24 WIND (KM/HR) AM SSE 20 PM SSE 26
PEMBERTON POSSIBLE EVENING SHOWER.	T 22 DP 8 RH 41 LAL 0	1100 S 10 1300 S 13 1500 S 15 1700 S 16 0300 ESE 9	SHOWER OR TWO.	MAXT 24 WIND (KM/HR) AM SSE 15 PM SSE 20
WALPOLE POSSIBLE EVENING SHOWER.	T 21 DP 9 RH 46 LAL 0	1100 SSW 10 1300 SSW 15 1500 S 20 1700 SSW 18 0300 SSE 11	SHOWER OR TWO.	MAXT 21 WIND (KM/HR) AM SSE 15 PM SE 20
ROCKY GULLY POSSIBLE EVENING SHOWER.	T 23 DP 8 RH 38 LAL 0	1100 SSE 4 1300 S 8 1500 S 15 1700 S 14 0300 SSE 7	SHOWER OR TWO.	MAXT 23 WIND (KM/HR) AM SE 14 PM SSE 20

**Fire Weather for C.A.L.M.
from the Weather Bureau, Perth**

Issued at 0750 WST on Sunday the 20th of November 2011

TODAY'S GRASSLAND FIRE DANGERS

LW Coastal: LOW-MODERATE
 LW Inland: LOW-MODERATE
 SW Coastal: LOW-MODERATE
 SW Inland: LOW-MODERATE
 Stirling Coastal: LOW-MODERATE
 Stirling Inland: HIGH

SYNOPTIC DISCUSSION

A high pressure ridge will continue to develop to the south of the state today. Isolated showers developing near the western south coast late evening. On Monday a high pressure system will move south of the state, with a moist onshore flow producing isolated showers or drizzle about the south coast west of Israelite Bay.

LOW LEVEL WINDS (KM/HR)

PERTH		ALBANY	
1000ft	E/43	1000ft	NW/09
2000ft	ENE/41	2000ft	NW/13
3000ft	NE/26	3000ft	WNW/15
5000ft	ESE/15	5000ft	W/11
7000ft	ENE/2	7000ft	W/15

Fire Weather for D.E.C. from the Weather Bureau, Perth		Issued at 1545 WST on Sunday the 20th of November 2011							
LOCATION	FORECAST FOR MONDAY	AM Dirn/Spd PM Dirn/Spd		OUTLOOK FOR TUESDAY	OUTLOOK FOR WEDNESDAY		OUTLOOK FOR THURSDAY		
PEARCE	SUNNY. SSW SEABREEZE 20 MID-AFTERNOON.	T 30 DP 4 RH 19	km/hr ESE 21 SSE 11	SUNNY.	T 33 ENE 26 ENE 10	SUNNY.	T 36 NNE 24 ENE 20	SUNNY.	T 36 NNE 28 W 18
BICKLEY	SUNNY. SEABREEZE 20 MID-AFTERNOON.	T 28 DP 4 RH 22	km/hr ESE 21 SE 11	SUNNY.	T 30 E 25 ENE 11	SUNNY.	T 33 NNE 24 ENE 15	SUNNY.	T 33 NNE 28 WNW 21
DWELLINGUP	SUNNY SEABREEZE 20 LATE AFTERNOON.	T 28 DP 5 RH 23	km/hr ESE 20 SE 12	SUNNY.	T 30 E 24 E 9	SUNNY.	T 32 NNE 23 ENE 15	SUNNY.	T 32 NNE 27 WNW 22
BRIDGETOWN	PARTLY CLOUDY.	T 25 DP 8 RH 34	km/hr ESE 14 SE 13	SUNNY.	T 29 ENE 18 ENE 12	SUNNY.	T 33 NNE 21 NE 15	SUNNY.	T 33 NNE 27 NW 27
WITCHCLIFFE	PARTLY CLOUDY.	T 24 DP 10 RH 41	km/hr SE 17 SSE 21	SUNNY.	T 27 E 15 S 10	SUNNY.	T 30 NNE 29 NNE 13	SUNNY.	T 29 N 33 NW 28
PEMBERTON	SHOWER OR TWO.	T 24 DP 0 RH 20	km/hr SE 12 SSE 18	SUNNY.	T 28 ENE 17 ENE 11	SUNNY.	T 33 NNE 24 NNE 14	SUNNY.	T 33 N 28 NW 33
WALPOLE	SHOWER OR TWO.	T 21 DP 11 RH 53	km/hr SE 15 SE 18	PARTLY CLOUDY.	T 26 ENE 21 E 27	SUNNY.	T 31 NNE 31 NE 26	SUNNY.	T 31 NNE 31 WNW 27
ROCKY GULLY	SHOWER OR TWO.	T 23 DP 9 RH 41	km/hr SE 10 SE 16	SUNNY.	T 28 ENE 17 ENE 16	SUNNY.	T 33 N 27 NE 15	SUNNY.	T 34 N 33 NNW 30
COMMENTS:									

**Fire Weather for D.E.C.
from the Weather Bureau, Perth**

Issued at 0750 WST on Monday the 21st of November 2011

LOCATION	DATA	WINDS (KM/HR)	TOMORROW'S WEATHER	TOMORROW'S OUTLOOK
PEARCE SUNNY. SSW SEABREEZE 20 MID-AFTERNOON.	T 30 DP 4 RH 19 LAL 0	1100 ESE 21 1300 SE 11 1500 SSE 11 1700 S 12 0300 E 20	SUNNY.	MAXT 33 WIND (KM/HR) AM ENE 26 PM ENE 10
BICKLEY SUNNY. SEABREEZE 20 MID-AFTERNOON.	T 28 DP 4 RH 22 LAL 0	1100 ESE 21 1300 ESE 10 1500 SE 11 1700 SE 13 0300 ESE 17	SUNNY.	MAXT 30 WIND (KM/HR) AM E 25 PM ENE 11
DWELLINGUP SUNNY. SEABREEZE 20 LATE AFTERNOON.	T 28 DP 5 RH 23 LAL 0	1100 ESE 20 1300 SE 11 1500 SE 12 1700 SE 15 0300 E 16	SUNNY.	MAXT 30 WIND (KM/HR) AM E 24 PM E 9
BRIDGETOWN PARTLY CLOUDY.	T 25 DP 8 RH 34 LAL 0	1100 ESE 14 1300 SSE 10 1500 SE 13 1700 S 18 0300 E 11	SUNNY.	MAXT 29 WIND (KM/HR) AM ENE 18 PM ENE 12
WITCHCLIFFE PARTLY CLOUDY.	T 24 DP 10 RH 41 LAL 0	1100 SE 17 1300 SSE 17 1500 SSE 21 1700 S 22 0300 ESE 10	SUNNY.	MAXT 27 WIND (KM/HR) AM E 15 PM S 10
PEMBERTON SHOWER OR TWO.	T 24 DP 0 RH 20 LAL 0	1100 SE 12 1300 S 13 1500 SSE 18 1700 S 17 0300 E 9	SUNNY.	MAXT 28 WIND (KM/HR) AM ENE 17 PM ENE 11
WALPOLE SHOWER OR TWO.	T 21 DP 11 RH 53 LAL 0	1100 SE 15 1300 SSE 13 1500 SE 18 1700 SSE 17 0300 ENE 15	PARTLY CLOUDY.	MAXT 26 WIND (KM/HR) AM ENE 21 PM E 27
ROCKY GULLY SHOWER OR TWO.	T 23 DP 9 RH 41 LAL 0	1100 SE 10 1300 S 11 1500 SE 16 1700 SSE 15 0300 E 10	SUNNY.	MAXT 28 WIND (KM/HR) AM ENE 17 PM ENE 16

**Fire Weather for C.A.L.M.
from the Weather Bureau, Perth**

Issued at 0750 WST on Monday the 21st of November 2011

TODAY'S GRASSLAND FIRE DANGERS

LW Coastal: LOW-MODERATE
LW Inland: LOW-MODERATE
SW Coastal: LOW-MODERATE
SW Inland: LOW-MODERATE
Stirling Coastal: LOW-MODERATE
Stirling Inland: LOW-MODERATE

SYNOPTIC DISCUSSION

A high pressure system will move south of the state, with a moist onshore flow producing isolated showers or drizzle about the western south coast. On Tuesday the high pressure system will move into the Bight and continue to strengthen with isolated morning drizzle about the south coast east of Esperance. Temperatures will rise away from the south coast. On Wednesday the high pressure system will continue to lie in the Bight with a surface trough developing near the west coast. Sunny conditions throughout the Division with hot N/NE winds. On Thursday generally hot conditions prevail. The trough moves just inland from the west coast late morning or early afternoon bringing a cool change to parts near the west coast. There is a chance of thunderstorms in the far north of the Central West district in the afternoon associated with the trough.

LOW LEVEL WINDS (KM/HR)

PERTH		ALBANY	
1000ft		1000ft	SSW/13
2000ft		2000ft	SSW/13
3000ft		3000ft	SW/15
5000ft		5000ft	WSW/20
7000ft		7000ft	W/28
		1000ft	E/26
		2000ft	E/28
		3000ft	ESE/17
		5000ft	SSE/13
		7000ft	W/22

<i>Fire Weather for D.E.C. from the Weather Bureau, Perth</i>				Issued at 1545 WST on Monday the 21st of November 2011					
LOCATION	FORECAST FOR TUESDAY	AM Dirn/Spd PM Dirn/Spd		OUTLOOK FOR WEDNESDAY	OUTLOOK FOR THURSDAY		OUTLOOK FOR FRIDAY		
PEARCE	SUNNY.	T 33 DP 2 RH 14	km/hr E 23 E 23	SUNNY.	T 36 NE 24 NE 19	SUNNY.	T 37 NNE 29 ENE 23	SUNNY. T 31 S 8 WSW 20	
BICKLEY	SUNNY.	T 30 DP 3 RH 18	km/hr E 22 E 19	SUNNY.	T 33 NE 24 NE 19	SUNNY.	T 33 NNE 29 ENE 17	SUNNY. T 29 S 5 WSW 17	
DWELLINGUP	SUNNY.	T 30 DP 5 RH 21	km/hr E 21 E 18	SUNNY.	T 33 NE 24 NNE 16	SUNNY.	T 32 NNE 29 NE 18	SUNNY. T 29 SSW 4 W 15	
BRIDGETOWN	SUNNY.	T 29 DP 7 RH 25	km/hr ENE 15 E 13	SUNNY.	T 33 NE 21 N 17	SUNNY.	T 33 NNE 28 NNE 17	POSSIBLE LATE SHOWER. T 27 SSW 9 WSW 17	
WITCHCLIFFE	SUNNY.	T 28 DP 9 RH 30	km/hr E 13 SE 11	SUNNY.	T 30 NNE 27 N 27	SUNNY.	T 29 N 33 NNE 16	POSSIBLE LATE SHOWER. T 24 S 13 SSW 18	
PEMBERTON	SUNNY.	T 28 DP 8 RH 28	km/hr ENE 14 E 11	SUNNY.	T 33 NE 22 NNW 21	SUNNY.	T 33 N 28 NNE 16	POSSIBLE LATE SHOWER. T 25 SSW 12 SW 19	
WALPOLE	PARTLY CLOUDY.	T 26 DP 10 RH 37	km/hr ENE 17 E 24	SUNNY.	T 31 NE 26 N 20	SUNNY.	T 32 NNE 32 NNE 27	SUNNY. T 25 S 12 SW 27	
ROCKY GULLY	SUNNY.	T 28 DP 7 RH 27	km/hr ENE 14 E 12	SUNNY.	T 33 NE 25 N 21	SUNNY.	T 35 NNE 33 N 18	SUNNY. T 28 SSW 7 SSW 18	
COMMENTS:									

*Fire Weather for D.E.C.
from the Weather Bureau, Perth*

Issued at 0750 WST on Tuesday the 22nd of November 2011

LOCATION	DATA	WINDS (KM/HR)	TOMORROW'S WEATHER	TOMORROW'S OUTLOOK
PEARCE SUNNY.	T 33 DP 3 RH 15 LAL 0	1100 ENE 20 1300 ENE 14 1500 E 12 1700 ESE 8 0300 ENE 20	SUNNY.	MAXT 36 WIND (KM/HR) AM NE 24 PM NE 19
BICKLEY SUNNY.	T 30 DP 4 RH 19 LAL 0	1100 E 18 1300 ENE 14 1500 E 10 1700 ESE 8 0300 E 22	SUNNY.	MAXT 33 WIND (KM/HR) AM NE 24 PM NE 19
DWELLINGUP SUNNY.	T 30 DP 4 RH 19 LAL 0	1100 E 16 1300 E 12 1500 E 10 1700 ESE 8 0300 E 15	SUNNY.	MAXT 33 WIND (KM/HR) AM NE 24 PM NNE 16
BRIDGETOWN SUNNY.	T 29 DP 8 RH 27 LAL 0	1100 ENE 12 1300 ENE 9 1500 ENE 8 1700 ENE 7 0300 ENE 14	SUNNY.	MAXT 33 WIND (KM/HR) AM NE 21 PM N 17
WITCHCLIFFE SUNNY. SSE SEABREEZE 16 ABOUT 3PM.	T 28 DP 9 RH 30 LAL 0	1100 ENE 12 1300 E 8 1500 SSE 15 1700 SSE 18 0300 ENE 13	SUNNY.	MAXT 31 WIND (KM/HR) AM NNE 27 PM N 27
PEMBERTON SUNNY.	T 28 DP 10 RH 32 LAL 0	1100 ENE 10 1300 ENE 7 1500 ENE 6 1700 ESE 6 0300 NE 14	SUNNY.	MAXT 33 WIND (KM/HR) AM NE 22 PM NNW 21
WALPOLE SUNNY. SE SEABREEZE 18 AROUND NOON.	T 25 DP 10 RH 39 LAL 0	1100 ENE 14 1300 SE 20 1500 SE 22 1700 SE 24 0300 NE 24	SUNNY.	MAXT 32 WIND (KM/HR) AM NE 26 PM N 20
ROCKY GULLY SUNNY.	T 27 DP 8 RH 30 LAL 0	1100 ENE 12 1300 ENE 10 1500 ENE 9 1700 ENE 10 0300 NE 12	SUNNY.	MAXT 32 WIND (KM/HR) AM NE 25 PM N 21

**Fire Weather for C.A.L.M.
from the Weather Bureau, Perth**

Issued at 0750 WST on Tuesday the 22nd of November 2011

TODAY'S GRASSLAND FIRE DANGERS

LW Coastal: LOW-MODERATE
 LW Inland: LOW-MODERATE
 SW Coastal: LOW-MODERATE
 SW Inland: LOW-MODERATE
 Stirling Coastal: LOW-MODERATE
 Stirling Inland: HIGH

SYNOPTIC DISCUSSION

A high south of the state is moving east. Expect a sunny day throughout today with E/NE winds becoming light in the afternoon and afternoon coastal seabreezes. Tomorrow will be warmer as winds turn N/NE with afternoon coastal seabreezes. Warm to hot conditions will continue on Thursday with N/NE winds turning W/NW during the afternoon as a trough moves inland from the west coast. Friday is expected to be cooler with a trough inland from the coast.

LOW LEVEL WINDS (KM/HR)

PERTH		ALBANY	
1000ft	ENE/61	1000ft	ENE/26
2000ft	ENE/50	2000ft	ENE/26
3000ft	ENE/30	3000ft	ENE/22
5000ft	E/4	5000ft	NE/13
7000ft	W/22	7000ft	ESE/07

Fire Weather for D.E.C. from the Weather Bureau, Perth		Issued at 1545 WST on Tuesday the 22nd of November 2011							
LOCATION	FORECAST FOR WEDNESDAY	AM Dirn/Spd PM Dirn/Spd		OUTLOOK FOR THURSDAY	OUTLOOK FOR FRIDAY		OUTLOOK FOR SATURDAY		
PEARCE	SUNNY.	T 37 DP -2 RH 8	km/hr NE 35 NE 20	SUNNY. PM WINDS SHIFTING WNW 20KM/H MID AFTERNOON.	T 38 NNE 35 NE 25	SUNNY.	T 31 SW 10 SW 20	PARTLY CLOUDY.	T 27 SSW 20 SSW 25
BICKLEY	SUNNY.	T 33 DP 0 RH 12	km/hr NE 35 NE 20	SUNNY. PM WINDS SHIFTING WNW 20KM/H MID AFTERNOON.	T 34 NNE 35 ENE 20	SUNNY.	T 29 SW 10 SW 20	PARTLY CLOUDY.	T 24 S 18 SSW 20
DWELLINGUP	SUNNY.	T 34 DP 1 RH 12	km/hr NE 35 NNE 18	SUNNY. PM WINDS SHIFTING WNW 20KM/H MID AFTERNOON.	T 34 NNE 35 NE 20	SUNNY.	T 28 SW 10 WSW 20	PARTLY CLOUDY.	T 24 S 18 S 20
BRIDGETOWN	SUNNY.	T 34 DP 6 RH 18	km/hr NE 25 N 20	SUNNY.	T 33 NNE 35 N 20	SUNNY.	T 27 SW 10 SSW 20	PARTLY CLOUDY.	T 21 SSW 18 S 20
WITCHCLIFFE	SUNNY.	T 31 DP 8 RH 24	km/hr NNE 30 N 30	SUNNY.	T 31 N 35 N 28	SUNNY.	T 24 SSW 15 SSW 20	PARTLY CLOUDY.	T 21 S 25 S 21
PEMBERTON	SUNNY.	T 34 DP 8 RH 20	km/hr NE 25 NNW 20	SUNNY.	T 34 N 30 NNE 20	PARTLY CLOUDY.	T 25 SW 15 SSW 18	PERIODS OF DRIZZLE.	T 19 SSW 20 S 20
WALPOLE	SUNNY.	T 32 DP 8 RH 23	km/hr NE 30 NE 25	SUNNY.	T 32 NNE 30 NNE 30	MORNING DRIZZLE.	T 24 WSW 20 SW 20	PERIODS OF DRIZZLE.	T 19 SW 25 S 20
ROCKY GULLY	SUNNY.	T 33 DP 5 RH 17	km/hr NE 28 N 20	SUNNY.	T 34 NNE 30 N 20	PARTLY CLOUDY.	T 29 WSW 15 SSW 18	PERIODS OF DRIZZLE.	T 20 SW 18 S 20
COMMENTS:									

**Fire Weather for D.E.C.
from the Weather Bureau, Perth**

Issued at 0750 WST on Wednesday the 23rd of November 2011

LOCATION	DATA	WINDS (KM/HR)	TOMORROW'S WEATHER	TOMORROW'S OUTLOOK
PEARCE SUNNY.	T 35 DP -3 RH 9 LAL 0	1100 NNE 24 1300 NNE 19 1500 NE 16 1700 NE 15 0300 NE 21	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	MAXT 36 WIND (KM/HR) AM NNE 35 PM NE 25
BICKLEY SUNNY.	T 32 DP -1 RH 12 LAL 0	1100 NNE 24 1300 NNE 19 1500 NNE 16 1700 NE 13 0300 NE 15	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	MAXT 33 WIND (KM/HR) AM NNE 35 PM ENE 20
DWELLINGUP SUNNY.	T 33 DP 0 RH 12 LAL 0	1100 NNE 23 1300 NNE 17 1500 NNE 13 1700 NNE 11 0300 NE 16	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	MAXT 33 WIND (KM/HR) AM NNE 35 PM NNW 20
BRIDGETOWN SUNNY.	T 33 DP 5 RH 17 LAL 0	1100 NNE 21 1300 N 18 1500 N 13 1700 N 7 0300 NE 14	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	MAXT 33 WIND (KM/HR) AM NNE 35 PM NNW 20
WITCHCLIFFE SUNNY.	T 31 DP 7 RH 22 LAL 0	1100 N 27 1300 N 27 1500 N 22 1700 NNW 13 0300 NE 15	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	MAXT 30 WIND (KM/HR) AM N 35 PM NNW 28
PEMBERTON SUNNY.	T 33 DP 7 RH 20 LAL 0	1100 NNE 24 1300 N 21 1500 NNW 17 1700 NW 12 0300 NE 13	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	MAXT 33 WIND (KM/HR) AM N 30 PM NNE 20
WALPOLE SUNNY.	T 31 DP 8 RH 24 LAL 0	1100 NNE 26 1300 N 22 1500 N 18 1700 NNE 14 0300 NNE 23	SUNNY. PM WINDS SHIFTING WNW 20KM/H IN THE EVENING.	MAXT 32 WIND (KM/HR) AM NNE 30 PM N 30
ROCKY GULLY SUNNY.	T 32 DP 5 RH 18 LAL 0	1100 N 25 1300 N 22 1500 N 18 1700 NNE 14 0300 NE 15	SUNNY. PM WINDS SHIFTING WNW 20KM/H IN THE EVENING.	MAXT 33 WIND (KM/HR) AM NNE 30 PM N 20

**Fire Weather for C.A.L.M.
from the Weather Bureau, Perth**

Issued at 0750 WST on Wednesday the 23rd of November 2011

TODAY'S GRASSLAND FIRE DANGERS

LW Coastal: HIGH
 LW Inland: HIGH
 SW Coastal: LOW-MODERATE
 SW Inland: LOW-MODERATE
 Stirling Coastal: HIGH
 Stirling Inland: HIGH

SYNOPTIC DISCUSSION

HIGH PRESSURE SYSTEM IN THE BIGHT WITH A TROUGH JUST OFFSHORE FROM THE WEST COAST AND IS EXPECTED TO REMAIN OFFSHORE UNTIL THURSDAY, WHEN THE HIGH IN THE BIGHT MOVES FURTHER EASTWARDS AND A COLD FRONT DRAWS CLOSER, THE TROUGH MOVES INLAND. THE COLD FRONT IS EXPECTED TO REACH THE SWLD BY FRIDAY EARLY MORNING, SHOULD AFFECT ONLY THE SOUTHWESTERN PARTS OF THE SWLD. A HIGH PRESSURE RIDGE IS ESTABLISHING ITSELF OVER THE SOUTHERN PARTS OF THE STATE IN THE WAKE OF THE COLD FRONT. ISOLATED THUNDERSTORMS IS EXPECTED FROM FRIDAY OVER THE EASTERN PARTS OF THE SWLD AS A RESULT OF THE TROUGH AND A DISTURBANCE IN THE UPPER AIR.

LOW LEVEL WINDS (KM/HR)

PERTH		ALBANY	
1000ft	NE/57	1000ft	NE/30
2000ft	NNE/67	2000ft	NNE/39
3000ft	N/76	3000ft	NNE/41
5000ft	NNE/41	5000ft	N/22
7000ft	NW/15	7000ft	W/17

Fire Weather for D.E.C. from the Weather Bureau, Perth		Issued at 1545 WST on Wednesday the 23rd of November 2011							
LOCATION	FORECAST FOR THURSDAY	AM Dirn/Spd PM Dirn/Spd	km/hr	OUTLOOK FOR FRIDAY	OUTLOOK FOR SATURDAY	OUTLOOK FOR SUNDAY	T	E	S
PEARCE	SUNNY. PM WINDS SHIFTING WNW 20KM/H MID AFTERNOON.	T 37 DP -2 RH 8	NNE 40 NE 25	SUNNY.	T 31 SW 10 SW 20	PARTLY CLOUDY. S 15 SSW 20	T 27	T 28	E 25 SSW 20
BICKLEY	SUNNY. PM WINDS SHIFTING WNW 20KM/H MID AFTERNOON.	T 34 DP -2 RH 10	NNE 40 ENE 20	SUNNY.	T 28 SW 10 SW 20	PARTLY CLOUDY. S 15 SSE 20	T 25	T 25	E 25 S 15
DWELLINGUP	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	T 34 DP 0 RH 11	NNE 40 NNW 20	SUNNY.	T 27 SW 10 WSW 20	PARTLY CLOUDY. SSE 20 SSE 20	T 24	T 24	E 22 S 10
BRIDGETOWN	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	T 33 DP 4 RH 16	NNE 35 NNW 20	SUNNY.	T 26 SW 10 SSW 20	PARTLY CLOUDY. S 20 SSE 20	T 20	T 23	E 20 SSE 20
WITCHCLIFFE	GUSTS TO 65KM/H ALL DAY. WINDS EASING WNW 20KM/H AFTER 8PM.	T 30 DP 7 RH 24	N 45 NNW 40	SUNNY.	T 23 SSW 15 SSW 20	PARTLY CLOUDY. S 25 SSE 25	T 21	T 22	ESE 15 S 25
PEMBERTON	SUNNY. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	T 33 DP 6 RH 19	N 35 NNE 28	PARTLY CLOUDY.	T 24 SW 15 SSW 20	PERIODS OF DRIZZLE. S 25 SSE 20	T 19	T 22	E 15 S 25
WALPOLE	SUNNY. PM WINDS SHIFTING WNW 20KM/H IN THE EVENING.	T 32 DP 6 RH 20	NNE 35 N 30	MORNING DRIZZLE.	T 24 WSW 20 SW 20	PERIODS OF DRIZZLE. S 30 SSE 25	T 19	T 20	E 15 SE 25
ROCKY GULLY	SUNNY. PM WINDS SHIFTING WNW 20KM/H IN THE EVENING.	T 33 DP 2 RH 14	NNE 35 N 25	PARTLY CLOUDY.	T 27 WSW 15 SSW 20	PERIODS OF DRIZZLE. S 20 S 20	T 19	T 22	E 15 SE 20
COMMENTS:									

**Fire Weather for D.E.C.
from the Weather Bureau, Perth**

Issued at 0750 WST on Thursday the 24th of November 2011

LOCATION	DATA	WINDS (KM/HR)	TOMORROW'S WEATHER	TOMORROW'S OUTLOOK
PEARCE SUNNY.	T 37 DP -2 RH 8 LAL 0	1100 NNE 38 1300 N 25 1500 NW 25 1700 W 15 0300 W 10	SUNNY.	MAXT 31 WIND (KM/HR) AM SW 12 PM SW 20
BICKLEY SUNNY.	T 34 DP -2 RH 10 LAL 0	1100 NNE 38 1300 N 25 1500 NW 20 1700 WNW 15 0300 W 10	SUNNY.	MAXT 29 WIND (KM/HR) AM SW 12 PM SW 20
DWELLINGUP SUNNY.	T 34 DP 0 RH 11 LAL 0	1100 NNE 35 1300 N 25 1500 NNW 20 1700 WNW 15 0300 WNW 10	SUNNY.	MAXT 28 WIND (KM/HR) AM SW 12 PM WSW 20
BRIDGETOWN GUSTS TO 50KM/H LATE MORNING/EARLY AFTERNOON.	T 33 DP 4 RH 16 LAL 0	1100 NNE 35 1300 N 25 1500 NNW 20 1700 NW 15 0300 WNW 10	PARTLY CLOUDY.	MAXT 26 WIND (KM/HR) AM SW 12 PM SSW 20
WITCHCLIFFE GUSTS TO 65KM/H ALL DAY. WINDS EASING WNW 20KM/H AFTER 8PM.	T 31 DP 6 RH 21 LAL 0	1100 N 45 1300 N 40 1500 NNW 40 1700 NNW 28 0300 W 15	PARTLY CLOUDY.	MAXT 23 WIND (KM/HR) AM WSW 20 PM SSW 20
PEMBERTON GUSTS 45-65KM/H IN AM UNTIL MID PM. PM WINDS SHIFTING WNW 20KM/H LATE AFTERNOON.	T 33 DP 6 RH 19 LAL 0	1100 N 36 1300 N 38 1500 NNE 34 1700 NNW 20 0300 WNW 10	PARTLY CLOUDY.	MAXT 24 WIND (KM/HR) AM SW 15 PM SSW 22
WALPOLE GUSTS TO 50KM/H IN AM.	T 32 DP 6 RH 20 LAL 0	1100 NNE 35 1300 N 28 1500 N 30 1700 N 17 0300 WNW 17	MORNING DRIZZLE.	MAXT 24 WIND (KM/HR) AM WSW 20 PM SW 28
ROCKY GULLY GUSTS TO 45KM/H IN AM.	T 34 DP 2 RH 13 LAL 0	1100 NNE 35 1300 N 30 1500 N 25 1700 N 18 0300 WNW 10	PARTLY CLOUDY.	MAXT 27 WIND (KM/HR) AM WSW 15 PM SSW 25

TODAY'S GRASSLAND FIRE DANGERS

LW Coastal: HIGH
LW Inland: LOW-MODERATE
SW Coastal: LOW-MODERATE
SW Inland: LOW-MODERATE
Stirling Coastal: LOW-MODERATE
Stirling Inland: VERY HIGH

SYNOPTIC DISCUSSION

Strong N/NE winds aloft in the low levels, easing inland during the morning and turning to NNW during the afternoon in coastal areas and easing during the evening as a cold front passes the coasts. This will lead to strong gusty conditions at the surface which will last into the late afternoon/early afternoon. As the cold front passes overnight and during Friday morning expect some isolated showers and areas of drizzle, mainly during the morning, redeveloping Saturday morning and contracting eastwards to be out of the area by Sunday.

LOW LEVEL WINDS (KM/HR)

PERTH		ALBANY		
1000ft	NNE/52	1000ft	N/46	1000ft
2000ft	NNE/72	2000ft	N/57	2000ft
3000ft	N/76	3000ft	N/54	3000ft
5000ft	N/50	5000ft	N/35	5000ft
7000ft	NNW/28	7000ft	N/26	7000ft

ANNEXURE 6: ROLES UNDERTAKEN BY DEC OFFICERS

The following table summarises the evidence received by the Special Inquiry regarding the roles undertaken by DEC officers from 19 November to 23 November 2011.

Date	Position	Ellenbrook BS520	Prevelly BS255
19 November	State Duty Officer	unknown	unknown
	Regional Duty Officer	Peter Henderson	Peter Henderson
	District Duty Officer	Murray Mitchell	Murray Mitchell
	Operations Officer	Jeremy Chick	Jeremy Chick
	Burn Sector Commander/s	Melissa Manns	
20 November	State Duty Officer	Terry Maher	Terry Maher
	Regional Duty Officer	Peter Henderson	Peter Henderson
	District Duty Officer	Murray Mitchell	Murray Mitchell
	Operations Officer		Jeremy Chick
	Burn Sector Commander/s		Melissa Manns Ben Lullfitz
	Incendiary Operations Officer	N/A	
21 November	State Duty Officer	Murray Carter	Murray Carter
	Regional Duty Officer	Peter Henderson	Peter Henderson
	District Duty Officer	Murray Mitchell	Murray Mitchell
	Operations Officer	Jeremy Chick	Jeremy Chick
	Burn Sector Commander/s	Steve Blythe (approx. 4:10 pm – 4:30 pm) Steve Tate (4:30 pm onwards)	Melissa Manns
	Incendiary Operations Officer	Grant Eikelboom	Grant Eikelboom
22 November	State Duty Officer		
	Regional Duty Officer	Peter Henderson	Peter Henderson
	District Duty Officer	Murray Mitchell	Murray Mitchell
	Operations Officer		
	Burn Sector Commander/s	Ben Lullfitz	Melissa Manns
23 November	State Duty Officer		
	Regional Duty Officer	Peter Henderson	Peter Gibson and Peter Henderson
	District Duty Officer	Jeremy Chick	Jeremy Chick
	Operations Officer	Melissa Manns (9:25 am – 9:50 am) Steve Mills (9:50 am onwards)	
	Burn Sector Commander/s	Melissa Manns (9:50 am onwards)	Melissa Manns

ANNEXURE 7: PUBLIC CONSULTATION MAPS FOR BS520 AND BS255

ELLENBROOK BLOCK – LEEUWIN-NATURALISTE NATIONAL PARK Strategic Protection Burn BS_520

Description

The burn is located within Ellenbrook block in the Leeuwin-Naturaliste National Park and Unallocated Crown Land, 1 km south of Gracetown. The burn is bounded by Leithamers Road and unnamed tracks to the north, Ellen Brook Road to the south, private property and unnamed tracks to the east, and the Cape to Cape Walk Track to the west. Records indicate this area was last burnt prior to 1982.

Purpose

Primary: Strategic Protection
To minimise the potential size and intensity of bushfires and/or the risk of damage to the natural and cultural values of the Leeuwin-Naturaliste National Park, including its infrastructure and other recreational facilities within the Leeuwin-Naturaliste National Park, Collins Tower, endangered fauna and Threatened Ecological Communities in Ellenbrook, and adjacent private property by the application of fire under prescribed conditions to reduce the quantity of combustible material.

Secondary: Biodiversity Management

To protect, maintain and enhance biodiversity values and ecological processes within the Leeuwin-Naturaliste National Park by applying fire under prescribed conditions to achieve a mosaic of fire intensities and burnt and unburnt areas at both a landscape and a local scale.

Operations

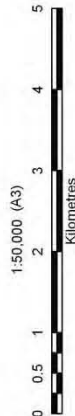
It is intended to commence the burn in spring 2011 by a combination of ground ignitions on the perimeter followed by a series of spot ignitions internally in order to achieve a mosaic of burnt and unburnt patches within the burn area.

Summary

District: Blackwood
Proposed season and year: Spring 2011
Burn area: 722 hectares
Burn perimeter: 12 kilometres

District Manager: _____ Date: _____

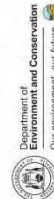
Regional Manager: _____ Date: _____



Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94

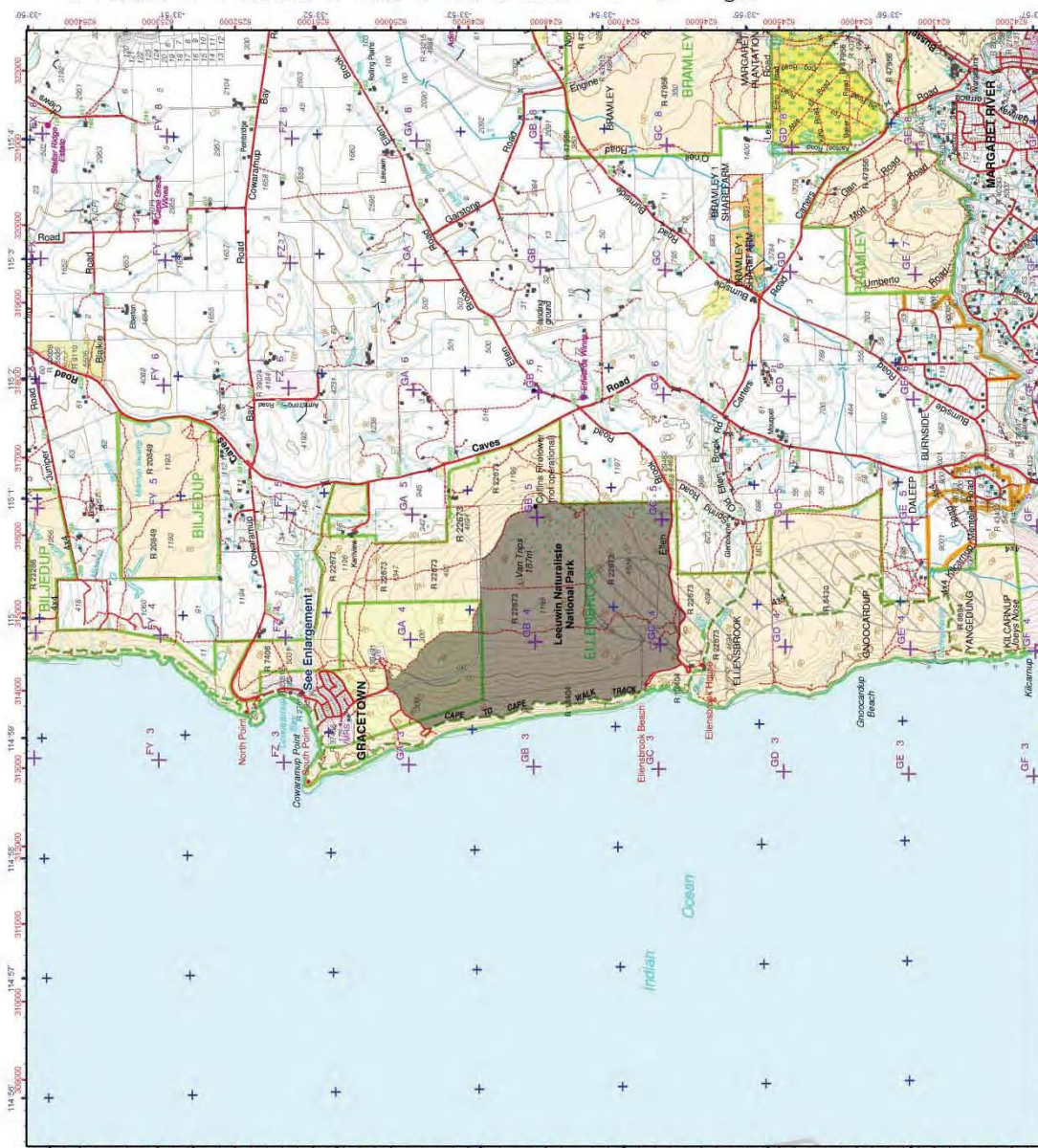


Produced by
Forest Management Branch,
Department of Environment
and Conservation



Our environment, our future

Produced on September 21, 2011



Roads and tracks on land managed by DEC may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.
The Dept. of Environment and Conservation does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, omissions or other consequences which may arise from relying on any information depicted.

Grid shown at 1 minute intervals
Grid shown at 1000 metre intervals

LEEUWIN-NATURALISTE NATIONAL PARK & CROWN RESERVE 8428 (PROPOSED NATIONAL PARK)
Strategic Protection Burn Bs_255

Description

The burn is located within the Leeuwin Naturaliste National Park and Crown Reserve 8428 (Proposed National Park) 7 km south west of Margaret River and adjacent to the Prevelly town site. The burn is bounded by Wallcliffe Road to the east, and Wallcliffe road and private property to the west and south. The area was last burnt in 1983.

Purpose

Primary: Strategic Protection
To minimise the potential size and intensity of bushfires and the risk of damage from lightning to the Prevelly and Gnarabup town sites, adjacent private property, and the Crown Reserve 8428 (Proposed National Park) by the application of fire under prescribed conditions to reduce the quantity of combustible material.

Secondary: Biodiversity Management

To protect, maintain and enhance biodiversity values and ecological processes within Crown Reserve 8428 (Proposed National Park) and Leeuwin-Naturaliste National Park by applying fire under prescribed conditions to achieve a mosaic of fire intrasites and burnt and unburnt areas at both a landscape and a local scale.

Operations

It is intended to commence the burn in spring 2011 by using ground ignitions on the perimeter followed by a series of spot ignitions in the internal area, in order to create a mosaic of burnt and unburnt areas.

Summary

District: Blackwood
Proposed season and year: Spring 2011
Burn Area: 131 Hectares
Burn Perimeter: 7 Kilometres

District Manager: _____ Date: _____

Regional Manager: _____ Date: _____



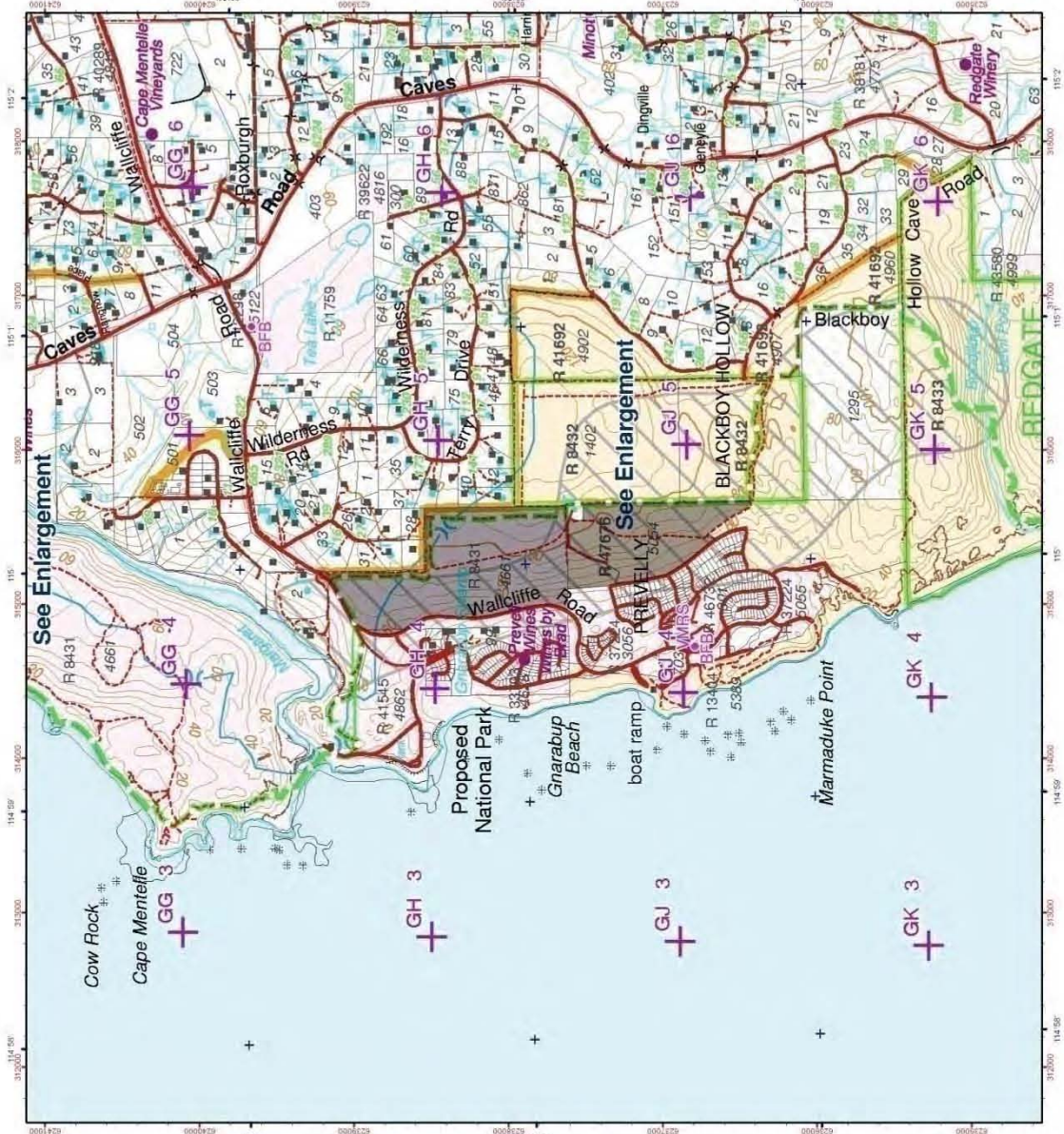
Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94



Produced by
Forest Management Branch,
Department of Environment
and Conservation



Produced on September 21, 2011



Roads and tracks on land managed by DEC may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.
The Dept. of Environment and Conservation does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequences which may arise from relying on any information depicted.

Grid shown at 1 minute intervals
Grid shown at 1000 metre intervals

ANNEXURE 8: DAILY WEATHER OBSERVATIONS FROM WITCHCLIFFE

Date	Daily observations						9am observations				3pm observations				
	Maximum (°C)	Minimum (°C)	Max Wind Gust (km/h)	Max Gust Direction	Precipitation (mm)	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Direction	MSL Pressure (hPa)	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Direction	MSL Pressure (hPa)
1/09/2011	19.4	6.7	67	N	0	13.8	100	15	N	1011.6	15.9	92	22	N	1005.3
2/09/2011	14.6	9.6	50	WSW	17.2	9.8	79	22	WSW	1006.1	13.1	58	18	SW	1008.4
3/09/2011	16.4	8.9	50	WSW	2.4	13.3	73	18	W	1016.7	13.4	76	18	WNW	1017.5
4/09/2011	18	12.4	42	W	3.6	16.1	66	13	W	1022.9	14.1	83	13	WNW	1022
5/09/2011	17	12.1	39	S	9.4	14	73	18	SSW	1027.4	15	65	24	SSW	1028.1
6/09/2011	17.3	5.5	35	SSW	0.2	14.1	80	9	SSE	1035.4	17.1	70	21	S	1033.6
7/09/2011	16.4	9.7	44	SSE	1.4	12.5	73	9	SE	1037.9	15.2	60	26	SSE	1035.1
8/09/2011	18.4	7.7	35	SSE	0	12.2	71	15	ESE	1039.3	17.5	63	21	SE	1036.7
9/09/2011	18.4	5.2	31	SSE	0.2	10.2	91	8	SE	1041	17.1	60	21	SSE	1037
10/09/2011	19.3	3.6	26	SSE	0	11.3	77	13	NE	1038.2	17.4	55	13	W	1034.4
11/09/2011	21.5	2.8	35	NNW	0.2	14	89	0	Calm	1031.2	20.4	41	22	NW	1027.1
12/09/2011	20.7	7.8	57	NNW	0	18.1	59	22	NW	1021.4	19.1	59	31	NW	1019.1
13/09/2011	16.7	10.9	28	SW	1	13.4	75	5	SSE	1024.1	15.5	50	15	W	1022.4
14/09/2011	17.9	5.5	39	NNW	0	15.3	60	15	WNW	1021.3	16.9	67	15	N	1018.7
15/09/2011	18.3	12.6	41	WNW	24.6	15.2	82	18	W	1017.8	17.4	63	21	WNW	1016.2
16/09/2011	19	13.1	57	W	3.2	17.3	72	26	NW	1012.8	15.8	65	24	WNW	1010.7
17/09/2011	18.5	10.4	57	NW	1.2	14.8	62	13	NW	1012.6	15	73	31	NNW	1008.6
18/09/2011	15.6	9.6	67	WSW	28	12.1	71	18	SW	1003.8	13.8	56	33	W	1007.5
19/09/2011	17.8	8.8	52	SW	6.8	15	71	21	WSW	1019.1	15.8	72	18	W	1019.6
20/09/2011	19.4	13.9	57	NNW	1.2	17.6	69	26	NW	1018.9	17.6	68	31	NW	1016.5
21/09/2011	17.2	11.5	57	W	15.4	14.8	70	17	W	1010.4	14.6	62	30	WSW	1011.8
22/09/2011	15.5	6.7	31	SSW	3	12.3	63	11	SSE	1022.8	13.9	56	11	S	1022.4
23/09/2011	17.8	5.4	30	WNW	0	13.3	66	11	NNE	1025.7	15.8	49	13	W	1023.7
24/09/2011	18.8	4.3	33	NW	0	14.6	67	13	N	1021.7	16.7	61	21	NNW	1017.9
25/09/2011	19.2	8.9	42	WSW	2.4	15.9	80	17	NW	1014.3	16.5	69	21	WNW	1012.3
26/09/2011	14.7	10.2	46	WSW	7.8	11.8	66	17	SW	1011	13.9	53	18	WSW	1010.6
27/09/2011	14.2	9	57	SW	10.8	10.1	76	15	SW	1008.6	11.8	53	30	SW	1010.1
28/09/2011	17	6.4	31	WNW	2.2	13.6	66	8	NE	1018.3	15.2	51	13	W	1018.3
29/09/2011	18.5	8.9	28	S	0	13.8	70	13	N	1018.8	17.9	52	15	S	1017.6
30/09/2011	20.2	6.4	28	SE	0	13.9	73	13	E	1019.7	19.8	46	13	ESE	1016.3

Date	Daily observations						9am observations				3pm observations				
	Maximum (°C)	Minimum (°C)	Max Wind Gust (km/h)	Max Gust Direction	Precipitation (mm)	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Direction	MSL Pressure (hPa)	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Direction	MSL Pressure (hPa)
1/10/2011	23.4	6.9	26	W	0.2	15.1	68	15	E	1013.2	21.5	51	17	W	1009.6
2/10/2011	19.6	12.2	35	SSE	19	15.8	90	9	SE	1009.1	16.5	72	17	S	1008.2
3/10/2011	17.9	12.3	42	S	4	15.1	81	17	S	1013.9	16.4	76	18	S	1013.6
4/10/2011	18.2	12.6	31	W	0.2	15.3	59	4	W	1018.6	16.5	63	17	W	1017.3
5/10/2011	19.2	10.8	31	NNW	0	17	75	13	N	1019.9	16.1	79	11	WNW	1019.3
6/10/2011	19.9	8	26	WNW	0.8	16.7	78	5	ESE	1019.5	18.8	61	13	WSW	1017.2
7/10/2011	20.5	8.5	35	NW	0	16.8	78	13	N	1014.9	18.2	64	22	NW	1012.6
8/10/2011	17.4	10.6	52	SE	5	16	76	18	ESE	1015.5	13.4	99	18	SSE	1015.6
9/10/2011	18.9	12	42	SE	11.4	14.4	82	18	ESE	1021.3	17.9	72	24	SSE	1019.3
10/10/2011	20.9	8.2	42	SSE	0	14	70	15	ESE	1019.4	19	66	22	S	1015.8
11/10/2011	20.3	8.2	33	S	0	16.5	72	8	SSE	1015.3	19.3	68	18	S	1014.9
12/10/2011	18.6	11.1	41	WNW	0	15.9	57	8	N	1017.2	17.6	59	18	NNW	1014.3
13/10/2011	17.3	10.1	55	W	6.2	15.5	57	24	WSW	1012.3	16.9	51	22	WSW	1014.6
14/10/2011	19.1	12.1	42	WSW	0	15.8	80	18	WNW	1018.9	16.5	79	21	W	1019.9
15/10/2011	20.7	10.7	33	SSE	0.2	15.9	72	11	S	1024.9	18.8	60	21	SE	1022.3
16/10/2011	27.9	10.8	50	N	0.2	18.8	69	9	ESE	1015.5	26.7	39	22	NW	1010
17/10/2011	20.2	12.5	33	NW	0	16.8	78	8	N	1011.7	18.7	63	21	WNW	1010.9
18/10/2011	16.6	12.1	54	SSW	5.6	13.5	81	18	SSW	1014	15	61	24	S	1016.6
19/10/2011	18.1	4.5	28	SSW	1.8	15.4	57	11	S	1024.9	17	48	15	SSW	1024.2
20/10/2011	20.6	5	33	S	0.2	15.4	55	11	NNE	1026.4	19.6	52	21	SSE	1022.7
21/10/2011	24.8	6.9	33	SSE	0	17.2	60	11	ENE	1020.3	21.7	49	21	SE	1017.6
22/10/2011	23.3	12.5	42	SSE	0	17.1	72	21	SE	1013.2	19	73	18	SSE	1011.5
23/10/2011	19.8	14.2	54	SE	0.2	16.9	81	26	SSE	1017	16.7	76	31	SSE	1017.3
24/10/2011	19	11.7	41	E	1.8	13.6	93	15	SE	1020.4	18.1	61	26	E	1017.2
25/10/2011	22.4	12	30	SE	0	14.9	77	11	ESE	1014.4	21	51	13	E	1011.2
26/10/2011	22.2	13.2	24	W	0.2	16	78	11	SE	1011.4	21.8	67	13	W	1008.9
27/10/2011	20.3	12.7	39	S	1	16.3	99	21	SSE	1012.1	18.8	60	24	SSE	1013.6
28/10/2011	18.6	7.1	39	E	0.4	14.2	76	17	SE	1022.2	17.9	53	22	SSE	1021.3
29/10/2011	22.4	5.1	39	E	0.2	15.6	50	17	E	1023.7	21.9	35	17	E	1020.1
30/10/2011	24.3	8.8	41	S	0	19.3	47	13	ENE	1023.7	21.3	51	24	S	1021.9

Date	Daily observations					9am observations					3pm observations				
	Maximum (°C)	Minimum (°C)	Max Wind Gust (km/h)	Max Gust Direction	Precipitation (mm)	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Direction	MSL Pressure (hPa)	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Direction	MSL Pressure (hPa)
1/11/2011	28.6	12.2	41	SSE	0	21.5	55	11	E	1021.9	25	49	22	S	1018.2
2/11/2011	31.4	12.9	33	N	0	25.7	42	15	NNE	1014.7	30.7	32	5	N	1010.6
3/11/2011	25.6	18.8	48	NW	0	24	64	22	N	1006	18.6	92	13	NNW	1004.3
4/11/2011	21.1	15.7	37	WSW	13.6	18.1	77	15	SW	1005.4	18.7	67	18	W	1005.4
5/11/2011	21.6	13.1	31	WNW	3.6	17.2	79	5	SW	1007.9	19.8	54	13	SW	1007
6/11/2011	21.3	10.4	50	NW	0	18.7	52	17	WNW	1007.6	19.3	52	22	NW	1006.1
7/11/2011	21.4	14.6	68	W	0.8	16.8	83	24	NNW	1004.3	18.5	61	30	NW	1001.8
8/11/2011	17.7	11.2	59	WSW	8.4	14.4	55	28	W	1006	16.8	52	31	W	1008.8
9/11/2011	19.9	8			2.4	16.2	58	15	WSW	1017.2					
10/11/2011	20.5	14	33	NW		17.8	66	18	WNW	1018	19.5	64	17	WNW	1017
11/11/2011	21.6	11.6	30	SSW	0.8	17.4	58	4	SSW	1021.5	20.5	53	18	SW	1019.1
12/11/2011	21.9	7.4	44	W	0	18.5	66	17	W	1019.7	18.3	69	21	W	1017.7
13/11/2011	20.4	16.4	41	W	0.2	18.6	63	18	WSW	1015.9	17.7	74	22	W	1015.6
14/11/2011	21.7	15.4	46	SW	1.6	18.6	75	22	W	1016.1	18.9	53	24	SW	1017.7
15/11/2011	21.4	7.4	35	SSW	0.2	17.1	47	9	SE	1022.6	20	47	21	SSW	1018.6
16/11/2011	21.4	7.7	48	NW	0	18.4	54	15	NW	1012.7	20.4	59	22	NW	1010.6
17/11/2011	18.8	16	44	W	4.8	16.5	95	13	W	1007.9	15.3	94	17	WSW	1008.5
18/11/2011	20.4	9.2	35	W	6.8	13.8	75	13	SSW	1017.6	19.1	49	18	SW	1018.1
19/11/2011	21	6.7	35	SSE	0.2	16.8	49	15	SSE	1024.9	19.7	48	18	SE	1023
20/11/2011	22.3	7.7	39	S	0	18.3	56	11	ENE	1024.3	20.6	50	21	SSE	1022.1
21/11/2011	23.5	7.7	41	SE	0	18.2	59	18	E	1022.4	22.1	53	21	SE	1019.3
22/11/2011	27.5	11	26	S	0.2	19.5	63	15	NE	1019.7	25.8	49	17	SSE	1016.6
23/11/2011	32.2	12.4	61	N	0	27.4	29	37	N	1015.5	32.1	25	30	N	1014.7
24/11/2011	33.1	13.9	72	N	0	28.1	26	37	NNE	1012.1	31.9	23	46	N	1011.2
25/11/2011	23.8	15.7	31	SSW	0	22	56	11	W	1015.6	22	55	17	SSW	1016
26/11/2011	22	10.2	41	S	0	17.3	53	21	S	1019.6	20	35	22	S	1019.1
27/11/2011	21.2	7.8	35	S	0	16.3	49	17	E	1018.2	18.6	43	24	SSE	1015.1
28/11/2011	20	7.3	50	WSW	0	17.7	55	15	WSW	1012	18.1	59	21	W	1011
29/11/2011	19.3	8.5	50	SSE	1.8	16	47	22	S	1019.8	17.7	46	26	SSE	1020.7
30/11/2011	23.9	5.5	48	S	0	16	47	21	E	1024.2	21.8	41	24	SSE	1020.2

ANNEXURE 9: 'RED FLAG BURN' NOTIFICATION FOR BS520

RED FLAG BURN

NAME: ELLENBROOK

BURN ID: BS_520

LOCATION: Located within the Leeuwin-Naturalist National Park 1km south of the Gracetown Townsite.

This burn has high potential and/or high consequence for loss. The following must be considered:

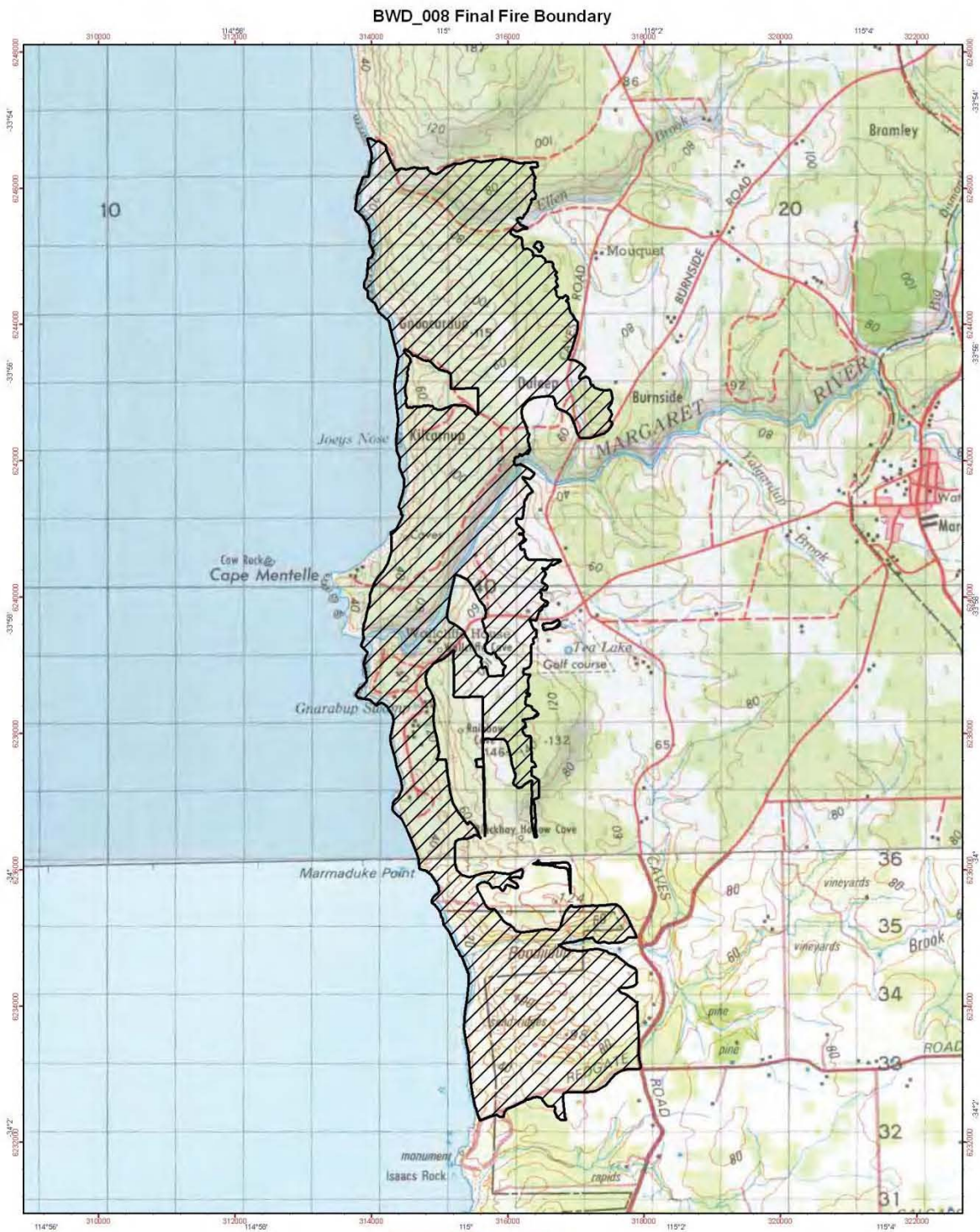
- Resource levels – check that adequate resourcing exists including additional units in reserve. Utilise experienced IMT members and Sector Commanders only
- Ensure high level of burn security – confirm depth of downwind edge and mop up to standard. Take every opportunity to mitigate risk of escape

This burn has the following issues:

1. High level of consultation and notification to the Gracetown Townsite. Significant public interest.
2. Numerous registered Highly Sensitive Indigenous sites and European Cultural Heritage sites in/ or adjacent to burn area.


• Resources Park Note &
Information to Gracetown
Community (in Addition to
Ellenbrook N/Board)

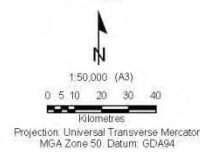
ANNEXURE 10: TOTAL FIRE BOUNDARY



Graticule shown at 2 minutes intervals
Grid shown at 2000 metre intervals

Legend

 BWD_008_Final_Boundary



Produced by Fire Management Services,
Department of
Environment and Conservation



Roads and tracks on land managed by DEC may contain unmarked hazards and their surface condition is variable. Exercise caution and drive to conditions on all roads.
The Dept. of Environment and Conservation does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

ANNEXURE 11: LIST OF HEARINGS

Date	Witness
13 December 2011	Bureau of Meteorology Mr G. Reader, Acting Regional Director, Western Australia Region Mr A. Burton, Acting Manager, Weather Services
15 December 2011	Shire of Augusta-Margaret River; Fire and Emergency Services Authority Mr B. Jordan, Community Emergency Services Manager
15 December 2011	Shire of Augusta-Margaret River Mr D. Holland, Deputy Chief Bush Fire Control Officer
15 December 2011	Shire of Augusta-Margaret River Mr R. Bootsma, Chief Bush Fire Control Officer
16 December 2011	Fire and Emergency Services Authority Mr J. Tillman, Regional Director, Lower South West Region
16 December 2011	Department of Environment and Conservation Mr G. Mair, District Manager, Blackwood District
19 December 2011	Mr A. Byrne, Resident, Margaret River
19 December 2011	Department of Environment and Conservation Mr G. Eikelboom, Assistant Operations Officer
19 December 2011	Department of Environment and Conservation Mr J. Prins, National Park Ranger
19 December 2011	Department of Environment and Conservation Mr B. Lullfitz, Flora Conservation Officer
19 December 2011	Fire and Emergency Services Authority Ms M. O'Connor, Bushland Mitigation Officer
20 December 2011	Department of Environment and Conservation Ms M. Manns, Sustainable Forest Management Coordinator
20 December 2011	Department of Environment and Conservation Mr J. Chick, Regional Leader, Sustainable Forest Management, South West Region
20 December 2011	Department of Environment and Conservation Mr S. Mills, Fire Operations Officer
4 January 2012	Mr J. Bradbury, Resident, Margaret River
4 January 2012	Mr J. Harrison, Resident, Margaret River
4 January 2012	Mr L. Rowe and Mrs C. Rowe, Residents, Redgate
4 January 2012	Department of Environment and Conservation Ms C. Forward, Conservation Officer
5 January 2012	Shire of Augusta-Margaret River; Cowaramup Bushfire Brigade Mr I. Earl, Deputy Shire President; Fire Control Officer

Date	Witness
5 January 2012	Department of Environment and Conservation Mr S. Tate, Acting District Works Coordinator, Blackwood District
5 January 2012	Department of Environment and Conservation Mr S. Blythe, Works Coordinator, Nannup Work Centre
6 January 2012	Department of Environment and Conservation Mr J. Carter, Acting Operations Manager
6 January 2012	Department of Environment and Conservation Mr M. Mitchell, Senior Fire Operations Officer
6 January 2012	Wallcliffe Volunteer Bushfire Brigade Mr B. Trunfull, Captain and Fire Control Officer, Prevelly
9 January 2012	Department of Environment and Conservation Mr P. Henderson, Regional Leader, Parks and Visitor Services, South West Region
9 January 2012	Department of Environment and Conservation Mr P. Gibson, Regional Fire Coordinator, South West Region
11 January 2012	Department of Environment and Conservation Mr B. Commins, Project Officer, Sustainable Forest Management
11 January 2012	Department of Environment and Conservation Mr R. Chandler, Regional Manager, South West Region
12 January 2012	Department of Environment and Conservation Mr M. Carter, Manager, Fire Management Services Branch
12 January 2012	Department of Environment and Conservation Mr K. McNamara, Director General
13 January 2012	Department of Environment and Conservation Mr T. Maher, Principal Fire Operations Officer
13 January 2012	Department of Environment and Conservation Mr G. Eikelboom, Assistant Operations Officer
16 January 2012	Department of Environment and Conservation Dr L. McCaw, Principal Research Scientist
16 January 2012	Department of Environment and Conservation Mr D. Boothey, District Fire Coordinator, Blackwood District
16 January 2012	Mr R. Klok, Resident, Margaret River
17 January 2012	Department of Environment and Conservation Mr J. Chick, Regional Leader, Sustainable Forest Management, South West Region
17 January 2012	Department of Environment and Conservation Mr P. Simmonds, National Park Ranger
17 January 2012	Department of Environment and Conservation Mr J. Nguyen, Spotter Pilot