



INDEPENDENT REVIEW  
OF THE EXTREME  
WEATHER EVENT  
SOUTH AUSTRALIA  
28 SEPTEMBER –  
5 OCTOBER 2016

Report presented to the  
Premier of South Australia

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## Table of Contents

|  |           |
|--|-----------|
| <b>Figures</b> .....   | <b>iv</b> |
| <b>Glossary</b> .....  | <b>v</b>  |
| <b>Acknowledgements</b> .....  | <b>ix</b> |
| <b>Executive Summary</b> .....   | <b>xi</b> |
| THE BLACK SYSTEM EVENT (a loss of power to the entire State).....                        | xi        |
| EMERGENCY MANAGEMENT – STRATEGIC AND OPERATIONAL – IN SOUTH AUSTRALIA.....               | xii       |
| OPERATIONAL RESPONSE AND COORDINATION.....   | xiii      |
| FLOOD RISK.....  | xiii      |
| Conclusion.....  | xiv       |
| <b>Recommendations</b> .....   | <b>xv</b> |
| <b>1. INTRODUCTION</b> .....   | <b>1</b>  |
| <b>2. REVIEW TERMS OF REFERENCE (TOR)</b> .....  | <b>3</b>  |
| <b>3. REVIEW METHODOLOGY</b> .....   | <b>6</b>  |
| <b>4. WEATHER</b> .....  | <b>7</b>  |
| <b>4.1 Severe thunderstorm and tornado outbreak, 28 September 2016</b> .....             | <b>7</b>  |
| <b>5. EVENT TIMELINE</b> .....   | <b>8</b>  |
| <b>6. A BUSY WINTER</b> .....  | <b>9</b>  |
| <b>7. A STATE WITHOUT POWER (BLACK SYSTEM EVENT)</b> .....                               | <b>11</b> |
| <b>7.1 SA Power supply</b> .....   | <b>11</b> |
| <b>7.2 The black system event</b> .....  | <b>12</b> |
| <b>7.3 Public information</b> .....  | <b>15</b> |
| <b>7.4 Industry</b> .....  | <b>16</b> |
| <b>7.5 Fuel</b> .....  | <b>17</b> |
| <b>7.6 Food and Retail</b> .....   | <b>18</b> |
| <b>7.7 Police and Emergency Services</b> .....   | <b>19</b> |
| State Emergency Services (SES) and Country Fire Service (CFS) State Control Centres..... | 20        |
| Police (SAPOL).....  | 20        |
| SA Ambulance (SAAS) .....  | 21        |
| Metropolitan Fire Service (MFS) .....  | 21        |
| <b>7.8 SA Water</b> .....  | <b>22</b> |
| <b>7.9 SA Health</b> .....   | <b>22</b> |
| Aged Care .....  | 23        |
| Emergency Management Arrangements.....   | 24        |
| <b>7.10 Department of Planning, Transport and Infrastructure (DPTI)</b> .....            | <b>25</b> |
| Traffic Management Centre (TMC) .....  | 26        |
| <b>7.11 Telecommunications (mobile)</b> .....  | <b>27</b> |
| ABC 891 Radio.....   | 29        |
| UHF / VHF radio .....  | 30        |
| Satellite phones .....   | 30        |

---

|  |           |
|--|-----------|
| National Broadband Network (NBN) .....                                       | 30        |
| South Australian Government Radio Network (SAGRN) .....                      | 31        |
| <b>8. IMPACT OF EXTREME WEATHER AND FLOODING .....</b>                       | <b>35</b> |
| <b>8.1 Damage assessment process .....</b>                                   | <b>37</b> |
| <b>9. FLOODING .....</b>   | <b>39</b> |
| <b>9.1 Dams .....</b>  | <b>41</b> |
| <b>9.2 Angus and Bremer Rivers .....</b>                                     | <b>43</b> |
| <b>9.3 Metropolitan rivers and creeks .....</b>                              | <b>45</b> |
| <b>9.4 Onkaparinga River .....</b>   | <b>46</b> |
| <b>9.5 Gawler and Para Rivers .....</b>                                      | <b>48</b> |
| <b>9.6 North of Gawler .....</b>   | <b>52</b> |
| <b>9.7 Naracoorte Creek .....</b>  | <b>54</b> |
| <b>9.8 Flood risk .....</b>  | <b>55</b> |
| <b>9.9 SA Flood Inquiries Taskforce and Flood Reform Taskforce .....</b>     | <b>56</b> |
| <b>9.10 Flood information system .....</b>                                   | <b>57</b> |
| <b>9.11 Intelligence .....</b>   | <b>57</b> |
| <b>9.12 Levees .....</b>   | <b>59</b> |
| <b>10. EMERGENCY RESPONSE .....</b>  | <b>61</b> |
| <b>10.1 Call receipt and dispatch .....</b>                                  | <b>61</b> |
| <b>10.2 Effective allocation of resources .....</b>                          | <b>62</b> |
| <b>10.3 Coordinating multiple agencies and many tasks .....</b>              | <b>63</b> |
| <b>10.4 Automatic Vehicle Location (AVL) and resource tracking .....</b>     | <b>65</b> |
| <b>10.5 Emergency services and response agencies .....</b>                   | <b>66</b> |
| <b>10.6 Interstate resources .....</b>                                       | <b>68</b> |
| <b>10.7 Sandbag activities .....</b>   | <b>70</b> |
| <b>10.8 Rescues from fast moving water .....</b>                             | <b>72</b> |
| <b>10.9 Traffic management .....</b>   | <b>74</b> |
| <b>11. EMERGENCY MANAGEMENT IN SOUTH AUSTRALIA .....</b>                     | <b>77</b> |
| <b>11.1 Emergency Management Act .....</b>                                   | <b>79</b> |
| <b>11.2 Prevention, Preparedness, Response and Recovery (PPRR) .....</b>     | <b>79</b> |
| <b>11.3 The Third 'R' - Resilience .....</b>                                 | <b>80</b> |
| Being Resilient - The need to do more in South Australia .....               | 80        |
| Resilience messages .....  | 82        |
| <b>11.4 Natural Disaster Resilience Program (NDRP) – Grant Funding .....</b> | <b>82</b> |
| <b>11.5 State Emergency Management Plan .....</b>                            | <b>83</b> |
| <b>11.6 Control agency for black system events .....</b>                     | <b>85</b> |
| <b>11.7 Emergency Management Council .....</b>                               | <b>85</b> |
| <b>11.8 The State Emergency Management Committee .....</b>                   | <b>87</b> |
| <b>11.9 Advisory Groups/Committees .....</b>                                 | <b>87</b> |
| State Mitigation Advisory Group (SMAG) .....                                 | 87        |
| State Response Advisory Group (SRAG) .....                                   | 88        |
| State Recovery Committee (SRC) .....   | 88        |
| State Public Information and Warnings Advisory Group (SPIWAG). .....         | 89        |
| <b>11.10 Assurance .....</b>   | <b>90</b> |

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|       |  |            |
|-------|--|------------|
| 11.11 | Emergency Control and Coordination Centres .....   | 91         |
| 11.12 | State Crisis Centre.....   | 91         |
| 11.13 | State Emergency Centre .....   | 92         |
| 11.14 | Role of Emergency Management Australia and Defence.....  | 94         |
| 11.15 | Zone Emergency Management Centres (ZECs), now Zone Emergency Support<br>Teams (ZESTs) under the December 2016 SEMP ..... | 95         |
| 12.   | <b>STATE EMERGENCY MANAGEMENT AND INCIDENT MANAGEMENT.....</b>   | <b>97</b>  |
| 12.1  | Control Centres.....   | 97         |
| 12.2  | Incident information systems (electronic systems) .....  | 99         |
| 12.3  | Incident management systems (people management systems) .....  | 101        |
| 12.4  | Personnel for incident and emergency management roles .....  | 103        |
| 12.5  | Fatigue management.....  | 104        |
| 12.6  | Rostering and availability .....   | 105        |
| 12.7  | Mapping Functional Support Group as a potential model for resourcing .....   | 107        |
| 12.8  | Training and accreditation .....   | 108        |
| 12.9  | Exercising .....   | 110        |
| 12.10 | Debriefs and lessons management .....  | 110        |
| 13.   | <b>PUBLIC INFORMATION .....</b>  | <b>113</b> |
| 13.1  | Public information functional support group .....  | 114        |
| 13.2  | Messages .....   | 114        |
| 13.3  | Communication tools .....  | 115        |
| 13.4  | Emergency Alert – a multi-agency capability .....  | 117        |
| 13.5  | Community liaison and information .....  | 118        |
| 13.6  | Relief and recovery information .....  | 119        |
| 13.7  | Continuity of public information throughout PPRR phases .....  | 120        |
| 14.   | <b>EMERGENCY RELIEF AND RECOVERY.....</b>  | <b>122</b> |
| 14.1  | Relief centres .....   | 122        |
| 14.2  | Relief funding and loss of power grant .....   | 124        |
| 14.3  | Homelessness Code Blue response .....  | 126        |
| 14.4  | Outreach to the community .....  | 126        |
| 14.5  | Red Cross.....   | 127        |
| 14.6  | Recovery Centre (Virginia).....  | 127        |
| 14.7  | Assistant State Coordinator Recovery.....  | 128        |
| 14.8  | Public health .....  | 129        |
| 14.9  | Waste management .....   | 129        |
| 14.10 | Natural Disaster Relief and Recovery Arrangements.....   | 130        |
| 15.   | <b>AN ALTERNATIVE MODEL FOR CONSIDERATION.....</b>   | <b>134</b> |
| 15.1  | South Australian Emergency Management Office.....  | 134        |
| 15.2  | State Relief and Recovery Office .....   | 135        |
| 16.   | <b>BIBLIOGRAPHY .....</b>  | <b>138</b> |
| 17.   | <b>ADDITIONAL REPORTS ALSO CONSIDERED .....</b>  | <b>141</b> |
|       | Legislation .....  | 143        |
| 18.   | <b>ATTACHMENTS .....</b>   | <b>145</b> |
|       | Attachment 1 – SA Health Flinders Medical Centre Standby Power Electrical Systems<br>Post-incident Review, AURECON.....  | 145        |

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|   |     |
|---|-----|
| Attachment 2 – Port Augusta Generator Failure Investigation Report, Systems Solutions Engineering .....   | 145 |
| Attachment 3 – Australian Government, Bureau of Meteorology, Severe thunderstorm and tornado outbreak South Australia 28 September 2016 .....     | 145 |
| Attachment 4 – Submission to Independent Review of the Extreme Weather Event South Australia 28 September – Dennis Mulroney and Peter Schar ..... | 145 |

## Figures

|   |     |
|---|-----|
| Figure 1 - Sequence of severe weather events from May - October 2016.....                         | 9   |
| Figure 2 – Damage to Port Victoria jetty.....   | 36  |
| Figure 3 - Flood affected catchments - locality map - 4/10/2016 - DEWNR mapping support team..... | 40  |
| Figure 4 - Beerenberg dam, Hahndorf (DEWNR) .....   | 41  |
| Figure 5 - Dam at Hahndorf (DEWNR).....   | 41  |
| Figure 6 - Angas River (DEWNR)      Figure 7 - Bremer River, Callington Road (DEWNR) .....        | 43  |
| Figure 8 - Langhorne Creek (DEWNR) .....  | 44  |
| Figure 9 - Strathalbyn town centre (DEWNR).....   | 45  |
| Figure 10 - River Torrens in flood, Felixstow .....   | 45  |
| Figure 11 – Verdun township (DEWNR).....  | 46  |
| Figure 12 - Shillabeer Road, Oakbank .....  | 47  |
| Figure 13 - Mt Bold Reservoir water outflows (DEWNR) .....  | 48  |
| Figure 14 - South Para (DEWNR)      Figure 15 - North Para River, Turretfield dam (DEWNR) .....   | 49  |
| Figure 16 - Gawler River break outs (DEWNR).....  | 50  |
| Figure 17 - Gawler River - Flood Map (DEWNR mapping support team) .....                           | 51  |
| Figure 18 - Wakefield River at Balaklava, including Balaklava hospital (DEWNR).....               | 52  |
| Figure 19 - Wakefield River, looking south towards Port Wakefield (DEWNR) .....                   | 53  |
| Figure 20 - Naracoorte airport (DEWNR) .....  | 54  |
| Figure 21 - Footbridge at Naracoorte Creek.....   | 54  |
| Figure 22 - Minister Malinauskas addressing SES crews .....                                       | 68  |
| Figure 23 – information about how to fill and lay sandbags .....                                  | 70  |
| Figure 24 - Sand-bagging at Two Wells staging area.....   | 71  |
| Figure 25 - Queensland 'if it's flooded, forget it' campaign.....                                 | 73  |
| Figure 26 - Excerpt from sa.gov.au emergency section of the website.....                          | 74  |
| Figure 27 - Weather briefing in the SES SCC .....   | 97  |
| Figure 28 - Community meeting at Virginia .....   | 118 |
| Figure 29 – Information on mosquito control after floods and storms, in Khmer .....               | 120 |
| Figure 30 - Emergency relief information .....  | 124 |

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## Glossary

The following abbreviations and terms are used within this document.

| <b>Term</b> | <b>Description</b>  |
|-------------|---|
| ACMA        | Australian Communications and Media Authority                           |
| AEMC        | Australian Energy Market Commission                                     |
| AEMO        | Australian Electricity Market Operator                                  |
| AFAC        | Australasian Fire and Emergency Service Authorities Council             |
| AGM         | Annual general meeting  |
| AIDR        | Australian Institute of Disaster Resilience                             |
| AIIMS       | Australasian Inter-service Incident Management System                   |
| ALERTS      | Adtec Linked Emergency Response Telephone System                        |
| ANCOLD      | Australian National Committee on Large Dams                             |
| ANZCTC      | Australia-New Zealand Counter Terrorism Committee                       |
| ANZEMC      | Australia-New Zealand Emergency Management Committee                    |
| ATM         | Automatic Teller Machine  |
| AVL         | Automatic Vehicle Location  |
| BCP         | Business Continuity Plan  |
| BoM         | Bureau of Meteorology   |
| CALD        | Culturally and Linguistically Diverse                                   |
| CBD         | Central Business District   |
| CEWT        | Central Exercise Writing Team   |
| CFS         | Country Fire Service  |
| CIMS        | Critical Incident Management System (SAPOL System)                      |
| COAG        | Council of Australian Governments                                       |
| Comcen      | SA Metropolitan Fire Service Communications Centre                      |
| CRIMSON     | Critical Resource Incident Information Management System Online Network |
| CSIRO       | Commonwealth Scientific and Industrial Research Organisation            |
| DASP        | Damage Assessment Support Plan  |
| DCSI        | Department of Communities and Social Inclusion                          |
| DECD        | Department of Education and Child Development                           |
| DEWNR       | Department of Environment, Water and Natural Resources                  |
| DPC         | Department of the Premier and Cabinet                                   |
| DPTI        | Department of Planning, Transport and Infrastructure                    |
| DSD         | Department of State Development   |
| EARS        | Emergency Assessment Reporting System                                   |
| EEP         | Eastern Eyre Peninsula  |
| EFTPOS      | electronic funds transfer point of sale                                 |
| EM          | emergency management  |

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|        |  |
|--------|--|
| EMC    | Emergency Management Council                             |
| ESO    | emergency services organisation                          |
| ESP    | essential services power                                 |
| FMC    | Flinders Medical Centre                                  |
| FRT    | Flood Reform Taskforce                                   |
| GIS    | Geospatial Information System                            |
| GPS    | Global Positioning System                                |
| IAP    | Incident Action Plan                                     |
| IC     | Incident Controller                                      |
| ICC    | Incident Control Centre                                  |
| ICCS   | Incident Command and Control System                      |
| ICS    | Incident Control System                                  |
| ICT    | Information, Communication and Technology                |
| IMT    | Incident Management Team                                 |
| IRT    | Impact Recording Tool                                    |
| IVR    | Interactive Voice Recording                              |
| kV     | Kilovolt   |
| LGA    | Local Government Association                             |
| LGDRAG | Local Government Disaster Recovery Assistance Guidelines |
| LRC    | Local Recovery Committee                                 |
| MFS    | Metropolitan Fire Service                                |
| MFSG   | Mapping Functional Support Group                         |
| MoU    | Memorandum of Understanding                              |
| MST    | Mapping Support Team                                     |
| MW     | MegaWatts  |
| NDRP   | National Disaster Resilience Program                     |
| NDRRA  | Natural Disaster Relief and Recovery Arrangements        |
| NDSR   | National Strategy for Disaster Resilience                |
| NEM    | National Electricity Market                              |
| NERAG  | National Emergency Risk Assessment Guidelines            |
| NGOs   | Non-government organisations                             |
| NOCC   | Network Operations Control Centre (SAGRN)                |
| NRM    | Natural Resources Management                             |
| NSDR   | National Strategy for Disaster Resilience                |
| ODG    | Office for Digital Government                            |
| PC     | Productivity Commission                                  |
| PLS    | Patawolonga Lake System                                  |
| PCB    | Police Communications Building                           |
| PFCP   | Police forward command post                              |

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|         |   |
|---------|---|
| PIFSG   | Public Information Functional Support Group                     |
| PIRSA   | Department of Primary Industries and Regions SA                 |
| POC     | Police Operations Centre  |
| PPC     | Personal Protective Clothing                                    |
| PPRR    | Prevention, Preparedness, Response, Recovery                    |
| PV      | Photovoltaic  |
| RCC     | Regional Coordination Centre                                    |
| RDO     | Regional Duty Officer   |
| SA      | South Australia   |
| SAAS    | South Australia Ambulance Service                               |
| SACFS   | South Australia Country Fire Service (see also CFS)             |
| SAFECOM | South Australian Fire and Emergency Services Commission         |
| SAGRN   | South Australian Government Radio Network                       |
| SAHEMS  | South Australia Health Emergency System                         |
| SAMFS   | South Australia Metropolitan Fire Service (see also MFS)        |
| SAPN    | South Australia Power Networks                                  |
| SAPOL   | South Australian Police   |
| SASESVA | South Australia State Emergency Service Volunteers' Association |
| SCC     | State Control Centre  |
| SDO     | State Duty Officer  |
| SEC     | State Emergency Centre  |
| SEICCC  | State Emergency Information Call Centre Capability              |
| SEMC    | State Emergency Management Committee                            |
| SEMP    | State Emergency Management Plan                                 |
| SEMPO   | State EM Planning Officer                                       |
| SEMTO   | State EM Training Officer                                       |
| SES     | State Emergency Service   |
| SESIIMS | SASES Incident Information Management System                    |
| SIMT    | State Incident Management Teams                                 |
| SMAG    | State Mitigation Advisory Group                                 |
| SPIWAG  | State Public Information and Warnings Advisory Group            |
| SRAG    | State Response Advisory Group                                   |
| SRC     | State Recovery Committee  |
| SRRO    | State Relief and Recovery Office                                |
| SSP     | State Support Package   |
| TMC     | Traffic Management Centre                                       |
| TOR     | Terms of Reference  |
| UHF     | Ultra High Frequency (radio frequency)                          |
| UPS     | Uninterrupted Power Supply                                      |

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|      |                                       |
|------|---------------------------------------|
| VHF  | Very High Frequency (radio frequency) |
| ZEC  | Zone Emergency Centre                 |
| ZEMC | Zone Emergency Management Committee   |
| ZEMP | Zone Emergency Management Plan        |

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|   |   |
|---|---|
| Adelaide Airport Ltd                            | Department for the Environment, Water and Natural Resources                 |
| Adelaide City Council                           |   |
| Australian Energy Market Operator               | Department of Communities and Social Inclusion                              |
| Aged Care Industry Association                  |   |
| Aldridge Traffic Controllers Pty Ltd            | Department of Planning, Transport and Infrastructure                        |
| Alexandrina Council                             | Department of Primary Industries and Regions SA                             |
| Attorney General's Department                   |   |
| Australian Energy Regulator                     | Department of State Development   |
| BHP Billiton (Olympic Dam)                      | Department of the Premier and Cabinet                                       |
| BNJ Group - Management Consultants Logistics    | Department of Treasury and Finance  |
| Broadcast Australia                             | District Council of Kimba   |
| Bureau of Meteorology                           | ElectraNet  |
| Bushfires SA Assistance                         | Emergency Management Committee  |
| Business SA                                     | Emergency Management Council  |
| Cavpower - Power Systems - Regency Park         | Environment Protection Authority  |
| City of Holdfast Bay                            | Eyre Peninsula Local Government Association                                 |
| City of Tea Tree Gully                          | Eyre Peninsula Mineral and Energy Resources Community Development Taskforce |
| Coorong District Council                        |   |
| Correctional Services                           | Flinders Fertility  |
| Country Fire Service                            | Flinders Medical Centre   |
| Country Fire Service Volunteers Association     | Gawler River Flood Authority  |
| Department for Communities and Social Inclusion | Grains Research and Development Corporation                                 |
| Department for Education and Child Development  | Green Industries SA   |
| SA Health                                       | KordaMentha   |
|   | Local Government Association  |

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|  |  |
|--|--|
| Local Government Business Services   | Royal Adelaide Hospital                                      |
| Lower Eyre Health Advisory Council   | SA Ambulance Service   |
| Member for Flinders, Mr Peter Treloar MP   | SA Fire and Emergency Services Commission                    |
| Minister for Agriculture, Food and Fisheries, The Hon Leon Bignell MP  | SA Metropolitan Fire Service                                 |
| Minister for Communities and Social Inclusion, The Hon Zoe Bettison MP   | South Australian Police                                      |
| Minister for Health, The Hon Jack Snelling MP  | SA Power Networks  |
| Minister for Police, Minister for Emergency Services, The Hon Peter Malinauskas MLC  | SA State Emergency Service                                   |
| Minister for Regional Development; Minister for Local Government, The Hon Geoff Brock MP                                   | SA State Emergency Service Volunteer's Association           |
| Minister for Sustainability, Environment and Conservation; Minister for Water and the River Murray, The Hon Ian Hunter MLC | SA Tourism   |
| Minister for Transport and Infrastructure, The Hon Stephen Mullighan MP  | SA Water   |
| Nyrstar  | Shadow Minister for Emergency Services, Duncan McFetridge MP |
| Office for Digital Government  | South Australian Wine Industry Association Incorporated      |
| Optus  | State Emergency Management Committee                         |
| Port Lincoln City Council  | State Emergency Services                                     |
| Port Pirie Regional Council  | State Mitigation Advisory Group                              |
| Premier of South Australia   | Stockport Peak Body Community Association                    |
| Queensland Reconstruction Authority  | Town of Walkerville  |
| Red Cross  | Treasurer, The Hon Tom Koutsantonis MP                       |
| Regional Development Australia Far North   | Vodafone   |
|  | Western Adelaide Zone Emergency Management Committee         |

Over 300 individuals provided information to the Review

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## Executive Summary

On 28 September 2016, South Australia experienced an extreme weather event which brought thunderstorms, destructive winds, large hailstones and heavy rain.

Between 3.00pm and 4.00pm tornados moved across the State, primarily in the Mid-North, which damaged 23 transmission towers and at 3.48pm triggered a State-wide power outage – a black system event.

Whilst power was restored to Adelaide and its environs within several hours, large areas of the State remained without power for several days.

There was significant loss to businesses and the community caused by the consequences of the loss of power and the damage inflicted by wind, rain, hail, flooding and storm surge.

This weather event was forecast well before it eventuated and public warnings had been issued. State emergency arrangements were in place and appropriate briefings had been provided to the Emergency Management Council in the lead up to, and during the event.

At 5.30pm, the State Coordinator declared the event a 'Major Incident' and the Chief Executive of the Department of Communities and Social Inclusion was appointed as Assistant State Coordinator Recovery.

An Independent Review (Review) was commissioned by the Premier of South Australia, The Honourable, Jay Weatherill, MP on Tuesday 4 October 2016. The objectives included to review: the emergency management response to the impacts caused by the extreme weather; the response to and management of the impacts of the State-wide power outage; and, the adequacy of the State's prevention, preparedness, response and recovery arrangements.

A number of other enquiries have been established to examine the electrical power issues associated with the State-wide power outage.

While emergency services dealt the myriad of tasks associated with the extreme weather, they were concurrently also required to deal with the consequences of a black system event.

Whilst most people were following safety advice and taking shelter from the storm to ensure their own well-being; emergency services, police, State government and local government employees, telecommunications and power network personnel, non-government organisations and volunteers were out in this weather or in various control, coordination or relief centres providing assistance to the community of South Australia.

Further, many volunteers, as they regularly do, put their lives on hold to assist the community. They worked long hours and many were then required to return to their usual paid employment with little rest or respite.

Essentially, there are four key themes covered by the review, all being referenced against South Australia's emergency management arrangements, being: the black system event, operational response and coordination, flood risk, and emergency management arrangements.

### **THE BLACK SYSTEM EVENT (a loss of power to the entire State).**

The significance of wide-spread power loss over several hours and in some areas days, identified new challenges for State and local governments, businesses, and individuals. There were problems associated with loss of power, including; access (lack of) to food, medications, fuel, credit card payments, cash, telecommunications, essential home appliances and water.

Many business continuity plans (BCPs) across the business sector and within government departments including emergency services, proved to be inadequate. BCPs lacked contingencies for back-up power or the planned contingencies failed.

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There are established emergency plans to manage shortages of electricity, fuel and gas in South Australia. However, there is no plan for or wide spread, extended duration power outage and the associated consequences.

The egress of thousands of people from the Adelaide Central Business District (CBD) in a relatively short period of time was orderly despite the frustrations of access to public transport, inoperative traffic lights, traffic congestion, and poor weather and road conditions. However, it highlighted a need for an evacuation plan for the CBD and backup power for traffic lights to achieve a rapid exit from the CBD through identified traffic corridors.

The role of all communications including mobile tele-communications during emergencies is critical. Mobile phone towers have limited backup power or maybe overwhelmed which can result in communications difficulties and inability to access services such as Triple Zero (000). The National Broadband Network may add further complications to home users during emergencies due to the handset's reliance on electrical power.

A State plan to manage information, communication and technology (ICT) failure, particularly mobile communications, needs to be developed. The plan needs to include contingencies for when mobile telecommunications are unavailable.

Businesses and individuals should also assess their circumstances and develop or amend their own business continuity plans or individual safety plans accordingly.

## **EMERGENCY MANAGEMENT – STRATEGIC AND OPERATIONAL – IN SOUTH AUSTRALIA.**

South Australia's primary emergency legislation is the *Emergency Management Act 2004* (amended July 2006) which provides a basis for the establishment of emergency arrangements in this State. Four key principles which underpin the Act and emergency management are Prevention, Preparedness, Response and Recovery.

The State Emergency Management Plan (SEMP), is the primary plan to manage emergencies and is supported by a range of other plans and operating manuals at State and departmental level.

The response phase of an emergency is the phase that is most visible. During this emergency, responders provided a highly professional and capable response, under very trying conditions. Emergency services are generally well-equipped and trained, and have gained experience during past emergencies.

The various command, control and coordination centres performed well, but there are opportunities to improve their capability and capacity to support those in the field. There were issues concerning planning, staffing, fatigue and roster management, knowledge of role and function, training, exercising, interoperability of information management systems and the condition of the centres themselves have been identified in this review and recommendations made to improve these aspects.

Because this event was declared a 'Major Incident' by the State Coordinator an Assistant State Coordinator Recovery was appointed, and a recovery operation implemented, predominately focussed on the market gardens at Virginia. A Local Recovery Coordinator was also appointed.

The timing and the administration of the Loss of Power Grant, caused considerable consternation, not only with potential recipients, but also with those involved in emergency relief and recovery. Members of the community overwhelmed help lines with enquiries. Emergency relief centres became congested and the ability of these centres to effectively provide physical support and comfort to those seeking relief was severely hampered.

It would seem that recovery operations in South Australia are somewhat ad-hoc and inconsistent in the manner in which they are identified and carried out.

The Review proposes an alternative model for emergency relief and recovery to make these aspects of emergency management more effective and efficient.

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It is in prevention and preparedness that significant gains can be made by improving South Australia's ability to withstand, or minimise the consequences of, events of this nature. It is not the domain of government alone, but also the responsibility of the broader community, business, and individuals to participate through shared-responsibility and develop their own resilience.

Resilience is often talked about; there is a national strategy agreed by the Council of Australian Governments (COAG), and whilst there is mention of it in plans and documents, it would appear that at this time, it is insufficient and requires a concerted effort to develop strategies, operationalise them and achieve government, community and public 'buy-in'.

The guiding principles of the *Emergency Management Act 2004*, are that the emergency management arrangements must: be based on an all hazards approach in addressing emergency prevention, preparedness, response and recovery; reflect the collective responsibility of all sectors of the community; and, recognise that effective arrangements require a co-ordinated approach from all sectors of the community.

Whilst the Act recognises that all sectors of the community, including local and State government, non-government organisations and individuals have a role to play, it is another thing to achieve those objectives. This is made particularly difficult with the disparate State of South Australia's structural arrangements and the lack of a robust assurance framework. The State government needs to commit to the strategic development of emergency management in South Australia to enable and develop a more holistic, cohesive approach to prevention, preparedness, response and recovery.

The Review proposes changes to the State Emergency Management Plan, continued development of an assurance framework and a new structural model to provide a point of focus for emergency management. This could be achieved by consolidating core components into one agency (the South Australian Fire and Emergency Services Commission) and placing all components (prevention, preparedness, response and recovery) of emergency management under one Responsible Minister (The Minister for Police and Emergency Services).

## OPERATIONAL RESPONSE AND COORDINATION

The SES is the Control Agency for a severe weather event and together with the CFS, MFS, SAPOL, DEWNR, PIRSA, local government/councils and the ADF provided the core operational response, in very difficult circumstances.

The response and coordination of operational crews from the emergency services was generally well-managed.

With events of this scale, complexity and duration there will always be opportunities for improvement. Some of the challenges that need to be addressed by response agencies include: managing the number of calls for assistance from the public; prioritisation, allocation and coordination of hundreds of tasks across multiple agencies; and, tracking operational resources such as vehicles during emergencies to ensure efficient and effective resource allocation.

Incident management is another area where improvements could be made such as: State control centre facilities upgrades; upgrade of connectivity to, and facilities of, incident control centres; better coordination and management of incident management and emergency management personnel; and, consistent training, exercising and development of those personnel.

## FLOOD RISK

Flooding is the most costly natural disaster in South Australia, currently average annual damages from flooding in the State in exceed \$32 million.

The significant rain event which commenced on 28 September 2016, occurred on an already saturated environment so even the smallest amount of rain would produce runoff with almost no loss. As little as 5mm of rain resulted in almost instantaneous spikes in river levels at gauges. All catchments in SA were effected.

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Adelaide is built on a natural floodplain and there are many dwellings situated within known flood risk areas. Despite historical impacts, many places and communities in South Australia are not well adapted to floods. The time between floods and the fragmentation of responsibilities between councils, State Government, the Commonwealth and private land owners creates barriers to agreement on collective action to adapt to floods and the changing risk profile.

In SA there is currently very little dam safety legislation and governance and no provisions for how a dam is designed or constructed with regard to safety risk, nor any ongoing supervision to ensure dams are properly maintained. The challenges with identification and management of dams have been raised in previous reports. The increased level of risk that was evident during this event, and the impact on responders and the community, reinforces the need for policy development in relation to dam safety.

The flood intelligence activities undertaken by DEWNR during this event highlighted a number of gaps in information which impede the ability of hydrologists to predict potential flooding and the ability of the SES to warn the community and respond effectively to flooding. The two main information gaps are gaps in flood risk information (flood studies) and gaps in flood monitoring (rainfall and river level gauges). Both of these information sources are critical for understanding the vulnerability of a community to flooding, its likely impacts, and the severity of the flood in real time.

A recommendation of the SA Flood Inquiries Taskforce (DEWNR, 2012) was to 'clarify responsibilities for management of watercourse, levee banks and other infrastructure in relation to flooding'.

During this event many levees were overtopped and lost their structural integrity causing widespread flooding in areas they were designed to protect. There is also evidence in the aftermath of this event, of landholders creating new levees to protect their properties for future flooding vents without seeking any approval or giving appropriate consideration of where re-directed water would impact further downstream.

## Conclusion

When reading this Review, and considering the comments and recommendations made; do not forget that the overall assessment of the Review was that this State-wide, complex event was in general, well-managed, with coordinated, effective response and recovery operations put in place.

Government departments and other organisations have undertaken their own reviews and, in the case of the Department of Health and Ageing, sought independent investigations into generator failures at Flinders Medical Centre and Port Augusta Hospital. Many of the actions and recommendations contained within these reviews are already being implemented.

Those who were involved assisting South Australians during the response and recovery phases of the extreme weather and black system event deserve praise for their efforts, their dedication and commitment.

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## Recommendations

- Recommendation 1. That relevant agencies, such as the Department of State Development, SA Police and emergency services, collaborate to establish an education campaign to encourage businesses in South Australia to develop Business Continuity Plans which, among other potential hazards such as flood and fire, also take into account the potential impact of an extended power outage.
- Recommendation 2. That SA Health, develop an emergency plan to manage an extended power outage or black system event which, in addition to the requirements outlined in recommendation 16:
- a) includes a process for identification and registration of vulnerable persons in the community to ensure an effective support is provided
  - b) enables access to pharmaceutical medicines for at risk persons
  - c) provides for the support of individuals with equipment in their homes to support their own health e.g. oxygen equipment
- Recommendation 3. That SA Health undertake a review of their emergency management arrangements. Health State Controllers should be consulted during this review and arrangements should be consistent throughout the department and across the State and compatible with State emergency management arrangements and information systems
- Recommendation 4. That the Department of Planning, Transport and Infrastructure review their Business Continuity Plan to:
- a) minimise the loss of public transport services
  - b) ensure ongoing fuel supply
  - c) improve public information e.g. electronic signage on buses, about alternative transport arrangements when there is a significant disruption to operations.
- Recommendation 5. That SA Police develop an evacuation plan for the Adelaide Central Business District (CBD) which includes:
- a) a Traffic Management Plan to assist in the movement of persons and vehicles away from the CBD
  - b) protocols for the early placement of a SA Police liaison officer within the Traffic Management Centre.
- Recommendation 6. Install UPS on traffic lights on main Central Business District (CBD) and arterial roads to allow an effective movement of traffic during a loss of power.
- Recommendation 7. That a State Plan be developed for managing the consequences of a black system event or other major power outage. The plan should include:
- a) public information strategies including providing advice on: the extent of the outage; anticipated and worst-case time frames for power restoration; services impacted by the outage; and, information about contingencies and actions by local and State government to provide support
  - b) identification of key providers that will supply fuel to emergency services and other critical services (vehicles and generators)

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- c) identification of priorities for provision of fuel and restoration of power
- d) arrangements for purchase of essentials, for government agencies and the public, when electronic payment systems fail; and
- e) arrangements for obtaining and distributing food.
- Recommendation 8. In order to increase resilience and public safety during emergencies, the State Emergency Management Committee should request the Australia and New Zealand Emergency Management Committee to place on the agenda, and consider establishing a national position, on redundancies for mobile communications (including phone tower back-up power) and the National Broadband Network.
- Recommendation 9. That the Office for Digital Government, in close partnership with telecommunications companies (e.g. Telstra, Optus, Vodaphone), develop a Control Agency Plan for Information and Communication Technology including mobile communications. The plan should consider:
- a) provision of back-up power to priority infrastructure
- b) back-up equipment requirements e.g. satellite phones for government ministers (including training and other support)
- c) potential impact on the National Broadband Network on emergency services when there is an extended power outage / black system event
- d) arrangements with commercial mobile network carriers to ensure emergency and support services have priority access to available mobile networks; and
- e) contingencies to ensure ongoing functionality of the Broadcast Australia network
- Recommendation 10. Consider bringing other agencies onto the SA Government Radio Network, in particular, Department of Education and Child Development and local government, to support more effective coordination and provide a reliable communications contingency during emergencies.
- Recommendation 11. Deliver consistent and regular training in the use of the SA Government Radio Network to all users to maximise the efficiency and effectiveness of the network in times of emergency e.g. reduce the issues associated with network busy signals.
- Recommendation 12. Identify, document and communicate contingency arrangements and procedures for emergency services in the event SA Government Radio Network paging is turned off to conserve power, or other loss of paging capacity.
- Recommendation 13. That the Attorney General's Department consult with local government regarding potential for them to provide logistical support associated with backup power supply to SA Government Radio Network towers in the event of an emergency.
- Recommendation 14. That the glossary of terms in the State Emergency Management Plan be reviewed to ensure all relevant language is included. All agencies need to ensure the use of clear communication and accurate use of terminology, including in describing the status of critical services e.g.
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- Triple Zero (000), SA Government Radio Network, electrical and water supplies and infrastructure.
- Recommendation 15. That Attorney General's Department explore options to overcome fatigue and welfare issues of SAGRN staff associated with emergency events of extended duration.
- Recommendation 16. That SA Police, emergency services, health facilities, utility providers and other key service providers, review their Business Continuity Plans giving consideration to factors such as:
- a) identification of: business critical needs; essential services power requirements; back-up power requirements for all facilities including State, regional and local facilities such as Police, SES, MFS and CFS stations; the need for any arrangements for back-up power to be included in contracts for design and or lease of Government premises
  - b) contingencies for black system events and extended power outages
  - c) regular back-up generator testing regime protocols, including testing under load and for long durations
  - d) contingencies for communications when mobile, landline and/or radios are not operational e.g. satellite phones; and
  - e) alternative State control centre facilities that are pre-identified, equipped and have procedures for moving to the alternative facility.
- Recommendation 17. Continue development of the Damage Assessment Support Plan to:
- a) integrate data produced from Control Agency Stage One Assessment into the Stage Two Assessment
  - b) develop a capability to undertake Stage Four Assessments which includes assessment of impacts to infrastructure, agriculture, businesses and the economy; and
  - c) consult with the Local Government Association regarding how/if their Emergency Assessment Reporting System (EARS) data can be utilised in the damage assessment process.
- Recommendation 18. That the Flood Reform Task Group, as proposed by the Department of Environment, Water and Natural Resources, develop a business case for Cabinet, based on the dam safety discussion paper (Pisaniello & Tingey-Holyoak, 2016) which identifies options and a way forward to address dam safety in SA.
- Recommendation 19. That, giving consideration to the previous recommendation, the Flood Reform Response Working Group identify and consider appropriate agency involvement and protocols for response to and management of dams which are in danger of losing their structural integrity or spilling.
- Recommendation 20. That the Flood Reform Task Group identify an appropriate mechanism for stakeholder agencies (including the State Emergency Service, Department of Environment and Natural Resources, Bureau of Meteorology and SA Water, as a minimum) to share data and information and develop plans and strategies for management of water levels in reservoirs and spill management during floods in South Australian water catchments.
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- Recommendation 21. That consideration and resources be given to support the implementation of recommendations in the report prepared on behalf of Department of Environment, Water and Natural Resources (Australian Water Environments, 2016), for flood warning classification of stream gauges and other locations.
- Recommendation 22. That resources be provided to support the implementation of recommendations in the South Australian Levee Bank Management Issues Paper (DEWNR, 2015) including:
- a) development of relevant policy; and
  - b) identification of responsibilities in relation to levee management and flood mitigation
- Recommendation 23. That the SES in collaboration with MFS Communications Centre (Comcen) investigate and implement options to reduce the number of calls coming into the Comcen, (particularly on 132500). Options could include better utilisation of the available options on the Interactive Voice Recording and community education to increase community resilience.
- Recommendation 24. Engage an independent business analyst to review the current call, receipt and dispatch process for emergency services i.e. the Metropolitan Fire Service, Country Fire Service and State Emergency Service, from the initial call for assistance through to response of emergency service resources, including the allocation and coordination of multiple taskings.
- Recommendation 25. That the State Emergency Service, in consultation with key stakeholders, identify and implement a robust system and procedures for prioritising, allocating and coordinating multiple tasks.
- Recommendation 26. That systems for Automatic Vehicle Location and personnel tracking be implemented within the emergency services sector.
- Recommendation 27. That the State Emergency Service explores options for providing suitable personal protective clothing to personnel from supporting emergency services during major flooding events and sandbagging operations.
- Recommendation 28. Establish an 'Interstate Deployment Support Plan' for incoming interstate resources. The plan should outline responsibilities and arrangements for this function. Consider including this plan into the State emergency management arrangements.
- Recommendation 29. That the State Emergency Service together with the Local Government Association and Country Fire Service establish a plan for coordinated provision of sandbags to the public, including options for what is provided, where and when, and the process for effective communication of availability to the public.
- Recommendation 30. That the State Emergency Service be provided with resources to enable them to deliver swiftwater awareness training to all first responders including emergency services, SA Police and council crews.
- Recommendation 31. That SA Police, as the control agency for search and rescue, and State Emergency Service who have the responsibility for providing search and rescue services under the State Emergency Management Plan, develop a swiftwater rescue capability plan that describes key
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swiftwater risk locations, roles and responsibilities of emergency services, State swiftwater resources and dispatch arrangements.

- Recommendation 32. That the annexure to the State Emergency Management Plan, 'Traffic management during emergencies', be updated to include: responsibilities and processes for road closures; and, Department of Planning, Transport and Infrastructure requirements in regards to provision of road closure information, notification of changes in road closure status and publishing of that information.
- Recommendation 33. Develop practical policy outcomes to support resilience (e.g. the 72-hour model) and promote this broadly to community through media, awareness campaigns, policies etc. Research should be undertaken to gain insight into the types of messaging and activities that have the most impact on sustained behaviour change within the community before committing to a particular model.
- Recommendation 34. That, as with earthquake, SA Police be designated the Control Agency under the State Emergency Management Plan for black system events or other major power outages.
- Recommendation 35. That the Department of the Premier and Cabinet revise the ministerial documents relating to emergency management.
- Recommendation 36. That members of Emergency Management Council ensure they are prepared to undertake their roles and responsibilities during emergency events, including establishing:
- a) contingencies for communication e.g. satellite phone
  - b) access to relevant documents such as the State Emergency Management Plan, supporting plans, ministerial guidelines, agency plans and contacts in hard copy and/or portable device
  - c) formalised arrangements for briefings (up and down), and
  - d) arrangements for suitable representation e.g. relevant Chief Executive(s) or their deputy, at all Emergency Management Council meetings .
- Recommendation 37. That additional guidance be provided in the State Emergency Management Plan regarding the activation, structure and operation of Zone Emergency Support Teams. This should include:
- a) the reporting relationship between the Zone Emergency Support Teams, the State Emergency Centre and the State Coordinator
  - b) briefing requirements between the State Coordinator (or their representative) and the Zone Emergency Support Teams when the State Emergency Centre is activated
  - c) responsibilities for provision of local public information; and
  - d) the appointment of public information officers in Zone Emergency Support Teams (where there is no incident management team (established) to provide information to local communities
- Recommendation 38. That the State Emergency Management Plan be reviewed and updated including:
- a) a better description of the responsibilities of Hazard Leaders

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b) establish a mechanism for a hazard leader to identify systemic failures in coordination of their hazard, with a clear process to raise those issues with SEMC and seek a remedy

c) establish resilience as a key heading in the plan, with clearly documented strategies and responsibilities; and

d) consider the Schar/Mulroney submission and taking a 'fresh eyes' approach

Recommendation 39. That the Department of Education and Child Development be included as a member of State Emergency Management Council and represented in the State Emergency Centre.

Recommendation 40. That regular training and exercising is conducted for all State Emergency Centre participants including Liaison Officers.

Recommendation 41. That an Emergency Management Assurance Framework be established as soon as possible to support the emergency management arrangements and the State Emergency Management Plan.

Consider establishing an Inspector General Emergency Management department or position.

Recommendation 42. That a review of the role and effectiveness of the State Emergency Management Committee (SEMC) including: the legislative functions; membership including the chair; roles and responsibilities; and, SEMC Advisory Groups be undertaken.

Recommendation 43. That the position of Deputy Director, Office for Digital Government is dedicated to the Office for Digital Government; and  
that people throughout DPC are identified and trained to perform appropriate roles within the State Crisis Centre.

Recommendation 44. Review representation in the State Emergency Centre including:  
a) determining if there is a more suitable functional support group e.g. the Procurement Functional Support Group, to replace the Logistics Functional Support Group, and if so, Chief Procurement Officer, DPC, has responsibility for the management of this role within the State Emergency Centre.

b) That when the State Crisis Centre is not operating from a physical location, a State Crisis Centre liaison officer is attached to the State Emergency Centre.

Recommendation 45. That the recommendation made following the Pinery bushfire, 'to review control facilities at State, region and incident level', be expanded to include all emergency services facilities that will be utilised for major incidents other than bushfire e.g. flood and earthquake and to also be extended into metropolitan areas, and implemented.

Recommendation 46. That a single emergency service multi-agency control centre be established with sufficient capacity and capability to deal with all types of emergency incidents in SA. Also consider Police and State Emergency Centre.

Recommendation 47. Review existing electronic information systems used by emergency services organisations and other government agencies, and:

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- a) establish a single incident information system across the Emergency Services Sector (MFS, CFS and SES), and
- b) identify opportunities to consolidate incident information systems of other agencies
- Recommendation 48. Through the Emergency Management Workforce Project, identify and provide training and development for SA's emergency management sector personnel (government agencies, and non-government agencies including volunteers). State Emergency Management Committee should consider supporting recommendations from stage two of the project when the project report is tabled.
- Recommendation 49. Consider opportunities to identify synergies between the incident management systems used in SA being the, Australasian Inter-service Incident Management System (AIIMS) and ICCS Plus. This might include joint training and exercising in roles that are common across both systems.
- Recommendation 50. Review and update the role, function, workload and focus of the groups/committees that contribute to incident management and emergency management capabilities including the State Emergency Management Training Committee, Interagency Incident Management Sub-Committee and the Central Exercise Writing Team.
- Recommendation 51. Establish a State incident management and emergency management training capability which provides for:
- a) consistent training across the State
- b) personal development and endorsement processes for roles
- c) identification, recruitment and development of personnel from other government agencies; and
- d) incident management and State emergency centre functional role training and development across all sectors.
- e) skills maintenance including upskills, refresher training and exercises
- f) incident and strategic leadership training
- g) consistent training for inter-agency liaison officers at all levels
- Recommendation 52. Review and reinstate the State Emergency Management Training Officer and State Emergency Management Planning Officer (capability development) positions to operate with a broad, strategic and leadership focus.
- Recommendation 53. Establish a State-wide resourcing capability to support incident management teams, regional coordination centres, zone emergency centres, relief centres, recovery centres and State control centres. some of the features of such a capability should include:
- a) multi-agency, cross-government, State-wide pool of incident management and emergency management personnel building on the State incident management team concept currently facilitated by the Country Fire Service, and expanded to include all hazards, multi-agency teams with a roster that provides year-round coverage
- b) a system that enables staff and volunteers from any agency to identify their availability for upcoming shifts
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c) a rostering system that enables one or more incident management teams, staging areas, regional coordination centres, State control centres and relief centres to develop, maintain and distribute rosters and structure charts in a more coordinated manner

d) identifying areas of expertise for key incident and emergency management functions (e.g. public information, alerts and warning, media liaison, logistics and resource management) that would benefit from a coordinated and resource pooling approach and take steps to implement (consider the Mapping Functional Support Group model as a potential service delivery model).

Recommendation 54. Establish a lessons management capability across the SA emergency management sector to collect, analyse and track lessons identified during debriefs and reviews following events and other sources such as interstate and overseas reviews and inquiries.

Recommendation 55. Update the SEMP Part 3, Annex F 'Debriefs' to provide more guidance regarding the types of debriefs, when they are required to be undertaken and at what level and guidance for undertaking and recording debriefs, and implementing lessons identified.

Recommendation 56. Review and update Part 3, Annex C, of the SEMP 'Public Information and Warnings' to:

a) clarify the role and responsibilities of the Public Information Functional Support Group and control agencies in relation to public information

b) define requirements and processes for liaising with the community, including holding community meetings

Recommendation 57. Update the Public Information Functional Support Group Plan to include:

a) standards, outputs, systems and processes required to be used by control agencies and the Public Information Functional Support Group during emergencies

b) guidance on the public information cycle through the prevention, preparedness, response and recovery phases which includes the responsibilities and information requirements during different phases, and effective transition between phases

c) establishing a public information intelligence cell within the Public Information Functional Service Group; and

d) identifying tools or resources to monitor social media

Recommendation 58. Task South Australian Fire and Emergency Services Commission with further developing the Emergency Alerts capability across government agencies including to:

a) establish and maintain a centralised training program for emergency alert initial and refresher training.

b) establish a pool of endorsed Emergency Alert personnel from across government agencies to enable control agencies to assist each other with the emergency alert function during emergencies.

c) develop supporting processes to ensure that the capability supports: emergencies involving any hazard; consistent issuing of alerts and warnings; consistent messages; and effective

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- communication and notification of alerts issued to relevant internal and external stakeholders.
- Recommendation 59. Develop a Disaster Waste Management Plan to form part of the State Emergency Management Plan which describe participating agencies and responsibilities for various aspects of waste management during and after emergencies.
- Recommendation 60. Develop a State Relief and Recovery Plan as a distinct part of the State Emergency Management Plan which should include:
- a) potential locations for suitable facilities for relief and recovery centres which: are in locations safe from hazards such as flooding and bushfire; and, have appropriate access and suitable ablutions.
  - b) formalisation of roles and capabilities of non-government organisations such as Red Cross.
- Recommendation 61. Conduct a review into South Australia's arrangements for relief and recovery grant, Local Government Disaster Recovery Assistance Arrangements and Natural Disaster Relief and Recovery Arrangement claims, the review should include governance coordination and criteria for provision and processing of relief/recovery grants
- Recommendation 62. Explore alternative emergency management models including the alternative model proposed above to establish a South Australian Emergency Management Office and State Relief and Recovery Office within the South Australian Fire and Emergency Services Commission, to ensure that all the objects and guiding principles of the *Emergency Management Act 2004*, and State Emergency Management Plan are addressed efficiently and effectively.

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## 1. INTRODUCTION

On 28 September 2016, an intensifying low-pressure system moved across the State bringing thunderstorms, destructive winds, large hailstones and heavy rain. At 3.48 pm tornados in the State's Mid-North damaged 23 transmission towers triggering a State-wide power outage (known as a 'black system event').

At 5.30 pm on 28 September 2016, the South Australian Police (SAPOL) State Coordinator declared the event a 'Major Incident', and the Chief Executive of the Department for Communities and Social Inclusion (DCSI) was appointed as Assistant State Coordinator in relation to recovery operations.

Power was restored to the metropolitan area within a few hours, but large areas of the State remained without power for an extended period. Port Lincoln for example, was not returned to full power supply until early in the morning of 1 October 2016.

There was significant financial loss incurred to businesses and the community due to the power outage (Business SA, 2016).

Considerable damage occurred across many parts of South Australia. Major flooding impact occurred on the Northern Adelaide Plains, including Virginia with around 1500 hectares inundated by floodwaters, 250 growers were affected and 727 greenhouses damaged. Over 10 000 tonnes of crops were lost with an estimated value of \$51 m.

Private losses included 43 dwellings with major damage, 53 with minor damage, and 38 out-buildings and 14 vehicles also damaged. There have been approximately 5 000 insurance claims made.

The elevated sea levels and storm tides on 28 and 29 September 2016, caused damage along the west coast of Eyre Peninsula. The high tide in the Spencer Gulf on the afternoon of 29 September coincided with significant storm surges and large, locally generated sea waves and swell, which caused flooding and erosion to coastal settlements on the eastern coast of Eyre Peninsula and the Yorke Peninsula. There was widespread cliff erosion, lowering of beaches and dune erosion along much of the South Australian coast.

Flooding in the Waterfall Gully precinct of the Cleland Conservation Park resulted in significant damage and the closure of the Mount Lofty Summit Trail.

There was damage to critical infrastructure such as roads, bridges and electrical infrastructure, and economic and social impacts in the intensive horticultural areas near Virginia, and viticultural areas in the Barossa and Langhorne Creek.

Following the extreme weather event of 28 September – 5 October 2016, the Premier of South Australia, The Hon Jay Weatherill MP announced that an Independent Review would be undertaken to investigate the circumstances surrounding the event and consider the adequacy of the State's prevention, preparedness, response and recovery plans.

This report is a consolidation of the findings of the Review based on incident information and information provided by organisations, individuals, groups and agencies during interviews and submissions.

Given the complicating factors of a black system event, the extreme weather emergency, and the broad spectrum of damage and flooding across the State; overall the response from all local and State government and non-government agencies was predominantly well executed.

It is easy to ask questions in retrospect without the constraints of a major emergency such as limited time, significant pressure, incomplete information, incident complexity and fatigued personnel. It can be assumed that all response and support personnel, endeavour to do the

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best job they can, and make the best decisions possible based on the knowledge they have at the time.

While most people were following safety advice and taking shelter from the storm and generally looking after their own well-being, the emergency services, police, State government and local government, non-government organisations (NGOs), telecommunications and power network personnel were out in the severe weather or in various control/coordination centres providing assistance to the community of South Australia.

Further, many volunteers, as they regularly do, put their own well-being and comfort secondary to assisting the community. They worked long hours in a voluntary capacity and many were then required to return to their usual paid employment with little rest or respite.

Too often criticism is levelled at response agencies and responders for the decisions they make, the time taken to provide aid and a perceived lack of assistance. Much of this criticism comes from individuals and groups in the community who need to be far more resilient and take responsibility for their own safety, welfare and non-life/injury threatening problems.

The nature of reviews is such that a critical eye is cast over an event, including the lead up to, the response and the recovery from the event. This Review makes a number of recommendations aimed at improving emergency management in South Australia.

When reading this Review, and considering the comments and recommendations made, it should not be forgotten that the overall assessment of the Review was that this very complex event was, in general, well managed, with coordinated, effective response and recovery operations put into place by many local and State government and non-government agencies.

It should also be recognised that all government agencies involved in this event have conducted their own critical debriefs and reviews and in the case of SA Health, sought independent investigations into generation failures at Flinders Medical Centre (FMC) and Port Augusta hospital. Many of the actions and recommendations contained within these reviews are currently being implemented.

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## 2. REVIEW TERMS OF REFERENCE (TOR)

The Premier of South Australia, The Hon Jay Weatherill MP appointed former Police Commissioner, Gary Burns to lead an Independent Review to investigate the circumstances surrounding the event and consider the adequacy of the State's prevention, preparedness, response and recovery plans.

The Review team comprises Mr Gary Burns, Mrs Leanne Adams, SES, Manager Policy and Projects, Superintendent Guy Buckley, SAPOL, Mrs Rachel Danjkov, DPC, Project Officer.

The Australian Emergency Market Operator (AEMO) is undertaking its own independent inquiry into the technical issues surrounding the power outage; and the Council of Australian Governments (COAG) Energy Minister's Council will also review this incident at a national level, and a more recent announcement is that a South Australian Parliament Legislative Council Select Committee has been established for similar purposes.

The TOR of this Review are;

### Objectives

The objectives of this Review are to:

- review the emergency management response to the State-wide impacts of the extreme weather events which occurred between Wednesday 28 September and Thursday 5 October 2016
- review the response to and management of the impacts of the State-wide power outage caused by damage to infrastructure resulting from destructive winds on Wednesday 28 September 2016
- consider the adequacy of the State's prevention, preparedness, response and recovery arrangements

### Principles

The principles of this Review and of lessons management in general:

- lessons management is a process involving: recording observations; analysing cause and effect; identifying how to improve and what needs to change; implementing changes required; and communicating lessons to all of those involved
- no blame: it's not an inquiry or investigation, it's a process to learn and improve
- focussing on the future and seize opportunities for improvement
- a systems view: identify any negative circumstances and how they might be avoided in future
- learning from what 'might have happened'
- gathering information from a variety of sources because all perspectives can be valuable

### Outcomes

The Review is to identify:

- activities that were done well, that should be repeated in future and captured in documentation for future events
- opportunities for improvement to response, incident management and emergency management arrangements, processes or activities

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- measures that could mitigate the impacts and consequences of future weather events of this magnitude
  - recommendations, actions and accountabilities to facilitate required changes

#### Inclusions

The Review is to consider, analyse and make recommendations as appropriate regarding:

1. The impact of State-wide power outage, including on:
  - 1.1. critical infrastructure
  - 1.2. South Australian Government Radio Network (SAGRN)
  - 1.3. transport and traffic management
  - 1.4. hospitals and health
  - 1.5. Telstra and other networks
  - 1.6. community preparedness and response
  - 1.7. business continuity planning
  - 1.8. access to food, water, cash, fuel and other essentials
2. The impact of various aspects of the weather event including:
  - 2.1. significant flooding in highly impacted locations such as Virginia
  - 2.2. damage from destructive winds
  - 2.3. damage to homes, businesses, primary industries, community assets and infrastructure
3. The adequacy, appropriateness, effectiveness and timeliness of response, incident management and emergency management activities including:
  - 3.1. The preparedness of control and supporting agencies, functional services, local councils and communities.
  - 3.2. Public information including:
    - alerts and warnings
    - State Emergency Information Call Centre Capability (SEICCC) and Triple Zero (000) and other relevant public assistance numbers
    - evacuation management
    - traditional, digital and social media, and press conferences
    - community liaison and information
    - continuity of public information through prevention, preparedness, response and recovery phases
  - 3.3. Incident management arrangements including: multi-agency incident management teams; availability of personnel to fill roles; coordination of personnel and; the capability, training and experience of personnel.
  - 3.4. Emergency management arrangements including: activation of the State Emergency Centre (SEC); roles and interaction of agencies in the SEC; the capability, training and experience of personnel; declaration of a major incident;

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traffic management; interstate and Federal assistance; and, consideration of the impact of/on the updated State Emergency Management Plan (SEMP).

- 3.5. Access to and sharing of intelligence resources including weather, hydrological and water catchment and reservoir intelligence.
- 3.6. Damage assessment processes including responsibilities, coordination of resources, prioritisation of tasks, data collection and information sharing.
- 3.7. Reporting to, from and within the: State Emergency Service (SES) State Control Centre; the SEC; Emergency Management Council and other relevant command and control centres.
- 3.8. Relief arrangements including the establishment, communication of availability and effectiveness of relief centres and services.
- 3.9. Recovery including responsibilities relating to waste management.
- 3.10. Any other matters the Reviewer sees fit.

The Reviewer may issue interim recommendations at any point relating to any of the above items as appropriate.

#### Exclusions

The Review will not consider the extent of the damage to the State's electrical infrastructure or matters to do with the national electricity market.

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### 3. REVIEW METHODOLOGY

The approach taken in the Review has been consistent with the terms of reference. Submissions were provided and people were interviewed in a way which sought to avoid individual blame, and concentrate on discovering how well arrangements worked and where they could be improved. It is important to note that this Review was not a Royal Commission or a form of Judicial Inquiry, where a forensic examination of witnesses occurs.

Given the TOR, which in effect, provides for an examination of the extreme weather event referenced against the State's emergency management arrangements, this Review will be based on an 'all hazard' approach, although highlighting the extreme weather together with a black system event. It should also be borne in mind that a black system event and the consequences of it may also be caused by other natural (e.g. earthquake) and man-made hazards (e.g. terrorism).

The aim is to seek improvement of the State's emergency arrangements and as such, more time and words will be spent on the challenges for the various government agencies and organisations involved and opportunities to improve, rather than the multitude of actions undertaken which were successful and well done.

It is common practice for emergency services and other agencies in SA to hold internal debriefs following a major event. There were debriefs specific to the extreme weather held at multiple levels including for local response, communities and businesses, agencies, State control centres, regional coordination centres, the State emergency centre, zone emergency centres, incident management teams support agency command centres and others.

All government agencies have carried out their own debrief(s) and identified opportunities for improvement and made recommendations within their own remit to be implemented to increase the efficiency and effectiveness of response.

The Review undertook a significant amount of research into reports from previous reviews and enquiries including reports from SA, across Australia and around the world.

Some of the key reports that have influenced the direction and findings of this report are referenced throughout the document and can be found within Section 16 Bibliography; Additional Reports also Considered are contained in Section 16.

The comments made concerning areas of improvement will be focussed on those observations which have a major impact within an agency and/or more broadly impact and provide opportunities for improvement to the State's emergency management arrangements and those government agencies and organisations which contribute to them, including local government and non-government organisations (NGOs).

On 2 November 2016, a call was made for submissions to the Review. Any individual or group could make a submission, which were required to relate to one or more of the Review's TOR.

Over 80 submissions or other documents were received from members of the public and government agencies.

The Review team met with stakeholders including ministers, State and local government representatives, emergency services personnel, industry leaders, community representatives, businesses and associations as well as affected individuals in person and through teleconference facilities.

Site meetings were held at the Port Lincoln Zone Emergency Centre and Virginia Recovery Centre as well as at various emergency service and other agency sites.

The Review has been mindful of the requirement to report by 26 January 2017, and inquiries have been made and issues researched and analysed in order to meet this deadline.

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## 4. WEATHER

Extreme weather impacted SA between 28 September and 5 October 2016. The weather included a series of severe thunderstorms, tornados and damaging winds, heavy rain, large hailstones and high tides.

### 4.1 Severe thunderstorm and tornado outbreak, 28 September 2016

The Bureau of Meteorology (BoM) prepared a comprehensive report on the severe thunderstorm and tornado outbreak on 28 September 2016 (Attachment 3) (Australian Government, BoM, 2016). This report describes in detail the meteorological conditions relating to the initial phase of a week of severe weather, below is a summary:

| TIME             | EVENT  |
|------------------|--|
| 11.30am - 1.00pm | Thunderstorms occur along a front extending from Woomera in the north and Port Lincoln in the south. Two cells over Eastern Eyre Peninsula (EEP) were beginning to show supercell characteristics.   |
| 1.00 - 2.00pm    | Supercell thunderstorms impacted various townships across EEP including Kimba, Cleve, Arno Bay and Cowell before moving into Spencer Gulf.   |
|                  | Reports of large hail (up to 5cm at Cleve), heavy rainfall with local flash flooding and damaging winds.   |
| 1.30 - 3.00pm    | Thunderstorms impact Whyalla, Port Augusta and Woomera with very strong wind gusts.  |
| 2.30 - 3.00pm    | Supercell thunderstorms begin to impact the eastern coastline of Spencer Gulf.   |
| 2.50pm           | Reports of a tornado near Port Broughton.  |
| 3.00 - 3.30pm    | The line of thunderstorms along and ahead of the front stretches from west of Hawker in the north to the Fleurieu Peninsula in the south. Supercells begin to impact the Mid North and Flinders districts. Large hail of 4-6cm recorded at Snowtown and Blyth. |
| 3.30 - 4.30pm    | A further six tornadoes are believed to have occurred at Crystal Brook, Blyth, Melrose, Wilmington, Mid North and at Andrews.  |
| 4.30 - 11.00pm   | Thunderstorms begin to merge into a squall line during the evening and move through the State and eventually exist the State late in the evening.  |

Cyclonic winds battered small towns like Blyth and Melrose in the State's Mid-North, where tornadoes lifted the roofs off sheds and buildings.

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*'It picked the machinery shed up... and it plucked it up out of the ground and threw it 30 yards or so out into the paddock. The hay shed was thrown about another 50 yards from that. It got pretty much flattened. It's held up by a truck trailer and a stack of hay at the moment.'*

*Blyth resident*

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## 5. EVENT TIMELINE

The following graphic provides a summary of the timeline of the weather and impacts during the event from Monday 26 September through to Friday 7 October 2016.

|                      |   |
|----------------------|---|
| <b>Mon 26 Sept</b>   | <ul style="list-style-type: none"> <li>• Bureau of meteorology predicts severe weather for Wednesday</li> <li>• SES State Control Centre activated and the level of preparedness is increased to medium</li> <li>• SES briefs State Emergency Centre</li> </ul>   |
| <b>Tues 27 Sept</b>  | <ul style="list-style-type: none"> <li>• SES level of preparedness raised to high</li> <li>• flood watch issued for Mid North, Mt Lofty Ranges and Metro Adelaide</li> <li>• sandbags made available to the public at some locations</li> </ul>   |
| <b>Wed 28 Sept</b>   | <ul style="list-style-type: none"> <li>• storm force winds, lightning, thunderstorms, heavy rain, large hail stones and storm tides</li> <li>• wind damage to homes and businesses, 23 electrical transmission towers blown over in the Mid North</li> <li>• State-wide black system event, no telecommunications in some areas, Adelaide CBD without power and grid-locked without traffic lights, power restored in Adelaide and some suburbs after a few hours</li> </ul>                    |
| <b>Thurs 29 Sept</b> | <ul style="list-style-type: none"> <li>• Eyre Peninsula still without power</li> <li>• heavy rain, ground is saturated, dams threatening to burst, rivers overflowing, many roads blocked, starts to flood in many areas including Langhorne Creek, Clare and Onkaparinga, Gawler and South Para Rivers</li> <li>• flood emergency warnings, advice and watch and act messages issued at multiple locations</li> </ul>  |
| <b>Fri 30 Sept</b>   | <ul style="list-style-type: none"> <li>• mains power restored to much of the area south and east of Port Augusta but outages remain for most of Eyre Peninsula</li> <li>• catchments saturated and high water levels, flood warnings for many catchments</li> <li>• relief centres open to communities affected by flooding</li> <li>• multiple people rescued from floodwaters</li> <li>• SA ESOs, ADF and crews from WA and Vic assist with operations</li> </ul>                             |
| <b>Sat 1 Oct</b>     | <ul style="list-style-type: none"> <li>• weather conditions moderate and in some rivers levels begin to recede</li> <li>• power restored to most of the State</li> <li>• many flood warnings are downgraded</li> <li>• flood emergency warnings for Port Wakefield and Galwer River</li> <li>• properties inundated north of Adelaide</li> <li>• large numbers of roads closed due to flooding</li> <li>• the township of Langhorne Creek is isolated due to all roads being cut off</li> </ul> |
| <b>Sun 2 Oct</b>     | <ul style="list-style-type: none"> <li>• reservoirs at or near 100% capacity and spilling over</li> <li>• water levels decreasing in most areas but potential for more rain over coming days</li> <li>• areas impacted by floodwaters being assessed</li> <li>• severe thunderstorm warning issued</li> </ul>   |
| <b>Mon 3 Oct</b>     | <ul style="list-style-type: none"> <li>• river levels continue to decrease despite rain continuing in some areas</li> <li>• more fronts predicted over coming days</li> <li>• flood watch issued for Onkaparinga, Mount Lofty Ranges, Adelaide Metro, Gawler and Torrens</li> </ul>   |
| <b>Tues 4 Oct</b>    | <ul style="list-style-type: none"> <li>• increase in calls for assistance for flood and storm damage</li> <li>• tornadic winds reported in southern suburbs</li> <li>• dams spilling and threatening to overtop, levee breaches</li> </ul>  |
| <b>Wed 5 Oct</b>     | <ul style="list-style-type: none"> <li>• weather warms and rain eases</li> <li>• Langhorne Creek flood levels and Naracoorte Creek yet to peak</li> <li>• damage assessments undertaken at Virginia</li> </ul>  |
| <b>Thurs 6 Oct</b>   | <ul style="list-style-type: none"> <li>• breach in levee along the Gawler River in Buckland Park</li> <li>• water levels in most locations are stable or dropping but Naracoorte Creek continues to pulse</li> <li>• damage assessments undertaken in Adelaide Hills and Fleurieu Peninsula</li> <li>• no BoM flood warnings or SES advice or warning messages</li> </ul>   |
| <b>Fri 7 Oct</b>     | <ul style="list-style-type: none"> <li>• water levels stable or dropping</li> <li>• demobilisation activities commence and Victorian support force return home</li> <li>• no BoM flood warnings or SES advice or warning messages</li> </ul>  |

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## 6. A BUSY WINTER

Over a period of five months between May and October 2016, emergency services organisations (ESO's), the State Emergency Service (SES), Country Fire Service (CFS) and Metropolitan Fire Service (MFS) were exceptionally busy and attended thousands of taskings. SES is the control agency for extreme weather and flooding and responded to a significant proportion of these events, particularly for trees down.



### 9 May 2016

- intense low pressure system
- tidal inundation causing significant coastal damage
- heavy rain and damaging winds resulting in many trees falling
- in-excess of 1 300 requests for assistance (RFAs) to Emergency Service Organisations (ESOs)



### 9-13 July 2016

- damaging wind gusts and strong to gale force winds
- power outages
- flooding in the Adelaide Hills
- record cold temperatures
- almost 3 200 RFAs to ESOs, the majority of them for fallen trees



### 23 July 2016

- damaging winds across a significant proportion of the State
- series of cold fronts
- power outages
- nearly 900 RFAs to ESOs, including trees down, damage to homes and a roof severely damaged at Tennyson



### 25-26 July 2016

- locally damaging winds
- trees down
- power outages
- flooding including Adelaide Hills
- nearly 900 RFAs to ESOs,



### 14-17 September 2016

- heavy rain caused widespread flooding in Mt Lofty Ranges, Adelaide metropolitan area and southern suburbs and dams at capacity
- almost 50 homes with significant damage
- flooding and evacuation of residents at Old Noarlunga
- 1 670 RFAs to ESOs



### 28 September - 5 October 2016 (this event)

- six tornados
- Statewide power outage
- heavy rain causing widespread flooding
- storm damage and trees down
- 4 280 RFAs to ESOs

*Figure 1 - Sequence of severe weather events from May - October 2016*

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The extreme weather event that commenced on 28 September 2016 occurred at a time when there had been multiple recent extreme weather events (as per the Figure 1 above). The exceptionally high rainfall across the State resulted in saturated catchments which meant that any further rainfall caused a quick rise in water levels in rivers, creeks and dams. There was also an existing level of fatigue of emergency services staff and volunteers which impacted on availability and capacity of individuals and organisations.

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*'The frequency of severe weather events requiring State-level coordination over the 2016 winter and spring seasons represents an unprecedented level of operational activity and provides some context for the conduct of operations in response to the September/October event.'*  
(SASES, 2016)

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Emergency services in SA are stretched for resources even during 'business as usual' activities and everyday response to incidents (particularly when it comes to volunteer agencies during volunteers normal working hours). Consecutive and sometimes overlapping events compound the impact of minimal resources such as fatigue due to long working hours; stress due to high levels of emergency operations; volunteers needing to spend time in their paid employment; and the backlog of usual duties that doesn't go away while services are operational.

The internal DCSI audit report of emergency relief and State Recovery Office articulated it well in the Statement below. It also demonstrates that the impact of frequent events impacts the agencies involved in relief and recovery for an even longer period of time, compared to response agencies, to recover and resume normal business following an event.

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*'The growth in size, impact and frequency of significant events, combined with the longevity of post-event recovery commitments, means that, increasingly, there is insufficient opportunity between events to develop and implement all necessary practice and improvement initiatives arising'*  
(DCSI, 2016)

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Councils encountered many challenges with the multiple events. Some council areas were unable to remedy damage caused previously, before being impacted by another event. Consecutive events exacerbated the clean-up and undermined work that had already been undertaken.

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) and BoM have reported that 2016 was a year of extreme weather events, wetter than average overall, and the fourth warmest on record for Australia and that there is significant evidence that climate change will increase the frequency and intensity of extreme weather events (CSIRO & Bureau of Meteorology, 2016).

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*'As the global climate system has warmed, changes have occurred to both the frequency and severity of extreme weather.'*  
*Extreme rainfall events are likely to increase in intensity by the end of the century across most of Australia*  
(CSIRO & Bureau of Meteorology, 2016).

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All indications are that, increased frequency and severity of severe weather events are part of the 'new normal', and the SA emergency services sector will need to adapt to ensure that prevention, preparedness, response and recovery activities are sustainable in the long-term.

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## 7. A STATE WITHOUT POWER (BLACK SYSTEM EVENT)

A large scale blackout of power system is called a black system event. (AEMC, 2016)

The comments that follow are a general overview across the many agencies and facilities that exist within Police, ESOs and other State government agencies that have some response or involvement within EM arrangements within the State. Individual government agencies have recognised that there is a need to review their own internal practices including each facility and function to ensure they have considered and addressed issues associated with a loss of power. In doing so, they now need to consider the impact of an extended loss of power not just those power outages of short duration.

Some police, ESO and State government facilities had no back-up generator capability or uninterrupted power supply (UPS) for critical business to continue. Government agency responses to the blackout were quite varied, as was their ability to function and continue their provision of service to the community. A number of government agencies were reactive to the events on the night, with their ability to evacuate staff from buildings impacted by a number of issues which should have been identified within a BCP.

Some staff did not know what was required and were not conversant with or have an understanding of documented plans that they should have followed. Those plans that were in place and practiced were implemented and worked well.

A number of back-up generators activated as planned, which is evidence of agencies with a robust maintenance and testing regime (including regular testing of back-up generators under load for sustained periods combined with the exercise of BCP's). Those agencies that had a documented, tested and practiced BCP stood up well against the power outage. With any situation a number of technical / mechanical faults occurred resulting in a loss of power with back-up power systems. Attendance of required trades/technicians to address the faults was compounded by issues not normally impacting the call out of responding technicians, such as the lack of communications and slowed road traffic network caused by the blackout.

In some government agencies back-up generator power or essential services power (ESP) was found not to be connected to the required critical business needs and equipment. Building and workplace re-design had occurred without consideration to moving ESP with that re-design. This showed a lack of testing and exercising within preparation and preparedness of existing BCPs.

### 7.1 SA Power supply

South Australia (SA) generates electricity from both renewable and non-renewable sources, which is sold to electrical retailers through the National Electricity Market (NEM) managed by the independent Australian Energy Market Operator (AEMO). Retailers obtain electricity through the transmission network and sell to households and businesses. AEMO has overall responsibility for the management of power system security within the NEM through cooperation and assistance of network service providers and market participants.

Additional electricity can be brought into SA from eastern States via the Murraylink (Riverland) and Heywood (Limestone Coast) electricity interconnectors.

Natural gas is the main source of non-renewable energy generated in SA. Natural gas-fired generation equates to the largest percentage of the States non-renewable energy generation.

SA has established significant levels of renewable energy through large scale wind generation developments (wind towers) and rooftop solar photovoltaic (PV) installation and around 45% of SA's power generation now comes from renewable energy resources.

However, integrating the changing supply mix while maintaining affordability, reliability and security of supply is a key challenge facing the energy sector (ElectraNet, 2016, p. 11).

Generated electricity travels long distances along high voltage wires, 132 kV or 275kV to supply substations. Transformers further reduce that voltage to 60kV or 33kV.

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In SA the high-voltage transmission network and large transmission towers are operated and managed by ElectraNet. In 1998, the State government announced the privatisation of the Electricity Trust of SA and the resulting sale saw the establishment of ElectraNet. In October 2000, ElectraNet began trading as a private company, operating the high-voltage electricity transmission network. The network includes 91 high-voltage substations with approximately 5 600 circuit kilometres of transmission lines. (ElectraNet, 2016 b)

The electricity distribution network was also privatised and SA Power Networks (SAPN) are the distribution network managers within the State. Lower voltage electricity feeds into a transmission system to distribution substations, where the voltage is further reduced. This electricity is distributed along wires before being further reduced in voltage to supply electricity to homes and businesses. With few exceptions power lines, distribution stations and most household electricity meters are owned and operated by SAPN.

SAPN have:

- over 750 000 customers
- 95 000 small business customers
- 5 000 large business customers
- 400 zone substations
- 73 000 street transformers
- 720 000 stobie poles
- 200 000 km of wires, and
- Coverage of 179 000 square kilometres within the State. (ElectraNet, 2016 c)

It is not in the scope of the TOR of the Review to comment on the extent of the damage to the State's electrical infrastructure; or matters to do with the national electricity market; as this will be addressed through a number of other reports currently being undertaken by AEMO – Black System Event Report in SA, COAG Energy Council and the South Australian Parliament Legislative Council Select Committee.

## **7.2 The black system event**

One of the most significant severe thunderstorm outbreaks in recent decades was experienced in central and eastern districts of South Australia during the afternoon and evening of 28 September 2016. Multiple supercell thunderstorms produced damaging and destructive wind gusts, including at least seven tornadoes, very large hailstones and locally intense rainfall. These supercell thunderstorms and tornadoes impacted the South Australian power network, contributing to the State-wide power outage.'

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*'On Wednesday 28 September 2016, at 03.48pm electricity supply was lost across the State of South Australia (Black System Event). The loss of supply corresponded with a widespread outbreak of supercell thunderstorms with an exceptional number of tornadoes'*

*'Five faults led to the Black System Event, with four of these occurring on three transmission lines (Brinkworth - Templars West, Davenport - Belalie and Davenport – Mt Lock) (AEMO, 2016).*

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A damage assessment on 6 October identified that the faults were caused by the impact of supercell thunderstorms and tornadoes.

The BoM further reported that in some areas wind gusts peaked at 190 – 260 kilometres per hour.

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*'On this occasion critical infrastructure was damaged  
by an extreme weather event'  
(Australian Government, BoM, 2016)*

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The events of 28 September 2016 demonstrate that the risk of black system events and the widespread loss of electrical power, regardless of cause is real. The majority of metropolitan Adelaide had power restored within several hours, however, the Far North, West Coast and Eyre Peninsula were without power for a substantially longer period.

Port Lincoln has three generators that are support to and 'backup' the primary network. These generators successfully started when the primary network suffered storm damage, and supply to Port Lincoln was restored at about 7.15pm on 28 September 2016. However, early in the morning of 29 September 2016, two generators failed and the other was manually shut down shortly afterwards because of stability issues. The generator which was shut down was made available mid-morning on 30 September 2016, after repairs. However, it was not until mid-afternoon on 30 September 2016 that it was supplying electricity to Port Lincoln. Following repairs to the primary network, this generator was shut down to allow the reconnection of Port Lincoln to the main network at 8.55pm on 30 September, with all power to Port Lincoln being restored shortly afterwards.

Port Lincoln business owners, Eyre Peninsula local government officials and State government officials were highly critical of the unreliability of electrical power on Eyre Peninsula. Whilst storm damage may have caused the main network repair problems and power loss during this extreme weather event, the generator failure had been experienced earlier in the month resulting in an extended power outage and for it to occur again about two weeks later raised the levels of frustration.

The Review team met with a large cross section of agencies, businesses and individuals. A consistent message was that there is an expectation and requirement for a reliable and secure supply of electricity to the State.

This event has shown that the State must plan for and consider all the implications that come with an extended loss of power, not just short-term power outages which people have previously experienced and seem better able to cope with and manage. Owing to the reliance on electrical power, the SA community needs to become more resilient for longer outages by being better prepared for any future events.

Today's modern, digital and highly technical society involves complex networks, communications and infrastructure, which are often linked and interdependent. Electricity is, with few exceptions, integral to all our systems, needs and requirements as a modern society.

The loss of power quickly impacts upon essential services, critical infrastructure and the very fabric of our society. Electrical power is often taken for granted but modern society (at all levels) is heavily reliant and dependent on it.

Services impacted by the immediate and long term loss of power include:

- information, communication and technology (ICT)
- transportation
- essential services
- fuel
- water and sewerage
- food
- health care
- financial services, including access to cash
- emergency services

Widespread loss of power has occurred previously in SA and on many occasions throughout the world. Loss of power can occur for many reasons, at any time and on any network.

Some recent examples of black system events are listed having similar impact to what was experienced with a widespread and sustained loss of power 28 September 2016.

The causes of a widespread and prolonged power outage can include: extreme weather; terrorism; a criminal act; technical failure; human error; human pandemic; and accidents. Black System events are believed by some to be more likely in the future.

### International events

|                           |   |
|---------------------------|---|
| <b>13 March, 1989</b>     | Entire province of Quebec, Canada - six million Quebec residents suffered an electrical power blackout lasting 12 hours.<br><br>On March 10, 1989, a coronal mass ejection CME (billion-ton cloud of ionized gas), 'about the size of 36 Earths' escaped. On the 12 March 1989 the gas cloud crashed against Earth's magnetosphere and caused the Northern Lights to be seen as far south as Texas and Cuba.  |
| <b>11 August., 1996</b>   | Outage affected 4 million people in nine States caused by heat, sagging power lines and unusually high demand for electricity.  |
| <b>11 March, 1999</b>     | Southern Brazil, 97 million of the 160 million people living in Brazil lost power in what was the biggest blackout ever at the time. A bolt of lightning struck an electricity substation, which in turn shut down Itaipu, which was the largest power plant in the world.  |
| <b>14-15 August, 2003</b> | Northeast United States and Canada outages spread over an area of 9,300 square miles, 50 million people affected by the blackout and was the biggest power outage in U.S. history. New York City, Albany, Hartford, Toronto, Ottawa, Detroit, Cleveland and Ontario. Cleveland, the loss of power also meant a loss of water - as there was no way to continue pumping water to 1.5 million people.   |
| <b>28 September, 2003</b> | Italy- almost all of the country's 57 million people. The event occurred during the early morning hours after Rome's Nuit Blanche, an all-night arts festival. Because of this, trains were still running at 3:01 a.m. when a fault on the Swiss power system caused the overloading of two internal lines near to the Italian border. About 110 trains carrying more than 30 000 passengers were stranded.   |
| <b>4 November, 2006</b>   | Germany, France, Italy, and Spain. German power company switched off a high-voltage line across the River Ems in order to let a cruise ship pass, 10-15 million Europeans lost power. The company said that the problems began in northwestern Germany when its network became overloaded, possibly due to that manual switch off (although transmission lines had been shut down in the past without incident). The blackouts stopped trains in Germany and trapped dozens of people in elevators in France and Italy. Austria, Belgium, and Spain were also affected by the outage. |
| <b>30-31 July, 2012</b>   | India, largest electrical outage in history (so far), the July 31st blackout of India affected an area encompassing about 670 million people, which is around 9% of the world's population. On the 31st, three of the country's interconnected northern power grids collapsed for several hours, affecting 22 States from the country's Eastern border with Myanmar to its western border with Pakistan.  |
| <b>29 August 2015</b>     | Power to 710 000 customers on Vancouver Island and lower mainland was lost, 705 000 customers had power restored within 72 hours of the storm.  |
| <b>21 November 2015</b>   | Power outage left 1.2 million people in Russia with reduced or no power after transmission towers in Ukraine were blown up.   |

|                          |   |
|--------------------------|---|
| <b>1 September 2016</b>  | Hurricane Hermine Florida knocked out power for more than 350 000 people in Florida and southern Georgia, many were without power for several days. |
| <b>21 September 2016</b> | Full power system collapse occurred on the island of Puerto Rico affecting its entire population of 3.5 million inhabitants (Wikipedia, 2016).      |

These incidents demonstrate that the wide spread loss of power is not a unique event. It is important to recognise, that wide-spread power loss can occur and that individuals, communities, business and governments need to improve their resilience to better withstand the impact of power loss, whether of short or long term duration.

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*Power is coming back to some of the 50 million people affected by the blackout which hit Thursday, continued into Friday, and is the biggest power outage in U.S. history.*

*The outage affected a wide swath of territory in the U.S. and Canada - including New York City, Albany, Hartford, Toronto, Ottawa, Detroit, Cleveland and Ontario - and has officials in the two countries engaging in a blame game as to what went wrong.*

*In Cleveland, the loss of power also meant a loss of water - as there was no way to continue pumping water to 1.5 million people...But the New York metropolitan area is still in a major mess, with full power still not back, meaning that subway and train systems are also not back.*

...

*However, Canadian authorities said it appeared lightning had struck a power plant on the U.S. side of the border in the Niagara Falls region, setting off outages that spread over an area of 9,300 square miles with a population of roughly 50 million people.*

*Nine nuclear power reactors - six in New York and one each in New Jersey, Ohio and Michigan - were shut down because of the loss of offsite power..Traffic lights were out throughout downtown Cleveland and other major cities, creating havoc at the beginning of rush hour.*

*In New York City, subways and elevators lost electricity or resorted to limited backup power. Thousands of people streamed into the streets of lower Manhattan in 90-degree heat, and some subway commuters were still stuck underground hours after the blackout hit.*

*Amtrak suspended passenger rail service between New Haven, Conn., and Newark. Some northbound trains from Washington, a city that did not lose power, turned around at Newark.*

*In Cleveland, Olga Kropko, a University Hospitals labor and delivery nurse, said the hospital was using its back-up generators and had limited power. 'Everyone is very hot because the air conditioning is off,' she said. 'Our laboring moms are suffering.'*

*...For New York police, the focus was on the ramifications of the blackout rather than its cause. 'We're more concerned about getting the traffic lights running and making sure the city is OK than what caused it,' ...In Times Square, Giovanna Leonardo, 26, was waiting in a line of 200 people for a bus to Staten Island.*

*'I'm scared,' she said. 'It's that unknown 'What's going on?' feeling. Everyone's panicking. The city's shutting down.*

*Along several blocks near midtown Manhattan, deli owners brought their suddenly unrefrigerated food out on tables, iced in buckets. 'Half price on everything,' read one sign.*

*Excerpt taken from CBS news report of 15 August, 2003*

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### **7.3 Public information**

A major criticism emanating from the community and businesses of the West Coast power outage related to the information provided about the blackout; and the projected timeframes for return of

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power. Messaging indicating that the power would be restored within ‘two hours’ impacted peoples’ decision making about what level of BCP arrangements or alternatives they should implement. The messages meant people delayed implementing options; those delays in many cases coming at a significant cost. While SAPN were attending to network problems and upon repairing and restoring that part of the network, other faults were identified resulting in further delays to restoring the full network.

An example of the issues associated with this on-going messaging was a fish merchant with frozen fish stocks of significant value, who held off accessing a freezer truck, believing power was soon to be restored. After several messages and still without power, attempts were unsuccessful in accessing a local freezer truck, instead one was despatched at a higher cost from Adelaide with the associated delay in arrival. Problems with fuel supplies and road closures due to the weather meant even further delays on arrival times placing the stocks at risk.

Other examples included smaller businesses keeping staff at work believing power was to be restored soon, thereby incurring costs and bringing additional complications, without being able to provide their services.

If public notification messages had been sent advising that power may be restored in two hours but the potential exists for much longer delays, the community believe this would have allowed better, more relevant personal and business decisions to be made.

Power outage messaging received via the approved ABC 891 radio broadcasts was perceived as lacking relevance by a number of communities. These communities needed to have more information about local issues, the potential impact and what help was available. People in regional areas, especially those in more isolated and remote locations felt isolated and forgotten by the lack of information relative to their locations.

The loss of power, and subsequent loss of communications, meant many of the people most affected by the longer-term power outage did not receive information about a Loss of Power Grant provided by the government. Many did not have power restored prior to the closure of the offer and therefore were unaware of it. As there was no electronic lodgement ability, this disadvantaged those in rural communities most impacted by the extended power loss, who would have to travel (sometimes considerable distances) to lodge an application. This contributed to the communities feeling of isolation and being over looked.

Once power was restored and communications re-established, a number of public alerts were received by persons over the many communication mediums, with some of these messages not including time and/or date stamps. Many people commented that they could not tell if the message was old or current and therefore the messages were of less value when received. This was confusing and misleading.

## **7.4 Industry**

The impact of the extended loss of power had significant implications for industry. Many of the issues already identified resulting from the black system event were consistent across businesses and industry. Industry preparedness for an extended power outage varied greatly. The short-term loss of power is more manageable, whereas there are far greater and more significant problems associated with the extended loss of power.

Loss of revenue for BHP, Arrium and Nyrstar were significant and impacted their large-scale operations. All commented on the need for power security, reliability and affordability. Their operations require significant power and any power redundancies come at a significant cost, which is considered within their BCP cost/benefit analysis.

The initial primary concern for these companies was to safely shut down critical elements of their plants such as smelters and ensure employee safety. Even with adequate BCP’s companies had to manage and maintain critical elements of their operations brought about by an extended loss of power, which otherwise could have resulted in long-term plant damage and ultimately significant shutdowns. Their ability to acquire additional power sources and communicate with personnel

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within the power industry throughout the event assisted in maintaining those critical elements. The outcome for all could have been far worse; however, the extended power outage came at a significant financial cost to business.

Business SA estimated the cost of the blackout to South Australian businesses at \$367 million. (Business SA, 2016)

## 7.5 Fuel

From the Adelaide CBD to the far north and west coast, fuel and access to it, was a major concern for ESOs, agencies and the community alike. The State's main fuel distribution point does not have the capacity to pump fuel under a black system event. An enduring power outage would quickly impact the whole State supply network leading to a shortage.

The Department of State Development (DSD) is identified as the control agency under State Emergency Management Plan (SEMP) for an energy shortage. Energy includes liquid fuel, gas and electricity. There is an existing Energy Support Plan, but the plan focuses on:

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*'..... those severe energy shortfall events where it is clear that private industry is unable to adequately manage the severe energy shortfall on its own and there is a need to restrict or ration remaining supplies.' (DSD, 2014)*

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The plan does not adequately address the situation where there is a total loss of power. The plan also provides for liquid fuel shortages which in this event was not the issue; the issue was access to fuel stocks that existed. There is legislation and authorities that can be enacted to acquire fuel but these were not necessarily relevant within this event especially relating to liquid fuel.

There appears that little consideration has been given to dealing with an extended power outage leading to the inability to access and pump fuel. Government agencies had little pre-planned or contractual arrangements for access to, or delivery of fuel for emergency service vehicles and back-up generators.

The availability and access to fuel was a significant problem for all government agencies, not only from ability to respond, but also their ability to implement and sustain their BCP arrangements. A number of government agencies had supply contracts in place but suppliers could not supply the fuel as they could not pump it. Contracts do not have clauses to cover power outage events that would ensure supply. Some government agencies had contracts in place with fuel suppliers to refuel back-up generators, but priority was given within this event to critical sites (eg hospitals), and therefore their access to fuel was restricted.

The prioritisation of fuel requirements during the event was developed 'on the run' across agencies by existing fuel suppliers. It was evident that no consideration had been given to the fuel suppliers ability to deliver fuel at times of extreme demand. Under a 'no pressure/business as usual scenario' fuel is broadly accessible, but with many requests being made simultaneously in an emergency, the suppliers were quickly overwhelmed. They could not service all points in the short time frames required through the surge in demand.

Little consideration had been given within BCP arrangements about who the approved supplier was, who else they supplied, their ability to continue to supply fuel during a power outage and pre-determined documented and even contractual arrangements to protect the provision of supply.

It was evident there was a lack of preparedness in general terms for organisations, government agencies and business to access and distribute fuel even though supply stocks were not the issue. Government agencies, businesses and individuals, not unexpectedly, had not fully considered the loss of power and the subsequent inability to access and distribute fuel from service stations which are the main supply points relied upon, with few exceptions, for SA Police (SAPOL), ESOs and government vehicles in general.

Compounding access to fuel that was available, was the inability to pay because automatic teller machine (ATM), card services and electronic payment options were not available. People could

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drive to where fuel was but businesses were unable to supply and if people were without cash, transactions not could take place. Many service stations had generator back-up which could keep their shop fronts working but few had their essential services power connected to fuel pumps. If they did, they would not or were resistant to sell fuel because of the limited alternative payment methods available.

Typical of these type of situations, people began using hastily arranged alternatives to access fuel, such as connecting external generators to pumps which then raises potential safety issues with access and delivery.

The State government has contractual arrangements in place with fuel retailers. An option exists to tighten or create new contract clauses to ensure the supply for SAPOL and ESOs and other critical government resources when lack of supply is not the issue.

Another observation made by the Review was that it appeared that the further away from the metropolitan area, the more resilient individuals and communities were. This is not to say they were not impacted but their ability to cope, cooperate and get things done as a community far exceeded that within the larger cities and metropolitan area.

## 7.6 Food and Retail

The food sector is comprised of a complex chain from production to consumer and the impact on the food sector varied during this event. Shorter power outages in the metropolitan area did not cause the same issues as in the Far North or Eyre Peninsula with the extended outage. If an extended outage had occurred in the metropolitan area or where food processing, production and preparation occurred this likely would have resulted in significant disruption to the supply chain with the potential to impact communities to a far greater extent.

The extended loss of power impacted retailers who did not have robust or resilient BCP arrangements. Back-up generators add cost for businesses but the alternative of having no back-up power can incur other costs such as the loss of revenue and refrigerated stock. Additional costs associated with the loss of information, communication and technology (ICT) can lead to the inability to sell and have people pay for transactions and purchases. Some businesses traded without cash or electronic payment defaulting to a manual system for the benefit of their customers which in turn incurred additional costs.

Upon losing communications, retailers lost the ability to offer electronic payments, EFTPOS facilities, cash out transactions, send or receive orders which included general grocery items, perishables and frozen foods. With banks and ATM's not operational, retailer and community access to cash was prevented. An increasing dependence on electronic financial transactions led to access and holdings of cash quickly running out.

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*'inability to access ATM's or use credit cards for transaction purposes became quite extreme in communities where the power outage extended over days. This was particularly so at Ceduna where there are restrictions on certain social benefits cards.'*  
(LGA, 2016)

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Retailers on Eyre Peninsula and in the Far North were impacted more severely by the extended power outage. Those not fully prepared or who had not invested in alternative power sources had the most difficulties. There were examples of considerable stock loss (for example approximately \$200 000 in perishable food products) by some retailers. This related to the tonnes of food product that had to be collected, transported and dumped at a cost.

A number of retailers were not impacted because they had made their own substantial investment in back-up generators. The costs to business varied for such preparation ranging from \$1000 to \$200 000 with on-going yearly costs to maintain that capability.

Some retailers made the point that this type of investment is required owing to the lack of electricity security and reliability within their region. Insurance pay-out on loss of goods does not always

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cover the total actual expenses involved so the investment can be worthwhile if businesses are able to afford it.

Individuals in the community were unable to keep and store refrigerated food for any duration. Resilient individuals utilised their own generators, portable fridge/freezers and other methods to protect their food stores. There was no ability to prepare and cook food unless gas appliances were available.

People who were unprepared and had not thought about their own resilience or ability to sustain themselves at least for a few days, reacted by panic-purchasing, which quickly reduced available stocks of food.

The inability to communicate with suppliers to place orders, when coupled with the associated transport issues and the inability to access fuel meant re-supply brought additional challenges that are not normally an issue within the food supply chain.

Emergency management services and relief centres were impacted in that some centres did not have back-up power on site requiring portable supplies to be brought in. This hampered their ability to provide services and meals to impacted community members.

The challenges with transport impacted re-supply arrangements, which had to be coordinated across agencies. This worked well under State arrangements.

Accommodation businesses such as hotels and apartments reported that customers were unable to pay at the time, and some have still not paid their accounts.

A number of businesses that were not prepared for an event such as this, have commented that they are now taking action to prevent similar occurrence and associated consequences.

**Recommendation 1.**

That relevant agencies, such as the Department of State Development, SA Police and emergency services, collaborate to establish an education campaign to encourage businesses in South Australia to develop Business Continuity Plans which, among other potential hazards such as flood and fire, also take into account the potential impact of an extended power outage.

## 7.7 Police and Emergency Services

The impact of the power outage on emergency services was immediate and varied. The ability to provide service continuity in the longer term was impacted upon by their own prevention and preparedness arrangements and quality of their BCP. The capacity of agencies to implement and react as required within their business continuity arrangements effected their ability to respond.

The extended loss of power caused mobile and landline networks to fail or at best provide an intermittent and therefore unreliable network. This impacted upon the ESOs' ability to communicate with their personnel. As an example, on Eyre Peninsula it required the physical attendance to ESO personnel homes to advise personnel of alternative arrangements that had been put in place for an emergency service response. This was a drain on a number of agency resources which were involved in a large scale incident of this type.

All agencies have commercial arrangements in place with mobile network operators. Those arrangements do not give ESOs any priority of use within these networks. The use of the mobile device technology and broadband by ESOs/agencies is increasing and therefore the ability, if possible, to gain priority access to available mobile networks in times of emergency or significant events for ESOs, key agency personnel and members of the Emergency Management Council should be explored.

ESOs and other government agencies were well briefed and prepared for the significant weather events. The pre-event warnings and messages that were sent out, still did not necessarily convey the significance of what was approaching and the potential consequences.

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*'... there has been a view expressed within local government that the public or community did not fully comprehend the warning messages they were receiving, nor did they understand what was expected of them.'*  
(LGA, 2016)

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There were many positive examples relative to government agency response and business continuity arrangements. The Review however have identified a number of consistent issues that arose that require further consideration by each government agency.

### **State Emergency Services (SES) and Country Fire Service (CFS) State Control Centres**

The SES and CFS State Control Centres (SCCs) are located on different floors within the same building. Although they do not have an uninterrupted power supply (UPS), the SCCs functioned using power from automatic back-up generators.

SES, as control agency for the extreme weather event found their SCC insufficient in size for the number of personnel required to manage the events. As the need for space grew due to the numbers of personnel, not all ICT equipment was connected to the essential services power of the back-up generator which caused some operational limitations within the SCC.

Both SES and CFS commented on the need to increase capacity and capabilities of their SCCs. There is no back-up to the back-up generator. Loss of back-up generation for the co-located but separated CFS and SES SCCs would have forced their move to alternative locations. This would have proved to be challenging in any scenario but when added to the many other issues associated with an extended power outage resulting complications would have increased the difficulty of managing this event State-wide.

### **Police (SAPOL)**

The Police Communications Building (PCB) was constructed in 1989 and houses the Police Operations Centre (POC) and State Emergency Centre (SEC). The building is rated to withstand a 1:500-year earthquake however the internal structures of the building are not. The building infrastructure (mechanical and electrical) is now at capacity and its service life has expired. The physical layout does not now provide sufficient amenities for all required agency staff when activated and there are other issues surrounding security and accessibility.

The centre's UPS and back-up generation operated correctly and sustained the centre throughout the incident. Police communications were not interrupted and their ability to provide a police response was maintained and supported throughout the extended power outage and weather event.

The PCB being the main coordination centre for the State in an emergency functioned as designed. This enabled the emergency management arrangements to be performed, albeit with the other complications associated with the extended blackout such as loss of mobile networks and social media etc.

The PCB back-up generator endurance was not challenged owing to the restoration of mains power within several hours and therefore re-fuelling was not an issue. The centre is a critical facility within State emergency management (EM) arrangements and there is no backup to the backup generator. In addition, there is no pre-wired capability to bring an alternate or temporary generator in to support or maintain the facility in the event of a generator failure. The loss of power to the PCB comes with significant State consequences.

SAPOL communications, in preparation of the warnings, activated extra call-taking capacity within the centre, however they were still tested with the increase in Triple Zero (000) and 131444 calls for assistance.

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An emergency power failure at police headquarters (PHQ) caused the Police Call Centre (PCC) to re-locate and operate from the PCB as per BCP arrangements. Of concern is that as part of SA Ambulance (SAAS) BCP arrangements in the event of their SCC failing, they would also re-locate to the PCB in the exact location call centre operators took up position.

Given the growth in SAAS and other EM agency call centres and despatch needs, the PCB's ability to meet the redundancy needs of others is significantly compromised. A number of agency BCP arrangements need to be re-considered as the existing size, layout and ICT requirements have changed significantly over time.

SAPOL suffered other power failures at a considerable number of operational stations, both metropolitan and country due to failure of either a 'back up' problem or having no alternative power at all.

### **SA Ambulance (SAAS)**

The SA Ambulance service (SAAS) SCC back-up generators and UPS functioned as designed. SAAS is one of the few agencies that have a back-up generator to their back-up generator. In preparation for the warnings SAAS activated additional personnel in their communications centre but were still overwhelmed by the increase in Triple Zero (000) calls.

The increased volume of calls were, at least in part, attributed to:

- a surge in medical problems such as breathing difficulties, calls from people on home oxygen which required power for their medical equipment to operate, chest pain, falls, calls from other emergency services
- the power failure triggering activation of a large number of medical alarms which required a response., even though in most instances it didn't involve a person requiring support.

Because SA Health incident management team (IMT) room was not able to properly function it meant hospitals had to rely on SAGRN radio for communications. This was problematic because there were only a few handsets available and operating them within hospitals also caused reception problems.

SAAS could not access the health multi-agency talk-group. By default, SAAS SCC became a coordination centre for health utilising the SAAS multi agency talk group. The Medical Retrieval Coordinator performed a triage role of patients with subsequent advice as to where patients should be conveyed dependent upon health services capabilities and hospital availability.

The age, capacity and size of the SAAS SCC was an issue and there is a need for a better purpose-built centre to house SAAS SCC and communications facilities.

The loss of SAGRN paging was managed by SAAS because of the early advice of deactivation. It allowed impacted members time to arrange their alternative communication methods such as SAGRN and satellite phone. The incident has provided opportunity for BCP arrangements and alternatives to be further considered by SAAS.

Fuel for SAAS generators was not an issue but lack of access to fuel for their vehicles caused concern. This resulted in SAAS triaging taskings and not responding to lower level tasks to allow conservation of fuel for vehicles for emergency or urgent tasks. SAAS lacked fuel supply in this situation, and like most agencies, this had not been considered as part of their BCP arrangements.

### **Metropolitan Fire Service (MFS)**

The MFS Communications Centre (Comcen) receives Triple Zero (000) calls and other non-urgent calls via 132500, and dispatches relevant fire and emergency services i.e. MFS, CFS and/or SES. During the power outage Comcen continued to function as designed increasing their call taking capacity in the lead up to the event and subsequently, it coped well with the increase in calls.

Back-up generation worked well and all essential services power operated as planned within their BCP arrangements.

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SAGRN remained operational and ultimately communications were not an issue within the event for the MFS. Normally MFS back-up communications contingency is the mobile telephone network (which failed during this event). MFS is reviewing BCP arrangements with a focus on communications issues during an extended power outage.

The withdrawal of SAGRN paging was an issue for their crews but they managed because there was sufficient time given, advising that this capability was being closed down to conserve SAGRN tower uninterrupted power supply (UPS) life.

MFS is one of the few government agencies that still holds bulk fuel and has the ability to pump under black out conditions as pumps are attached to their essential services supply. Unlike other agencies, fuel was not a critical issue for MFS.

With the loss of power, MFS had to consider the potential of lack of or loss of mains water because power loss may have affected the ability of SA Water to pump water around the network. This was certainly considered at Eyre Peninsula at Port Lincoln as part of their planning and alternative water sources were identified owing to the extended outage.

## **7.8 SA Water**

SA Water's BCP arrangements ensured the supply of water and sewer network, avoiding public health issues. In the metropolitan area the loss of power, of much shorter duration than the Far North and West Coast, still saw some immediate impacts to the network that were well managed. Redundancies and the use of portable back-up generators, at key pumping stations maintained the integrity of the network.

SA Water's close liaison and communication links with SAPN ensured a coordinated approach to power management and restoration of their network / assets as power became available.

The extended power loss on Eyre Peninsula was managed well due to lessons learned from previous power outages. As an example in Port Lincoln, a rotational system of back-up generation was implemented at key sites, ensuring town effluent did not become a major issue. Although labour-intensive, it was well coordinated locally and ultimately effective through their extended loss of power. Further pre-planned capital works commencing in 2017 will ensure greater water security for the town with further redundancies being placed at the town water supply from the Uley Basin.

## **7.9 SA Health**

Overall both metropolitan and country hospitals generally stood up well during the event.

The functionality of hospitals was impacted by the power outage. Despite back-up generation, common issues across health were experienced with the loss of power but in all, health professionals performed well in trying and stressful circumstances and high levels of demand for services.

Flinders Medical Centre (FMC) was without power for about three and a half hours due to the black system event. Not all, but parts of FMC were without normal or emergency power for about one and a half hours due to the failure of the main generator.

The power outage resulted in the loss of 17 embryos at the Flinders Private Fertility Clinic located within the hospital because of the loss of power to the facility incubators in which they were located (rather than the loss of frozen embryos as reported by some media). The Flinders Private Fertility Clinic has now moved to a more modern and capable facility with State of the art redundancies. A similar incident would not have the same impact upon their incubation process or procedures. See Attachment 1: SA Health Flinders Medical Centre Standby Power Electrical Systems Post-incident Review, AURECON

The generators failed at Port Augusta and Cummins Hospitals which had significant impact on their operations. The Cummins Hospital had a second generator delivered from Port Pirie.

SA Health commissioned an investigation into the failure of the backup generator at the Port Augusta Hospital, which was without any power at all for about five and a half hours. This

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Investigation Report is attached see Attachment 2 – Port Augusta Generator Failure Investigation Report, Systems Solutions Engineering. The Department is already taking steps to implement the recommendations of both reports.

Many of the issues identified across other sectors were also experienced by metropolitan and country hospitals such as loss of communications, lack of adequate planning for an extended power outage, inadequacy of BCPs and lack of fuel for back-up generators.

Apart from the exceptions listed above, in the main, back-up generation in hospitals worked well and with few issues. A number of hospitals identified that there is a need to re-consider and build on existing BCP arrangements to ensure the impact of an extended power outage is included in their future planning.

A number of medical clinics closed down and people needing medical assistance were directed to local hospitals, which increased their workload.

Pharmacies, without back-up generation, were unable to dispense or keep cool pharmaceutical products as required. Information communication and technology (ICT) systems (including dispensing software) did not work, similar to EFTPOS and other payment methods. People were directed to hospitals for immediate dispensing of medications, which many of the hospitals were unable to do. Some communities were able to provide back-up generation to pharmacies to assist them to operate in a limited capacity. A lack of BCP meant many pharmacies, especially those impacted by the longer term power outage closed.

Aged care facilities activated their BCP arrangements and back-up generators worked as designed for most minimising the impact of the power outage and associated issues on residents. Care for the aged and frail was of concern especially as the duration of the event grew.

Those that did not have a back-up system for home oxygen equipment were directed toward hospitals or became reliant on agencies support, further compounding the issues at hospitals and within Health.

Personal and medical alarms did not work with the loss of communications and power. Upon the restoration of power many alarm activations caused resource issues, especially with SAAS and country health practitioners, because each alarm had to be personally checked. Domestic care and health assistance for elderly and disabled was impacted primarily owing to the lack of fuel and communications.

A number of discussions raised concerns about registration, coordination and contact with vulnerable persons (eg oxygen dependent). The process for validating a person who qualifies with these needs has little accountability, yet a person registered as a vulnerable person can have considerable impact upon a number of agencies and power distributors. The issues associated with vulnerable persons during a power outage require a coordinated approach, to the administration of and response to vulnerable persons.

## Aged Care

A submission was received from the Aged Care Industry Association after an industry forum that was held to receive feedback on the impact of the power outage and weather event.

South Australian residential aged care providers support over 18 000 older South Australians every day in a variety of ways from metropolitan to remote locations. Overall the industry response to the event was well managed and their ability to adapt and ensure continuity of care to their range of residents was seen as a success.

In their submission they identified that the event highlighted issues relating to communication between SA Health and the aged care industry. Improvement in the areas of Intelligence sharing (pre-event especially), an understanding of each other's roles in an emergency and joint preparation leading into an emergency event are topics for discussion and advancement.

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Channels of communication and the clear identification of the roles and responsibilities of the Commonwealth Department of Health and the South Australian Department the Health and Ageing in emergency situations will assist in management of future emergency situations. The aged care industry peak bodies are well placed to support this process.

**Recommendation 2.**

That SA Health, develop an emergency plan to manage an extended power outage or black system event which, in addition to the requirements outlined in recommendation 15:

- a) includes a process for identification and registration of vulnerable persons in the community to ensure an effective support is provided
- b) enables access to pharmaceutical medicines for at risk persons
- c) provides for the support of individuals with equipment in their homes to support their own health e.g. oxygen equipment

## Emergency Management Arrangements

SA Health is an integral part of South Australia's emergency management arrangements it is a very large organisation and is generally well prepared in this regard having its own emergency management unit and five very experienced State Controllers.

The system in place for managing emergencies is the Gold, Silver, Bronze command structure (strategic, tactical, operational), as is the case with SAAS. This, like other government agencies usually relates to people being placed into these roles, based on position in the organisation and not necessarily capability.

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*Health needs more trained people who can assist EMU staff during SCC activations*

*Difficulties arise when experienced staff leave as they leave a gap in corporate knowledge and operational capability*

*More training for Health commanders at all levels*

*Have a clear understanding on the roles of the SCC and LHN's (Local Health Network)*

*Inconsistencies across the organisation*

*Need for State based training and exercise programs*

*Very few exercises involving metropolitan hospitals over the last 5 years.*

*Should consider being on the same information management system (CIMS)*

*Should consider using ICCS Plus or AIIMS in lieu of or in conjunction with gold, silver, bronze.*

*Serious consideration should be given to the development of a State Disaster Medicine Management Course*

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The South Australia Health Emergency System (SAHEMS) is used for information management and was developed specifically for Health.

Similar to other government agencies involved in emergency management in South Australia, a disconnect can occur due to the use of different systems.

In 2014 SA Health was one of the nine government agencies which signed the 'Common Incident Management Framework Control Agency Agreement'. One of the aims of this document was to bring a closer working relationship between government agencies to resolve incidents.

The preponderance of emergency management systems throughout South Australia, adds complexity, not only to operations, but to training and exercising.

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It was also apparent that what should be a standard response to an emergency incident anywhere in the State, might vary, because centrally developed policies may not be adopted by all hospitals and consistent, regular training and exercising both within the Department and at State level is not provided.

The adoption of common standards and operating procedures should be instilled throughout the entire organisation. People in SA Health involved in emergency management response should be able to operate in any location with little in role, function and procedures changing, other than information such as contact names and numbers peculiar to that location.

**Recommendation 3.**

That SA Health undertake a review of their emergency management arrangements. Health State Controllers should be consulted during this review and arrangements should be consistent throughout the department and across the State and compatible with State emergency management arrangements and information systems

### **7.10 Department of Planning, Transport and Infrastructure (DPTI)**

A number of transportation issues arose from the power outage across the greater metropolitan area. Electric trains and trams, transport signals, traffic lights and extraction fans within the Adelaide Railway station failed.

The Adelaide Railway Station is serviced by three generators. One is owned by the Government of South Australia and was undergoing maintenance on 28 September 2016. The two other generators are owned by Adelaide State and Environs Redevelopment (ASER). One of these generators failed soon after ignition and the other operated for 90 minutes (adequately servicing all operational needs of the station platform extractor fans) before overheating and also failing.

The Adelaide Railway Station was unable to be used and so diesel trains, which could have operated without electrical power were not available, requiring more buses. Issues with refuelling added to the difficulties of moving people from the CBD.

The public transport network had to adapt to multiple events occurring across the network, including all electric trains and trams stopping on the rails and being unable to operate, as well as planning for the next day's peak period not knowing the extent of the power outage, with fuel conservation and need for re-fuelling a key consideration.

DPTI experienced a number of generator and re-fuelling issues and are reviewing their practices, to ensure a more effective and coordinated response around any future event of such magnitude.

DPTI plans were implemented to manage and change transport arrangements to enable people to reach their destinations. The magnitude of this event overwhelmed DPTI resources, but overall their BCP arrangements were implemented and eventually people were provided with transport. In accordance with the DPTI BCP buses were directed to other locations to assist passengers when electric trains and trams were unable to operate.

Some individuals became agitated by their inability to access public transport, communicate with transport providers, family and friends or be able to organise alternative arrangements and access information relevant to their predicament. Many people waited for hours at stops with no buses arriving; driving past because they were already full; or empty buses showing the 'not in service' banner. To most it appeared that there was no coordination or consideration to the resultant surge of people trying to get out of the CBD owing to this event. Journeys that would normally take 30 minutes were extending into hours.

Better messaging and timely information to the public may assist in future to alleviate many of the frustrations felt or perceived by the public. The lack of communications or the inability to communicate owing to the black out further complicated matters for DPTI in providing advice to the public. The possibility of better use of electronic signage on buses (as an example) to assist in communicating messages to the public could be considered.

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DPTI and public transport personnel should be recognised for their efforts and flexibility demonstrated within the event. DPTI were organising contingencies such as express buses stopping at all stops, drivers stopping for members of the public outside normal practice and assisting people in gaining access to available public transport.

### Traffic Management Centre (TMC)

The DPTI Traffic Management Centre (TMC) was well prepared for the power outage. TMC is heavily reliant on electrical ICT infrastructure and the TMC back-up generation is designed with considerable endurance. It is regularly tested under load. The TMC itself performed well throughout the events of the power outage and extreme weather.

DPTI is one of the few government agencies that still has bulk fuel holdings so access to and the ability to re-fuel their generators was not an issue.

There are over 890 traffic lights across the State which TMC operate and coordinate. Within that number, 132 are owned and maintained by the Adelaide City Council but operated by DPTI through the TMC. Only 46 of the 890 traffic lights have an ability to function without power on UPS. Many of those UPS units are the result of recent upgrades and new infrastructure projects. UPS installations are planned to align with new works and a small number of sites per year are being upgraded with this capability.

Loss of power resulted in loss of connectivity to the ICT systems in the TMC and their ability to observe and control intersections. UPS units would have assisted in maintaining connectivity. Additionally, loss of powered intersections resulted in increased call rates and requests for police attendance at a time when they were already attending to an array of tasks associated with the events of the day.

If the UPS capability existed on main arterial roads away from the CBD, the significant traffic management issues that arose would have been alleviated. This would have allowed SAPOL to focus their activities on more urgent matters within the event and not heavily on traffic control.

The power outage, combined with the extreme weather event, resulted in an exodus from the CBD of workers and shoppers, with the vast majority compressed into the immediate period after the blackout. It was not an evacuation.

The catalyst for this exodus did not generate levels of fear and panic that may have resulted if the blackout occurred because of an incident such as a terrorist attack or gas explosion. The mass exodus may have stretched peoples' patience due to the vehicular congestion and public transport issues, people left unhurriedly, and drivers basically accepted the traffic conditions.

A terrorist attack, or gas explosion or similar or threat of these, would be a different matter and may require an evacuation of the CBD or part(s) of the CBD. An evacuation plan of the CBD does not exist. This needs to be developed and should include a traffic management plan to ensure the safe and orderly evacuation of persons from the CBD.

The loss of traffic lights had enormous consequences on main arterial roads within the suburbs and the ability to efficiently move people away from the CBD. Once people had left the CBD, main arterial roads that were without traffic lights further compounded peoples' difficulties travelling to their destinations.

There was actually a reduction in the number of car crashes because in the main, the public were patient, considerate and took a cautious approach to navigating the many uncontrolled intersections. The ability of the TMC to assist diminished with the loss of connectivity to their network.

The number of requests for police to control intersections was overwhelming. SAPOL attendance had to be prioritised to ensure it was able to perform normal functions in addition to the surge demand for services. It was not possible to staff every intersection; in some instances well-meaning members of the public took it upon themselves to assist in traffic control at various

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locations and in various forms of dress. This was not an ideal or safe practice in the poor weather which brought reduced visibility.

Within the CBD SAPOL personnel were used to control key intersections in difficult weather conditions. This worked well as did the police liaison officer placed within the TMC and communications between the POC and TMC to coordinate traffic movement.

A more considered and coordinated approach to prioritise police attendance at intersections (because they cannot be at all intersections) and the placement of the police liaison officer in the TMC should be formally documented.

A more coordinated response between agencies would be beneficial in the event of a large area or large scale black out and associated traffic management issues.

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|--------------------------|---|
| <b>Recommendation 4.</b> | That the Department of Planning, Transport and Infrastructure review their Business Continuity Plan to:<br>a) minimise the loss of public transport services<br>b) ensure ongoing fuel supply<br>c) improve public information e.g. electronic signage on buses, about alternative transport arrangements when there is a significant disruption to operations.   |
| <b>Recommendation 5.</b> | That SA Police develop an evacuation plan for the Adelaide Central Business District (CBD) which includes:<br>a) a Traffic Management Plan to assist in the movement of persons and vehicles away from the CBD<br>b) protocols for the early placement of a SA Police liaison officer within the Traffic Management Centre.   |
| <b>Recommendation 6.</b> | Install UPS on traffic lights on main Central Business District (CBD) and arterial roads to allow an effective movement of traffic during a loss of power.  |
| <b>Recommendation 7.</b> | That a State Plan be developed for managing the consequences of a black system event or other major power outage. The plan should include:<br>a) public information strategies including providing advice on: the extent of the outage; anticipated and worst-case time frames for power restoration; services impacted by the outage; and, information about contingencies and actions by local and State government to provide support<br>b) identification of key providers that will supply fuel to emergency services and other critical services (vehicles and generators)<br>c) identification of priorities for provision of fuel and restoration of power<br>d) arrangements for purchase of essentials, for government agencies and the public, when electronic payment systems fail; and<br>e) arrangements for obtaining and distributing food. |

## 7.11 Telecommunications (mobile)

In Australia, mobile phone towers are regulated under the *Telecommunications Act 1997* and mobile phone services currently reach 99 % of the Australian population. The reliability of wireless service in an emergency has become increasingly critical as more Australians disconnect their landlines for mobile phones.

Events of this nature exposed weaknesses in wireless communications during emergencies and pose questions of whether carriers should be required to make their networks more resilient.

Mobile communications are critical to the management of emergencies both from an internal and external view, more so now than ever before and is still growing. Power disruption and increased mobile traffic may occur resulting in significant difficulties when dealing with emergencies and increase the risk of loss of life and/or property.

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## Internal

This refers to the use by responding agencies and can include the following actions:

- calling out of personnel by mobile phone and/or paging before or during an emergency
- deployment of personnel and/or resources by mobile phone and/or paging
- provision of situation reports from the field to the control/command/coordination centres
- provision of reports/tasks/actions/instructions via Wi-Fi internet
- transmitting public warnings via AlertSA, SMS, Wi-Fi internet.

## External

This refers to the use by government agencies / organisations/people affected by the event but not part of the response and can impact the following activities:

- access to Triple Zero (000) or other assistance lines
- access to information concerning the emergency
- access to Alert SA, SMS and other public warning messages
- ability to contact relatives/friends.

The critical nature of mobile communications necessitates a comprehensive emergency telecommunications plan and a very close working relationship with the providers of these services. Contact with these organisations should occur before, during and after the emergency to ensure a holistic approach is taken with regard to emergency arrangements, particularly during the response phase.

Many submissions received by the Review and face to face discussions were critical of the vulnerability of the mobile and existing landline networks. The perceived 'quick loss' in general terms of the mobile network or inability to access the network owing to the volume of use was a State-wide issue.

Mobile towers operated for approximately four hours but the duration varied depending on a number of site specific factors. Many towers had no backup generation, whether by solar or generator, and public perception was that there was little evidence of any attempt by telecommunication companies to provide generators to the relevant sites to get the networks back-up and running. This was not correct as companies were attending to tower problems.

Submissions received and discussions with relevant community members, indicated that some local communities would be willing to assist in times of emergency to keep the mobile towers and exchanges powered, especially those in more remote and isolated locations.

This may be an opportunity in the future for telecommunication companies to develop if they are not prepared to invest in greater site redundancies.

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*'Our council or emergency services would happily make sure the units were started and refuelled as necessary if basic training and equipment was provided.'*

*Mayor District Council of Kimba*

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Telephone exchanges without backup generation and/or no UPS power meant landline communication was lost in a short time. This was experienced extensively across the Eyre Peninsula owing to the duration of the power loss leaving much of the community feeling isolated, vulnerable and unable to communicate with ESOs, friends, relatives or other agencies as required.

Triple Zero (000) was incorrectly reported as being down. The service was available but could not be accessed in some locations because of the loss of landline and mobile capability to access the service.

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The loss of mobile and landline communications also impacted on ESOs, however, SAGRN was invaluable and allowed networked communications across the majority of the State and within agencies.

Problems experienced by people when making telephone calls to ESOs included:

- poor reception
- limited or no network coverage
- running out of battery on individual devices, and
- inability to provide information about their precise location to assist emergency services in response to them.

Many people are unaware that when calling Triple Zero (000) in an emergency that, if their particular carrier service is out, the roaming capabilities of mobile phone allows Triple Zero (000) calls to be carried on another service network. It was the case on the Eyre Peninsula where one service was unavailable but another carrier's towers were still in operation. The ability to request an emergency service response by Triple Zero (000) was still available depending upon location, time and local impact of the outage and any restorative power.

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*'Special roaming capabilities of mobile phones when calling 000 mean that when you are out of your service provider's coverage area but are in another carrier's mobile phone network coverage area, your call will be carried on the other carrier's network.'*  
(ACMA, n.d.)

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When calling Triple Zero (000) some information is provided to the agency call-taker. The accuracy of that information can be affected by a number of factors. Australian mobile networks do not automatically transmit Global Positioning System (GPS) information to emergency call takers. The important consideration for individuals, when calling to report an emergency, is to be prepared to provide detailed information and the exact location to the emergency service call taker, so a response can be directed.

With the loss of communications came even more reliance on the community receiving information and updates via battery operated radios through the emergency broadcaster and local radio stations if they were still transmitting. Some were critical of the nature of that information indicating they would have liked more detailed local information which would have allowed them to make better, more informed decisions and plans for their situation.

### **ABC 891 Radio**

The Review received a submission from Broadcast Australia. A privatised company responsible for the delivery of television and radio services for Australia's national broadcasters – ABC and SBS.

Their network comprises 622 sites (404 owned by them), covering 99% of Australia's population with 113 South Australian sites and a 24/7 monitoring and technical support. They deliver services on behalf of the ABC, SBS and commercial broadcasters throughout Australia.

ABC radio is the designated source of communications in time of emergency. Broadcast Australia is integral to the ability for those messages to be delivered. During this event approximately 200 services (radio and television) across 45 State sites were impacted by the weather and power outages. 24 back-up generators came on line and restored services in the larger metro and regional areas.

Broadcast Australia was also impacted with loss of communications to their sites with the mobile network loss. Their BCP arrangements were initiated to ensure sites were maintained. 22 State based sites are without back-up generation in regional SA. Those sites provide radio service to more than 110 000 South Australians. Some of these sites have other telecommunications capabilities located with them which are all impacted without power.

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The loss of power to those sites reduced the ability for communities surrounding the site to receive emergency broadcasts and further isolated them with the loss of other communications capabilities.

This has highlighted some of the vulnerabilities that still exist within the network infrastructure that Broadcast Australia will re-visit within their risk management and emergency planning process.

### **UHF / VHF radio**

Feedback from agencies located on the Eyre Peninsula identified the local communities' effective use of UHF/VHF radio channels. The network is supported by some repeater infrastructure but in the main are line of sight transmissions.

Local communities on the Eyre Peninsula who are regular users of this type of communication, commented on how they utilised this to great effect during the power outage. A number of ESOs have now also increased their ability to operate these networks to better support the community in times of an extended power outage.

### **Satellite phones**

A number of agencies used satellite phones with varying degrees of success. There were limited numbers of these devices across agencies, some were fixed and located in vehicles which impeded their portability.

The training and understanding of how to use satellite phones varied. Many premises did not have external aerials therefore users had to go outside to use the phones because they could not receive calls inside premises.

A number of agencies were unaware they had satellite phones located in places or were available to access them. Numbers for those phones were recorded on electronically stored documents within computers that were not accessible because of the power outage.

The event has provided an impetus for agencies to review the need for and use of satellite phones.

### **National Broadband Network (NBN)**

Those households and businesses on the National Broadband Network (NBN) had no landline capability if they had not purchased a backup power supply unit (BPSU) through their carriage service provider at the time of installation. Even with a BPSU this only provides a limited period of operation during a power failure. Community understanding of this vulnerability appeared to vary widely.

Previous landline communications technology using the copper network was powered by the source at the telephone exchange. This is why hardwired telephone access was generally available during the power outage.

Many people now use portable or cordless telephones in the home, whereby the base station requires main power in order to communicate with the portable handset which itself is powered by a rechargeable battery. This type of telephone had no landline access even though the network was still accessible.

UPS capability and backup power at telephone exchanges is limited. The move to the NBN and use of fibre to node, or fibre to the premises, requires the power to now be at those locations. There is limited power at those locations so the period of operation for home phones under the NBN service is limited during an extended power outage.

The loss of landline and the ability to call Triple Zero (000) means people then use the mobile network. This is often already at, or near capacity, in times of emergency or is not available with the loss of mobile towers owing to the power outage.

A number of issues also arose in other areas associated with the loss of landline capability such as personal, lift, fire and other alarms and elevator phones which rely on the landline capability.

**Recommendation 8.**

In order to increase resilience and public safety during emergencies, the State Emergency Management Committee should request the Australia and New Zealand Emergency Management Committee to place on the agenda, and consider establishing a national position, on redundancies for mobile communications (including phone tower back-up power) and the National Broadband Network.

**Recommendation 9.**

That the Office for Digital Government, in close partnership with telecommunications companies (e.g. Telstra, Optus, Vodaphone), develop a Control Agency Plan for Information and Communication Technology including mobile communications. The plan should consider:

- a) provision of back-up power to priority infrastructure
- b) back-up equipment requirements e.g. satellite phones for government ministers (including training and other support)
- c) potential impact on the National Broadband Network on emergency services when there is an extended power outage / black system event
- d) arrangements with commercial mobile network carriers to ensure emergency and support services have priority access to available mobile networks; and
- e) contingencies to ensure ongoing functionality of the Broadcast Australia network

### South Australian Government Radio Network (SAGR N)

With 20 000 active users across 22 agencies and over 210 sites State wide, SAGR N provides emergency communications services 24 hours a day, 7 days a week, 365 days a year through a trunked radio network. Through a system of interconnected repeater sites, it has resilience and availability that is not met by many other commercial carrier services.

The SAGR N is one of the largest public safety radio networks in the world as it covers over 226 000 km<sup>2</sup> and 96% of the State's population.

The SAGR N provides a State wide paging network as well as both analogue and digital voice radio communications. SAPOL, SAAS and South Australian Department of Fisheries use encrypted digital radios while all other users use unencrypted analogue radios. The network is also utilised by SAPOL for in-vehicle mobile data terminals.

In times of emergency, any network load/congestion is managed through established plans and processes.

An important feature of the SAGR N is that it enables full communications interoperability between all agencies managing, responding to and/or supporting emergencies. A multi-agency talk group was used with great success for the extended power outage on the Eyre Peninsula and Far North where the SAGR N was the only networked communication available for some time by ESOs.

SAGR N sites have UPS capability with endurance well above that of other commercial telecommunications sites. With the restoration of power in the greater metropolitan area the loss of power to towers in the metro was not a significant issue when compared to the towers on the Eyre Peninsula or in the Far North owing to the duration of the outage.

Given the power outage and the extent of damage caused by the weather SAGR N functioned extremely well and proved a reliable means of contact across the majority of the State.

A list of existing SAGR N users appears in the table below.

**SA Government - State Budget funded agencies**

Courts Administration Authority

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|   |
|---|
| Department for Correctional Services                          |
| Department for Communities and Social Inclusion               |
| Department for Environment Water and Natural Resources        |
| Office for Digital Government                                 |
| Passenger Transport (DPTI)                                    |
| Transport SA (DPTI)   |
| Department of Health  |
| Department of Primary Industries and Regions                  |
| SA Ambulance Services   |
| South Australian Police                                       |
| <b>Community Emergency Service Fund (ESL) funded agencies</b> |
| SA Country Fire Service                                       |
| SA Metropolitan Fire Service                                  |
| SA State Emergency Service                                    |
| SA Government - Public Non-Funded Corporations (PNFC's)       |
| Adelaide Convention Centre                                    |
| Forestry SA   |
| SA Water  |
| <b>External entities (non - SA Government)</b>                |
| Australian Federal Police                                     |
| Australian Customs and Border Protection Service              |
| Royal Flying Doctor Service                                   |
| St John Ambulance   |

**Table 1 – agencies currently using SAGRN**

To assist in achieving an efficient, effective and coordinated response to emergencies in SA consideration should be given to extending the number of users on SAGRN.

For example, a properly integrated solution with a SAGRN radio in every school office and at Department of Education and Child Development (DECD) head office and regional centres could be of real benefit during a major emergency, including the threat of one.

However, government agencies would need to be very clear about what they wish to achieve in using the SAGRN. Importantly, they would need to then integrate those requirements into their operational plans/procedures and regularly exercise (practice) the procedures, preferably on a number of occasions throughout the year. They will also need ensure all staff expected to use the SAGRN are properly trained in how to use it.

Local Government/Councils are an integral component of emergency response and have close working relationships with the SES and CFS. During this incident, there were occasions where a better coordinated response could have improved access to resources, response times, and efficiency.

Local government does not use the SAGRN during emergencies. During these events consideration should be given for council resources to be issued SAGRN's or CFS VHF radios when working on the fire ground. Allocation of these radios would be for coordination/control functions with the councils utilising their own radio networks for internal command. Obviously, a limiting factor would be the cost and network fees.

A positive outcome within the black system event was the continued operation of the SAGRN. Significant investment has been made in the network and continues to be made with a current upgrade of the SAGRN in progress.

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Loss of power to mobile phone towers caused failures within a few hours (once their UPS ran down or where there was no generator back-up), whereas SAGRN sites operated well beyond that. This allowed time for planning and coordination within BCP arrangements to ensure the integrity of the network. The SAGRN has well developed preparatory arrangements, for example a site with known access problems during poor weather had its UPS endurance almost doubled. Further redundancy protections will be in place by 2017 for key assets within the SAGRN. These redundancies were planned prior to this event.

Despite preparatory arrangements there were still issues with the network, but overall the SAGRN provided effective communications for ESOs when no other networked communications were available. There were unavoidable factors outside of SAGRN control associated with weather events, such as damage caused by lightning strikes. But, ESO feedback was that the SAGRN was vital and remained in service when required.

The SAGRN lost some network coverage in the far west and far north of the State, but local communications were still available within reach of local towers. The repairs required for such events are considered within their planning and repairs occurred within acceptable time frames.

Portable generators were coordinated and moved around the network to charge SAGRN sites and maintain the network. This was prioritised and coordinated within State emergency management arrangements through the SEC and local Zone Emergency Centres (ZEC).

Councils on Eyre Peninsula advised that they may be able to assist in the future thereby alleviating ESO resources being required to service SAGRN towers. Dialogue is required between local councils and SAGRN to confirm that capability, the ability to make potential use of it and any willingness for this to occur to alleviate any future potential burden on ESOs.

A decision was made, by the State Controller Communications in consultation with the SAGRN Network Operations Control Centre (NOCC) to turn off paging within the network. As paging consumes more power, this would extend UPS battery life and the ability for voice communications to be maintained. A number of ESOs utilise paging as their direct method of contact to personnel. Although this was communicated via the SEC to agencies, some agencies identified the message was not received by all of their members. Because the type of paging will be amongst the first actions to conserve power on SAGRN agencies who heavily rely on it will need to consider alternatives to ensure contact with their personnel.

The Eyre Peninsula community had a separate extended power outage earlier in the month on 8 September 2016. That event highlighted a number of issues which the ZEC, to their credit, were quick to remedy and implement solutions. When the event of 28 September 2016 occurred many of those earlier learnings were already in place. This was evident with the early activation of the multi-agency talk group where communications were maintained between ESOs and local plans put in place to ensure continued response by ESOs to the needs of the Eyre Peninsula community.

Learnings from the Pinery fire had also been implemented such as the inclusion of key SAGRN personnel within the SEC. This was advantageous for the State Controller Communications and their presence allowed a broader understanding of the State communications issues from a strategic and operational perspective. This enabled better planning and coordination of use.

As with other significant events there were problems associated with end-users of the SAGRN. There was the now common name of 'radio disciplines' a lack of awareness and understanding of how to properly use the network including interpretation of network busy signals and resultant queuing. A sound user understanding would have increased the efficiency in the use of the network, and extended the battery life of towers through less power usage.

A number of agency de-brief comments incorrectly Stated that the SAGRN 'was down' and inoperable, however, this was not the case. There were some issues within the network owing to loss of power and network connectivity on very few sites, but when considered from the overall State perspective in the duration and spread of the power outage and weather event, the SAGRN performed extremely well. Care needs to be taken of the context and use of terminology within agency de-briefs reports to ensure the correct interpretation and reporting.

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An issue, not dissimilar in many agencies was the impact of the duration of the event on SAGRN staff. They commented that the duration of this event stretched their ability to staff the many responsibilities that came with the emergency response (there are only 4.3 positions located in AGD committed to SAGRN). Fatigue and welfare issues were of concern and would have become even more problematic had the duration of the event gone much further. Alternatives and options need to be explored to overcome this issue to the future.

|                           |  |
|---------------------------|--|
| <b>Recommendation 10.</b> | Consider bringing other agencies onto the SA Government Radio Network, in particular, Department of Education and Child Development and local government, to support more effective coordination and provide a reliable communications contingency during emergencies.   |
| <b>Recommendation 11.</b> | Deliver consistent and regular training in the use of the SA Government Radio Network to all users to maximise the efficiency and effectiveness of the network in times of emergency e.g. reduce the issues associated with network busy signals.  |
| <b>Recommendation 12.</b> | Identify, document and communicate contingency arrangements and procedures for emergency services in the event SA Government Radio Network paging is turned off to conserve power, or other loss of paging capacity.   |
| <b>Recommendation 13.</b> | That the Attorney General's Department consult with local government regarding potential for them to provide logistical support associated with backup power supply to SA Government Radio Network towers in the event of an emergency.  |
| <b>Recommendation 14.</b> | That the glossary of terms in the State Emergency Management Plan be reviewed to ensure all relevant language is included. All agencies need to ensure the use of clear communication and accurate use of terminology, including in describing the status of critical services e.g. Triple Zero (000), SA Government Radio Network, electrical and water supplies and infrastructure.  |
| <b>Recommendation 15.</b> | That Attorney General's Department explore options to overcome fatigue and welfare issues of SAGRN staff associated with emergency events of extended duration.  |
| <b>Recommendation 16.</b> | That SA Police, emergency services, health facilities, utility providers and other key service providers, review their Business Continuity Plans giving consideration to factors such as:<br>a) identification of: business critical needs; essential services power requirements; back-up power requirements for all facilities including State, regional and local facilities such as Police, SES, MFS and CFS stations; the need for any arrangements for back-up power to be included in contracts for design and or lease of Government premises<br>b) contingencies for black system events and extended power outages<br>c) regular back-up generator testing regime protocols, including testing under load and for long durations<br>d) contingencies for communications when mobile, landline and/or radios are not operational e.g. satellite phones; and<br>e) alternative State control centre facilities that are pre-identified, equipped and have procedures for moving to the alternative facility. |

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## 8. IMPACT OF EXTREME WEATHER AND FLOODING

Considerable damage was caused by strong winds, tornadoes, hail and flooding across many parts of SA. Detailed assessments of building and vehicle losses were undertaken in impacted locations by a multi-agency damage assessment team. The total assessments recorded are in the table below.

| Damage  | No. |
|---|-----|
| Major Damage (water inundation higher than 150mm above floor boards and/or structural damage) | 43  |
| Minor Damage (water inundation less than 150mm above floor boards)                            | 53  |
| Outer Buildings Damaged   | 38  |
| Vehicles Damaged  | 14  |
| Injury  | 1   |
| Total assessments recorded on system  | 910 |

*Table 2 - impact assessment summary as at 14 October 2016*

In the Mid-North, 23 electricity towers and three high-voltage circuits were brought down by the storm, causing a shutdown of power to the entire State. Power supply was restored to most of the Adelaide region within six hours, although more than 25 000 properties were still without power the next day. Parts of the Eyre Peninsula, Far North and Far West regions were without electricity for up to three days.

Major types of damage during this event included:

- road pavement failures due to intrusion of water
- flood damage to roads and creek crossings
- damage to footbridges
- landslips and rock falls due to weakness induced by saturated soils
- failure of septic systems
- damage to drainage infrastructure
- coastal impacts including significant erosion of beaches and sand dunes
- damage to jetties and boating facilities
- fallen trees and vegetation damage which require significant effort by councils to clear up and remove
- building debris caused by strong winds deposited on roads and public lands
- impacts of loss of power (see next section)

There was significant damage to roads, bridges and other infrastructure with initial estimates for repairing Department of Planning, Transport and Infrastructure (DPTI) infrastructure estimated at \$20 million for departmental roads, \$3.5 million for rural jetties and around \$1.2 million for passenger rail infrastructure.

Councils in SA manage approximately 75 000 km of roads including 50 000 km of unsealed roads. Many of these are important transport routes to support primary production in rural areas. Council-managed roads suffered considerable damage with initial damage estimates - \$15 million.

At least eleven councils, rural and metropolitan, suffered substantial damage to their coastal environment such as erosion of sand dunes to major damage to sea walls. Preliminary estimates indicate a repair bill in excess of \$2 million, but may be much higher (LGA, 2016).



*Figure 2 – Damage to Port Victoria jetty*

Damage caused to specific assets include:

- the power outage in the Adelaide Central Business District (CBD) cause the loss of traffic signals resulting in grid-locked traffic, building lifts, transport and other electrical infrastructure
- the River Torrens Linear Park was severely affected by high water levels which caused widespread damage and erosion along multiple council boundaries
- large amounts of waste and contaminated water and soil was generated by flooding of the Gawler River Floodplain
- severe damage to metropolitan and regional jetties (e.g. Port Germein jetty and sea wall with costs estimated at over \$1 million for the jetty and approximately \$400 000 for the sea wall)
- storm surges caused coastal damage and erosion, particularly on the West Coast and eastern coast of the Spencer Gulf
- 95% of the unsealed road networks in the Mt Barker council were damaged
- major roads needed to be closed including critical transport routes such as Port Wakefield Road, the Barrier and Spencer Highways.
- minor flooding within the Snowtown hospital
- Department of Education and Child Development (DECD) received reports from 31 sites State-wide advising of impact damage
- homes, sheds and equipment were damaged by tornadoes and very strong winds including at Blyth, Snowtown and Mid-North, Port Lincoln, Hallett Cove and Aldinga
- >11 000 applications were made for loss of power grant, 134 emergency relief grants paid (\$76 670), 120 flood clean up grants paid (\$56 450)

More difficult to measure, are the less visible impacts on the community such as the physical and emotional impact on vulnerable people including homeless people.

Economic and social impacts included:

- damage to jetties leading to financial loss of local businesses relying on the tourist economy
- economic impacts on businesses when holiday-makers cancelled travel plans due to weather and road conditions, including road closures along Port Wakefield Road which is a major thoroughfare to popular tourist destinations such as Yorke Peninsula and the Flinders Ranges
- economic and social impacts associated with flood losses, to current and future crops, in the intensive horticultural areas near Virginia

- 
- many schools were closed either due to severe weather, flooding on nearby roads or flooding of the school itself
  - community events were cancelled
  - Sealink Ferry services were cancelled
  - Department of Environment, Water and Natural Resources (DEWNR) conservation parks were closed

## **8.1 Damage assessment process**

The SA Damage Assessment Support Plan (DASP) was updated in 2016 in response to recommendations from the Pinery and Sampson Flat bushfires. During these events it was identified that the processes and responsibilities for damage assessment needed clarification.

The DASP outlines responsibilities, authorities and mechanisms to gather information about the damages and community losses that occur during and immediately after a significant incident. (Government of South Australia, 2016). The plan relies on relationships among State government agencies and other specialists. Control agencies undertaking a damage assessment during and immediately after an emergency event will base their plans on the DASP.

During significant events, information is collected about damage caused during an emergency and is shared with agencies that have a role in responding to, or assisting in recovery, from the impact of an emergency.

A centralised impact recording platform, called the Impact Recording Tool (IRT), created by DCSI, is now the primary recording mechanism used to capture and store damage assessment data.

On Thursday 29 September 2016 the State Recovery Office requested that the SES undertake a 'stage two impact assessment' in accordance with the DASP. SES made a request to SAPOL who, as per the DASP, appointed a Damage Assessment Manager to arrange and coordinate damage assessment requirements.

Six damage assessment teams were established and deployed the IRT. The damage assessment teams assessed 670 properties over four days.

The teams provided feedback that the IRT worked well during the event, particularly given that it was the first time the system had been used during an emergency. Some work is being undertaken to make minor adjustments and improvements to the system and the process.

Challenges identified relating to the damage assessment process include the disconnect between a 'stage one impact assessment' process conducted by the control agency and the 'stage two impact assessment' process. Presently a stage four impact assessment process does not exist.

Local government has identified that 'there is still a gap in the way damage assessment is performed. There appears to be a conflict between the detailed collection process focussed on individual properties and inhabitants opposed to a very rapid assessment that gives a 'helicopter' view of the impacts of an event. Councils that have used the LGA's emergency assessment reporting system (EARS) feel that there is considerable potential for the system to be integrated with the State system so that local information is quickly and accurately conveyed to incident management teams.' (LGA, 2016)

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**Recommendation 17.**

Continue development of the Damage Assessment Support Plan to:

- a) integrate data produced from Control Agency Stage One Assessment into the Stage Two Assessment
- b) develop a capability to undertake Stage Four Assessments which includes assessment of impacts to infrastructure, agriculture, businesses and the economy; and
- c) consult with the Local Government Association regarding how/if their Emergency Assessment Reporting System (EARS) data can be utilised in the damage assessment process.

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## 9. FLOODING

Flooding is the most costly natural disaster in South Australia, currently average annual damages from flooding in the State in exceed \$32 million.

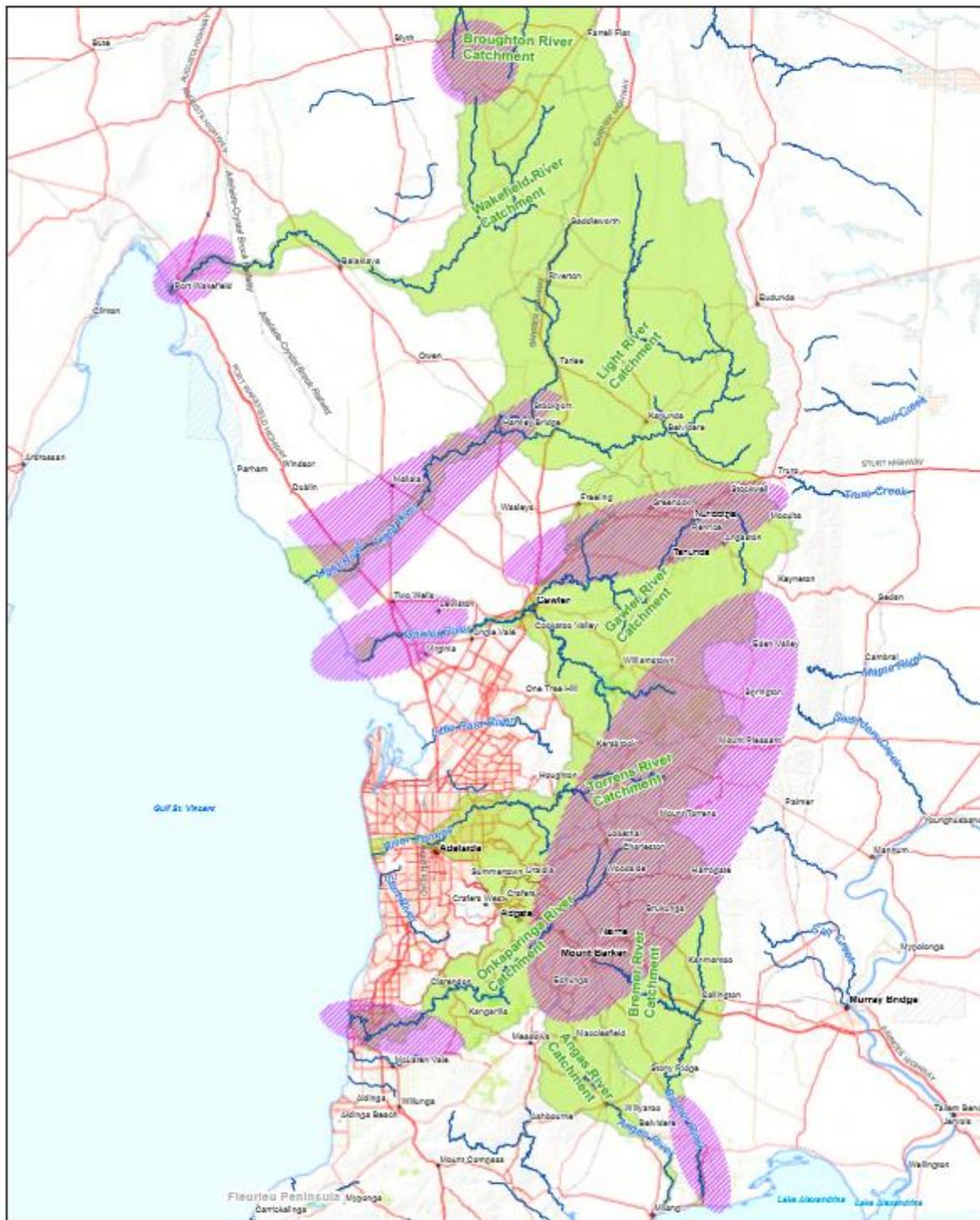
Under the State Emergency Management Plan (SEMP); DEWNR is the designated hazard leader for flood, which requires them to undertake a leadership role for planning of emergency management activities pertaining to flood, and ensuring that all activities across Prevention, Preparedness, Response, Recovery (PPRR) to do with that hazard are coordinated. The SES is the control agency for flood and will take charge of a flood or severe weather emergency and provide leadership to all other agencies responding (SA Government, 2016).

The significant rain event which commenced on 28 September 2016, occurred on an already saturated environment so even the smallest amount of rain would produce runoff with almost no loss. The top 100mm soil was at 100 % saturation which can take months without rain to dry out. As little as 5mm of rain was resulting in almost instantaneous spikes in river levels at gauges

The flooding resulting from the persistent rain during this event, affected all catchments in SA to a greater or lesser extent. The map below identifies general areas where catchments areas were flooded.

Adelaide is built on a natural floodplain and there are many dwellings situated within known flood risk areas. Despite historical impacts, many places and communities in South Australia are not well adapted to floods. The time between floods and the fragmentation of responsibilities between councils, State Government, the Commonwealth and private land owners creates barriers to agreement on collective action to adapt to floods and the changing risk profile.

## Flood Affected Catchments - Locality Map - 4/10/2016



- Higher Order Streams
- Affected Surface Water Catchments
- Focus Areas

Produced by: Mapping Support Team  
 Department of Environment, Water and  
 Natural Resources  
 Location: DEWNR  
 Data Source: DEWNR/DEWNR  
 Project Name: Flood  
 Projection: Transverse Mercator  
 Datum: GDA2011  
 SRS: GDA2011  
 Zone: 50  
 Date: 4/10/2016 5:23:15 AM

Created: 4/10/2016 5:23:15 AM

File ID: C:\Intranet\GIS\2016\04\_10\_16\_Flood Affected Rivers\mxd\01016\_Flood Affected Rivers\_2016\04\_10\_16\_Flood Affected Rivers.mxd User ID: ffran

Figure 3 - Flood affected catchments - locality map - 4/10/2016 - DEWNR mapping support team

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## 9.1 Dams

Due to high rainfall in the months leading up to and during this event, the ground and all South Australian catchments were saturated. Dams, including farm dams, were already at capacity meaning that any additional rain resulted in dam levels higher than planned. Dams with effective spillways released water via those spillways. Other dams, due to poor design construction or maintenance threatened to lose their structural integrity and burst. Some of the thousands of dams across the catchment did burst and cause additional flooding.

A rural dam at Greenock burst its banks and threatened to cause flooding of properties and roads in the Greenock township. Fortunately, only a relatively small amount of water flowed into back yards in the township.

Another dam at Tooperang burst and threatened properties and there were fears of dam failure at many locations including at Mount Torrens, Greenock, Verdun, Port Elliott, Hahndorf, Sevenhill and Hahndorf.



*Figure 4 - Beerenberg dam, Hahndorf (DEWNR)*



*Figure 5 - Dam at Hahndorf (DEWNR)*

A flood emergency warning was issued for people in the Auburn area due to a dam north of the township threatening to burst.

Emergency service personnel were responded to dams that were bursting or showing signs that their integrity was being compromised. Response crews are trained to deal with flooding however, to determine the best course of action in relation to the dam required input from a qualified geotechnical engineer.

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The uncertainty regarding appropriate response to dams highlights a need for greater collaboration around regulation and maintenance of, and response to, incidents involving dams.

Initially it was difficult to find suitable and available geotechnical engineers to provide advice. There was also confusion regarding who was responsible for paying for the technical advice and for performing and paying for mitigation activities i.e. SES as the responders or the landowner.

As a result of the large number of dams that responders were being called to, the planning section in the SES SCC developed a new procedure which was provided to IMTs and responders. The procedure outlined the requirements for SES response and a process to follow to minimise risk of dam breach and risk of flooding downstream communities. It also outlined potential risks such as owners having unrealistic expectations and abusing crews, which had already been experienced during this event by crews in some instances.

Previously requests for assistance from emergency service personnel to dams only occurred occasionally and was not documented in SES procedures. The SES and DEWNR have identified that research needs to be undertaken and protocols developed to ensure coordinated and effective multi-agency response to these events in future.

In SA there is currently very little dam safety legislation and governance. While dams provide multiple benefits they can also present risks to downstream communities.

SA Water owns the majority of large and extreme hazard dams and voluntarily complies with Australian National Committee on Large Dams (ANCOLD) guidelines.

For smaller, private dams there are limited provisions for dam safety with the exception of some regulations around siting and construction of dams in the *Development Act 1993* and *Natural Resources Management Act 2004*. But neither Act provides for assessment of how a dam is designed or constructed with regard to safety risk, nor any ongoing supervision to ensure dams are properly maintained.

The challenges with identification and management of dams have been raised in previous reports including the Queensland Floods Commission of Inquiry (2012) and the SA Flood Inquiries Task Force report (DEWNR, 2012).

The University of SA was commissioned by DEWNR on behalf of the Flood Inquiries Task Force to develop an options paper on dam safety. The paper identifies that policy options need to be discovered and implemented to provide adequate dam safety assurance to community, especially in relation to dam failure flood risk (Pisaniello & Tingey-Holyoak, 2016).

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*Floods from dam failures constitute a widespread hazard to people, property and the environment ...Failures of large dams (commonly those higher than 15 m) are spectacular and receive greater attention than those of smaller dams. However, small dam failures, particularly those of privately-owned farm dams, occur with greater frequency ...and overtopping due to inadequate spillway flood capability is their most common cause of failure... these threats and losses are exacerbated by climate change due to the significant predicted increases in rainfalls in many regions both in Australia (including SA) and around the world.*

*(Pisaniello & Tingey-Holyoak, 2016)*

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The paper also identified that the safety of private farm dams is unregulated and is putting community lives at risk.

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*'dam failure flood risks are significant ...between 70 - 90% of hazardous private dams have highly inadequate spillway flood capabilities ...and/or other structural dam safety problems, representing unacceptable individual dam failure flood risks....safety risks are linked to land development risks and need to be accounted in land use planning policy.*

*(Pisaniello & Tingey-Holyoak, 2016)*

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The dam safety paper provides the following general recommendations for SA policy makers:

1. Established minimum and best practice assurance benchmarks should be integrated into policy for safe catchments;
2. A supervisory system should be implemented to plan, design, review and maintain dams according to acceptable safety practice in line with the benchmarks and ANCOLD guidelines;
3. Within this system most dams, but especially those that could pose either considerable individual or cumulative hazard, need registration and regulatory control, and spillway flood capabilities should be particularly in focus.
4. The system should be fit-for-purpose (i.e. simpler, cheaper obligations for low hazard dams and increasingly more stringent requirements for higher hazard dams) and include provision of inexpensive safety design/review and monitoring solutions.

The increased level of risk that was evident during this event, and the impact on responders and the community, reinforces the need for policy development in relation to dam safety.

## 9.2 Angus and Bremer Rivers

The Angus and Bremer River catchments are part of the Lower Murray River Basin that discharges into Lake Alexandrina. There is a long history of flooding in and around the townships in these catchments including Strathalbyn and Langhorne Creek.



**Figure 6 - Angus River (DEWNR)**



**Figure 7 - Bremer River, Callington Road (DEWNR)**

Langhorne Creek is an example of a South Australian township that has developed in harmony with the natural cycle of floods. Floods in the area enrich the soil and provide a valuable source of irrigation water for agriculture (McCarthy, et al., 2006).

In a report commissioned by DEWNR it was Stated that 'several tributaries converge upstream of, or within Strathalbyn which have caused flooding in the past and has been addressed by some flood mitigation works' (Tonkin Consulting, 2016). This appears to be supported by evidence of less flooding in the Strathalbyn area than previous events.

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Due to heavy rains prior to the severe weather on 28 September 2016, Langhorne Creek, Ashbourne, Strathalbyn and Finnis had already been identified as areas of concern for potential flooding and houses in these areas were already sandbagged to protect them during recent storm events.

Rivers, creeks and tributaries reacted quickly to small amounts of rain and as little as 5mm created almost instantaneous spikes in river levels at gauges.

Around the Langhorne Creek area, water levels were higher than the 2002 floodwaters that affected the area. Roads were inundated and quickly became impassable.



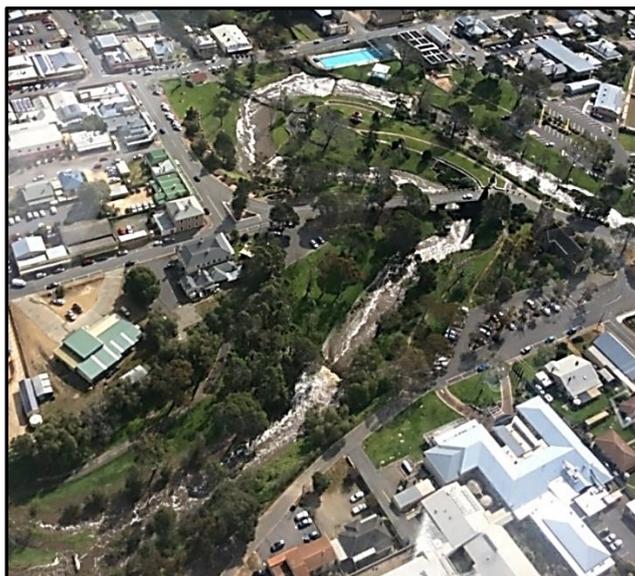
*Figure 8 - Langhorne Creek (DEWNR)*

The Langhorne Creek community is aware of the flood risk in their area and took the necessary precautions to minimise flood damage to properties. They are also generally prepared to be isolated for a period of time due to inaccessible roads. The community IMT identified the need for, and in conjunction with SAAS and SES established, a medivac plan for Langhorne Creek, because floodwaters were too high for emergency vehicles to travel through.

The Bremer and Angas both peaked several times and there was potential to cause major damage to the surrounding area. The Rodwell Creek which flows from Wistow and Bugle Ranges added to the higher levels at the gauges in the Bremer River around Hartley and Woodchester.

An initial generalised flood warning for the Angus and Bremer rivers was issued on Thursday 29, followed by another generalised flood warning on the Friday, and a final warning issued on the Saturday.

Threat to the community in the area were fast flowing water, dangerous driving conditions, potentially contaminated water, potential electrical issues around flooded properties, high wind, flying debris, inundated agricultural land, full farm dams and potential for levy breaches or collapse.



*Figure 9 - Strathalbyn town centre (DEWNR)*

### **9.3 Metropolitan rivers and creeks**

The River Torrens is the most significant river on the Adelaide Plains and runs from the Adelaide Hills near Mount Pleasant through to Adelaide and empties into the Gulf St Vincent at West Beach. It is fed by the 'numbered creeks' (First through to Fifth creeks) as well as other creeks and tributaries.

As a result of the heavy rain, SES issued a flood advice on 3 October 2016 for an elevated risk of flooding of the Torrens. Then on 4 October a watch and act message was provided to the community to advise of flooding of the river and to take care around the water.

Moderate flooding occurred across the Torrens River catchment. Flooding was reported at multiple locations along the extent river from Birdwood in the Adelaide Hills, along Linear Park and at the West End Brewery on Port Road.

Linear Park runs along 35 kilometres of the River Torrens. It contains tracks for cyclists and pedestrians as well as other infrastructure such as playgrounds, park furniture and barbecues. Areas directly alongside the river bank are kept clear of buildings for flood mitigation however, due to the extent of the flooding there was still a large amount of park infrastructure damaged.



*Figure 10 - River Torrens in flood, Felixstow*

Large sections of Linear Park were severely affected by high water levels and warnings and park closures required considerable coordination between bordering councils. There was debris strewn

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along the park, five out of eight pedestrian bridges were under water and closed, and there were collapsed creek embankments and erosion of river banks.

Sturt River is another metropolitan waterway for which the SES issued an advice message. It advised residents of the potential for localised flooding along the Sturt Creek including Coromandel Valley and Marion

Waterfall Gully Road was also affected. It had already been significantly damaged two weeks earlier in another flood when large amounts of mud, rocks and other debris were washed onto the road. There was water impacting homes and blocking the road. This event impacted both Waterfall Gully Road and Waterfall Terrace Burnside.

Flooding of the Patawolonga Lake System (PLS) can be a concern during some events when there are high levels of rainfall, particularly when high water levels within the system coincide with high tides.

There was also a notable flood in 2003 when the mechanisms of the Barcoo Outlet failed to operate correctly, resulting in flooding of Glenelg East. Since that time, the systems which operate the PLS have been made significantly more resilient.

In this event the system operated at levels slightly above normal, however there were no flooding concerns.

#### **9.4 Onkaparinga River**

The Onkaparinga River runs from its source between Mount Torrens and Charleston in the Mount Lofty Ranges, and flows for 95 kilometres in a south-westerly direction to an estuary at Port Noarlunga. Mount Bold Reservoir, which is on the Onkaparinga River system, is the largest reservoir in SA.

For catchment management purposes the Onkaparinga River is divided into the upper, middle and lower catchments.

Minor flooding occurred in the upper Onkaparinga River affecting roads from Lobethal to Hahndorf causing road closures. Levels in the middle Onkaparinga River between Mount Barker and Mount Bold reached minor flood levels affecting roads and pastoral land. Areas in the Lower Onkaparinga catchment below Mount Bold reservoir, such as Old Noarlunga and Port Noarlunga were monitored for potential riverine flooding and flooding caused by storm surge.

The Adelaide Hills were most affected on Tuesday and water flooded the main street in Hahndorf, where homes and businesses reported damage. There was also flooding in homes and buildings at Verdun and Aldgate.



*Figure 11 – Verdun township (DEWNR)*



*Figure 12 - Shillabeer Road, Oakbank*

Old Noarlunga had been flooded two weeks prior to this event, on 14 September 2016, which caused damage to around 60 homes. Residents in the area were nervous that they would be flooded again and some had not yet been able to return to their homes since that event. The MFS pumped large volumes of water to reduce the risk of homes being inundated and assisted council to block stormwater entrance points to reduce further flooding.

The release of water from Mt Bold contributed to flooding in the Noarlunga area on 14 September 2016. Downstream tributaries were completely full, the catchment response was unprecedented and the water that was released had nowhere to go. In addition, the amount of rainfall that was received was much greater, and fell more quickly, than was predicted which reduced the ability of SA Water to release water in a timely way without causing damage.

On 14 September, SA Water released water from Mt Bold reservoir at the rate at which it was coming into the reservoir. This is consistent with SA Water spill management procedures and is based on experience from previous events. The purpose of the reservoir is for water storage, so the objective of the spill management procedure is to manage the reservoir level. The goal is to maximise the amount of water held so that the cost to the consumer is minimised. The purpose of the reservoir is not for flood mitigation.

Following the flooding on 14 September 2016, SA Water reviewed their spill management procedure. In addition, the SES Chief Officer met with the CEO SA Water, A/CEO DEWNR and the BoM Regional Director, to discuss issues surrounding releases from Mt Bold reservoir. At the meeting agreements were made for closer liaison and communication between the agencies, both prior to and during events. The agencies agreed to a greater degree of collaboration involving: sharing data; communicating requirements for information; and, sharing combined knowledge; and, contributing to procedures for prediction and management of future flooding event.

Once the BoM predicted that more rain was expected on 28 September 2016, SA Water reduced the level of Mt Bold to 80 %. This is a different strategy compared to the previous event. Due to the predicted weather, SA Water decided to commence releasing water on the Monday to minimise the risk of flooding downstream. To adequately reduce the level before the weather impacted, an early start to releasing water was imperative.

The amount of water released was in response to a number of factors including: lessons learned from the 14 September event; a more accurate prediction from the BoM; better communication between SA Water, the BoM and DEWNR; and, the prediction that further rainfall would follow the 28 September 2016 event enabling topping up of the reservoir after the weather event.

There were ongoing discussions between SA Water, the BoM and DEWNR regarding predicted rainfall, potential hydrological impact of water coming into and leaving Mt Bold and the amounts and timing of release required to minimise the risk of flooding.



*Figure 13 - Mt Bold Reservoir water outflows (DEWNR)*

There was some minor flooding again at Noarlunga however this was due to full storm water pipes rather than riverine flooding.

The release strategy chosen by SA Water for this event resulted in a positive outcome. SA Water has identified additional learnings including establishing a more formal arrangement with the BoM so that the information required by SA Water to undertake effective planning and implement appropriate water release strategies is available.

## **9.5 Gawler and Para Rivers**

The Gawler River is located to the north of Adelaide and flows from the township of Gawler to the sea near Buckland Park. It receives very little inflows along its length and its hydrology is dominated by the catchment inflows of its two major tributaries the North and South Para Rivers, which have a catchment area of over 1000 km<sup>2</sup> (Australian Water Environments, 2008). There are natural and man-made levees along much of its length many of which are in poor condition because they haven't been constructed to appropriate standards and/or have not been maintained.

Floods in the Gawler River are driven by flows from the upstream rural catchments of the North and South Para Rivers. These two river systems join immediately downstream of the town of Gawler. The capacity of the Gawler River channel falls from east to west and varies. Major overtopping in large floods occurs along much of the river length. Even modest flows are likely to cause flooding (at least in parts) of the lower Gawler River, on a relatively regular basis.

Significant flooding commences within Gawler township from both the North Para River and South Para River. Mitigation works within Gawler, construction of the Bruce Eastick Flood Mitigation Dam on the North Para, and modifications to the South Para Reservoir, have reduced the extent of this flooding for a 1 in 50 ARI event and greatly reduced flood extents for events around the 1 in 20 ARI and less. Flooding from the 1 in 20 ARI still occurs in the lower reaches of the Gawler River (west of Virginia) due to the limited capacity in this area (Australian Water Environments, 2015)



*Figure 14 - South Para (DEWNR)*



*Figure 15 - North Para River, Turretfield dam (DEWNR)*

When floodwaters overtop the banks of the Gawler River they spread north and south along the floodplain and are unable to return to the river channel. This is exacerbated by the limited capacity of the Gawler River and the progressive reduction in channel capacity from Gawler to the sea. The Gawler River has had a long history of flooding causing significant economic losses (Australian Water Environments, 2008).

Given the history of flooding in the area, and the various studies that have been undertaken, and despite mitigation activities having reduced the potential for flood in some areas, there is still an expectation that during sustained rain events, floodwaters will break out of river channels. Further mitigation activities are required to reduce the risk of flood on the Gawler River Floodplain.

The Gawler River Floodplain Management Authority has engaged Australian Water Environments to carry out a hydrological review of the 2016 flood and identify alternative flood mitigation options for the lower Gawler River. This will include collation of rainfall and streamflow data from across the Gawler River, North Para and South Para, and a summary of the flood and its magnitude characterised at key locations across the catchment. This report will provide detailed information about the hydrological component of this event.

Figure 17 shows the key locations where break outs occurred and flowed onto agricultural properties causing extensive damage. Figure 18 illustrates the extent of the flooding.

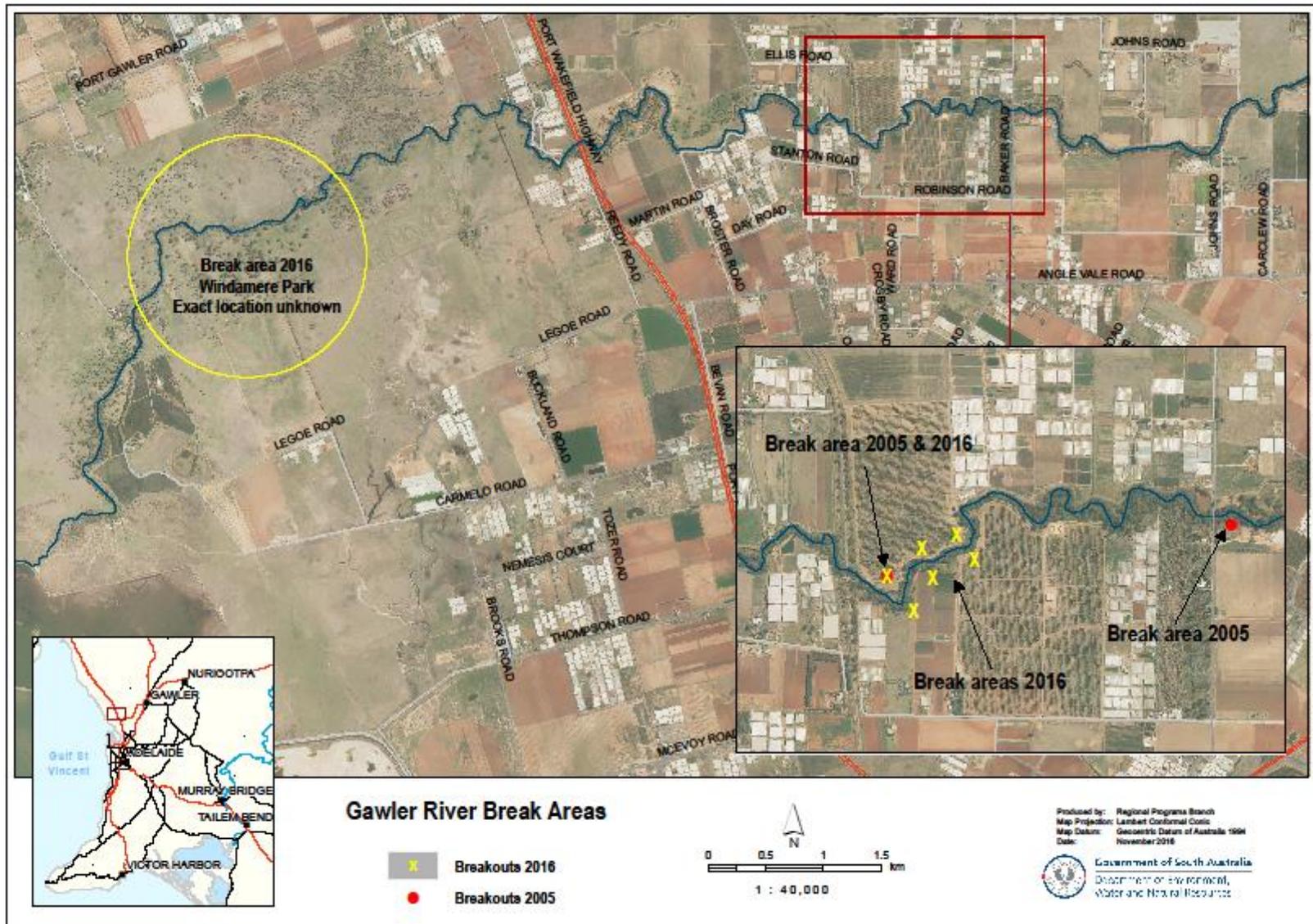


Figure 16 - Gawler River break outs (DEWNR)

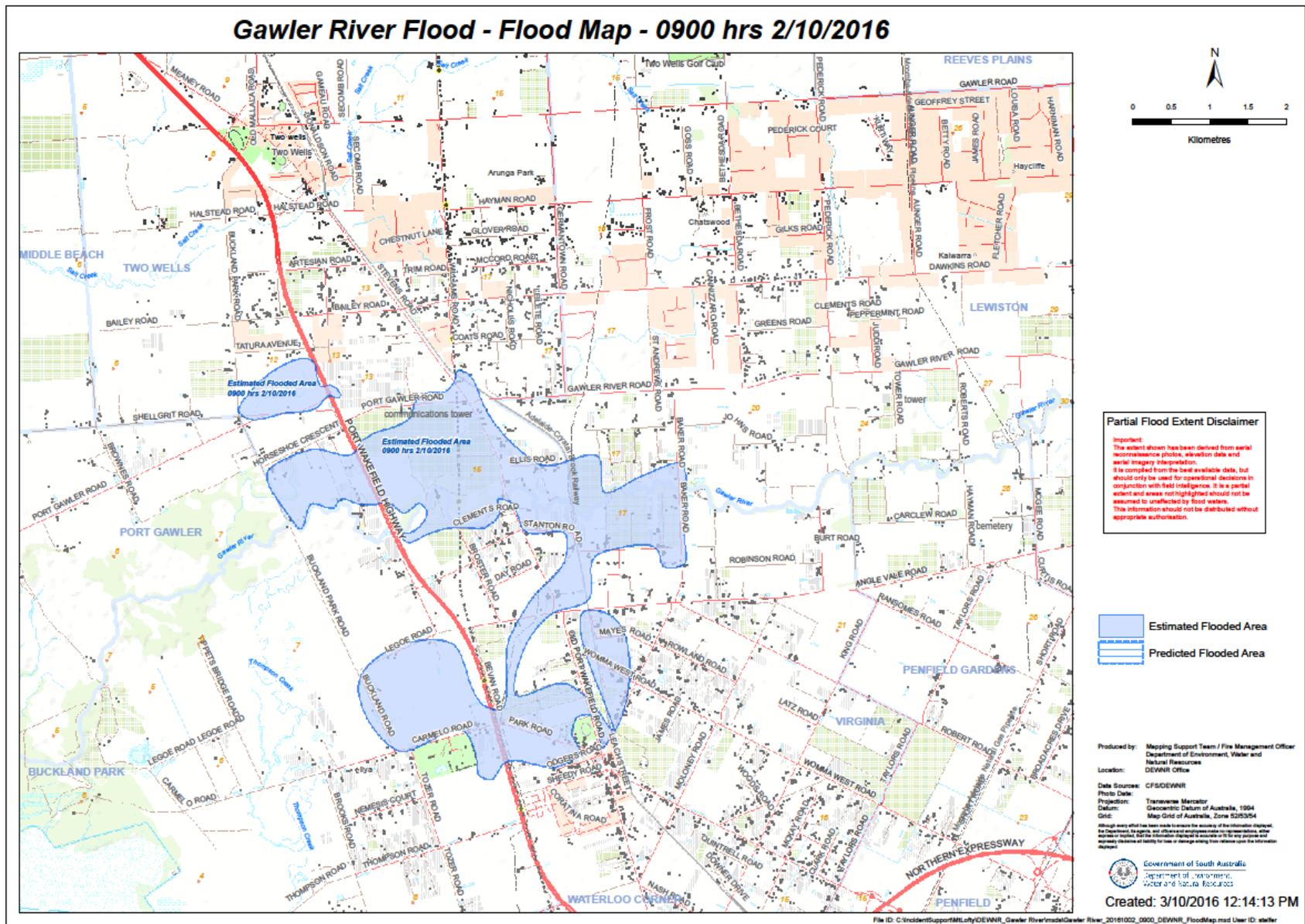


Figure 17 - Gawler River - Flood Map (DEWNR mapping support team)

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Primary producers in the Northern Adelaide plains were impacted, with initial costs estimates of damage of more than \$51 million, with up to 300 primary producers affected and around 1500 hectares of farming land (open fields and 727 greenhouses) inundated. It is notable that the damage was concentrated in a small area of high-value land.

Emergency relief and recovery arrangements were established to support the local community and businesses.

The river level at Gawler township peaked on Friday 30 September. The levels in the Gawler River downstream of the Gawler township continued to rise during Saturday morning with moderate flooding with a number of properties inundated.

Water flowed from Gawler to the sea and breached the road at the Old Port Wakefield Road bridge.

Major flooding occurred in the North Para, South Para and Gawler Rivers and the at Little Para and South Para Reservoirs were spilling.

## 9.6 North of Gawler

All catchments north of Gawler were at capacity with many rivers breaking out.

The township of Bowmans was flooded, as a result of a breach of the Wakefield River north of Bowmans. Approximately 20 houses were inundated and one family was evacuated and taken to alternate accommodation. Emergency services door knocked other premises but no further evacuations were required.

A number of breakouts occurred in the lower reaches of the Wakefield River, threatening the township of Port Wakefield and spreading water into low lying farmland. Port Wakefield and Mallala Roads were closed with diversions in place for several days.



*Figure 18 - Wakefield River at Balaklava, including Balaklava hospital (DEWNR)*

The Barrier, Wilkins and Horrocks Highways and the Port Wakefield to Balaklava road were all closed due flooding.

The Light River which runs parallel to the rail line alongside Mallala Road was under threat of flood water and trains were cancelled due to the water impinging on the rail corridor.

SAPOL undertook door knocking Middle Beach and Webb Beach Communities to advise of the predicted tidal surge. The Parham Caravan Park was closed and relocated. The South Westerly winds caused a tidal surge of around 2.4 m along the upper Spencer Gulf.



*Figure 19 - Wakefield River, looking south towards Port Wakefield (DEWNR)*

About mid-day on Friday 30 September, reports were received of flooding in the small, rural township of Koolunga which is on the Broughton River. By late afternoon, waters were impacting many rural properties along the Broughton River, the township of Wandearah experienced flooding and there was water across many of the roads in the area.

There are no flood gauges on the Broughton River and no flood modelling which, if it had been available, could have been used to predict flooding and provide advice to potentially affected communities. The only intelligence available was local knowledge of previous events. CFS and SAPOL were deployed to monitor the lower Broughton River flood progress.

As a result of the lack of available intelligence there was no advance warning advice provided to the Koolunga community of flooding and they were caught unaware. The impact of the floodwaters could potentially have been mitigated against, if advance warning had been provided to residents.

Flooding occurred in the Barossa Valley on the North Para River around Nuriootpa and downstream, and at Balaklava on the Wakefield River. There was significant local government response to flooding particularly in and around mitigation wall at Nuriootpa.

The town of Clare was impacted by flooding in the main street. The local caravan park was evacuated and town infrastructure, such as the information centre, was under threat. Surrounding the town there were a number of strategic dams at risk.

Many local roads were blocked by trees downed by strong winds.

There were a number of dams in the area that were causing concern. A rural dam broke its banks at Greenock, which caused flooding of properties and roads in the Greenock Township.

The Gilbert River threatened the towns of Riverton and parts of Stockport were flooded. The local caravan park was threatened and the Gilbert Valley Senior Citizens Retirement Home was put on watch with sandbags in place. The town was noticeably better prepared than previous occasions, with sandbags already in place.

The townships and roads in the areas of Hamley Bridge, Tarlee and Saddleworth were also affected by the rising floodwaters of the Gilbert River.

The Beetaloo Reservoir was at 100 % capacity, and spilling over which posed a risk of flooding of the Crystal Brook (creek), with several houses in Beetaloo Valley at risk, and the Crystal Brook Township Caravan Park. People in the area were contacted and made aware of the situation.

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## 9.7 Naracoorte Creek

Naracoorte recorded 120mm of rainfall over the period of a week. There were concerns about the rising flood water and emergency service crews supported the community by providing sandbags.

A watch and act message was issued for Naracoorte on Tuesday 4 October 2016 and the river continued to 'pulse' over the following few days.

While Naracoorte and surrounding areas became waterlogged, the damage caused by flooding of the Naracoorte creek was largely confined to back yards and rural areas. Most of the requests for emergency service assistance in the area related to storm damage and trees down rather than flooding.



*Figure 20 - Naracoorte airport (DEWNR)*



*Figure 21 - Footbridge at Naracoorte Creek*

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## 9.8 Flood risk

It is recognised that hazards such as storms, floods and bushfires are not only responded to when an emergency occurs but events occur within a broader emergency management context. In addition to response this also includes prevention, preparedness and recovery (PPRR).

Responsible agencies such as hazard leaders, control agencies, local government and other service providers undertake planning and activities across the PPRR spectrum to mitigate potential consequences, prepare the community and provide resources and systems to enable communities to recover following an emergency.

Zone emergency management plans are developed for each of South Australia's 11 emergency management zones, as part of this process flood hazard risk management reports are developed where the Zone Emergency Management Committee (ZEMC) determines it to be a priority. 9 of the 11 Zones have prepared a flood risk assessment, including the four zones of metropolitan Adelaide, and the Barossa, Limestone Coast, Far North, Murray Mallee, and Yorke Mid North Zones.

Flood hazard risk management reports provide an assessment of flood risks in the zone and consider the impacts on people, environment, economy, public administration, social setting and infrastructure.

The plans present a view of stakeholders' understanding and perception of risk across the zone. They are a preliminary representation of flood risk in the zone and present a strategic view of the risks and priorities for treatment for input to the zone emergency management plan and for broad zone planning purposes.

Options for flood mitigation include structural measures (infrastructure), land use planning, development and building controls, and flood emergency measures. Identifying appropriate and effective mitigation strategies and crucial to minimising damage caused by flooding. However, mitigation measures can be very complex and difficult to achieve because there are many stakeholders. Control improvements and treatment options for flood risks can include activities such as:

- community education programs including on flood risk, insurance for floods
- Bureau of Meteorology (BoM) flood warning service
- SES warning messages and information
- land-use planning
- community information through councils
- local government emergency management plans.
- stormwater management plans
- promote mitigation research
- community education – general resilience

There are many groups including multiple local councils, various State government agencies and authorities who have a level of responsibility for mitigation however the specific responsibilities are not well defined. Mitigation activities can be very difficult and expensive to implement and it can be a significant challenge for groups such as mitigation authorities, to progress these activities, due to the inability to acquire funds or the commitment required from any of these groups.

At the Local Government Association (LGA) Annual General Meeting (AGM) held 21 October 2016 it was agreed that the LGA will investigate whether there is sufficient evidence across Local Government to liaise with the State Government in order to develop guidelines and/or appropriate legislation to enable the control and management of the flooding caused by rivers and creeks on private land.

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## 9.9 SA Flood Inquiries Taskforce and Flood Reform Taskforce

The South Australian Government convened the Flood Inquiries Taskforce in 2011 to review inquiries into the major floods which occurred in 2010 and 2011 in Queensland and Victoria, and to determine the implications for SA. The taskforce concluded in July 2012, making a total of 15 strategic recommendations.

One recommendation was to form a Flood Reform Taskforce (FRT) to implement and monitor all recommendations. In 2015, DEWNR reviewed the progress of the FRT recommendations (DEWNR, 2016a).

In summary seven recommendations, plus part of recommendation 1.1, have been completed, these are:

- 1.1 Integrate River Murray planning and operation into flood management arrangements
- 1.2 Prepare policies to support decisions to evacuate before and during floods
- 2.1 Improve flood risk assessment at State, zone and local levels
- 3.1 Develop and implement a flood intelligence decision support system
- 3.2 Develop a business case for a flash flood warning service for SA
- 4.1 Undertake a flood monitoring review
- 5.1 Facilitate the broader adoption of the Community FloodSafe Program
- 6.4 Regulate the construction of new levees

Seven recommendations, plus part of recommendation 1.1, are yet to be completed, and still require the attention of the FRT:

- 1.1 Integrate reservoir planning and operation into flood management arrangements
- 1.3 Clarify responsibilities for management of watercourses, levee banks and other infrastructure in relation to flooding
- 2.2 Develop and maintain knowledge of persons and communities vulnerable to flood
- 6.1 Assess the need for a safety regulator to manage risks of structural failure of dams, levee banks, and decommissioned mine sites
- 6.2 Reform development controls to explicitly reflect flood risk
- 6.3 Review regulation of hazardous materials in times of flood
- 7.1 Undertake a flood response capability and capacity review
- 7.2 Assurance of the operational capabilities and capacities of agencies and organisations with functions under the SEMP.

For the remaining recommendations, a work plan has been established and a great deal of work has been progressed during 2016. The FRT and its working groups are reconvening during 2017

Throughout this Review the value of these recommendations has been highlighted. The steps that have already been taken have provided a better understanding of the status of flood risk, mitigation strategies and intelligence requirements.

The recommendations that are yet to be completed will be very important to the response to, and mitigation and management of any future flooding events. Many of these measures will assist in reducing the impact on communities. It is very important that this work continue to be supported through to implementation.

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## 9.10 Flood information system

This event demonstrated the need to have up to date and relevant flood intelligence as well as the challenges that lack of intelligence can result in. One of the key outcomes of the Flood Reform Taskforce was to propose the development and implementation of a flood intelligence decision support system

As the Control Agency for flood, the SES leads the emergency response and is responsible for ensuring that the public is adequately informed and warned regarding potential floods, including providing relevant and timely information about the need to evacuate. DEWNR, in its role as Flood Hazard Leader, is required to ensure that appropriate processes are in place so that the SES have access to information to enable them to provide warning, and ensure implementation of relevant community education programs.

To meet these responsibilities DEWNR and the SES are working collaboratively to deliver an improved flood warning and hazard management system and supporting processes. This is an initiative to improve flood management in SA, particularly with respect to flash flooding.

The broader scope of the program is to improve the State's capability and capacity to provide timely flood warnings; to facilitate safe, effective and coordinated emergency response; and provision of flood information to the community. The program will deliver flood warning, especially for flash flood scenarios, flood intelligence and community education and flood awareness.

The Flood Information System is being developed to provide:

- visualisation of current and forecast data
- analysis of current and forecast data
- visualisation of flood exposures
- integration of known flood intelligence

This system will be hugely beneficial for effective, coordinated and evidence-based management of flood emergencies in the future.

## 9.11 Intelligence

The intelligence function within incident management is necessary to support decision-making. This involves collecting information, processing information into timely, accurate and relevant intelligence, and then providing that intelligence to relevant agencies and parts of the incident management structure and ultimately to the public.

Intelligence was provided by a variety of sources including weather information from the BoM and hydrological intelligence from the DEWNR and BoM hydrologists. This information was critical for prediction of floodwaters, planning activities and for public information and warnings.

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*The embedding of a meteorologist from the Bureau of Meteorology proved critical for the flow of information and updates on wind, flood and coastal risks. This arrangement improved the connectivity between DEWNR's hydrologists working in the SCC and the Bureau's flood desk. The establishment of dedicated computing links from the SCC back to the Bureau's ICT environment proved essential for the meteorologists to undertake their functional support role.*

*(SASES, 2016)*

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Flood monitoring is dependent on weather forecasts provided by BoM. Real-time monitoring of watercourses and rainfall in SA is undertaken by a number of organisations including DEWNR (incorporating Natural Resource Management Boards), the BoM, SA Water and councils.

Flood warnings are based on predictions of flood levels and timing that are uncertain. The prediction depends on the quality of real-time rainfall and river level data, the capability of rainfall

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and hydrological forecast models and the level of service required (DEWNR, 2016b). In South Australia, the Bureau of Meteorology has responsibility for forecasting and warning for riverine catchments. SASES has responsibility for forecasting for flash flood catchments, as well as 'value adding' to Bureau forecasts riverine catchments with information such as likely impacts and areas affected.

The flood response activities by DEWNR during this event highlighted a number of gaps in information which impede the ability of hydrologists to predict potential flooding, which in turn, constrains the capability of the SES to warn the community and respond effectively to flooding. The two main information gaps are gaps in flood risk information (flood studies) and gaps in flood monitoring (rainfall and river level gauges). Both of these information sources are critical for understanding the vulnerability of a community to flooding, its likely impacts, and the severity of the flood in real time.

The gaps in the stream gauge network have been assessed on behalf DEWNR (Australian Water Environments, 2016) in an effort to identify, prioritise and resolve these gaps. However, funding for gauges is problematic because they require an initial investment to purchase and install a new gauge and then ongoing maintenance and calibration costs. There is no agency identified as being responsible for gauges and therefore no clear direction on how to address gaps in the network.

This event highlighted some of the gaps in the gauge network. There are no flood gauges on the Broughton River and there is no flood modelling which, if available, could have been used to predict flooding and provide advice to potentially affected communities.

There are gaps in the gauge networks including in the Mid North, which effected the ability of BoM and DEWNR to provide flood predictions in this area. There is a need to expand the monitoring network and DEWNR has undertaken some studies to prioritise potential gauge sites.

DEWNR was not fully aware of the impact that an outage of its servers could have on external parties. During the outage, DEWNR staff relied on the mobile phone network to communicate with gauging stations and relay readings manually to the BoM. Had this outage continued, it would have hampered the Bureau's ability to provide timely and accurate warnings for areas such as the Gawler River catchment.

There were also problems encountered with some SA Water gauging stations. In some locations this required SA Water staff to communicate manual readings to the BoM. In addition, storm tide prediction could be improved by installing a tide gauge in the Pirie River

There is also opportunity to improve the connection between the SES and local government to enhance intelligence gathering.

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*'More liaison and preparation between council and the control agency to share information/intelligence is required.'*

*'Council intelligence and data was not utilised to its full potential - intelligence at the local level does not equate to State knowledge.'*

*'Information flow to councils from the SES should have occurred sooner or conversely councils should have made a greater effort to liaise with the control agency.'*

*(LGA, 2016)*

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In 2015 a contract was confirmed for an embedded meteorologist from the BoM at the SES SCC during winter. This arrangement follows the lead of arrangements previously established between BoM and the CFS during the fire danger season.

The BoM will 'expand upon forecasts and outlooks, articulating uncertainties in the forecast, possible other scenarios and their likelihoods...the primary service will be a briefing service focused on enhancing situational awareness'. The ability to be provided with the briefing, be able

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to ask questions and discuss various options and scenarios greatly enhances the ability of SES to be able to plan effectively in the lead up to, and during, significant events.

Likewise, an MOU has been between SES and DEWNR which provides for 'flood incident management support arrangements' where DEWNR provides 'expertise in flood hydrology' at the SES SCC 'for the purpose of providing hydrological advice on developing flood situations'.

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*The operationalisation of the MOU between DEWNR and SES for the provision of mapping and hydrological support was effective and SES received outstanding support from that agency*  
(SASES, 2016).

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These relationships between BoM, DEWNR and the SES have proven to be invaluable for providing weather and hydrology intelligence enabling SES to undertake more effective planning and response activities. It has also resulted in enhanced relationships, high levels of trust and cooperation.

## 9.12 Levees

A recommendation of the SA Flood Inquiries Taskforce (DEWNR, 2012) was to 'clarify responsibilities for management of watercourse, levee banks and other infrastructure in relation to flooding'.

A levee is an embankment which has been raised to prevent a river from overflowing. It is estimated that the collective total of levee banks in SA could total well in excess of hundreds of kilometres (DEWNR, 2015). There is very little policy regarding management roles and responsibilities for levee banks. In some council areas levees are a major mitigation measure however there is no database on where levees are located and no determination for who is responsible for maintaining these.

During this event many levees were overtopped and lost their structural integrity causing widespread flooding in areas they were designed to protect. There is also evidence in the aftermath of this event, of landholders creating new levees to protect their properties for future flooding events without seeking any approval or giving appropriate consideration of where re-directed water would impact further downstream.

|                           |   |
|---------------------------|---|
| <b>Recommendation 18.</b> | That the Flood Reform Task Group, as proposed by the Department of Environment, Water and Natural Resources, develop a business case for Cabinet, based on the dam safety discussion paper (Pisaniello & Tingey-Holyoak, 2016) which identifies options and a way forward to address dam safety in SA.  |
| <b>Recommendation 19.</b> | That, giving consideration to the previous recommendation, the Flood Reform Response Working Group identify and consider appropriate agency involvement and protocols for response to and management of dams which are in danger of losing their structural integrity or spilling.  |
| <b>Recommendation 20.</b> | That the Flood Reform Task Group identify an appropriate mechanism for stakeholder agencies (including the State Emergency Service, Department of Environment and Natural Resources, Bureau of Meteorology and SA Water, as a minimum) to share data and information and develop plans and strategies for management of water levels in reservoirs and spill management during floods in South Australian water catchments. |
| <b>Recommendation 21.</b> | That consideration and resources be given to support the implementation of recommendations in the report prepared on behalf of Department of Environment, Water and Natural Resources (Australian Water Environments, 2016), for flood warning classification of stream gauges and other locations.   |

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**Recommendation 22.**

That resources be provided to support the implementation of recommendations in the South Australian Levee Bank Management Issues Paper (DEWNR, 2015) including:

- a) development of relevant policy; and
- b) identification of responsibilities in relation to levee management and flood mitigation

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## 10. EMERGENCY RESPONSE

Providing effective and coordinated response of multiple emergency services to a large number of events is challenging and complex. The three SA emergency services, State Emergency Service, Country Fire Service and Metropolitan Fire Service, have some capabilities in common, such as being able to undertake a basic (non-technical) rescue or to clean up debris from a road following a vehicle accident or storm.

Some other capabilities are specific to a single agency eg SES for severe weather, and floods, and in technical activities to remove a fallen tree from a roof; CFS for bushfire response; and MFS for house and building fires in the metropolitan areas.

Each agency has multiple capabilities, each of which involve having the relevant training and equipment, and there are also capabilities in which each of the emergency services specialise.

There are many aspects of emergency response, for each agency individually and all the agencies together, that need to be coordinated to ensure that the most efficient and effective response is provided to maximise the safety and protection of the community.

### 10.1 Call receipt and dispatch

Call-takers in the MFS Communication Centre (Comcen), also known as Adelaide Fire, receive Triple Zero (000) calls for fire and rescue. The Comcen undertakes the 'call receipt and dispatch' function for the MFS, CFS and SES. The Comcen also answers calls on the 132500 SES flood and storm response line (132500).

During extreme weather there is a dramatic increase in calls on Triple Zero (000) and 132500. To ensure there is adequate call-taking capability in the Comcen for when severe weather is predicted, a staffing matrix is used to establish a suitable number of call-takers for the predicted scale and impact of the event.

During the peak of this event over a 48-hour period, Comcen received 2279 calls and dispatched a total of 2311 units from the three agencies (MFS, 2016)

Despite increased staffing, it can be expected that during an extreme weather event, at some point the number of incoming calls will exceed the capacity of the call-takers. The MFS is currently considering ways in which they can increase the number of call-takers available to them at peak times additional means of managing this workload also need to be considered.

The public are encouraged to call 132500 when they require SES assistance but the situation is not an emergency, however many of the calls received on Triple Zero (000) are also for non-emergency situations. To address this, Comcen and SES developed a procedure whereby SES provides a liaison officer to attend the Comcen to assist with prioritisation and allocation of SES calls. An SES liaison officer was provided during this incidents and MFS found this invaluable in assisting Comcen staff to effectively dispatch SES units.

When people call 132500 they are initially directed to an interactive voice recording (IVR). The IVR explains the options for information available relating to the current even. Another option offers the caller the opportunity to seek further information which then diverts the caller to the Comcen. This requires a call-taker to attend to the request for further information.

During this event approximately 25% of the calls on 132500 and diverted into the Comcen were for information only, eg enquiries about where sandbags or relief centres were located. On a normal day this would not be a concern because it would only result in a small number of calls however, in this instance, it resulted in excess of 500 calls.

Requests for assistance on 132500 can also take a considerable amount time to process because the call-taker needs to request enough of information from the caller to: establish if an emergency service response is required; ensure the details are accurate; and, ensure an accurate assessment of the level of priority can be made so resources can be assigned quickly to the most urgent situation.

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The success of community take-up of the 132500 number can be attributed, in part, to the large amount of news outlets picking up the details from SES public information during events. During individual news segments reporters may read out the number multiple times, encouraging people to ring.

The Comcen has identified that triaging of incoming calls needs to be more effective to ensure Comcen operators' time is spent on the highest priority calls. It has already been determined that Comcen and SES will work together to identify options for: improved management of the IVR; more effective information options for callers; alternatives to diversion to emergency call takers; and, procedures to handle volume of inbound calls for information or requests for assistance. (MFS, 2016)

There is also an opportunity to provide more education to the community about when to call for SES assistance (and when not to). There is evidence that over time, the general community has become less resilient and have increased expectations that someone will come to assist them.

It needs to be reinforced that during extreme weather events all responders are very busy so anything that members of the community can safely and reasonably do by themselves or with their neighbours, friends or family, they should do so. It is not reasonable for the community to expect that emergency service personnel, including many of whom are volunteers taking time away from their usual job and families, to attend non-emergency situations that are better dealt with at a later time when the emergency and severe weather conditions have eased.

**Recommendation 23.**

That the SES in collaboration with MFS Communications Centre (Comcen) investigate and implement options to reduce the number of calls coming into the Comcen, (particularly on 132500). Options could include better utilisation of the available options on the Interactive Voice Recording and community education to increase community resilience.

## 10.2 Effective allocation of resources

There are many challenges during extreme weather events to being able to identify the nearest, fastest and most appropriate response to an incident. Some of these challenges include:

- the very large number of taskings that result from extreme weather
- understanding the priority of an incident (a caller's interpretation of an emergency is often different to a responder's interpretation)
- knowing where resources are currently located at any point in time
- knowing which emergency service resource is the closest at the time and if it has the appropriate capability (training and equipment) for the task
- understanding if a resource is already tasked with a number of jobs or if they will be available as soon as they finish the one they're currently attending to

Call-takers/dispatchers do not always have accurate or complete information to make the best decision about which resource to send. In many instances the required response is pre-determined in that it is already programmed into the response system. This is entirely appropriate and generally works well for day-to-day operations however can become problematic during extreme events.

Some of the challenges that are exacerbated during incidents involving many taskings include:

- confusion about which agency/ies or council resources have been responded
- responders having no knowledge as to whether other agencies have also responded to an incident and if so, which agencies and resources
- poor resource allocation and stop-calls resulting in inefficient use of volunteer time

- 
- crews driving long distances and zig-zagging across large areas to attend to tasks
  - crews from other areas without local knowledge attending incidents, where there are local resources available.

These challenges can result in less-than-ideal selection of resources to respond, duplication of resources, sending multiple resources to a minor response, and inaccurately triaged incidents.

During this event there were some resources that were extremely busy and others that could have been better utilised.

Issues with allocation of resources that were identified in several different locations across the State are described below.

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*'... in my local area as a CFS volunteer it appeared to take a long time to be asked to assist and at that stage significant ramping of jobs had already occurred'... many of us were waiting to be of any assistance and were called upon only late in the piece'*

*'resources (were) spread thinly with regard to the emergency services in our rural area'*

*'It would be timely to do a review on area call outs for storm damage and where the emergency services crew were travelling from. For example, 90% or higher of the storm damage callouts for the Maitland SES crew were located in the Moonta area. This would highlight that with the population growth Moonta should in fact have its own SES crew'.*

*'Coordination of the SES and the council need to be improved. Coordination between neighbouring councils need to be improved'.*

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### **10.3 Coordinating multiple agencies and many tasks**

During severe weather events, there are a very high number of calls from the public for assistance from emergency services. The Comcen may receive hundreds of calls in an hour and emergency services can be responded to thousands of jobs over a few days. This differs from other types of emergencies, such as bushfires, where there are generally a few calls that come in reporting the fire and additional resources are responded through a process of escalation. While days in the fire danger season will be busy, the calls won't be at the rate of a damaging storm.

The receipt and dispatch of many resources to a large number of incidents is very challenging for Comcen operators, SES units and IMTs as well as for the other agencies and local council resources. Currently SES units are using a combination of pager messages (arriving in quick succession) and the incident board on SES Incident Information Management System (SESIIMS) to receive and coordinate taskings.

Job-stacking is an SES process used whereby 'non-life threat' requests for assistance are triaged and prioritised. This process enables requests to be coordinated so that all life threat requests are dealt with immediately whilst other urgent but non-life threat requests are dealt with in a coordinated manner as soon as possible.

There are a number of parts to the job-stacking process that make this quite complex, require a large degree of human interpretation and intervention and, result in several potential points of failure. There is a great deal of reliance on the ability and experience of the operations officer who is sorting and tasking the jobs to ensure that nothing is missed.

Issues with job-stacking and management of multiple incidents has been highlighted in many previous debriefs. It has again been identified by SES volunteers and staff during this event, as well as the MFS, Comcen, SES Volunteer Association and CFS.

The SES is developing a multiple incident board to assist with this process for which implementation and training will commence shortly. However, even once this process is

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established there are a number of issues that need to be considered and resolved to ensure that allocation of tasks is efficient and effective as possible and that the possibility of error is reduced.

Some of the complexities that are making the job-stacking and resource allocation particularly difficult, time-consuming, complex and increase the margin for error include:

- two different computer aided dispatch (CAD) systems, one for fire and one for emergency/rescue:
  - the rules governing the number of resources dispatched and the priority of response required are different in the two systems
  - there is a lack of transparency between the systems and the respective rules for response
  - the systems do not interact with each other and if a job is created on one and then allocated to an agency on the other system, the Comcen operator must cancel that job and create a new job in the other system which creates additional workload; and
  - when resources from different agencies are sent out on the two different systems there is no visibility to responding agencies as to which other resources (if any) are being responded
- two different incident information systems being used, SESIIMS and CRIIMSON (see 12.2 Incident information systems (electronic systems))
  - this adds complexity and potential confusion for operators and responders
  - it results in two different incident numbers being allocated for the same job, one in each system
- for various reasons, sometimes a job may not appear on a pager it appears on SESIIMS, to ensure the response is not overlooked it relies on the operations officer to notice the discrepancy and act upon it
- SES 'out of areas' response (areas where there isn't pre-determined SES response) which require the Comcen operator to contact the SES Regional Duty Officer (RDO) to determine the appropriate response adds more time to the response and additional activity for the Comcen call-taker and SES RDO; and
- currently SES and other ESO crews call in to Comcen via SAGRN or telephone to confirm they have completed a job, this cannot be automated, or done remotely and sometime due to workload, Comcen operators are unable to answer these calls and therefore tasks are not getting removed from the list.

Overall, the CRD process has become overly complicated and time-consuming. Multiple changes and adjustments have been made without giving full consideration to the call, receipt and dispatch process as a whole or any unintended consequences. There are different processes for the different agencies which may not be justifiable. There are multiple options for stream-lining and improving the process which would assist with multi-incident coordination and management. This would ensure more efficient and effective use of resources, reduce responder fatigue and provide a better service to the community.

**Recommendation 24.**

Engage an independent business analyst to review the current call, receipt and dispatch process for emergency services i.e. the Metropolitan Fire Service, Country Fire Service and State Emergency Service, from the initial call for assistance through to response of emergency service resources, including the allocation and coordination of multiple taskings.

**Recommendation 25.**

That the State Emergency Service, in consultation with key stakeholders, identify and implement a robust system and procedures for prioritising, allocating and coordinating multiple tasks.

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## 10.4 Automatic Vehicle Location (AVL) and resource tracking

Another barrier in SA to effective allocation of resources is that with current systems, apart from crews calling in and notifying the Comcen of their location, there is no way of knowing where resources are located at any point in time. This can result in response times not being optimal because the dispatcher is not aware of available resources already in the vicinity of the incident.

When a major incident occurs, an IMT is established and personnel are assigned to roles within a defined organisational structure under an incident controller. Keeping track of emergency services resources, such as vehicles, personnel and equipment, that are responding to and attending emergencies is a critical function of the IMT.

One of the most significant challenges for IMTs is understanding in real-time what resources have been allocated to an incident and keeping track of where they are. For large emergencies such as this event, multiple vehicles from multiple SES units, CFS brigades and MFS stations operate at multiple locations and crews may be re-assigned many times during the day.

Previous events have shown that the process of tracking the location and status of all resources during a coordinated response to a major emergency currently makes up a significant portion of the total incident management workload.

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*Considerable time is spent during incidents trying to determine which vehicles and personnel are in attendance, and therefore determining if we have adequate resources and if they are being provided with appropriate welfare and support.*

*(CFS, 2007)*

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In SA resource tracking is undertaken using manual systems which rely heavily on verbal communications. This has the added disadvantage of needing to use radio networks for a large amount of voice traffic to convey location information as well as the considerable amount of time it takes to convey these messages.

In addition, faced with the immediate priorities of an incident, crews on the ground may fail to communicate their arrival at the incident, or may re-locate in response to immediate needs such as rapidly changing conditions, leaving the incident controller/operations controller with little or no visibility of their location.

Many interstate emergency services utilise automatic vehicle location (AVL) which provides the exact location of every vehicle to dispatchers and incident controllers in near real time. The information is updated through a regular GPS data signal sent back by each vehicle. If AVL was installed on emergency services' vehicles in SA this would improve response times by allowing the closest and most appropriate emergency vehicles to be dispatched directly from the field rather than from their fixed station locations.

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*AVL systems would have provided controllers with an important tool for understanding and control during this fire.*

*Project Pinery Report (Noetic, 2016)*

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There was limited visibility of resources during this incident due to the large quantity of resources from various agencies, allocated across the State. It was particularly highlighted when interstate emergency services crews were required to provide emergency response within SES response areas. The interstate crews, who were on local vehicles, could only provide verbal reports as to their location, which was especially difficult because they weren't familiar with the area. This reduced the ability for commanders to allocate crews to the nearest tasks or coordinate their tasks and activities.

Effective resource tracking enables more efficient allocation of resources and enhanced personnel safety. Personnel tracking can provide additional safety when crews are away from vehicles and

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higher levels of resource tracking. There are significant benefits to both of these resource tracking activities and both required for the future of emergency response and incident management in SA.

The introduction of an electronic resource tracking system in SA would:

- enhance incident management
- improve resource allocation
- increase safety of personnel
- replace time-consuming voice communications between incident controllers and field crews and
- provide the incident control centre (ICC) with immediate and accurate location data
- enhance situational awareness for incident controllers,
- improve the ability to manage and dynamically re-assign and re-locate resources as circumstances change.

Resource tracking was highlighted as an issued during the Wangary fire (Noetic, 2005) and has long been on the agenda for ESOs. The current Minister for Emergency Services and South Australian Fire and Emergency Services Commission (SAFECOM) Chief Executive and the Chief Officers of SES, CFS and MFS are supportive and have been pushing to have this achieved. A multi-agency workshop was held earlier this year in an effort to establish the requirements for and ultimately purchase a resource tracking system for the sector.

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| <b>Recommendation 26.</b> That systems for Automatic Vehicle Location and personnel tracking be implemented within the emergency services sector. |
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## 10.5 Emergency services and response agencies

Under the SEMP the SES is the control agency for flooding and severe weather. Accordingly, the SES established control for the severe weather and flooding impacts through coordination of responses to requests for assistance and establishing the SES SCC and relevant ICCs.

The geographical spread of flooding and storm impacts spread from Port Pirie and Whyalla in the north through the Mid-North, Barossa, Clare Valley, Mount Lofty Ranges, Adelaide Metropolitan area through to Naracoorte in the State's south east.

Often when significant events occur, additional SES and other agency personnel and resources can be requested from unaffected areas and agencies. During this incident, this was more difficult due to the distribution, scale and complexity of the impacts. Many operational resources were already busy attending incidents in their own or nearby areas.

The work-effort support provided to SES from other services, agencies and groups was outstanding and key to the success of effective response. The relatively small number of SES staff and volunteers is insufficient to adequately staff all ICCs and other emergency centres. The response to this event was truly multi-agency and during the emergency response phase the SES, CFS, MFS, SAAS, SAPOL, ADF and interstate agencies worked effectively together to protect the community.

SA ESOs and other supporting agencies responded to and provided support for many different activities including:

- storm damage
- removing fallen trees
- flood mitigation including filling and laying sand bags and pumping water away from/out of assets
- door-knocking to notify residents of potential problems

- 
- assisting with traffic control
  - ongoing response to other emergencies such as road accidents
  - providing personnel for IMTs, ZECs, SCCs and the SEC

The MFS and CFS provided strike teams (four response vehicles and a command vehicle), to assist SES at a variety of locations performing a variety of functions.

SAPOL provided support to the community through traffic management particularly during the power outage when the traffic lights on many intersections in the CBD and Adelaide suburbs were not operating. They also established road closures on flooded and blocked roads.

SAAS were kept very busy particularly during the black system event which activated a large number of medical alarms. These needed to be responded to even though many were found to be triggered by the power failure rather than a medical emergency. There was also a surge in medical problems such as breathing difficulties, specifically calls from those people on home oxygen which required power, chest pain and falls.

Local councils are always involved in responses for storms and floods and this event was another busy one for council personnel. Councils, also suffering for the compounding effects of consecutive storm events, were again required to respond to their communities to assist with storm damage and the effects of flooding on council property.

DEWNR has excellent capabilities for emergency response and incident management and they were invaluable both in the role of flood hazard leader, as well as contributing to the incident response and management effort in general. DEWNR provided invaluable skills in a wide range of roles during this event including:

- seasonal 'fire crews' for technical chainsaw activities and other storm and flood responses
- personnel to assist with staffing of the SES SCC and IMTs
- aerial reconnaissance
- hydrologist and mapping support personnel to the SES SCC and mapping to the IMT at Roseworthy

All of the above DEWNR contributions were in addition to them dealing with day to day business and the impacts on national parks including closing access the public and protecting assets.

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*'The operationalisation of the MOU between DEWNR and SES for the provision of mapping and hydrological support was effective and SES received outstanding support from that agency'.*

*(SASES, 2016)*

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An issue raised by the South Australian Country Fire Service Volunteer Association related to the personal protective clothing (PPC) of CFS firefighters.

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*'(CFS) personal protective clothing was not suitable for operating in very wet conditions, that they're 'not fit for purpose, cumbersome and post a danger to the wearer. Soaked PPC and waterlogged boots was an issued raised by many volunteers, who cited that this not only posed a safety risk, but also contributed to exhaustion, with the weight of the PPC a hindrance in performing tasks'.*

*South Australian Country Fire Service Volunteer Association*

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SES personnel have PPC suitable for operating in wet conditions. While there is some PPC issued in some instances to CFS and MFS personnel, not all personnel will have this PCC available to

them. CFS and MFS personnel generally respond wearing leather boots which are not suitable for operating in wet conditions and once they're wet they are uncomfortable and heavy.

**Recommendation 27.**

That the State Emergency Service explores options for providing suitable personal protective clothing to personnel from supporting emergency services during major flooding events and sandbagging operations.

## 10.6 Interstate resources

Personnel from the Victorian SES (VicSES) and Country Fire Authority (CFA) and Western Australian Department of Fire and Emergency Services (DFES) were called upon to provide operational and incident management personnel to support SA emergency services during this event.



*Figure 22 - Minister Malinauskas addressing SES crews*

Interstate deployments occur across Australia for a variety of incidents every year. These deployments provide critical support to agencies in the grip of an emergency and interstate crews assist with operational activities and enable local crews to rest and recover after a busy time and so that they are able to continue operations once interstate crews depart. Interstate deployments are also a very valuable opportunity for emergency service personnel to work with other agencies and observe the systems and operations in other States.

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*'we still have a lot to learn but this deployment showed to me as an individual how far we have come with our sister agencies'*

*'working with the SA agencies was a pleasure, friendly, helpful and always ready to help'*

*'relationships with other organisations was a highlight. Went very well. Goodwill clearly evident.'*

*'it was good to work consistently with another agency (SES) and see their protocols and methodology with respect to approaching an incident'*

*'despite the colour of our uniform we work as one. At no time did I see any 'them and us' I was proud of crews from both CFA and Vic SES, along with SA SES*

*'we had the opportunity to learn a lot from our SES counterparts and we took the opportunities whenever we could.'*

*Comments from Victorian SES and CFA personnel*

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While the benefits of interstate support are clear, there are also challenges when receiving personnel from other agencies. Much work has been done at a national level to establish arrangements that support interstate deployments but there are still gaps in the procedures for when SA receives interstate support.

The logistical effort required to effectively support and coordinate large numbers of incoming crews is often under-estimated. Management of deployments includes ensuring they are transported, fed, accommodated, coordinated, briefed and kept informed during their deployment.

This event highlighted challenges that are often identified during interstate deployments including: difficulty communicating; lack of understanding of command structures; poor information flow to crews regarding both the operations and the logistical plan for their movements and arrangements; long travel distances from accommodation to area of operation etc.

Effectively supporting incoming deployments requires a considerable planning effort as well as identification of information needs for these crews. Thorough and detailed briefings are also essential.

Both CFS and SES have plans for how they provide multi-agency support to other States. It would be beneficial for SA emergency services to establish a plan for receiving interstate support. There are many similarities with coordinating interstate deployments to support any SA emergency service. A combined plan would reduce the amount of planning required i.e. not having to plan for each service individually, it will likely identify additional resources available and it would enable agencies, other than the control agency, to support an interstate deployment during incidents. This would alleviate the need for the control agencies to manage interstate deployments as well as all the other responsibilities they are undertaking.

An SA interstate deployment (incoming) plan should include:

- liaison officer and deployment support requirements
- location(s) for interstate liaison personnel to be established to ensure effective communication and information exchange with relevant control agency
- options for accommodation for large groups at strategic locations (CBD, metro and regional)
- options for provision of vehicles suitable to the operation
- communications plan including communications equipment
- additional PPE requirements

- preferred composition of teams of incoming deployments
- information for briefings about SA emergency services, command and control, terminology, systems and protocols

**Recommendation 28.** Establish an 'Interstate Deployment Support Plan' for incoming interstate resources. The plan should outline responsibilities and arrangements for this function. Consider including this plan into the State emergency management arrangements.

## 10.7 Sandbag activities

During flood and storm events the SES encourages members of the community to undertake measures in order to prepare for potential impacts. Community preparedness and resilience is an important part of lessening the impact and damage caused by extreme weather and flood events.

The SES advocates for 'community resilience' and provides equipment, information, and advice on how to prepare and mitigate damage before, during and after flooding events. The SES in collaboration with councils and the CFS strategically establish sandbag distribution points comprising of sandbags and suitable sand fill, which are open to public, to attend and 'self-fill'.

Sandbag Quick Reference Guide



## Sandbagging

Sandbags will not stop the water completely but can reduce the amount of water entering your home.

During low level flooding, sandbags placed in the right locations around your home can reduce the impact of flooding. As little as 25 sandbags can reduce the damage to your home built on a slab. It is not necessary to place a sandbag wall around your house to provide protection.

Sandbags or similar products can be purchased from many hardware or garden supply stores.

**How do I fill the sandbag?**

- Only use sand to fill hessian bags. Do not use dirt.
- Only fill sandbag two-thirds full.
- Do not over fill the sandbag as it will be too heavy to carry.
- Do not tie the top of the sandbag.
- Take care when filling and lifting the sandbag, to avoid injury.



•-----• 2/3 full

**Figure 23 – information about how to fill and lay sandbags**

One of SES' objectives for the event was to '...increase community awareness and preparedness for storms and flooding'. Among other measures this involved the distribution of sandbags to the community from 44 locations across the State (primarily SES, CFS and council depots). Over 314 000 sandbags were utilised in both preventative and response operations during the emergency.

While this service was very well received and widely adopted, there were a number of issues including:

- variability of service provided in different locations, i.e. some locations had only sandbags, others also supplied sand, and others also had personnel to assist with filling sandbags
- in some locations there was 'panic acquisition' of sandbags where people who were not at risk of flooding and did not need sand bags, were collecting them 'just in case'
- some media releases did not have complete information on locations and services at the sand bag locations

- 
- some councils were not prepared to advertise the location through media releases (although they did release the information on the relevant council websites)
  - misinformation circulating in the media about the sandbags posing a health threat following an event
- 

*‘need to provide sand with sand bags, it is a big issue among the community’*

*‘traffic management around distribution points  
(for sand bags) requires management’*

*‘develop protocols around sand bag management with councils’*

*‘need to reduce people taking sand bags in low-risk areas’*

*‘messages about contacting your local council on what to do  
with used sand bags is not helpful’*

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Interstate emergency service personnel commented on the pro-active approach in SA of distributing sandbags and the level of resilience it is helping to build within the community. There is evidence from this event that in many locations where sandbags were utilised in high risk locations, it reduced and in some instances, eliminated potential damage.

A staging area was established at Two Wells primarily to provide a location for filling, collection and dissemination of sand bags. 100 ADF personnel and crews from CFS and SES were deployed as well as some local community members assisted with filling sandbags. This provided a crucial resource to protect areas around the Gawler and Light areas.



**Figure 24 - Sand-bagging at Two Wells staging area**

The coordination of a staging area for sandbagging could be improved in future with effective planning prior to establishing the facility as well as appropriate staffing including a staging area manager and support personnel for day and night shifts.

**Recommendation 29.**

That the State Emergency Service together with the Local Government Association and Country Fire Service establish a plan for coordinated provision of sandbags to the public, including options for what is provided, where and when, and the process for effective communication of availability to the public.

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## 10.8 Rescues from fast moving water

Between 28 September and 5 October 2016 there were approximately 30 people rescued by emergency services personnel and police from fast-moving water (referred to as swiftwater rescue). Most of these rescues involved people who had either attempted to drive through floodwaters or who undertaken 'recreational' activities in the dangerous and fast-flowing water.

Incidents where people made poor decisions and put themselves in harm's way through 'recreational activities' in floodwaters included when:

- thrill seekers kayaked in flooded rivers and were flung from their kayaks and into the water of the River Torrens at Lockleys
- a group of people floated down the River Torrens in Flinders Park in an inflatable boat and another on a rubber ring
- three people were rescued after attempting to kayak through fast-moving floodwaters in the Adelaide Hills.

Several incidents were captured in video footage and posted online. This could have had additional negative consequences by giving motivation to others to attempt dangerous activities. It also had positive ramifications because SAPOL officers were able to review the video footage and locate, identify and deal with the individuals involved.

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*. 'the men put themselves at great risk as the river was flowing very fast and the water is full of hidden debris including tree branches, logs, and other rubbish.'*

*SAPOL Statement to ABC*

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Many individuals chose to drive through floodwaters, some even bypassed road closure signs to do this. Several of those individuals needed rescuing.

When drivers are faced with water over the road they will usually stop to observe the water and make an assessment as to whether it might be safe to travel through. With floodwaters and swollen catchments, it can appear that the water is not deep and is only moving slowly, or not at all. However, this can be deceptive and underneath the surface the water may be flowing rapidly, have a very strong current and it may contain a lot of debris. It can take a surprising low level of water to shift a vehicle or cause it lose contact with the road and float away, even if the vehicle a 4WD.

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*'a bloke drove through the road closed sign, stalled the car probably 200 metres along the road and sat there'*

*Police Officer in the Barossa*

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When people make poor decisions around floodwater, they not only put themselves in danger, they also risk the safety of others who may attempt to assist them if they get into trouble. Potential rescuers may include SAPOL personnel and emergency services, they could also include members of the public who are not trained or equipped to deal with such an emergency.

Fortunately, there were no significant injuries or deaths during this event but the behaviour of some members of the community around floodwaters and the types of situations people got themselves into are consistent with a report 'An analysis of human fatalities from floods in Australia 1900-2015'. (Haynes, et al., 2016)

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*The highest proportions of both men and women died while attempting to cross a bridge, causeway, culvert, road, etc.*

*Children and young people (0-19 years) accounted for the greatest proportion of fatalities engaged in activities near the water and in or near stormwater drains*

*(Haynes, et al., 2016)*

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Other community behaviour that created obstacles and additional challenges for emergency service personnel and SAPOL, was sightseeing. This caused additional and unnecessary traffic on already dangerous and congested roads, and it blocked roads and access where people gathered (with their vehicles) near floodwaters and along river banks to watch the unusual spectacle.

A submission made to the Review by a member of the public made the following suggestion:

*'there should be laws that make it an offence to enter disaster zones and bypass any road closure into disaster zones; it should also cover entering flooded rivers against public warnings. Penalties could include the cost of rescuing such people'.*

*Submission to Review Team*

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Recommendations from the Queensland Commission of Inquiry (Queensland Floods Commission of Inquiry, 2012) recommended a comprehensive public education campaign about the dangers of driving into floodwaters through various media and education initiatives.

Subsequently, a campaign was developed in Queensland with the catch-cry of 'if it's flooded, forget it'. This is gaining traction as a national flood awareness message and has been taken on by the SES in SA.



**Figure 25 - Queensland 'if it's flooded, forget it' campaign**

The SES had already been actively promoting safety messages and were delivering the FloodSafe program to educate the community about the dangers of floods. Production of a flood safety campaign including videos and educational products was already underway.

In addition, every SES advice message, warning and media release produced, prior to predicted heavy rain and during actual flood events, provides the community with information relevant to an event or risk. SES personnel providing interviews to radio and television also use every possible opportunity to promote flood safety messages.

## Stay away from floodwater

Don't drive, ride, boat, walk, play or swim in floodwater.

The majority of flood-related deaths in Australia are due to people entering floodwater. People and vehicles can be swept away in fast moving floodwater. It's often deeper and faster than it looks. If you do become stranded, stay with your vehicle.

Floodwater can be contaminated by sewage or toxic chemicals.

Floodwater can contain submerged objects and debris that can cause injuries.

*Figure 26 - Excerpt from sa.gov.au emergency section of the website*

It is important that SES continues to develop and provide public education and increase awareness about the dangers of floods.

The SES has also been enhancing its swiftwater rescue capability over recent years and has continued to do so since this event. Some of the enhancements include a proposal to deliver additional training to assist crews to remove casualties from vehicles, additional and smaller (child) sized personal floatation devices, emergency vehicles specifically designated for the swiftwater capability and ancillary equipment for waterproof radios.

The SES currently provides swiftwater awareness training to personnel from other emergency services and to councils. Most SES units are also provided with land-based swiftwater training and equipment which enables them to effect a rescue from land e.g. a river bank. There are also SES swiftwater technicians who are highly trained and equipped to undertake rescues in floodwaters.

During this event, in addition to undertaking rescues, SES swiftwater teams, were able to apply their knowledge and skills to other supporting activities such as: reconnaissance and intelligence gathering on water levels; confirming potential breaches of levees, dams and rivers; and, safety assessments for particular locations such as caravan parks and townships.

### **Recommendation 30.**

That the State Emergency Service be provided with resources to enable them to deliver swiftwater awareness training to all first responders including emergency services, SA Police and council crews.

### **Recommendation 31.**

That SA Police, as the control agency for search and rescue, and State Emergency Service who have the responsibility for providing search and rescue services under the State Emergency Management Plan, develop a swiftwater rescue capability plan that describes key swiftwater risk locations, roles and responsibilities of emergency services, State swiftwater resources and dispatch arrangements.

## **10.9 Traffic management**

Throughout this event there were many challenges to effective traffic management. During the black system event, traffic lights in the Adelaide CBD and many suburbs had no power and were not operational. Many SAPOL personnel were responded to manage traffic at major intersections and coordination was established between SAPOL and the DPTI Traffic Management Centre (TMC).

In the days following the black system event, heavy rains resulted in flooding, large amounts of water and debris over roads and damage to roads, access tracks and bridges. SAPOL, DPTI, local councils and emergency services all worked to assess and manage impacted roads to ensure the community was kept safe. Hundreds of roads, including several major highways, across the State were closed at various times during the event and conditions were constantly changing.

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Due to the sheer number of roads impacted and the geographic spread of flooding, managing road closures was very complex, difficult and resource-intensive. All agencies, including councils and DPTI, were very busy with the high volume of work. Resources, including people and traffic management equipment such as signage, were stretched. This meant that some tasks needed to be prioritised over others, there were unavoidable delays in dealing with some tasks and a shortage of resources to be able to manage all road closures effectively.

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*'Management and reporting of road closures and water over water (was a challenge)'*

*Port Adelaide Enfield*

*'information in relation to road closures, (there was) confusion due to the volume and misunderstandings with locations and whole sections of roads'*

*Barossa ZEC*

*'Opportunities for improvement in the administration of the Traffic SA portal. Council reported roads that were cut off, (but) website staff couldn't accept our advice. They contacted SA Police for confirmation. SA Police then rang us to have someone go and check the road we had already rung about. Good to have SA Police as the primary verification agency but a procedure would be useful to assist the flow of information'*

*Barossa Council*

*'Response from DPTI for management of flood issues on State controlled roads was poorly resourced in our area. Seemed to defer all requests for road closure signage to council.'*

*Barossa Council*

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The liaison established between the TMC, SAPOL and other agencies was very beneficial and assisted with coordinating traffic management and road closures. The TMC commenced coordinating and recording all road closures on their website reported to them including council road closures. This provided a much more complete picture of road closures across the State than during previous events. So while there were still challenges, this was a significant improvement on previous events and DPTI provided excellent service and response given the circumstances.

The SEMP includes guidelines for 'Traffic management during emergencies' (SA Government, 2016). These were developed following the Sampson Flat fire, which was extremely complex in terms of road closures and the subsequent processes for assessing, clearing and re-opening roads that had been blocked and damaged by fire and hundreds of fallen trees. The guidelines provide information regarding the physical processes of how this is managed however it doesn't outline: responsibilities for road closures and management; coordination of road closure information; and, processes and authorisation for providing updates to the TMC.

The guidelines State that 'information regarding road closures will be provided by the Control Agency through a range of information sources, including the SAPOL website, Control agency websites, DPTI website, social media, main stream media, community meetings etc.'

This Statement isn't clear about responsibilities or processes and it would be more simple for the agencies involved as well as the community if road closure information was consolidated, easy to find and not duplicated across multiple sources of information. A single point of truth is required for road closures across the State. That information can then be linked to from other agencies websites and/or localised information provided on council websites (that is consistent with information on the DPTI site).

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**Recommendation 32.**

That the annexure to the State Emergency Management Plan, 'Traffic management during emergencies', be updated to include: responsibilities and processes for road closures; and, Department of Planning, Transport and Infrastructure requirements in regards to provision of road closure information, notification of changes in road closure status and publishing of that information.

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## 11. EMERGENCY MANAGEMENT IN SOUTH AUSTRALIA

When the Department of the Premier and Cabinet's (DPC) Security and Emergency Management Office (SEMO) was closed in 2006 their responsibility to provide 'leadership of whole of government emergency management' was transferred to SAFECOM.

To reflect this change clause (p) was added to section 8 Functions and Powers of Commission in the *Fire and Emergency Services Act 2005* specifying that SAFECOM was to:

undertake a leadership role from a strategic perspective with respect to emergency management within the State and to maintain an appropriate level of liaison with other bodies responsible for the management of emergencies in the State;

Under section 9(1) of the *Emergency Management Act 2004*, (the Act) State Emergency Management Committee (SEMC) has the following functions:

- (a) to provide leadership and maintain oversight of emergency management planning in the State
- (d) to undertake risk assessments relating to emergencies or potential emergencies where SEMC thinks fit or where requested by the Minister
- (g) to co-ordinate the development and implementation of strategies and policies relating to emergency management (including strategies and policies developed at a national level and agreed to by the State);

SAFECOM is a major contributor to the delivery of SEMC functions. SAFECOM's responsibilities include:

- intergovernmental liaison
- representation on and provision of support to the Australia-New Zealand Emergency Management Committee
- provision of support to the Minister for Emergency Services on the Law, Crime and Community Safety Council
- membership of Australia-New Zealand Emergency Management Committee (ANZEMC) Sub-committees and Working Groups
- jurisdictional representation on national committees and work programs
- coordination of jurisdictional input into national reviews
- contribute and/or lead development of State and national emergency management policy
- management of commonwealth and State grant programs
- membership and executive officer support to State committees and advisory groups; and
- leadership and/or oversight of State strategic emergency management projects on behalf of SEMC.

The Premier of South Australia is the Responsible Minister for this Act with the Chief Executive, DPC chairing meetings of the SEMC. DPC has very few people dedicated to counter terrorism and emergency management.

The Minister for Police and Emergency Services, through the various government agencies for which he has responsibility, has the largest commitment to not only operational response to emergencies, but also strategic and policy development.

The Minister for Communities and Social Inclusion has responsibility for the relief and recovery aspects of an emergency, noting that recovery extends well beyond 'people' aspects.

Emergency management in South Australia does not sit with one Responsible Minister.

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In 2003, when new emergency management arrangements in South Australia were developed, the Premier was made Responsible Minister. This was to engender greater commitment from government department chief executives. The Premier was also provided with the peak 'strategic' body in South Australia; SEMO to ensure cross government leadership, strategy and policy development and coordination of arrangements.

Since then, some government agencies' emergency management strategic capability and capacity has been eroded. In some instances, agencies do not have sufficient numbers of staff with appropriate skill-sets to effectively fulfil their roles as a hazard leader, control agency, or functional support group member.

Critical areas include emergency risk management, strategic policy, research and development, planning and training, areas where the cost/benefit is difficult to quantify but where any deficiencies are quickly exposed during emergency incidents and/or subsequent investigations or inquiries.

Following the closure of SEMO, SAFECOM and SAPOL were expected to take on increased responsibilities and absorb the three unfunded personnel transferred from SEMO within the existing budget.

Meanwhile, State and national initiatives (e.g. NSDR; requirements associated with National Partnership Agreements for Disaster Resilience; inquiries like the Productivity Inquiry into Natural Disaster Funding Arrangements; leadership of the State's emergency risk management programs etc.) have expanded SAFECOM's responsibilities and associated workload.

Emergency management in SA is comprised of a series of committees and State government agencies supposedly seamlessly meshed with local government NGOs, private companies and then communities and individuals, operating under the *Emergency Management Act 2004* and SEMP.

The philosophy behind these arrangements are sound and provides SA with a robust means in which to manage emergencies in the holistic perspective of PPRR (including resilience). The level of success in the implementation of those objects and guiding principles as described in the Act are mixed and the observations during this Review show that opportunities for improvement exist, but are limited by the current emergency management structure.

The response to an event usually highlights the gaps and opportunities for improvement in arrangements and planning, including in prevention, preparedness and recovery.

A broader approach needs to be taken so as to actively involve all those sectors mentioned in the plan including local government, NGOs and business and achieve the objectives of the *Emergency Management Act 2004*.

There are opportunities for agencies in the State Emergency Centre, as part of their respective plans, to brief key stakeholders and partners on a regular basis, leading up to, and during the event so as to improve preparedness and then during the event to gain additional intelligence, assistance and improve the response to the event.

For instance, when the first briefing of the SES State Control Centre took place, all of the support/functional agencies within the SEC, should have then provided a similar brief (obviously removing confidential material) to those organisations included in their particular emergency plan. These briefings cascading down to ensure cohesive, holistic actions.

As example, for the Health support service this would have included providing relevant information to public and private hospitals, nursing homes, aged care facilities and people at home with medical issues likely to be affected by the coming event. Similarly, for ICT Office for Digital Government (ODG) this would be the provision of briefings to the various telecommunication companies who may have then placed their own control centres into the same state of readiness and activation as SEC, and establish that initial dialogue before the event arrived.

There are many examples for each of the agencies and functional/support agencies represented in the SEC. For some, these cascading briefs occur, but it needs to be formalised as part of the

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SEMP and associated plans and becomes a normal protocol in the way in which emergencies are managed in SA, and this starts well before an emergency arises.

### **11.1 Emergency Management Act**

The *Emergency Management Act 2004* is the principal legislation for managing emergency response in South Australia.

(1) The objects of this Act are—

(a) to establish an emergency management framework for the State that—

- (i) promotes prompt and effective decision-making associated with emergencies; and
- (ii) makes provision for comprehensive and integrated planning in relation to emergencies; and

(b) to promote community resilience and reduce community vulnerability in the event of an emergency.

(2) The objects of this Act are to be achieved through—

(a) establishing the State Emergency Management Committee; and

(b) providing for the appointment of a State Co-ordinator; and

(c) the preparation, review and maintenance of the State Emergency Management Plan; and

(d) making provision for declarations relating to emergencies and disasters; and

(e) establishing structures for risk prevention and preparedness; and

(f) establishing structures to support a seamless transition from response to recovery in relation to an emergency.

(3) The guiding principles under this Act are that emergency management arrangements must —

(a) be based on an all hazards approach in addressing emergency prevention, preparedness, response and recovery (PPRR); and

(b) reflect the collective responsibility of all sectors of the community, including both State and local government, the business and non-government sectors, and individuals; and

(c) recognise that effective arrangements require a co-ordinated approach from all sectors of the community, including both State and local government, the business and non-government sectors, and individuals.

### **11.2 Prevention, Preparedness, Response and Recovery (PPRR)**

South Australia's emergency management arrangements involve the following activities:

**Prevention** - which seeks to eliminate or reduce the impact of hazards themselves and/or to reduce the susceptibility and increase the resilience of the community subject to the impact of those hazards.

**Preparedness** – which establishes arrangements and plans and provides education and information to prepare the community to effectively deal with emergencies.

**Response** – which activates preparedness arrangements and plans to put in place effective measures to deal with emergencies if and when they occur.

**Recovery** – which assists a community in the restoration of emotional, social, economic and physical wellbeing, reconstruction of the physical infrastructure and restoration of the environment.

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### 11.3 The Third 'R' - Resilience

Resilience requires an increased focus within South Australia's emergency arrangements.

The National Strategy for Disaster Resilience (NSDR) was endorsed by COAG in February 2011 to guide federal, State and local governments, businesses, community leaders and the not-for-profit sector.

In South Australia, the priority actions of the NSDR are also strategic priorities for the State Emergency Management Committee (SEMC). SEMC has established the SA NSDR Steering Group (co-chaired by SAFECOM and Department of the Premier and Cabinet (DPC) that reports bi-monthly on the implementation of the NSDR in South Australia.

The NSDR describes a disaster resilient community as one where:

- people understand the risks that may affect them and others in their community.
- people have taken steps to anticipate disasters and to protect themselves
- people work together with local leaders using their knowledge and resources to prepare for and deal with disasters.
- people work in partnership with emergency services, their local authorities and other relevant organisations before, during and after emergencies.
- emergency management plans are resilience-based, to build disaster resilience within communities over time.
- the emergency management volunteer sector is strong
- businesses and other service providers undertake wide-reaching business continuity planning that links with their security and emergency management arrangements
- land use planning systems and building control arrangements reduce, as far as is practicable, community exposure to unreasonable risks from known hazards, and suitable arrangements are implemented to protect life and property, and
- following a disaster, a satisfactory range of functioning is restored quickly.

#### Being Resilient - The need to do more in South Australia

Many of the submissions received by the Review from members of the public indicated that individuals were concerned about their own lack of preparedness or the preparedness of others. There were submissions indicating the need for individuals to be prepared by having radios, emergency kits, the ability to charge mobile phones and being able to sustain themselves during extended power outages and emergencies.

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*'We need to remain vigilant as climate change will bring more of this and we need to not forget the importance of battery powered radio. We need a campaign to highlight the importance of being prepared as we are also at risk of other severe weather events in the future'*

*Submission from a member of the public*

*'(There was a) general lack of community preparedness and resilience e.g. emergency kits with battery powered radios, torches, etc. While the loss of power was a problem for many people, the subsequent loss of telecommunications including internet in some locations was very difficult. Australians have become very reliant on technology for information, communication, work and entertainment.'*

*Port Pirie council*

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On the Eyre Peninsula, the power outage was extended and it affected individuals, businesses and essential services such as access to doctors, hospitals, chemist, fuel, money and the ability to pay for food, medication and other essentials. During interviews with business and community members, it became clear that they were not prepared for such a long power outage. They did not appear to comprehend the seriousness of the weather warnings and did not undertake adequate planning and actions to mitigate the potential consequences of the event.

The power outage was exacerbated by the inability of people to communicate with others. There was a strong feeling of isolation on the Eyre Peninsula and feeling like they had been forgotten and 'out of sight, out of mind'.

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*'(it) felt like we were a couple of hours away from community panic'*

*Port Lincoln resident*

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Some communities, particularly rural communities, considered that they would be resilient but were taken by surprise and did not feel ready when the power outage occurred. Other communities, particularly small ones, had stronger community networks and were more resilient.

The flooding of homes and property also highlighted that some residents were not aware that they lived in a high flood risk area and had not undertaken adequate preparations. Due to advertising and community engagement by the CFS, it was widely understood that communities in high fire risk areas in SA need to be prepared and develop a bushfire plan. However, there is much less awareness in the community about households and businesses being prepared for floods and preparing flood plans.

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*There were some people with flood plans, a lot of households have fire plans but it was the first time I'd heard of people actually having flood plans*

*Barossa ZEMC*

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Evidence and research continues to show that being prepared for an emergency improves people's ability to cope with the impacts of an emergency. The Red Cross in Australia and around the world works to reduce the impacts of disasters on people and work with communities before, during and after emergencies to help reduce vulnerability, ensure immediate needs are met and provide humanitarian support. At a practical level this means working in partnership with the community, building on existing networks, resources and strengths, identifying and supporting the development of community leaders and empowering the community to exercise choice and take responsibility (Australian Red Cross, 2016).

In SA, the Red Cross has been working to bring together agencies that are working towards increasing the resilience of South Australians. They are striving to coordinate public information about resilience, so that the various agencies cooperate and present a consolidated community resilience message rather than multiple, potentially conflicting and competing messages.

The Red Cross deliver a number of programs including the emergency RediPlan which is a national community education program to build community resilience. It is centred on face to face engagement, and is supported by a RediPlan guide including an emergency plan template for participants to complete. Red Cross works closely with hazard leader agencies such as the CFS, MFS and SES in the planning and delivery of RediPlan to ensure that messaging is consistent and complimentary.

The NSDR and the notion of building resilience are broad concepts and Prevention, Preparedness, Response and Recovery all have an impact on resilience. Most resilience-building efforts focussed on preparedness. Building resilience in people and community before an event happens can improve the way they respond and recover.

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The Productivity Commission Report on Natural Disaster Funding strengthens the case for governments investing in mitigation in order to reduce the costs (financial, social, environmental etc.) associated with events. Despite mounting evidence for this upfront investment and high level policy directions there remains a significant imbalance between investment in prevention and preparedness compared with response and recovery.

Addressing resilience and driving the resilience agenda needs to be a multi-faceted approach with interventions at all levels.

While significant projects have been undertaken in South Australia around disaster resilience, circumstantial evidence from recent events (including the September 2016 Extreme Weather event) suggests that there is further work to be done in supporting communities and government to take a resilience-based approach to emergency management.

In South Australia, there is no defined policy or approach for building resilience, for example New Zealand and Canada use the 72-hour model, asking individuals and communities to prepare and be self-reliant for 72 hours. Various campaigns have been developed and public information is provided to promote and support this model (SF72 San Francisco's hub for emergency preparedness based on the 72-hour model).

### **Resilience messages**

More needs to be done throughout the emergency management sector to educate politicians and the public about the disaster resilience agenda.

The Government, the Opposition and other politicians need to be better informed about resilience-based and shared responsibility approaches to emergency management, and to promote consistent messages to the public.

The types of messages they need to understand and to be able to communicate include that:

- social and economic costs of disasters in the future will be difficult to manage unless communities become more resilient
- national investment in cost-effective resilience and preventative activities can reduce the impact on government budgets of having to respond to disasters by more than 50%. (Australian Business Roundtable for Disaster Resilience and Safer Communities, 2013)
- more investment is requirements in preparedness and building local capacity and capability, rather than focussing resources on responding to events
- if individuals and communities are self-sufficient (e.g. they can support themselves for 72 hours following an emergency), authorities can focus their resources on where help is really needed
- with increasing frequency and intensity of weather events and the number of people impacted, emergency management agencies cannot manage this alone
- preventing, preparing, responding to and recovering from disasters needs to be a shared responsibility from all sectors of society (government, business, NGOs and individuals) and everyone needs to play their part.
- long-term and sustained behaviour change will take time and significant additional resources with the need for strong, bi-partisan support

Another important aspect that needs to be understood is that reacting to events, for example providing household level grants, can reduce resilience and create further reliance on government and it sets an undesirable precedent for future events.

### **11.4 Natural Disaster Resilience Program (NDRP) – Grant Funding**

A key driver of the resilience agenda, supporting prevention and preparedness measures, is through the NDRP grants administered by SAFECOM.

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The Commonwealth provides SA with approximately \$2 million of funding per annum for resilience building initiatives under a National Partnership Agreement. The matched funding model in South Australia requires grantees to provide approximately 25% of overall project funding.

This funding model differs to other jurisdictions which provide 50:50 State/territory funds to match Commonwealth provided grant funds. The South Australian funding model potentially creates a barrier, particularly for the community sector and non-government organisations, to access funding for community wide initiatives. Consequently, the majority of funding goes to State government agencies that are able to contribute to overall project costs.

In line with the NSDR's push towards 'shared responsibility' it is crucial that NGOs and community groups are not structurally disadvantaged from accessing mitigation funding.

If the State Government considers increasing its contribution in line with other States (i.e. so that a 50:50 State/Commonwealth funding model is established the intent of the NSDR, namely shared responsibility, can be more achievable, enabling NGOs and smaller community organisations better access to necessary funding.

In a sense, the South Australian government and the emergency management sector is in its infancy when it comes to committing to a resilience-based approach to EM.

Despite the preponderance of evidence about the importance of investing in preparedness and building the resilience of people and communities, the emergency management culture and allocation of resources in South Australia, is still heavily response focussed.

**Recommendation 33.**

Develop practical policy outcomes to support resilience (e.g. the 72-hour model) and promote this broadly to community through media, awareness campaigns, policies etc. Research should be undertaken to gain insight into the types of messaging and activities that have the most impact on sustained behaviour change within the community before committing to a particular model.

Whole of sector EM support is currently spread across two small teams at SAFECOM (Emergency Management Office, including the Resilience Program Coordinator) and DPC (Security and Emergency Management).

The current staffing of one temporary grant funded position focussed on the resilience agenda only allows for a limited scope of activities. The current focus is on providing executive support to the NSDR Steering Group and capturing the work being done that addresses and aligns with the NSDR priority areas.

There is significant opportunity for SAFECOM, supported by the NSDR Steering Group to identify gaps in the sector and drive new pieces of work that bring agencies together to address problems.

SAFECOM is also well placed to further develop broad community relationships, i.e. with peak industry bodies, and direct funding support to external organisations that are well placed to run cost-effective projects thereby driving the 'shared responsibility' agenda of the NSDR.

Better efficiencies could be achieved if the limited resources were pooled across the domains of Security and Emergency Management. This would leverage the existing governance roles with the and could better support the State Emergency Management Committee if driven chiefly from one central point.

## 11.5 State Emergency Management Plan

The *Emergency Management Act 2004* was amended in July 2016, which triggered the re-writing of the SEMP which came into effect on 16 December 2016.

The Premier of South Australia has responsibility for the Act and the Government of SA has the primary responsibility for managing emergencies within this State, emergency management is supported by DPC and SAFECOM which provides State-wide policy advice and support.

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The SEMP is the key plan for managing emergencies in SA.

Amendments to the *Emergency Management Act 2004* placed new requirements on the content of the SEMP, which must now, vide section 5A(1):

*'detail strategies for dealing with emergencies in the State, including strategies—*

- (a) for the prevention of emergencies; and*
- (b) relating to preparedness for emergencies; and*
- (c) for the containment of emergencies; and*
- (d) for the co-ordination of response and recovery operations; and*
- (e) for the orderly and efficient deployment of resources and services in connection with response and recovery operations.*

In addition, the SEMP must meet the Act's objectives and guiding principles - section 2(1):

- (a) to establish an emergency management framework for the State that—*
  - (i) promotes prompt and effective decision-making associated with emergencies; and*
  - (ii) makes provision for comprehensive and integrated planning in relation to emergencies; and*
- (b) to promote community resilience and reduce community vulnerability in the event of an emergency.*

During the 28 September 2016 event, emergency management authorities used a combination of the 'old' SEMP and introduced aspects of the 'new' SEMP. This initiative proved beneficial and demonstrated opportunities for improved outcomes in future events.

However, given that this Review proposes recommendations which will impact the SEMP, there is a need to undertake a fresh review of the SEMP.

A submission by retired police officers Mr Peter Schar and Dennis Mulroney (see Attachment 4) (very experienced in emergency management) proposes:

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*'The SEMP December 2016 update does not reflect the new requirements of the Act and is deficient in many respects including content that it does not align with the Act; lack of clear, specific and directive strategies; and conflicts in roles, terminology and definitions. Also, in some areas there has been fundamental changes to the emergency management arrangements some of which conflict with lessons learnt over the past decade.'*

*Peter Schar and Dennis Mulroney, Retired Police Officers*

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Whilst this Review, does not necessarily support all the recommendations made in the Schar/Mulroney submission, there are many relevant observations which require immediate attention and a 'fresh eyes' approach to ensure that the SEMP reflects the intention of the legislation and best practice.

This is further supported by other comments provided to the Review where there was a feeling that, whilst the new SEMP was an improvement on the previous version, there is still an opportunity to undertake a broader review of the SEMP. This would have the objective of ensuring best practice, and to establish a strategic and comprehensive view of emergency management for the future.

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## 11.6 Control agency for black system events

The black system event on 28 September 2016 was caused by destructive winds during an extreme weather event. As per the arrangements in the SEMP, the SES was the designated the Control Agency. However, a Declaration of a Major Incident was issued because of the power outages not the weather. A black system event has no designated Control Agency.

This did not impact the effectiveness of emergency management, given the extent of wind and water damage and the demands on SES. However, it highlights the need for an agency to be designated as a control agency for a black system event because of the range of other associated issues such as, loss of communications, traffic management, limited access to fuel, food and cash and the potential for public panic and disorder.

The Department of State Development (DSD) has the role of Control Agency for electricity, fuel and gas shortage and has well developed plans and arrangements to deal with an event of this nature. However, this Department, may not necessarily be the best option for a wide spread power outage of extended duration. DSD have no ability to return power in an event of this nature, and whilst they will liaise with the various private companies involved in providing South Australia's electrical power they are unable to control those companies.

In effect, the black system event of 28 September 2016 whilst long in duration in some areas of SA, lasted less than six hours for the majority of Adelaide and surrounding suburbs. What emergency services were managing, was in fact, the consequences of a State-wide power outage. This included managing the decanting of the CBD (it was not an evacuation on this occasion), traffic issues, access to fuel, food, loss of communications, public order (not in this instance, but highly probable if the event were of a longer duration).

During the extended power outage on Eyre Peninsula, this event; although still being managed with SES as the control agency, in the first instance; in fact, transitioned from the ZEC to an ICC and ultimately the PFCP with the Police Commander assuming the control and coordination role with exceptional support from the various agencies and local government represented within that centre.

### **Recommendation 34.**

That, as with earthquake, SA Police be designated the Control Agency under the State Emergency Management Plan for black system events or other major power outages.

## 11.7 Emergency Management Council

The Emergency Management Council (EMC) is a committee of Cabinet and the SEMP 2016, describes its objective:

'to ensure the adequacy of the SEMP, emergency management preparedness and mitigation arrangements of government for all emergencies (natural or human-caused, including terrorism) and ensure over-arching strategic coordination of emergency management arrangements across the State'

The Emergency Management Council met on seven occasions between 28 September 2016 and 1 October 2016. The Premier of South Australia chaired all of these meetings and led the government response.

The role and function of the EMC during an emergency is not addressed in the SEMP. This needs to be rectified so as to provide Ministers and other persons undertaking leadership roles and attending these meetings with a clear understanding of the role and function of EMC and government strategic and policy expectations.

The EMC can issue tasks and actions in line with its role and function and should ensure that these actions are being attended to and reported on at the following meetings. The EMC will also be considering broader potential impacts for the State resulting from the emergency event (e.g. impact on industry, tourism).

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In addition to the Recommendation that SEMP be revised (Recommendation 38), the guidelines for Ministers, prepared by DPC also needs to be updated and should include more information concerning communications and options available in the event of mobile phone failure (e.g. satellite phones).

These plans and guidelines should be accessible to the Minister at all times in hard copy and/or a stand-alone fully charged, portable device (and capable of being recharged in the event of power failure).

Whilst the EMC meetings provide attendees with briefings and information about the emergency event, attendees should also be receiving regular situation reports from their respective government agencies which they then may share with the attendees of the EMC.

Government agency representation at these seven meetings varied. It is the view of the Review that relevant Chief Executive's (or Deputy Chief Executives if Chief Executive is unavailable) attend all meetings to ensure appropriate/ consistent advice to Ministers are provided. Subject matter experts may be invited when necessary.

There needs to be a clear delineation between the role of an agency Chief Executive and the relevant Minister in operational matters associated with an emergency. A single point of contact should be established (in planning and enacted in an operation) between the Minister and the agency (usually the Chief Executive). This prevents confusion of role and misunderstandings/contradictory information/actions within an agency.

In addition, for minor enquiries (which may be brought to the attention of the Minister by other politicians, members of the public or media) which do not need the attention of the Chief Executive, consideration should be given to a link being established using a nominated Ministerial staff member contacting the Chief Executive's nominated person (e.g. executive/staff officer).

Similar to briefings at the SEC and other command/control areas, EMC meetings should be time constrained, only dealing with information and actions relevant to and at the strategic level for which that particular body exists. In most instances meetings should be of about 15 to 20 minutes duration.

**Recommendation 35.**

That the Department of the Premier and Cabinet revise the ministerial documents relating to emergency management.

**Recommendation 36.**

That members of Emergency Management Council ensure they are prepared to undertake their roles and responsibilities during emergency events, including establishing:

- a) contingencies for communication e.g. satellite phone
- b) access to relevant documents such as the State Emergency Management Plan, supporting plans, ministerial guidelines, agency plans and contacts in hard copy and/or portable device
- c) formalised arrangements for briefings (up and down), and
- d) arrangements for suitable representation e.g. relevant Chief Executive(s) or their deputy, at all Emergency Management Council meetings .

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## 11.8 The State Emergency Management Committee

The SEMP 2016, describes the role of the State Emergency Management Committee (SEMC) as: *'a strategic planning committee that reports to the EMC on matters related to the preparedness of the State against identified hazards or protective security matters'*.

SEMC was established under section 6 of the *Emergency Management Act 2004* and is the prominent strategic planning committee that provides leadership and maintains oversight of emergency management planning for SA.

Under Section 9 of the Act, SEMC's functions are to:

- (a) provide leadership and maintain oversight of emergency management planning in the State*
- (b) prepare and keep under review the SEMP*
- (e) ensure agencies and organisations with functions in the SEMP are aware of those functions and are provided with adequate information for the purpose of understanding and carrying out those functions*
- (f) monitor the capacity of agencies and organisations with functions in the SEMP to properly carry out those functions*
- (g) coordinate the development and implementation of strategies and policies relating to emergency management*
- (h) monitor and evaluate the implementation of the SEMP in relation to a major incident, a major emergency or a disaster*

DEWNR has commenced a project to develop an emergency management assurance framework to support SEMC.

## 11.9 Advisory Groups/Committees

There are four advisory groups that report to SEMC being the:

### State Mitigation Advisory Group (SMAG)

SMAG's functions are to:

- Advise the State Emergency Management Committee (SEMC) on all aspects of mitigation in South Australia across the full spectrum of prevention, preparedness, response and recovery activities including strategic policy advice.
- Provide oversight of South Australian Emergency Risk Management, consistent with national standards and using nationally agreed methodologies, as appropriate.
- Promote the development of effective emergency risk management practices by Hazard Leaders, Zone Emergency Management Committees, State and Local Government including through facilitation and support of research, training and sharing of information.
- Support Hazard Leaders to develop adaptive, flexible, resilience-based Hazard Plans, and provide oversight and assurance of those Plans.
- Support Zone Emergency Management Committees to develop adaptive, flexible, resilience based Zone Emergency Management Plans, and provide oversight and assurance of those Plans.
- Support and progress SEMC initiatives as directed

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## State Response Advisory Group (SRAG)

SRAG's functions are to:

- Advise the SEMC of South Australia's level of response preparedness.
- Support the State Coordinator and Assistant State Coordinators in the management of response operations as required.
- Collaborate with the State Mitigation Advisory Group (SMAG), State Recovery Committee (SRC) and the State Public Information and Warnings Advisory Group (SPIWAG) to ensure that emergency management in South Australia is a seamless process that recognises planning, preparation, response and recovery.
- Advise the SEMC on policy and planning aspects of response management.
- Develop strategic policies and procedures to ensure effective inter-agency coordination in relation to response matters and the coordination of response and recovery arrangements.
- Develop and maintain the State emergency response section within the State Emergency Management Plan with particular reference to the:
  - o roles and responsibilities of all agencies supporting the response process;
  - o identification of agencies responsible for particular aspects of the response process;
  - o planning of systems and procedures for the coordination of the response; and
  - o resolve urgent matters regarding the plan.
- Provide expert advice and guidance to hazard leaders to ensure plans include appropriate aspects as they relate to the response section within the State Emergency Management Plan.
- Investigate and report on any response matters referred by the SEMC.
- Approve functional sub-committees' plans and coordination arrangements.
- Provide oversight of the establishment, management, training and operation of the Zone Emergency Support Teams.

## State Recovery Committee (SRC)

Outside of an event, the State Recovery Committee undertakes planning and preparedness to ensure the State's disaster recovery capacity.

During and following an emergency event, the State Recovery Committee drives the State's recovery activities.

The State Recovery Committee's functions are:

Reporting to SEMC

- Advise the SEMC on preparedness for recovery planning and operations.
- Advise the SEMC on policy and planning aspects of recovery management.
- Investigate and report on any recovery matters referred by the SEMC.

Planning

Review and revise the Recovery chapter of the State Emergency Management Plan with particular reference to the;

- roles and responsibilities of all agencies supporting the recovery process,
- planning of systems and procedures for the delivery of recovery services to affected people, communities and agencies, and the
- need for emphasis on working with local communities, strengthening what is already in place.

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Establish and maintain links to relevant national emergency management forums

- Collaborate with the Mitigation and Response Advisory Groups to ensure that emergency management in South Australia is a seamless process that recognises prevention, preparation, response and recovery.
- Provide advice and guidance to Hazard Leaders, Functional Support Groups and Zone Emergency Management Committees to ensure integration of the key aspects of recovery.
- Develop, maintain and review strategic policies and procedures to ensure effective inter-agency coordination in relation to recovery matters.

Operational Support

- Support the State Coordinator and any Assistant State Coordinator in the management of emergency operations as required.
- Support the Assistant Coordinator Recovery and/ or Chair of the State Recovery Committee in coordinating the recovery process.

Monitor and review

- Monitor and coordinate State recovery activities and processes to ensure preparedness.
- Evaluate recovery operations and report on key findings.

### **State Public Information and Warnings Advisory Group (SPIWAG).**

Under the authority of SEMC, SPIWAGS functions are to:

- a) Identify, establish, and ensure the maintenance of the standards by which public information and warning (PIAW) activities are conducted across all levels of government
- b) Maintain the State Emergency Management Plan (SEMP) PIAW annexure and report to SPIWAG on compliance with it
- c) Maintain strategic oversight of PIAW systems to ensure their capability including the State Emergency Information Call Centre Capacity
- d) Ensure representation on national committees, reference groups and working parties is maintained to provide input to and maintain knowledge of best practice in PIAW to:
  - Identify and recommend the development of new systems to provide for currency of warning tools
  - Identify and promulgate best practice in policies and procedures
- e) Maintain a register of PIAW capability within Control Agencies, Hazard Leaders, Functional Support Groups and Zone Emergency Support Teams that can be drawn upon to support large scale emergencies.
- f) Ensure the Public Information Functional Support Group is provided with the register of PIAW capability.
- g) Ensure agencies conduct appropriate training in the strategies, policies, procedures, and use of all PIAW systems used to distribute public information and warnings including but not limited to Emergency Alert, Alert SA and SEICCC.
- h) Liaise closely with SMAG, SRAG and SRC to ensure consistency in PIAW activities

Additionally, Task Forces can be created to undertake specific projects (e.g. Flood Review Task Force) and make recommendations for action.

Committee arrangements are necessary in SA and bring a cohesive approach to emergency management but without an appropriate 'assurance' regime, many key projects and recommendations can linger.

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## 11.10 Assurance

When the SEMP was being reviewed during 2016, a number of issues were raised by agencies, many related to assurance.

For many people involved in these committees (both attending and undertaking nominated tasks), emergency management, is additional to their busy roles in their business as usual activities.

A scan of committee minutes identified issues with attendance, regularity of meetings, and task completion.

It is implicit under section 9(1) of the *Emergency Management Act 2004* functions and powers of SEMC

- (e) to ensure that agencies and organisations with functions under the State Emergency Management Plan are aware of those functions and are provided with adequate information for the purpose of understanding and carrying out those functions;
- (f) to monitor the capacity of agencies and organisations with functions under the State Emergency Management Plan to properly carry out those functions;

SEMC is responsible for providing assurance to the government and community of SA that the State has adequate emergency management arrangements and sufficient capability and capacity to manage hazards and associated risks, and effectively respond to and recover from emergencies and disasters.

Currently there is no process to assess the effectiveness of SEMC, its Advisory Groups, Sub-committees and working groups/task forces. Committee Terms of Reference are regularly reviewed but these are reviewed independent of each other rather than holistically. A more holistic approach would ensure that there is no overlap or duplication of effort, and more importantly, no significant gaps.

Many of SEMC's functions under 9(1) of the *Emergency Management Act 2004* need to be reviewed and re-written to provide SEMC greater clarity about its role.

Although SEMC schedules meetings on a bi-monthly basis, following the 24 March 2016 meeting and rescheduling and cancellation of subsequent meetings, SEMC did not meet until 11 August 2016.

SEMC is not an 'operational' committee. However, consideration should have been given to holding an extraordinary meeting after the 28 September 2016 extreme weather event in recognition that it had such a large impact. Instead SEMC did not meet until the next scheduled meeting on the 24 November 2016, nearly two months later.

The functions of SEMC described in the *Emergency Management Act 2004* do not have any 'teeth' and do not provide SEMC with authority to 'ensure' that all committees, agencies and organisations to properly carry out their functions, and meet their objectives in a timely manner, including the implementation of EMC/SEMC recommendations.

To address a recommendation of the Flood Reform Taskforce SEMC has funded a project to develop an Emergency Management Assurance Framework using State Significant Project funds from the Natural Disaster Resilience Program (NDRP).

The framework's objective is to support SEMC in its statutory function under section 9(1)(f) of the *Emergency Management Act 2004*: 'to monitor the capacity of agencies and organisations with functions under the State Emergency Management Plan (SEMP) to properly carry out those functions'. It is important to note that the 'framework' will not be the solution for SEMC to deliver on this function, but rather the first step in a long journey.

A number of States in Australia which experience significant emergency events have implemented a position of Inspector General for Emergency Management (IGEM) or similar.

This framework would provide the minimum position South Australia should adopt regarding governance and assurance.

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Consideration should also be given to the establishment of an IGEM position, or additional duties allocated to a current position, including:

- ensuring continuous improvement of emergency management
- development and maintenance of an assurance framework
- system-wide reviews of emergency management
- evaluation of State-wide training and exercise arrangements
- reporting on the implementation of emergency plans (all levels)
- auditing of the State's emergency management arrangements, including government agencies contributing to these arrangements.

### **11.11 Emergency Control and Coordination Centres**

There are a number of core bodies within the Act and SEMP which provide the strategic direction and coordination of emergency management within SA. This section will deal with the State Crisis Centre (SCC), the State Emergency Centre (SEC) and the Zone Emergency Centres (ZECs).

Other command/control centres exist within all government agencies and dependent on the type and scale of event may or may not be needed.

During this event the SES were the Control Agency and activated its State Control Centre. Other government agencies operating in support of the SES or requiring a command/control centre in their own right, such as Police, CFS, SAAS, DEWNR also opened their respective centres.

In the response phase of an emergency event the ability to effectively manage an emergency incident, with regard to planning, is always affected by a number of issues, including:

- no plan exists
- the plan does not meet the necessary standard or is out dated
- people who are in key positions have limited knowledge of the plan
- people who are in key leadership positions operate outside of the plan.

Generally, there are a series of cascading plans and 'practice guides' which should clearly articulate key strategies, roles and function of key government agencies, positions and key centres critical to the response phase of an event and how they contribute to, assist and support those involved with the event.

Operating to these plans generates the best opportunity for success and is more likely to prevent poor outcomes, inefficient responses, mistakes, false expectations and misinformation.

There is a need to understand the various roles and functions of key command, control and coordination centres during an event that requires the activation of one or more of these centres.

Not all centres necessarily need to be activated. For many incidents, only an IMT is established, or a PFCP.

The activation of other centres comes about through either pre-determined triggers or the incident becomes of such a magnitude that the Control Agency activates their RCC and/or SCC (POC) and further (if considered necessary) requests the activation of the SEC. All these subsequent centres are designed to provide strategic leadership and assist the IMT/PFCP in resolving the incident – not assume command at a 'tactical' level.

More detail about the operations of these centres are provided in other areas of this report.

### **11.12 State Crisis Centre**

The State Crisis Centre (DPC) generally activates when the SEC is activated.

The SEMP (2016) describes the SCC as

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‘...the central liaison point for the Premier and Executive Government and provides a focal point for dealing with the media and State government policy matters. ... The role of the SCC is to support the Premier with State level policy advice and guidance. The SCC contributes to the coordination of government agencies and liaises with Australian Government and other State/territory jurisdictions’

Officials within the SCC were able to provide briefings to relevant Ministers and organise and support EMC meetings. However, there was some disconnect with SAPOL liaison officers located in the SEC which contributed to late briefings and briefing papers not fully meeting the political considerations of this event.

The number of trained people required for the SCC if it were to operate physically over a 24-hour period for several days, is inadequate and places a significant burden on those few who now perform these roles.

For an event of this nature, it is not necessary to have the SCC fully staffed and operating in a physical sense, however, policy and procedural modifications are necessary to ensure that the Premier and EMC are provided with up to date and informative briefings relevant to the EMC role and function.

The Review considers, that a member of the SCC be attached to the SEC as an EMC/SCC liaison officer and be responsible for the preparation of EMC briefing papers (to be authorised by the State Coordinator or nominated representative).

This would eliminate the need for SAPOL to provide a Liaison Officer to the SCC, other than when the SCC is operational. The position would be a link between the SCC and the SEC and would not release information outside the SEC which has not been authorised for release.

Further challenges with staffing the SCC are exacerbated due to the Deputy Director, Security and Emergency Management, DPC having two roles, one being with ODG, and the other being within the SCC. It is the view of the Review, that the role within ICT is so crucial during emergencies that this position should be dedicated to the ICT support agency.

Therefore, to adequately staff the SCC and have some level of redundancy (people on leave, people sick, prolonged event, etc.) suitable people throughout DPC should be identified and trained for the various roles within the SCC.

### **11.13 State Emergency Centre**

The SEC when activated has representatives from the Control Agency, Support Agencies and Functional Support Groups.

The functions carried out in the SEC are to:

- coordinate support to the Control Agency by the Support Agencies, and Functional Support Groups
- provide information to the State Coordinator
- exercise the powers and functions of the State Coordinator in a declared emergency
- coordinate information sharing between Control Agency/s, Support Agencies, Functional Support Groups and executive government
- address strategic issues in support of response and recovery operations; and
- engage with Emergency Management Australia.

During this event the SEC successfully operated using the updated SEMP (December 2016). This included a number of new and/or revised support agencies and Functional Support Groups.

This event, as previously mentioned was complicated because of there being no designated control agency for a black system event.

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For all, but particularly some of the smaller organisational areas within government (eg. SAGR, ODG), the duration of the event caused issues with fatigue, replacement staff, and the need to staff multiple centres. This issue needs to be reviewed, and decisions made about whether these smaller, but critical organisations need to be in the SEC all of the time, or some of the time.

Currently, within the SEC arrangement a Logistics Functional Support Group (managed by SAFECOM) exists and its role and function is 'coordinating non-specialist supply and catering support when existing capabilities have been exhausted during an emergency'.

This FSG has existed during the time that government agencies maintained their own stores and supplies. This arrangement no longer exists.

In reviewing this event, and considering the need for transport (there is a Transport FSG), food, fuel, accommodation, it may be more appropriate that this function be managed through a procurement process.

The Chief Procurement Officer, (DPC), has responsibility for procurement in SA and therefore knowledge of government contracts and the ability to source 'logistical' support in the event of an emergency. It is also more likely to assist the Transport FSG with obtaining transport in the event of any difficulties being experienced in this regard.

Emergency management arrangements are outlined in the SEMP and include: activation of the SEC; roles and interaction of agencies in the SEC; the capability, training and experience of personnel; declaration of a major incident; traffic management; interstate and Federal assistance; and, functions and responsibilities of control agencies, supporting agencies and functional support groups.

The SEC is established to inform the State Coordinator, and act as a problem solving centre. However, the SEC needs to operate at a strategic level and does not need to know all the details of the event, only those which are relevant to its role.

The multi-agency SEC debrief identified a number of challenges and areas for improvement within the centre.

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*The provision of Liaison Officers from agencies and functional services – level within an organisation, fatigue, knowledge of plans, roles and functions, relief arrangements, impact on ability to conduct business as usual activities.*

#### *SEC debrief*

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Liaison Officers do not need to be the most senior persons from an agency, and do not need to make on the spot decisions committing their department to a course of action. However, they do need to have a sound knowledge of the agency or function they represent and the key agency contacts to seek approvals and information in a timely manner.

They also need to have a thorough understanding of their role and function, how to use information systems, provide succinct, informative briefings and contact key contacts so they can perform the liaison function effectively and efficiently. The selection of the suitable operators together with regular, ongoing training and exercising that build confidence and familiarity in the role, will ensure effective agency liaison over an extended emergency event.

At time, the SEC had difficulties in obtaining up to date information from the Control Agency Liaison Officer (SES on this occasion), which affected its situational awareness. This has been a common problem in past events, including Sampson Flat and Pinery and is usually due to the control agency being extremely busy.

A number of factors affect the timeliness of information including:

- IMTs not passing information up to the SCC and to the SEC
- the IMT being too focussed on the operation (not carrying out all the functions of Australasian Inter-service Incident Management System (AIIMS))

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- the SCC not providing the Liaison Officer the up to date information (poor functionality of the SCC would contribute to this)
  - the Liaison Officer not being proactive enough in seeking the information
  - the SEC being slow to seek information from other sources (e.g. POC/PFCP) through the appropriate Liaison Officer and/or functional support group
  - different information management systems and unfamiliarity with the Critical Incident Management System (CIMS) used in the SEC.

The SEC briefings were problematic in that they were not consistently timed e.g. on 28 September 2016 they were held at 0800, 1300, 1700, 1900 and 2030hrs. This makes it difficult for the control agency and other agencies to ensure that relevant briefing points are provided to their representative in a timely manner and that other briefings that should occur prior to the SEC briefing are planned and can occur.

During this event, difficulties in obtaining and communicating information were exacerbated by the power outage and communications difficulties and failures. This had a flow on effect as important information such as sandbagging operations, locations and times were not up to date and therefore not always accurate.

At present, DECD is not represented within SEMC or the SEC. During this event, largely due to the power outage and the resultant communications failures, the Chief Executive of this Department, had limited information from the State level about the event and potential issues for schools.

Given that DECD has sites situated across the State and has linkages to all forms of educational institutions together with their tens of thousands of staff and students within South Australia there appears to be a need to ensure that emergency information is immediately available.

Additionally, schools may form 'safe places/refuges' in an emergency and so contribute to the management of the emergency.

#### **11.14 Role of Emergency Management Australia and Defence**

Emergency Management Australia (EMA) is a division of the Commonwealth Attorney-General's Department and the Australian Government lead for disaster and emergency management. EMA works with State and territory governments and the international emergency management community, delivers critical programs, policies and services that strengthen and maintain Australia's national security and emergency management capability.

While State and territory governments are responsible for emergency management in their jurisdictions, EMA coordinates Australian Government support, both physical and financial.

EMA operates the Australian Government Crisis Coordination Centre (CCC), which is an all-hazards, 24/7 facility, that provides whole-of-government situational awareness to inform national decision-making during a crisis.

The CCC coordinates physical Australian Government assistance during disasters and emergencies.

Additional to support provided by State and territory governments, the Australian Government has a range of assistance measures to help hardest hit communities recover from disasters.

During this event, EMA deployed an Emergency Management Liaison Officer from Canberra to SA who was located in the SES SCC, or the SEC when it was activated. This was an effective strategy to improve flow of information between jurisdictions and there were clear, timely and open communications between EMA and SES. (SASES, 2016).

A representative of Defence is positioned within the SEC during an emergency event to provide assistance if required under Defence Aid to the Civil Community (DACC) which includes State/Territory government departments, police and emergency services. This aid is provided

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when the emergency is of such a magnitude that State/Territory resources are inadequate, unavailable or cannot be organised quickly and their support is requested.

Defence assistance was provided during this event (e.g.: sandbagging), the work effort and support of ADF personnel was greatly appreciated.

Access to Defence and EMA assistance is not restricted to the control agency and may be requested by any participating agency via the SEC arrangements.

### **11.15 Zone Emergency Management Centres (ZECs), now Zone Emergency Support Teams (ZESTs) under the December 2016 SEMP**

The SEMP (December 2016) describes the role of the ZEST as:

.....to support the resolution of an emergency by providing coordination of local resources in:

- Performing assigned or designated tasks from the Control Agency
- Supporting the sharing of information between the agencies involved
- Supporting community impact planning and assessment
- Supporting the development of public information to affected communities
- Supporting relief and recovery operations
- Remaining activated until recovery operations are established

The ZECs performed well under difficult circumstances and a degree of isolation. ZEC debriefs, provided a number of recommendations, generally associated with their local arrangements.

However, the ZEC located at Port Lincoln, experienced loss of power associated problems that were not experienced in Adelaide (power out for less time) such as access to pharmacies and potentially critical medication.

Difficulties for ZECs also arose from the nature of the event and the designation of the control agency being based around a storm event. For example, the Port Pirie and Barossa ZECs the issues were with storm associated problems, whereas the problems at Port Lincoln ZEC were predominately about the loss of power event and managing the multitude of consequences.

Some observations of ZECs included:

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*Lack of information from the SEC flowing back to the ZEC regarding actions being undertaken to assist the ZEC*

*Need support with resources that can't be obtained locally (e.g.: Media Liaison Officer)*

*Medical plan for black out required which includes pharmacies*

*Local government need to be included in the ZEC*

*Local Government 'talking head' needs to be identified. Then have similar media updates for local area as at State Level (Control Agency, Police and Local Government representative (e.g.: Mayor)*

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The concept of ZECs and under the new SEMP, Zone Emergency Support Teams (ZESTs) is sound and encourages a strong partnership approach by government/local government and local organisations.

Whilst ZECs operated independently of the SEC, the black system event caused State wide communications difficulties increasing the isolation of the ZECs and highlighting the need for a closer relationship with the SEC.

There is debate within the emergency management sector about the SEMP and the relationship of ZECs (and now ZESTs) to the SEC. This needs to be clarified, as ZECs/ZESTs offer the State Coordinator an opportunity for increased situational awareness, the ability to identify any support the ZEC/ZEST may require with human and physical resources and improve the coordination of resources in a large emergency event.

- Recommendation 37.** That additional guidance be provided in the State Emergency Management Plan regarding the activation, structure and operation of Zone Emergency Support Teams. This should include:
- a) the reporting relationship between the Zone Emergency Support Teams, the State Emergency Centre and the State Coordinator
  - b) briefing requirements between the State Coordinator (or their representative) and the Zone Emergency Support Teams when the State Emergency Centre is activated
  - c) responsibilities for provision of local public information; and
  - d) the appointment of public information officers in Zone Emergency Support Teams (where there is no incident management team established) to provide information to local communities
- Recommendation 38.** That the State Emergency Management Plan be reviewed and updated including:
- a) a better description of the responsibilities of Hazard Leaders
  - b) establish a mechanism for a hazard leader to identify systemic failures in coordination of their hazard, with a clear process to raise those issues with SEMC and seek a remedy
  - c) establish resilience as a key heading in the plan, with clearly documented strategies and responsibilities; and
  - d) consider the Schar/Mulroney submission and taking a 'fresh eyes' approach
- Recommendation 39.** That the Department of Education and Child Development be included as a member of State Emergency Management Council and represented in the State Emergency Centre.
- Recommendation 40.** That regular training and exercising is conducted for all State Emergency Centre participants including Liaison Officers.
- Recommendation 41.** That an Emergency Management Assurance Framework be established as soon as possible to support the emergency management arrangements and the State Emergency Management Plan. Consider establishing an Inspector General Emergency Management department or position.
- Recommendation 42.** That a review of the role and effectiveness of the State Emergency Management Committee (SEMC) including: the legislative functions; membership including the chair; roles and responsibilities; and, SEMC Advisory Groups be undertaken.
- Recommendation 43.** That the position of Deputy Director, Office for Digital Government is dedicated to the Office for Digital Government; and that people throughout DPC are identified and trained to perform appropriate roles within the State Crisis Centre.
- Recommendation 44.** Review representation in the State Emergency Centre including:
- a) determining if there is a more suitable functional support group e.g. the Procurement Functional Support Group, to replace the Logistics Functional Support Group, and if so, Chief Procurement Officer, DPC, has responsibility for the management of this role within the State Emergency Centre.
  - b) That when the State Crisis Centre is not operating from a physical location, a State Crisis Centre liaison officer is attached to the State Emergency Centre.

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## 12. STATE EMERGENCY MANAGEMENT AND INCIDENT MANAGEMENT

### 12.1 Control Centres

The SES SCC was activated pre-emptively on Monday 26 September when the BoM predicted severe weather for 28 September 2016. Two IMTs, being the North IMT (Port Pirie) and South IMT (Netley), were activated at 7:00 am on Wednesday 28 September 2016. On Saturday 1 October 2016, another IMT was established at Roseworthy to manage the flooding in northern areas including at Port Wakefield and Virginia.

As the event unfolded, specific SCC functions were expanded out into pre-determined office locations within the SES State headquarters building. However, the number of personnel required to perform the functions required for this event was far greater than any previous event which resulted in all available workstations across the entire floor being utilised.



*Figure 27 - Weather briefing in the SES SCC*

Office space became an even greater issue when the power black-out occurred. SES has a back-up generator to support essential activities. Continuous power to the SCC itself and the eastern side of the floor, and essential ICT was sustained. However, all air conditioning stopped working and workstations and appliances on the western side of the floor were no longer operational. Personnel needed to prioritise which work was the most urgent and others were working off battery power or helping out where they could.

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*‘physical layout of SCC/offices being used is a challenge to good communications’*

*‘insufficient, not adequate to deal with incident of this scale’*

*‘a rabbit warren with large numbers of people spread out in offices’*

*‘noise of operational and social conversations whilst trying to review docs/edit/prepare’*

*‘loss of power reduced the number of PCs that could be used, rationalised use – meant some people couldn’t do their work’*

*‘public information function is noisy and disruptive within the SCC, it needs its own space’*

*‘difficult to work together and difficult to conduct debriefs’*

*Comments from the SES SCC debrief*

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The SES SCC and CFS State Coordination Centre have both been identified as being inadequate for operations (AFAC, 2015) during previous events and this was demonstrated again during this event. Both SCCs have been established in locations that were primarily office space and have been adapted in an effort to facilitate effective operations.

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*'current SACFS SCC operational facilities (are) less than adequate when compared to other State level operational facilities. There appears to be duplication of agency control centres to enable all mandated activities and functions to be undertaken. ... During the January fires the following emergency coordination centres were activated at the State level, the SEC, the SACFS SCC and the SAMFS SCCF (State Control Centre Fire), each requiring staffing from individual agencies.... this could lead to an inefficient use of scarce human resources and a breakdown in effective communications.'*

(AFAC, 2015)

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The SES SCC does not have enough physical space the arrangement of offices does not effectively facilitate work flow, and it was often crowded and congested.

Additional issues relating to the current SCC accommodation include:

- no onsite car parking for operational vehicles.
- access to the premises can be difficult
- unreliable core building services such as lifts, air conditioning and power supply
- insufficient space to facilitate: control and coordination activities; expanding roles in public information; accommodation of critical support personnel from agencies such as the DEWNR and the BoM
- the building does not comply with current earthquake construction standards, meaning it may be rendered unusable at a time when it is needed most.

The Statement below relates to the CFS SCC during the Pinery fires. The same issues exist for both CFS and SES SCC facilities.

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*The SCC is office space that has been minimally adapted to the needs of its role in command, control, coordination and communication. Its size and layout are not conducive to the shared situational awareness and close collaboration required in a major incident. The specific needs of the State Coordinators are not well supported. There is little scope in the layout for the State Coordinator to manage across functions or to gain a comprehensive view of the situation*

(Noetic 2016).

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Many interstate emergency services have multi-agency coordination and control centres. There are many benefits to this including cost. It is cheaper in the long run to maintain one SCC rather than three. It minimises duplication of personnel, systems and equipment. It is also much easier to establish effective inter-agency liaison and communication which leads to more efficient and effective incident management and response.

This consolidation of control centres in SA would also flow onto consolidation of back-up facilities. If all agencies are co-located in the one SCC facility this would logically flow on to there being a single back-up facility rather than each agencies needing to maintain their own back-up facility and resources.

Another benefit of multi-agency centres relates to staffing. Some positions are duplicated in each SCC e.g. administration support and logistics, and the agency liaison positions that are required when there are separate SCCs would not be required because they are already in the same room.

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This reduces the number of personnel required which is a very beneficial where availability of staff is already a significant issue.

Concerns regarding the functionality of the current building continue. The Chief Executive SAFECOM and the Chief Officers of CFS, MFS and SES are continuing to work together to identify viable options for future accommodation arrangements. In support of this and with reference to the recommendation made during the Australasian Fire and Emergency Service Authorities Council (AFAC) independent operational audit, the following recommendations are made:

Two key recommendations following the Pinery bushfire are described below.

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*‘to review control facilities at State, region and incident level’  
and  
‘to review ICT capability and contingencies for control facilities to ensure they remain  
robust across a range of reasonable circumstances’  
(Noetic, 2016)*

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This event also highlighted that some ICC facilities were inadequate including the SES district headquarters at Port Pirie. The SES ICC facility at Netley was upgraded in 2016 and was greatly improved both technically and functionally, however landlines and site access continued to cause problems during this event.

Other challenges with many existing incident control facilities included:

- lack of space
- poor layout
- inadequate ICT connectivity and infrastructure, and,
- achieving a balance between locating facilities in reasonable proximity to high risk locations as well as having access to local resources such as food and accommodation.

|                           |  |
|---------------------------|--|
| <b>Recommendation 45.</b> | That the recommendation made following the Pinery bushfire, ‘to review control facilities at State, region and incident level’, be expanded to include all emergency services facilities that will be utilised for major incidents other than bushfire e.g. flood and earthquake and to also be extended into metropolitan areas, and implemented. |
| <b>Recommendation 46.</b> | That a single emergency service multi-agency control centre be established with sufficient capacity and capability to deal with all types of emergency incidents in SA. Also consider Police and State Emergency Centre.   |

## 12.2 Incident information systems (electronic systems)

In the emergency management sector there are several electronic incident information systems used by different agencies to support emergency management and operations. These systems are used as incident information databases, operational tools for incident management and internal agency communication during incidents.

The CFS and MFS use CRIIMSON (Critical Resource Incident Information Management System Online Network) which is a bespoke system developed in-house by CFS. The system was initially set up over a decade ago and it has continued to be developed each year to capture new processes, enhance operations and incident management activities and to be able to share information across agencies.

The SES uses SESIIMS (SES Incident Information Management System) which is based on the Intermedix WebEOC professional platform. WebEOC is a platform used by many agencies and

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emergency services across Australia and New Zealand. The WebEOC platform has add-on modules that can be tailored to the requirements of agencies. SESIIMS has only been in place for a few years and is being progressively developed and enhanced.

SA Health has recently developed and implemented a bespoke incident management system.

SAPOL have installed CIMS (across SAPOL and within the SEC, this system is also based on the Intermedix WebEOC professional platform).

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*'why are there multiple systems?'*

*'how do the systems share information?'*

*'how do we marry up the information to make a common operating picture?'*

*'information flow, didn't make it back to the SCC in time,  
causing disparity in information'*

*'validity of information'*

*'the use of multiple systems was captured as an issue following Pinery'*

*'daily incident number differences (CFS and SES different)'*

*Comments made during the SEC multi-agency debrief*

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South Australian agencies have implemented their own electronic incident management systems for a variety of reasons including that: they needed a platform on which to manage their business; each agency has different methods of operation and therefore different system requirements; and, it is relatively easy to make changes/enhancements in a system that only effect one agency.

Some of the disadvantages of multiple incident management systems include:

- some personnel need to operate more than one system and need to have initial training, refresher training, log-in credentials and access to each system
- users from one agency performing a role in support of another agency may not have access to or know how to use the relevant system
- incidents are duplicated on SESIIMS and CRIIMSON and the same incident is given a different number of each system which is confusing and could lead to errors
- potential for information being recorded against an incident in more than one system which could result in duplication, missed information, no single point of truth and confusion about which system to access or enter information
- users may not know which system to go to find the information they need
- the cost of licensing and ongoing changes and upgrades to multiple systems
- the work effort in delivering training and refreshers throughout the State and developing and maintaining training material for multiple systems.

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*'I learnt that CFS and SES have their own systems for incidents (CRIIMSON and SESIIMS).  
This was problematic when trying to find information regarding incident. Some in  
CRIIMSON e.g. Roseworthy IMT as they were CFS/DEWNR'*

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*'Files could not be shared between the agencies, at one stage a CFS liaison at the SES SCC was asked to download all relevant photos from CRIIMSON and upload them to SESIIMS to allow the SES SCC to access them to gain situational awareness. This took that person away from their core role for a considerable amount of time.'*

*'Lack of common systems between agencies SESIIMS (SES) and CRIIMSON (CFS)'*

*'Roseworthy IMT data was placed on CFS CRIIMSON system, air recon flight data, photos and logs were placed on CFS CRIIMSON system'*

*'IMT using CRIIMSON and inputted logistics requirements and intel on CRIIMSON. Was not always communicated through to SCC'*

*Comments from SES and CFS debriefs*

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This Review will not recommend any particular preference of electronic incident information system however, it does highlight that the ongoing development, maintenance and utilisation of multiple systems, particularly in the emergency services sector is undesirable. Multiple systems increase the margin for error and confusion and therefore risk, as well as increasing the cost across the sector for system software and personnel. In a State as small as SA, this is not a sensible option.

**Recommendation 47.**

Review existing electronic information systems used by emergency services organisations and other government agencies, and:

- a) establish a single incident information system across the Emergency Services Sector (MFS, CFS and SES), and
- b) identify opportunities to consolidate incident information systems of other agencies

### **12.3 Incident management systems (people management systems)**

In 2011 the Chief Officers of the CFS, MFS, SES and SAPOL together with five other SA government agencies signed the Common Incident Command and Control System Agency Agreement which was an agreement confirming those agencies would use common incident management arrangements during emergencies.

The agreement was expanded in 2014 to include all control agencies appointed in the SEMP and was re-named the Common Incident Management Framework Control Agency Agreement (CIMF) (SA Government, 2014). In this agreement it was Stated that it would eventually form part of the SEMP and the 2016 update of the SEMP incorporated new wording to this effect.

The purpose of the CIMF was to enhance incident management systems already used by agencies. SA ESOs and other emergency services and agencies across Australia use the Australasian Inter-service Incident Management System (AIIMS) and SAPOL uses Incident Command and Control System (ICCS) Plus in line with police in other jurisdictions.

At the time of initial discussions about the agency agreement the emergency service system (AIIMS) and the police system (ICCS) had some key differences including that ICCS included Intelligence and Investigation functions. Since that time there have been two updates of AIIMS, and a third is in progress and both systems have very similar incident management structures.

On this occasion, as with most events in SA, personnel from agencies worked very well together in IMTs, in the SES SCC (where the structure is modelled on AIIMS but tailored to State control functions rather than incident management) and at other incident management facilities. It is common in SA to see agencies working side by side in a seamless fashion during bushfires and other emergencies where each person understands their role, function and responsibilities and uses common terminology due to sharing a common incident management system. This

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cooperative, inter-agency approach was commented on, and seen as very positive, by interstate colleagues attending the SCC.

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*Some successes of using common systems highlighted during the SES SCC debrief:*

*'ability for multi-agencies to integrate in the SCC under common AIIMS system'*

*'fantastic to see all agencies working together to achieve outcomes'*

*'great to have access to liaison officers such as: LGA and SAPOL'*

*'great interoperability with DEWNR, they provided many staff for positions'*

*'good cooperation between emergency services and government agencies'*

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A feature of incident management systems that often provides challenges is that they are systems of management i.e. they are people-based. They are systems comprised of people who are trained at different levels, have different agency and personal backgrounds and cultures, they have different levels of incident management experience, inter-personal skills, management skills, personalities and they are likely to be fatigued and under stress.

While there is no alternative to a people-based system for this purpose, operating in this environment is always going to be imperfect. Challenges with incident management are frequently raised during incident debriefs for any incident in SA, interstate and overseas. This incident also exposed some shortfalls in incident management .

Debriefs conducted with Police and emergency services agencies, and other government agencies highlighted a number of common concerns regarding command, control and coordination, and the skill level of persons in leadership positions. The application of AIIMS and ICCS Plus principles were also mentioned.

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*Inexperience of roles and lack of practice*

*The difference between POC Commander and Executive Officer needs to be clearly identified*

*The nature of the incident will determine the level of substantive rank appointed to the Police Commander*

*Functional management not applied at all briefings/meetings*

*IMT and SCC not understanding roles – particularly with operations*

*Not enough staff trained in critical roles*

*Differences in application of emergency management arrangements in different physical locations*

*Better understanding of roles and functions is needed*

*More training and exercising at leadership level is needed*

*Comments from debriefs with Police and emergency service agencies*

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Some additional challenges included: interagency and interstate confusion regarding the SA command and control structure; inconsistencies in the application of AIIMS; poor information flow; confusion about responsibilities for rosters for each location; lack of detailed briefings including what crews were required to do, where their area of operation was, who they were reporting to and what resources they had available to them.

Ideally it would be beneficial for emergency services and SAPOL to use the same incident management system. Unfortunately, this isn't achievable in the short-term to because of alignment with respective agencies at a national level.

However, there are some activities that could be undertaken to increase interoperability. These could include:

- consistent use of common terminology
- joint training and exercising
- standard processes for requesting resources from other agencies
- memorandums of understanding and joint-agency plans.

## 12.4 Personnel for incident and emergency management roles

Without exception, all government agencies and the emergency services found it challenging to maintain the staffing levels required for the various operational centres.

There are insufficient numbers of personnel trained within individual emergency services and government agencies, in all incident management and emergency management roles, to manage a protracted event.

These were challenges sourcing personnel for IMTs, RCCs, SCCs, ZECs, relief and recovery centres and the SEC, many of which are staffed 24 hours a day. A number of other emergency services and supporting agencies also activate, operate and staff their own command centres for their operational requirements.

Even with the active involvement of many agencies, there were not enough resources available for incident management or, at times, crews to support the operations. Personnel were stretched and in limited supply within a couple of days following the blackout.

The shortage of personnel made it very difficult to undertake all the required planning activities such as to:

- collect and interpret information
- undertake thorough planning
- prepare incident predictions and situation reports; and
- to conduct briefings.

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*'seemed to run out of staff quickly, were other organisations looked at to fill positions?'*

*'given the control agency responsibilities it was important to have suitable SES staff and/or senior volunteers in positions, however with so many control and coordination facilities established: SEC, SCC, IMT x3 and Zone Emergency Centres, it was not always possible'*

*'need to be more proactive in seeking external agency support to fill rostered positions prior to the shift commencement'*

*'with such a small number of staff, balancing the duration and number of consecutive shifts against welfare considerations was a challenge'*

*Issues raised during the SES SCC debrief*

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The IMT at Roseworthy was established at the CFS group control centre using CFS and DEWNR personnel with very little involvement from SES. This was a previously untried scenario i.e. where agencies other than the control agency were performing the incident controller and all incident management roles.

It was relatively straight forward in some respects e.g. establishment of standard AIIMS functions, however in other ways such as the reporting structure and requirements and the use of incident information systems, this proved difficult. The personnel in the IMT utilised the CFS system CRIIMSON while SES, as the control agency, was using SESIIMS.

There were regular teleconferences held between the IMTs and the SES SCC and good liaison was established. However, with the shortfall of IMT personnel, and confusion relating to varying processes such as development of Incident Action Plans (IAPs), situation reports and incident sectorisation, there were gaps and omissions in the planning processes at SCC and IMT levels. This could possibly also be attributed to assumptions made by personnel from each agency about how the other agencies and their systems worked and who was responsible for what.

Local government also identified shortfalls in the current capacity of the council field organisation to respond to damages caused by large storm events.

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*'Field staff need to be trained in emergency management and responsive measures and tools need to be established for various types of storm events.'*

*'There were limited resources for such a long duration event and lack of understanding of the roles of multi-agency teams.'*

*(LGA, 2016)*

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South Australian ESOs have relatively few personnel resources compared to some interstate counterparts. This has some benefits because many SA personnel have worked together at incidents of multiple occasions. They understand how each other works, they have developed strong working relationships and have established and practiced systems and processes. This familiarity enables personnel to work more effectively together.

Some personnel from interstate supporting this event were impressed and commented on the ease with which the different South Australian agency personnel worked side-by-side in a cooperative and productive fashion.

The CFS has established four State IMTs (SIMT) that are intended to provide cohesion, stability and continuity to support and manage high level incidents. The SIMTs are intended to increase the State's capability to support and manage incidents and all agencies are encouraged to participate to achieve a multi-agency SIMT with the appropriate endorsements across all agencies. Many of these personnel were deployed across the State during these events.

Some personnel from emergency services and other agencies are highly experienced and can operate in a variety of roles, however they can (obviously) only be used in one location for one role at a time. The pool of available personnel looks quite impressive on paper however once an incident has been running for more than a few days across multiple locations, the ability to find rested, competent and experienced personnel is severely limited. This is a significant risk in that if (when) there is very large incident of longer duration, the ability of the State to manage it efficiently and effectively would be severely compromised.

Insufficient numbers of personnel can result in fatigue of personnel and increased stress due to the workload and ultimately is a risk to the health and safety of all involved.

## **12.5 Fatigue management**

The SES in particular, as well as other agencies found it a challenge to sustain operations as well as manage business as usual activities. The SES has a small staff of approximately 50 personnel and were maintaining the SCC 24 hours a day as well as two to three IMTs at any point during the

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event. DEWNR and other agencies provided significant support however, as with any event that extends longer than a few days, resources very quickly become depleted and fatigued.

Some of the observed impacts of fatigue during this event included individuals: feeling tired and overwhelmed; becoming susceptible to illness; falling asleep during shifts including briefings; physical injury; and, mental stress and anxiety.

Fatigue is a common challenge for all emergency services and CFS identified fatigue management as a major theme from 2014-15 fire season (Thomason, 2015).

Recommendations have been made in the past such as developing fatigue management policies and ensuring safety advisory and incident controllers monitor work hours. However, these recommendations do not address the underlying issues and place unrealistic expectations on individuals who have very little visibility of work hours and numbers of shifts.

Effort needs to be put into the systems and people that undertake shift planning and manage the systems for availability and rostering.

## 12.6 Rostering and availability

Within IMTs a significant proportion of time during shifts, of personnel such as resources, logistics and planning officers, is spent on identifying available incident management and response personnel, preparing rosters and resourcing plans. It is also a challenge at SCC, ZEC, SEC, RCCs, relief centres etc. to prepare rosters with disjointed knowledge about who, from various agencies and locations, is able to perform particular roles and if they are available.

It is a very time consuming, complicated, manual and frustrating process for personnel. It is not uncommon to have prepared a roster only to find that, as a shift is about to commence multiple personnel are not available because:

- they had called in to say they were no longer available but the message was not passed on
- no-one had communicated with them that they were on shift
- they had already worked the set number of shifts allowed for their agency
- they were rostered into another role at another location
- their supervisor hadn't passed on details etc.

Rosters need to be prepared for multiple positions in multiple control centres and IM facilities, for day and night shift for extended durations. The current 'process' can result in errors. There are many contributing factors to this including varying agency protocols and working arrangements, multiple points of contact to pass on availability information and operator error due to lack of training, poor systems, fatigue and the sheer complexity of rosters. This was a problem during this event and is a common problem during large, multi-agency incidents.

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*The IOA understood that there were some inconsistencies in the manner in which additional resources to support the incidents were being sourced. These were predominately related to either the IMT/SIMT sourcing resources directly from the SCC, or regional coordinator liaising directly with adjoining regions and/or SCC referring requests back to regions. This resulted in the IMT/SIMT not having a complete appreciation of the process for fulfilling the requests or the resources deployed at the incident*

*(AFAC, 2015).*

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Errors in rosters can inject additional risks into an already risky operating environment, including not having enough personnel to conduct operations or incident management activities. It can occur not just for individuals but also with grouped resources such as strike teams. In this instance if there is an error made with a single strike team, this could result in the incident ground being short

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by five vehicles and 30 people. This is a significant workforce to be reduced by and to somehow operate effectively without until they can be sourced. Requesting the resources again will require additional time to action.

Rosters that are not filled can particularly be a problem for night shift. There is already a tendency to under-resource night shift because there is a perception that night shift is 'quiet'. If some personnel that were 'rostered' on also do not arrive (eg due to miscommunication), this puts additional stress and pressure on the rest of the team to perform the same tasks with less people, resulting in a high level of fatigue.

Where night shift is short-staffed this is not simple to find additional personnel to backfill because people are either unavailable, already rostered on subsequent shifts, not-rested or asleep. An insufficiently resourced night shift inevitably leads to triaging of tasks and a bigger workload for the next day shift.

Issues raised during debriefs demonstrate some of the problems:

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*'incomplete or unrealistic rostering'*

*'rostering should have been more into the future, not just 1-2 days'*

*'availability and fatigue of personnel at all levels'*

*'seemed to run out of staff quickly, were other organisations looked at to fill positions?'*

*'rostering is critical; rosters need to be complete with sufficient time to communicate'*

*'there was no roster established for the Two Wells staging area therefore no staging area manager or staging area support for a significant proportion of the incident'*

*'it was important to have suitable SES staff and/or senior volunteers in positions, however with so many control and coordination facilities established: SEC, SCC, IMT x3 and Zone Emergency Centres, it was not always possible'*

*'ensuring rostered positions were filled – need to be more proactive in seeking external agency support to fill rostered positions prior to the shift commencement – having vacancies resulted in Chief of Staff (CoS) and SCC Manager playing too much of a 'hands on' role and took focus away from 'big picture'.*

*'with such a small number of staff, balancing the duration and number of consecutive shifts against welfare considerations was a challenge'*

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Technology is available to assist with some of these activities. At present some of this technology is being adopted in a relatively ad hoc manner for example operational SES units or CFS brigades using phone applications to communicate availability for response. Whilst this is assisting those units/brigades to meet their immediate needs it isn't being adopted consistently and could result in incompatible systems. This will be of little use for planning and rostering multiple agencies during more significant incidents.

In a State with such limited resources that is experiencing events more often, of longer duration, more extensive and with less 'break' between events, significant and strategic action needs to be undertaken to make better use of the available resources. Identification of additional personnel, provision of consistent training and coordination of rostering would increase the resources available and free up time of other personnel with more effective, efficient and accurate systems.

More effective rostering would also reduce fatigue by ensuring adequate breaks are provided and reduce the stress of those preparing rosters. It would also assist with planning further in advance.

Having one consolidated system would also ensure that incident management locations such as staging areas base camps are not inadvertently left off the list.

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## 12.7 Mapping Functional Support Group as a potential model for resourcing

In the 2016 update to the SEMP a new Mapping Functional Support Group (MFSG) was established. This was instigated by DEWNR who had already been providing a mapping capability to support CFS fire operations for over a decade. The DEWNR Mapping Support Team (MST) has become an integral part of IMTs and personnel are deployed as soon as a SIMT is deployed. The MST, along with CFS, have developed, an agreed suite of mapping products such as State overview maps, maps for incident action plan and division/sector maps that are regularly prepared for fires.

MST members work in pairs and can be deployed to ICCs, SCCs or other locations as required. During this severe weather event MST teams were deployed to the SES SCC and to the IMT at Roseworthy. While the role of the MST is evolving for flood events and the product requirements are still being developed, the MST was invaluable at these locations providing excellent resources to assist with decision making and to communicate plans.

Over time, the DEWNR MST found it increasingly difficult to supply sufficient numbers of personnel from within the agency, particularly where the mapping capability was required in multiple locations and for incidents of long duration. The MFSG under the new SEMP is being established so that mapping and Geospatial Information System (GIS) specialists from across government can be called upon during events. These operators will already have specialist mapping skills and will be provided with additional training in AIIMS, the mapping support role in IMTs, the interaction with other functions in the IMT, and the various products that are to be produced with events involving a variety of hazards. The MFSG will provide a professional and specialised mapping capability for events of all hazard types with DEWNR continuing to take the lead role.

There are many specialist areas other than mapping within IM and EM that do not need to be performed by emergency services personnel. Given the limited number of emergency services personnel and their capabilities in largely operational, command and control activities, it might be prudent to primarily use them in these roles and identify other individuals from other agencies that could fulfil non-operational roles.

There is an opportunity for the MFSG model to be applied to other specialist functions of IM and EM. This would reduce the requirement for control agencies to find personnel for every position, thereby reducing the impact on control agencies and freeing them up to effectively perform their control agency responsibilities.

Providing a surge capacity for each function and could involve:

- Identifying functions/roles that would benefit from this model
- identifying a lead agency
- identifying personnel with specialist skills drawn from across government (could potentially include local, State and federal governments)
- providing specialised training for specific roles (which builds on incident management system training e.g. AIIMS)
- establishing coordinated team systems, availability, rosters and leadership

Some of the specialised IM and EM functions/roles that could benefit from such an approach include:

- emergency alerts and warnings
- social media
- traditional media e.g. media releases, press conferences
- community liaison (in the community during an event)
- public information (coordination of the functions above for an event)

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- intelligence
  - management support including administration, control centre management, logging, records management
  - logistics including catering, transport arrangements and accommodation,
  - interstate deployment support liaison units

There are already many professionals working in similar functions across government that are not currently in IM or EM roles. Indeed, there are some government agencies that specialise in areas such as those listed above that are currently not utilised during emergencies. These people are potential resources that could be trained for these roles.

## **12.8 Training and accreditation**

Training in SA for the various EM and IM roles is insufficient. Training in the incident management systems (AIIMS or ICCS Plus) is available and delivered across the sector. However, training in specific roles is unavailable in many instances or is developed in-house or sourced from interstate. This leads to inconsistencies across agencies in what is delivered and to what level. It also, in many instances, becomes too time consuming for one agency to do alone and there is either delivered very infrequently or not at all.

Training (consistency, regularity and lack of) was a common concern amongst all government agencies. The concerns being, the number of trained personnel, the standard of training, the devolution of some core training to government agencies, consistency of training, recording of training, frequency of exercising and training.

There is no central record of emergency management training in South Australia, and therefore no clear picture of Statewide capability, capacity and resources.

Addressing the 10 functions of the control agency is required under the SEMP, and whether using AIIMS or ICCS Plus, there is a need for this to be reinforced for commanders/controllers of operations.

The focus by government agencies on core business, and budgeting for core business, have placed other activities such as emergency management on the side of the table. The SEMP requires government agencies to train their own personnel in emergency management activities. However, there is no oversight in any real sense, of this and it can result in inconsistent training and exercising.

This has been demonstrated in this event, in that all government agencies commented on access to trained staff for a prolonged emergency event and the observations regarding knowledge of position roles and functions, plans and information management systems.

In 2008-2009 SEMC conducted a training needs analysis (TNA) to examine the State of training and exercising in the EM sector. It was found that there was considerable variation across the sector in regards to quality and quantity of training, and that significant gaps exist State-wide. This indicated a clear need for a State training plan to be developed and significant support for a central training committee/body to be established.

One of the key outcomes of the TNA was the need to establish a State Emergency Management Training Committee (SEMTC) to provide more effective planning and coordination of EM training. It was to provide a forum that can effectively plan for and address emergency management training and higher level exercising requirements of organisations identified in the State's EM arrangements.

The South Australian Emergency Management Workforce Mapping Project (SA Government, 2016), was funded through the National Disaster Resilience Program (NDRP) to identify the gap in knowledge of the current EM sector in SA and the capabilities required of people working within the sector. The current phase of this project involves identify existing training and educational activities

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to increase professional development opportunities in the sector. It is intended that it will build the State's capability to provide relevant training and professional development.

Similar activities to map IM training and development requirements have been undertaken at national level and SA agency level. While much of this has been mapped out, agencies have had limited success in closing training and development gaps for their personnel.

The Australian Fire Authorities Council (AFAC) is developing a nation-wide accreditation program to ensure consistency when personnel are deployed interstate. When agencies request support from interstate they need to be able to know that the function and level of the role that they understand to be requesting is congruent with the abilities and experience of the person that arrives to fill that role.

This is a step in the right direction nationally, however it poses real problems for SA because (a) the training required for many of these roles is not available in SA, even though people are performing those roles already, (which is a risk in itself) and (b) there is no consistent training, endorsement or accreditation system for personnel in SA.

Some agencies have developed some training modules and development pathways however; they are not consistent across agencies nor are they delivered to the extent that those agencies have identified that they need to be within their own agency. This exposes South Australian agencies for events in SA and it will limit the ability of personnel to be able to meet the standards required for deployment across State borders and the capacity of SA to provide support to other States in their time of need.

Another problem with not having standardised training and accreditation for personnel State-wide is that the capabilities of personnel, who are at supposedly the same level, rank or role, vary markedly. This is an issue for staff and volunteers in IM and EM roles. At some point an individual may have been 'endorsed' by their agency for a particular role however as time progresses their skills may or may not be maintained, they may or may not participate in exercises (if there are any available to participate in), they may have used their skills to varying degrees at different types or incidents or not at all. Over time it is sometimes revealed that individuals may not as proficient at performing a role as they once were or thought they were.

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*'inconsistent use of AIIMS'*

*'poor level of training'*

*'Little, inconsistent or no training provided beyond the initial system training in AIIMS'*

*'inconsistencies in agency implementation and application of AIIMS'*

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Sometimes personnel may not be chosen for a role because of their skills rather because they were available at the time. Where a person has attended many incidents in an IM role this can give the impression that they are skilled at what they do however, it is sometimes because they are nearly always available to respond. This builds their own confidence and the confidence of others in their abilities when this is not necessarily warranted. It can also reinforce inadequate performance.

This becomes a real issue during incidents because personnel may be allocated to roles when they are not necessarily good at them. This adds to the pressure for section managers who not only have to work in a stressful environment with a very high workload and few resources, sometimes the personnel allocated to them are not performing their role well, or even at all. This provides additional, unnecessary and undesirable obstacles to effective incident management.

As long as there are no set standards, skills maintenance or consistent training and endorsement it is very difficult for supervisors, due to the shortage of personnel, to address shortfalls in performance ability.

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Historically, Commonwealth funding was provided via the State Support Package (SSP) to the SES for two whole-of-government EM roles, the State Emergency Management Training Officer (SEMTO) and the State Emergency Management Planning Officer (SEMPO). When the SSP ceased the State Government budget allocation to SES was adjusted so that the two roles continued to be funded on an ongoing basis. A subsequent restructure of the SES resulted in the loss of the SEMTO position and a resultant reduction in emergency management training across the sector.

This reduction in training was further exacerbated when the Australian Emergency Management Institute (AEMI) introduced course fees in 2012, and then closed in early 2015.

## **12.9 Exercising**

The Central Exercise Writing Team (CEWT) was established in 1984 coordinates all significant multi-agency emergency exercises conducted within SA. CEWT provides expert advice, assistance and guidance to emergency services and government agencies in the preparation and delivery multi-agency exercise activities.

The CEWT Terms of Reference (2015) include that it is to:

- develop an annual exercise program to meet the requirements of the SEMP
- research, design, conduct and evaluate approved multi-agency exercises
- assist with the exercise requirements of individual government agencies
- develop and deliver training and development of government personnel to undertake planning, delivery and debriefing of major multi-agency exercises
- advise State Response Advisory Group (SRAG) on the status of the multi-agency exercise program, any other significant exercises; and
- advise SRAG on levels of exercise preparedness and significant debriefing issues following major multi-agency exercises.

It is apparent that the CEWT role, tasks and actions are demanding and intensive and have grown significantly, since its inception. In the last financial year CEWT conducted over 70 exercises.

There is an unrealistic level of expectation of CEWT members. These members participate in CEWT activities only on a part time basis because all have very busy primary jobs within their respective government agencies.

In recent times the committee has expanded from its original membership of five agencies to ten agencies in 2016 bringing about an expanded role and exercise function. However, this has not reduced the high expectation placed on the committee nor the subsequent workload.

In many cases CEWT has taken on training and exercise activities that do not fit within its 'Terms of Reference'.

The closure of the national emergency management training centre at Mount Macedon, the Australian Government introducing a user pay system for EM courses/training and the abolishment of the State EM Trainers position have all contributed to the increased expectations and work load as there are few options, other than CEWT.

A far more strategic approach to training and exercising needs to be taken so as to build capability and capacity.

## **12.10 Debriefs and lessons management**

Agencies undertook debriefs for this event, over a lengthy period of time, and it seemed that some may have not conducted a debrief if the Review hadn't requested information of them.

Not all events will require all government agencies to undertake debriefs, but an event of this nature, where the SEC has been activated and where a Major Emergency has been declared

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should have ensured debriefs were conducted and within timeframes as close as reasonable possible to the event.

The SEMP States that the Control Agency should conduct a multi-agency debrief within three weeks of the completion of the response to an incident. This is almost impossible to meet in an incident of this nature, particularly when there is a reliance on other participants to conduct their own debriefs and in doing so liaise with external organisations/individuals.

The records of, and actions arising from the Multi Agency debrief should be reviewed by the relevant committees within the State's emergency management framework (including the EMC) so that holistic action can be taken where issues have been identified that have a broad State impact.

Some of the issues identified by this Review were raised in various debriefs and are of State level significance requiring the attention of the various committees and the Emergency Management Council.

Many of these issues identified during debriefs for this event have also been raised following previous events.

The Australian Emergency Management Lesson Management Handbook 2013 describes lessons management as 'collecting, analysing and disseminating experiences from operations, exercises, programs and reviews. A consistent approach to the management of lessons is an essential component for an organisation to become a learning organisation. Organisations are seen to be learning when their structure, systems and cultures are able to evolve based on past experiences' (Emergency Management Australia, 2013)

Establishing an organisational lessons management capability or process is common practice within emergency service organisations and other sectors such as Defence both nationally and inter-nationally. It facilitates a systematic process for collection of observations and identifying lessons, and an evidence-based approach to prioritising and allocating resources for remedial action.

The SA Country Fire Service has an established lessons management capability for their organisation, but a similar capability in other SA agencies is difficult to find. There is also no overarching framework for identifying, implementing and coordinating lessons across the SA emergency management sector.

There are existing lessons management tools and resources in other emergency services and defence agencies around Australia, e.g. databases to record and administer observations and lessons, tools, systems and lessons management networks. This provides opportunities for the SA emergency management sector to leverage good practice from other agencies and implement a lessons management capability in a cost-effective and efficient manner that is consistent with best practice.

Implementing an effective lessons management capability for the SA emergency management sector could provide a consolidated and consistent approach, improve efficiency and effectiveness, and contribute to organisational learning across the sector.

**Recommendation 48.**

Through the Emergency Management Workforce Project, identify and provide training and development for SA's emergency management sector personnel (government agencies, and non-government agencies including volunteers). State Emergency Management Committee should consider supporting recommendations from stage two of the project when the project report is tabled.

**Recommendation 49.**

Consider opportunities to identify synergies between the incident management systems used in SA being the, Australasian Inter-service Incident Management System (AIIMS) and ICCS Plus. This might include joint training and exercising in roles that are common across both systems.

|                           |   |
|---------------------------|---|
| <b>Recommendation 50.</b> | Review and update the role, function, workload and focus of the groups/committees that contribute to incident management and emergency management capabilities including the State Emergency Management Training Committee, Interagency Incident Management Sub-Committee and the Central Exercise Writing Team.  |
| <b>Recommendation 51.</b> | <p>Establish a State incident management and emergency management training capability which provides for:</p> <ul style="list-style-type: none"> <li>a) consistent training across the State</li> <li>b) personal development and endorsement processes for roles</li> <li>c) identification, recruitment and development of personnel from other government agencies; and</li> <li>d) incident management and State emergency centre functional role training and development across all sectors.</li> <li>e) skills maintenance including upskills, refresher training and exercises</li> <li>f) incident and strategic leadership training</li> <li>g) consistent training for inter-agency liaison officers at all levels</li> </ul>  |
| <b>Recommendation 52.</b> | Review and reinstate the State Emergency Management Training Officer and State Emergency Management Planning Officer (capability development) positions to operate with a broad, strategic and leadership focus.  |
| <b>Recommendation 53.</b> | <p>Establish a State-wide resourcing capability to support incident management teams, regional coordination centres, zone emergency centres, relief centres, recovery centres and State control centres. some of the features of such a capability should include:</p> <ul style="list-style-type: none"> <li>a) multi-agency, cross-government, State-wide pool of incident management and emergency management personnel building on the State incident management team concept currently facilitated by the Country Fire Service, and expanded to include all hazards, multi-agency teams with a roster that provides year-round coverage</li> <li>b) a system that enables staff and volunteers from any agency to identify their availability for upcoming shifts</li> <li>c) a rostering system that enables one or more incident management teams, staging areas, regional coordination centres, State control centres and relief centres to develop, maintain and distribute rosters and structure charts in a more coordinated manner</li> <li>d) identifying areas of expertise for key incident and emergency management functions (e.g. public information, alerts and warning, media liaison, logistics and resource management) that would benefit from a coordinated and resource pooling approach and take steps to implement (consider the Mapping Functional Support Group model as a potential service delivery model).</li> </ul> |
| <b>Recommendation 54.</b> | Establish a lessons management capability across the SA emergency management sector to collect, analyse and track lessons identified during debriefs and reviews following events and other sources such as interstate and overseas reviews and inquiries.  |
| <b>Recommendation 55.</b> | Update the SEMP Part 3, Annex F 'Debriefs' to provide more guidance regarding the types of debriefs, when they are required to be undertaken and at what level and guidance for undertaking and recording debriefs, and implementing lessons identified.  |

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## 13. PUBLIC INFORMATION

The public information function undertaken by control agencies during emergencies includes the provision of incident information to the media and to the community and the provision of timely and accurate advice and warnings through various media channels.

Under the SEMP the control agency, in this event the SES, is responsible to ensure that the public is adequately informed and warned so as to support community safety. All agencies also have a responsibility to ensure that public information is provided as part of the normal process of engagement with the community. In an emergency situation, the timeliness of that information is critical.

It is well recognised among emergency services that the thirst for information from the community and the capacity for this information to inform and protect the community is a critical feature of effective emergency management. Through the rapid expansion of access to information, individuals and groups have become accustomed to being able to access the information they need about anything, immediately.

Emergency services need to be proactive with public information and ensure they have excellent situational awareness during incidents and that they are able to communicate effectively to the community about the risk to them and actions they need to take to protect themselves.

There were many challenges in providing information to the public during these events particularly during the power outage. Many individuals were unable to access the internet, some mobile phones had no connection and many had no way of being recharged, this reduced people's ability to access information. Some media outlets themselves had no power and were unable to broadcast or provide information on social media. The ABC was unable to disseminate information from the ZEC due to no mobile phone coverage or ability to use a landline.

The challenges with providing public information during this event are similar to challenges during many recent events in SA and across Australia. Some of these were identified during a public information debrief held by SES and included challenges relating to:

- limited number of qualified personnel to fill the roles including public information officer and alerts and warnings officers
- accessing up to date information from the field from the various impacted locations
- providing information that needed to be collected from a variety of sources e.g. location of sandbagging facilities
- ability to produce alerts and warnings in a timely manner given the limited number of personnel qualified and available to perform this role, and the quantity of messages that needed to be a distributed
- cumbersome processes to ensure all media channels are provided with information regarding alerts and warnings

There were also some successes highlighted, such as:

- development of a media plan which included strategies for various phases of the event
- provision of suitable personnel to provide interviews to radio and television
- SES established a presence on Facebook a few weeks prior to the event
- many positive comments regarding the content of SES posts on Facebook and Twitter
- effective use of Hootsuite
- ability to access photos and video footage from responders and the public
- use of AUSLAN interpreters

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### 13.1 Public information functional support group

During a Declaration of a Major Incident, the Public Information Functional Service (which is the Public Information Functional Support Group (PIFSG) under the new SEMP), has a responsibility to ‘assist conduct of response and recovery operations by coordinating the release of official, timely, and accurate information to the media and public concerning the disaster/major emergency, including measures being undertaken or planned to respond to such situations’ (SA Government, 2016). There was a declaration made for a 12-hour period during this event due to the State-wide power outage.

The SEMP also States that the ‘release of public information rests with the control agency’, which was the SES for the event, apart from the 12-hour declaration period. Outside of a declaration, SAPOL have the role of providing a coordination function and is responsible for ensuring the control agency is exercising its powers and functions.

Some wording in the SEMP makes it difficult to distinguish between the responsibilities of the control agency and the PIFSG. For example, the PIFSG ‘*supports the release of public information by ensuring consistent and coordinated free flow of accurate information to the media and the community*’. There is a ver similar responsibility listed for the PIFSG.

The intent of the SEMP is more likely to be that the PIFSG provides strategic oversight of public information activities and ensures that public information is coordinated and consistent.

During this incident there appeared to be confusion regarding which parts of public information was the responsibility of the control agency and the PIFSG, there was also confusion about who was responsible and/or authorised to release information about the incident. At different times there were spokespersons from a variety of agencies and levels of government making Statements during radio or television interviews or making comments on social media.

The PIFSG plan needs to ensure the agreed authorisations for release of information or social media comment and the types of information or comment that may or may not be appropriate for release by individuals and agencies.

### 13.2 Messages

Throughout this event there was a lot of different messages and information that needed to be conveyed to the community. Some of the information and message requirements included:

- severe weather warnings
- flood warnings
- the location of sandbags available to the public
- actions required of the public to prevent flooding and storm damage
- cautions to advise on what not to do e.g. walk or drive through floodwaters
- information about what to do when returning home after floods
- location of relief centres and other support
- evacuations
- school closures

Some comments made about the initial weather information that was provided was that ‘*initially councils were slow to respond ... this is about understanding of the message*’ (LGA, 2016). Some councils were of the view that more emphasis on the potential effects of this event could have assisted them to understanding the potential severity and proactively undertake additional preparatory steps to minimise damage and prepare the community.

Other issues with messaging in the media were highlighted at various debriefs and are outlined overleaf.

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*'Metro-centric focus, rural communities felt they were being ignored...not provided with relevant and timely information and they felt that the media wasn't covering their plight.'*

*'Input from (politicians) was unhelpful as they made it into a political issue where there were communities at risk and extreme weather occurring.'*

*'Directing people to go to websites that they couldn't access'*

*'review the terminology of messaging ...when to be alarmist vs when to be cautious'*

*'Multiple alerts are sent by various agencies about the same risk e.g. BoM and SES. Would be better if joint framework was agreed.'*

*'Need to agree protocols for messaging (social media) between SES/State/Control Centre(s)/Council etc. i.e. closure of Linear Park.'*

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Some information provided by the SAPN, indicated that power should be restored within two hours. This resulted in businesses only planning for a short-term outage. Some of them delayed seeking back-up power or putting away stock because they were anticipating that the power would be quickly restored. However, as this did not occur, in some instances for several days, there were stock and business losses that could possibly have been avoided if they had been told initially to plan for an extended outage. Messages from SAPN and Telstra need to be pro-active, timely and as accurate as possible. A best and worst case scenario for potential duration of an outage may assist with preparedness and resilience at all levels.

There were some inconsistencies in communication at the emergency and incident management level which may have also lead to misunderstandings by the community. For examples there was information circulating suggesting that there was no water at Port Lincoln however, this was not the case. There was concerns for the water supply in the town however water was available throughout the event.

### **13.3 Communication tools**

A plethora of tools exist for agencies to communicate with the public which provides many options for reaching potential audiences but also creates a very complex environment within which to issue information.

Following are some of tools now used by emergency services to ensure the public is provided with appropriate advice and warnings during events.

- Emergency Alert is a national telephone based warning system that sends text messages to mobiles and voice messages to land lines during emergencies. It is primarily used in the most extreme circumstances where there is a perceived threat to life and/or property
- Alert SA provides the official SA Government website and mobile app for access to timely, personalised incident information to keep the public up to date and help them make informed decisions about their safety. It provides real-time event and warning information on an interactive map of SA including incident, flood, storm, earthquake, power outages, road closures, traffic delays and transport disruptions. It displays a range of official information sourced from emergency services, relevant government agencies and community partners
- SES flood and storm response line 132500 provides the community with the ability to request assistance if required, or to use menu options to find information they are seeking such as the location of relief centres. Depending on the option selected by the caller, 132500 either terminates at the Comcen who can respond and emergency service crew if required, or it terminates at the State Emergency Information Call Centre Capability (SEICCC)
- SEICCC provides call centre overflow capability arrangements and contributes to public safety by enabling emergency services and the State recovery office to draw on additional call centre

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resources to meet demand for information about an emergency. The SEICCC is staffed by call-takers from various parts of government who provide additional information, much of which they access from sa.gov.au

- The website, sa.gov.au has been developed and greatly enhanced during 2016 to provide 'information and services for South Australians'. This website consolidates information from all SA government agencies and has a page that brings all relevant information pertaining to a particular emergency including information across the PPRR spectrum
- individual agency social media sites including twitter and facebook
- media releases which alert and provide content to media agencies
- press conferences including using AUSLAN interpreters
- emergency services have agreements with the ABC who will convey emergency messages over radio and television during significant events
- 89.1 ABC radio is listened to extensively, particularly in country areas, during emergencies. This can be an excellent tool for local emergency services and agencies to communicate with their communities.

All of the above tools were utilised during this event to provide information to the public in an effort to keep them informed and support their safety. There was a very high demand from individuals and groups seeking information via websites and social media of emergency services, essential services, local councils and community groups.

Councils also found they were able to get good reach into their communities regarding road closures, services and sand-bagging through social media and websites and they used sa.gov.au to access and provide information to their communities.

During an emergency event, politicians, the public (including those immediately affected by the emergency) and media are very active on a variety of social media platforms, including facebook and twitter.

These mediums offer a very effective tool to communicate with the public as well as an opportunity to gain intelligence on events, which may not have yet come to the notice of emergency management authorities. While the information available to emergency services can be very beneficial, it can be very time-consuming to monitor.

Equally, Statements are made by politicians, media and the general public that are not correct and if this misinformation is not corrected as soon as possible, then public confidence and concern may be heightened which may lead to inappropriate action being taken by the public.

If hundred/thousands of people are commenting against posts, scanning them for intelligence would be too cumbersome and labour intensive. Consideration should be given to acquiring 'social media listening' software which will segregate and triage the information.

Consideration should also be given to establishing an intelligence cell within the public information functional service group (PIFSG) to monitor social media and mainstream media.

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*'language used in warnings needs to be targeted to specific stakeholders and consider the language limitations of ethnically diverse communities'*

*'Alert SA was widely used by councils and functioned effectively when power supplies were available'*

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*'ABC 891 radio station is a major source of public information in a situation where almost all communication technology has failed. I felt that the ABC 891 radio broadcast was at times inappropriate ...(and) politicised a natural disaster from the outset when no information was available as to the cause of the outage.*

*This resulted in the broadcast of misinformation and increased public disquiet unnecessarily. What was required of the public emergency broadcaster at this time was to inform the public of facts as they became known.*

*Political commentary and analysis should be left until the immediate situation had resolved.'*

*Individual submission*

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In country areas ABC 89.1 Radio is an important source of information and there were many comments made that this resource could have been used much more effectively to communicate with the public. The station is diverted to interstate coverage overnight which provided no information regarding the power or weather situation.

### **13.4 Emergency Alert – a multi-agency capability**

Emergency Alert is the national telephone based warning system that was implemented following the Black Saturday events of 2009, as a way of sending targeted and intrusive warnings to members of the community at risk from emergencies.

The only agencies enabled with its use are SAPOL (both independently and as the State emergency coordinating authority), SAMFS, SACFS and SASES.

There were 92 scaled warnings issued by the SES during this event these included: emergency warnings; and watch and act, advice and reduced threat messages. This was very time-consuming and labour intensive.

At times there were delays in the length of time taken for some warnings to be issued. In one instance an IMT requested through the SES SCC that a warning be issued for Saddleworth. It was not issued until after the water had started receding.

In the Bowmans area which was inundated and no warning was issued for this area until after the water had peaked. This however was due to a lack of intelligence relating to water levels rather than problems with the issuing of a warning.

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*'there was no appreciation of timely warning messages to the public e.g. none sent out to the Waterfall Gully Road flood until 12 hours after the crisis.*

*'the SES and CFS AFLO's (liaison officers) were not advised when warning messages or ALERTS messages were sent to the public'*

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The protracted nature and geographical spread of the flooding event revealed a need to increase the pool of people capability of performing this function and develop a multi-agency capability and capacity in the use of Emergency Alert.

The ability of agencies to support the control agency with this function is reduced due to the very agency specific training. The duration, mode of delivery and complexity of training and assessment tasks vary across the four agencies.

A higher degree of interoperability could be achieved by centralising the initial and refresher training which occurs in a number of other jurisdictions.

Training conducted uniformly, with standard, structured training and assessment strategy, over a set duration, would ensure individuals can provide a consistent and reliable service, regardless of which agency they come from or the particular emergency situation.

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Training should be followed up with the same, regular, structured refresher training to maintain competency

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*.... there was comprehensive messaging and warnings provided to the community throughout the event. The Emergency Alert application was utilised to send 59,752 text messages, 28,516 voice messages and 887 fax messages regarding 18 separate risks events. The majority of these messages related to flooding or dam bursts. During the same period SES distributed 34 Watch and Act messages, 33 Advice messages and 23 Emergency Warning messages. These warning messages were for 20 separate locations across a broad geographic area*

*(SASES, 2016)*

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### **13.5 Community liaison and information**

Emergency services personnel are always engaging with the community when they attend incidents and at the local level during emergencies.

The coordination of formal engagement activities such as newsletters and community meetings has been undertaken on many occasions during bushfire events but rarely during emergencies involving other hazards such as floods.

Holding community meetings is a public information function that is relatively new to SES. A meeting was held at Virginia Institute on Wednesday 5 October 2016 to provide information and advice to the community in and around that area. The meeting was attended by around 100 members of the community and while some attendees felt angry and upset about the event, the meeting was generally appreciated as an opportunity to gain first-hand information and ask questions.



**Figure 28 - Community meeting at Virginia**

There was also a community newsletter prepared to provide advice about the situation, what emergency services were doing and what residents could do to support themselves.

At various times and in various locations emergency service personnel including SES, CFS and MFS as well as SAPOL undertook doorknocking in areas that were under threat of flooding. Generally, the contact was to provide advice only rather than to request evacuation.

It was raised at Port Lincoln that providing community information at key locations would have been beneficial. During the power outage, the Port Lincoln Hotel was able to continue operating because there was a back-up generator on site. The hotel continued to provide meals, accommodation, warm showers and heaters as the temperatures were very cold. It became a hub

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for the community because it could provide accommodation for elderly people and young families who did not have power at their homes, and travellers and workers who were stranded in Port Lincoln.

Locals also came to the hotel seeking information but staff didn't have a lot of information because they did not have operating phones or internet. It would be beneficial for control agencies to provide information at key locations, particularly where there has been a power failure, so that communities can be kept informed.

At the Port Lincoln ZEC they have since arranged the appointment of a Community Engagement Officer who will be located in the ZEC for future events to provide the media and the community with information to disseminate.

### **13.6 Relief and recovery information**

Those affected by the floods include primary producers at Virginia, many of whom are from Vietnamese or Cambodian backgrounds. Appropriate communication with these communities has been a priority and provided through different formats such as ethnic radio and newspapers, translated written information and trusted community sources and organisations.

Public information messages for relief and recovery activities were issued including [www.sa.gov.au/recovery](http://www.sa.gov.au/recovery) website, social media (Facebook and twitter) and traditional media. Other agency media channels were monitored, including SES, PIRSA, EPA, DSD, SAPOL, SA Water and SA Power Networks, to share information as appropriate. (DCSI, 2016)

Key messages include:

- relief centre closures;
- recovery centre establishment (location, opening hours and services);
- emergency grants available and closure of Loss of Power Grant;
- access to volunteers for clean-up assistance;
- sharing other agency information (SA Health mosquito information, EPA waste levy, Foodbank Flood Appeal and PIRSA grants for primary producers);
- mental health and wellbeing; and
- promotion of key communication channels including the recovery hotline.

Communication products were developed including fact sheets on emergency relief centres and available grants, Gawler area relief information, Northern Adelaide Plains Flood Recovery Centre information and information for small businesses (developed by the Department of State Development). All fact sheets were translated into Vietnamese and Khmer to cater for the prominent languages spoken in the affected area.



Figure 29 – Information on mosquito control after floods and storms, in Khmer

### 13.7 Continuity of public information throughout PPRR phases

It is important that the community can access the information that they need throughout all phases of an incident. Members of the public do not necessarily know (or care) who is providing the information as long as they are able to find what they need. There needs to be continuity and consistency of information to the community throughout the PPRR cycle.

The various agencies responsible for distribution of including, such as SES, EPA, SA Water and the State Recovery Officer, worked hard to ensure relevant information was produced and distributed in a timely manner. The increased use and promotion of the sa.gov.au website is assisting with bringing all of the information together.

Following the 911 World Trade Centre disaster there was an extensive report prepared on the information, technology and coordination lessons from that event. The report identified that crisis-related information needs of the community (across the PPRR spectrum) include:

- Immediate and emerging threats to civilians and guidance for personal protection
- Ongoing advisement of continuing threats and what to do
- Ongoing advisement of recovery and restoration activities
- Continuing awareness and education (Dawes, et al., 2004).

It would be beneficial for some work to be done to ensure that all appropriate information is being provided in a format and location that is understood and accessible by those that need to see it.

**Recommendation 56.** Review and update Part 3, Annex C, of the SEMP 'Public Information and Warnings' to:

- a) clarify the role and responsibilities of the Public Information Functional Support Group and control agencies in relation to public information
- b) define requirements and processes for liaising with the community, including holding community meetings

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**Recommendation 57.**

Update the Public Information Functional Support Group Plan to include:

- a) standards, outputs, systems and processes required to be used by control agencies and the Public Information Functional Support Group during emergencies
- b) guidance on the public information cycle through the prevention, preparedness, response and recovery phases which includes the responsibilities and information requirements during different phases, and effective transition between phases
- c) establishing a public information intelligence cell within the Public Information Functional Service Group; and
- d) identifying tools or resources to monitor social media

**Recommendation 58.**

Task South Australian Fire and Emergency Services Commission with further developing the Emergency Alerts capability across government agencies including to:

- a) establish and maintain a centralised training program for emergency alert initial and refresher training.
- b) establish a pool of endorsed Emergency Alert personnel from across government agencies to enable control agencies to assist each other with the emergency alert function during emergencies.
- c) develop supporting processes to ensure that the capability supports: emergencies involving any hazard; consistent issuing of alerts and warnings; consistent messages; and effective communication and notification of alerts issued to relevant internal and external stakeholders.

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## 14. EMERGENCY RELIEF AND RECOVERY

Emergency relief is given very little attention in the SEMP 2016. The largest section on emergency relief within the plan is provided as a definition:

*'The provision of immediate shelter, life support and human needs of persons affected by or responding to, an emergency. It includes the establishment, management, and provision of services through emergency relief centres'* (SA Government, 2016)

This role is undertaken by DCSI (Housing SA) and is a critical component of any emergency. Relief is part of emergency response, but also closely associated with Recovery and requires a complimentary working relationship with both aspects (relief and recovery) to operate effectively and efficiently.

The Emergency Relief Functional Support Group (ERFSG) has a position within the SEC and establishes relief centres in consultation with, and the approval of, the Control Agency.

There are opportunities for improvement, and increased efficiency, of relief and recovery operations to alleviate confusion of roles and responsibilities and provide a stronger nexus between relief and recovery.

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*Current relief and recovery arrangements in SA seem to be somewhat disjointed... This appears to result in some conflict over ownership and boundaries of where relief and recovery starts and finishes. Ideally the model would be more integrated due to the synergies and natural progression from relief to recovery with the former being integral in informing early recovery activities*

*Red Cross*

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The development of a State Relief and Recovery Plan (similar to Victoria's) would go a long way to improving the current arrangements.

Observations included:

- need better transition between relief and recovery
- recovery needs to sit under the NDRP
- information collected on people in the relief phase and case management not transitioned effectively to recovery
- require a proper case management system for recovery
- recovery will be long term and some locations were covered in water for weeks and months, the Virginia area will take years to rehabilitate and re-establish crops and businesses, the negative physiological effects on the community following an event such as this can be long term.

### 14.1 Relief centres

DCSI with support from other agencies established emergency relief centres to offer advice and assistance to communities affected by the extreme weather and flooding event. During this event there were eight relief centres established with the aim of providing 'care and comfort' to members of their respective communities.

| Relief Centre Location           | Number Registered |
|----------------------------------|-------------------|
| Ceduna                           | 310               |
| Clare                            | 748               |
| Gawler (Evanston Gardens)        | 196               |
| Port Augusta                     | 940               |
| Port Lincoln                     | 4,988             |
| Port Pirie                       | 1,276             |
| Virginia (Mobile Relief Service) | 16                |
| Whyalla                          | 1,490             |
| <b>Total</b>                     | <b>9,964</b>      |

*Table 3 - number of families registered at relief centres*

The biggest impact on relief (and recovery) centres was the announcement of the loss of power grant (see the next section of this report). Without the requirement to administer the grant, the need for many of the relief centres would have been minimal and of short duration.

There were some issues regarding the suitability of some relief centres including the location, access and facilities.

In some instances, there was a delay in activation of centres. This can be attributed to the approval process for activation which requires the Control Agency to approve the proposed location, prior to activating a relief centre, to ensure it will not be under threat of flooding.

Control Agencies will always be very busy coordinating response during incidents. A more efficient method would be for suitable options for relief centres to be pre-determined and documented in a State relief plan.

Control agencies such as SES and CFS would be consulted during the planning process regarding suitability of the facility during a major flood or fire.

This pre-planning would also provide the opportunity to ensure that proposed facilities have the suitable requirements such as access, back-up power, toilets, showers and parking.

Pre-determining of facilities for relief (and recovery) centres prior to an event will ensure that the process of activation of facilities during an emergency is much quicker. Agencies involved can be assured that the facilities will be suitable and it will streamline arrangements.

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*'Everyone is used to evacuation centres being for fire, I don't think anyone has thought the suitability for locations given the potential for either flood or another type of event.'*

*'...two locations suggested were totally inappropriate and the other suggestion.. would mean you'd have to get everybody to drive through potential floodwaters to get there.'*

*'The establishment of relief centres and the parameters for their establishment has been questioned by councils. The LGA has received feedback form rural areas that they appear only to be established in the larger regional centres.'*

*'Councils need notification of where the relief centres are so we can assist with access requirements etc.'*

*(LGA, 2016)*

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The communication between agencies regarding establishing relief centres during an emergency could also be improved. It is important that all relevant stakeholders, such as councils, are provided with information regarding the location and services being provided at relief centres.

## 14.2 Relief funding and loss of power grant

There were a number of grants made available to fund relief including:

- loss of power grant (\$280 per adult and \$140 per child, up to \$700 per family)
- emergency relief grant for immediate essential needs
- flood clean-up grant
- recovery assistance grants for primary producers who suffered direct damage as a result of the Gawler River Floodplain floods; and are intending to re-establish their primary production businesses.



30 September 2016

# Emergency Relief Information

Three emergency relief grants are available for people whose homes have been affected by the severe weather and floods.

1. **The Loss of Power Grant** for immediate essential needs is not means tested and is available to support people directly impacted by power outages during the declared Major Incident 28-29 September 2016.

To be eligible you must meet all of the following criteria:

- your principal place of residence must have been continuously without power from 3.50pm Wednesday 28 September to at least 12pm Thursday 29 September
- have suffered hardship as a result of the power outage
- unable to meet your immediate essential needs for food, clothing, medical supplies or temporary accommodation.

This grant is not asset tested. Eligible people will receive \$280 per adult and \$140 per child up to a maximum of \$700 per household.

To apply for the Loss of Power Grant, you will need to complete an application form available online or at relief centres and lodge in person at an Emergency Relief Centre

2. If you have been affected by the severe weather event but have not experienced at least 18 hours of power outage you may be eligible for **The Emergency Relief Grant** for immediate needs when you are unable to access your home. Eligible people will receive \$280 per adult and \$140 per child up to a maximum of \$700 per family.

To be eligible your home must be inaccessible because of the severe weather or flood and you are unable to meet your own immediate and essential needs such as food and medications.

3. **The Clean-up Grant** is to assist with the clean-up of flood damaged homes. This is paid per residence, up to a \$700 maximum, depending on the level of damage to your home. To be eligible at least one room inside your home must have been damaged by the floods.

For more information or to apply for a grant, download the application form online at [www.sa.gov.au/recovery](http://www.sa.gov.au/recovery) or visit an Emergency Relief Centre, currently at the following locations:

- Ceduna**  
Ceduna GP Plus
- Clare**  
The Valleys Lifestyle Centre
- Port Augusta**  
Port Augusta West Football Club
- Port Lincoln**  
Ravendale Sporting Complex
- Port Pirie**  
Lions Football Club
- Whyalla**  
Whyalla Hockey Association

**For the latest relief centre locations or for more information**

[www.sa.gov.au/recovery](http://www.sa.gov.au/recovery) 1800 302 787 [f SARecoveryInfo](https://www.facebook.com/SARecoveryInfo) [@SA\\_DCSI](https://twitter.com/SA_DCSI)

Figure 30 - Emergency relief information

The announcement of the loss of power grant and the assistance it provided should have been a good news story, but it ultimately caused considerable anger amongst affected communities and

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had a significant detrimental impact on relief and recovery organisations including hotlines and relief centres.

Some of the problems with administration of the loss of power grant included:

- it was announced without notification to agencies
- people had to travel to relief centres to lodge forms which was a long drive for some rural people, and there was no option to complete the forms online
- relief centres were inundated with people seeking the grant which took focus away from those who were seeking relief for their immediate needs
- some of the most effected people were not aware of the grant because they didn't have power or telecommunications.
- the timeframe was intended for people to seek relief in the first 12-24 hours however the processing time took weeks in some cases
- 10,578 calls were taken by the recovery hotline and the vast majority were in relation to grants
- the criteria for the grant was not clear so there were a lot of unnecessary calls seeking clarification of who was eligible which could have been avoided if there was appropriate information provided in the first instance
- a measurable increase in social problems associated with the influx of money into communities e.g. gambling, alcohol and domestic violence

The announcement of this Grant resulted in DCSI requiring additional resources to deliver the various relief and recovery responses.

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*To give a perspective to scale of impact of the Loss of Power Grant, of the 15,091 grants arising from this event issued as at the date of this report, only 289 were Emergency Relief or Clean-up grants. Two relief centres (Port Lincoln and Whyalla) handled only Loss of Power Grants. Without the Loss of Power Grant, the demands and needs of communities across the State were manageable.*

*(DCSI Internal Audit Report 28 November 2016)*

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Many of the loss of power grants were accessed by people considered not eligible and conversely many people who should have been able to access the grants were unable to do so, for a variety of reasons which included; were not aware due to telecommunications failures, living in remote areas and unable to attend a relief centre, unable to submit via the internet, were away from their home and returned outside of the time in which to claim.

There is also the important consideration that at times, cash grants can undermine individual and community resilience. This is contradicts the objective of providing grants in the first place.

There needs to be consultation and liaison with the control agency and the Relief Functional Service prior to announcing grants, and in fact, prior to an emergency. This would enable appropriate criteria to be established and ensure there is a framework including technology and people within which it can be effectively distributed without impacting other response, relief or recovery efforts.

When the Review team visited Port Lincoln and met with local business managers, local government and emergency services, the loss of power grant was clearly one of the most contentious aspects of this event.

Similarly, information received from the Flinders Electorate (synopsis of a survey undertaken by Mr Peter Treleor, Member for Flinders), reinforced these concerns.

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*Most common complaint about the relief grant was that people didn't know about it in time – and then when they finally did it was about to close or had already closed...*

*The second most common complaint was that the grant closed with little warning. We believe the closure was announced on the radio on a Saturday and it closed on the following Monday. This left little time for people – if indeed they even heard the information. A Flinders EO Staff member personally went to the relief centre that day it closed off and the staff at the centre told her it hadn't closed – she gave them the print out from the website where it said it was closing that evening. They didn't know about it.*

*Many of those who didn't apply were quite elderly – precisely the people that would've needed it the most – amongst the most vulnerable in our community...they couldn't get warm, they were scared as they lived alone, they didn't know what was going on. These people aren't waiting on the grant because they were too late to apply!*

*Synopsis of survey undertaken by Mr Peter Treloar, Member for Flinders*

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The relief and recovery section of the SEMP requires clear policy for announcements of emergency grants, taking into account building resilient communities (who and why), consistency of grant allocation, the method of processing grants and communications to the community (how) and the timing of the announcement of grants (when).

### **14.3 Homelessness Code Blue response**

The Homelessness Code Blue response is a relatively recent initiative which is 'a service to provide shelter, food and safety for rough sleepers during an extreme weather event. Housing SA instigates the response based on advice from the Emergency Relief Functional Service and coordinates participating agencies in the provision of response services' (Allwood, 2016).

The Code Blue response was activated on Wednesday 28 September 2016 for two nights following a Ministerial request. Non-Government Organisations (NGOs) opened their own facilities to provide food, shelter and support services. These facilities included Catherine House, Hutt Street Centre, Westcare building and St Johns Youth Service building.

The response was effective and well-coordinated during this event and provided much-needed support. An internal (DCSI) review of the 'Code Blue' response has been conducted which has deemed that relevant adjustments will be made to the documentation and it is planned that the service will be expanded into country areas.

### **14.4 Outreach to the community**

The Outreach service is a response instigated by Housing SA as part of the relief and recovery process and it provided by the Red Cross and Disaster and Recovery. It involves visiting people in affected areas who may be isolated or unable to attend a relief centre, to provide them with information and determine if they have support needs.

The Outreach service was initiated in the Virginia area on Friday 30 September during the transition from relief to recovery. Outreach volunteers distributed information packs in the flood affected areas.

Red Cross felt that there were other locations, in addition to Virginia area, that should be provided with support. This was based on reports from local volunteers who they felt these communities would benefit from some support. There were local volunteers Red Cross volunteers who were willing and available to provide the Outreach service in their communities and sent volunteers to Blyth, Fisherman's Bay and Bowmans. The visits were very well received, and some people commented that they felt they had been forgotten about.

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On 8 October 2016, mobile relief services were provided to the Vietnamese Farmers Association of SA, to support farmers who experienced damage to their crops. The Emergency Relief Functional Service and Red Cross provided support on the day.

A review undertaken by DCSI after the event highlighted a success of the Outreach program as being 'the number of volunteers that the Red Cross and the Disaster and Recovery Ministries are readily able to draw upon.'

### **14.5 Red Cross**

Red Cross have international and national capability and capacity with regard to emergency relief and recovery. In South Australia, it has two Memorandums of Understanding (MOU), with regard to emergencies, one being with Housing SA (emergency relief). The other is with the Relief Functional Service and assist with psychological first aid, register.find.reunite, supporting outreach programs, providing support at community meetings. Red Cross also have a range of other services that they consider could be greater utilised.

They have inroads into communities and community groups and have a strong brand and reputation that people associate with help and support. They have a network of regional personnel so they can be on the ground quite quickly and they have local knowledge of their communities, vulnerable people in the area, local resources and needs. They also understand the demographics of the area and can request support of Red Cross interpreters for culturally and linguistically diverse (CALD) communities.

Red Cross recovery activities could include:

- training and education for community leaders and local agencies to further develop their disaster recovery capacity
- expert advice to community leaders and local agencies before and after a disaster
- outreach activities to provide psychosocial support to residents in their homes, business and places of temporary residence
- facilitate and provide psychosocial support at community events, including at memorials and anniversary services
- connecting local organisations with peers around Australia who have recovery experience
- facilitate disaster recovery support groups in partnership with the Australian psychological society
- support medium – long term recovery planning by advocating for community needs
- assisting people to prepare for future disasters.

Red Cross currently do not claim their expenses against the cost of an emergency to recoup the money that it costs them to provide support during emergencies. This is something that they could consider making arrangements for in the future.

### **14.6 Recovery Centre (Virginia)**

Members of the Review team visited the Recovery Centre at Virginia on 7 December 2016 and met with the appointed Local Recovery Coordinator (LRC) and recovery centre staff.

At the time of this visit, the recovery centre manager was developing documentation and mapping out the reporting arrangements across the various government agencies involved in the process. There were challenges due to multiple reporting lines and multiples requests for the same information being made to the recovery centre.

There appears to be a disconnect between relief and recovery, and confusion regarding: transfer of case-management records; criteria and processes for changeover from a relief centre to a recovery centre; record keeping issues; no process to identify risk and vulnerability; and, unclear processes for working and reporting.

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There also seems to be a disconnect between relief centre staff and the Emergency Management Unit (Housing SA).

Observations and comments from the LRC supported these observations. He also advised that there was little in the way of guidance for a person taking on the role of LRC, that reporting relationships were unclear, and there was confusion in who had overall responsibility for the recovery centre.

#### **14.7 Assistant State Coordinator Recovery**

Recovery, without doubt, is a complex and difficult aspect of any emergency management operation and can last months and years, is costly and requires significant State and local government and volunteer resources.

The manager and staff of the State Recovery Office are very professional, knowledgeable and committed but their capacity to undertake the complete spectrum of their national and State obligations together with their strategic, training, and operational roles are significantly impacted by ongoing operations.

In South Australia a Duty Minister (for Recovery) is appointed, who also is involved in the relief phase of an emergency. The Review believes that this is not necessary and is a product of the fragmented nature of emergency management in South Australia.

It would seem that the arrangements in SA when it comes to recovery are ad-hoc, inconsistent and, in a legislative sense, formalised only after a Declaration has been made by the State Coordinator and at that time an Assistant State Coordinator Recovery is appointed (usually the Chief Executive of DCSI). A meeting of the State Recovery Committee is convened and a recovery hotline established.

The 'on ground' management for recovery usually sits with the Manager of the State Recovery Office and for some events a Recovery Coordinator (someone external to the Department and may be a person local to the area impacted and subject to the recovery operation) is established.

There seems to be little established criteria for the creation of this Coordinator, nor when a Recovery operation will occur.

During the period of this Review, three recovery operations were occurring, being, Pinery (fires), Virginia (floods) and then the Riverland (storm/hail damage). This is a huge commitment for a small team of staff from DCSI and reporting to the Manager of Housing SA, even with the support of other agencies and staff seconded from other areas.

Comparing the two recent emergency events in 2016, Virginia and the Riverland, highlights significant differences in the manner in which the emergencies were dealt with from a recovery perspective.

As there was an emergency declaration on 28 September 2016, an Assistant State Coordinator Recovery was immediately appointed, a State recovery operation was initiated, and the announcement of government grants occurred in quick time (e.g. loss of power). Soon after the event concluded (4 October, 2016) a Local Recovery Coordinator was appointed however, no Local Recovery Coordinator was announced for the Riverland until 5 December 2016.

The storm event in the Riverland was of a very short duration (around 15 minutes) but more damage than the Virginia market garden flood. Because it was over so quickly, there was no emergency declaration and as a result no Assistant State Coordinator Recovery was appointed. Financial assistance has taken weeks to be distributed.

On 28 December 2016, another severe weather event was experienced widely across South Australia, bringing similar issues including, widespread and prolonged power outages, flooding and storm damage. At the date of documenting this part of the report (17 January 2017) the Review is unaware of any announcement of government grants (loss of power).

Emergency Declarations are not frequent occurrences and are designed for the response phase of an emergency. They have little bearing on the recovery phase.

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A State Relief and Recovery Plan needs to be developed which provides more clarity and information for the roles, responsibilities and coordination of agencies involved in relief and recovery.

It should describe the 'management principles for relief and recovery planning, outlines the services which may be required in relief and recovery situations, and provides information on the considerations involved in operational recovery. It also establishes a framework within which recovery agencies, regions and local government can prepare their own relief and recovery plans' (Emergency Management Victoria, 2015)

## **14.8 Public health**

Public Health worked with councils within the affected area around concerns regarding septic tanks and other public health issues, including mosquito activity. This led to the development of public health fact sheets on: staying safe and healthy during flood recovery; septic tank problems after flooding; and, mosquito control after floods and storms. Councils were then able to share this information to ensure consistent messaging across the affected areas.

SA Health met with the Local Recovery Coordinator, Adelaide Plains Council, City of Playford and pest controllers, to develop a strategy to deal with the expected increase in prevalence of mosquitoes.

SA Health also liaised with local health providers through the Primary Health Networks to provide emotional support services to affected communities.

Additional public information messages were released over subsequent weeks, encouraging members of the community to seek assistance if they were feeling overwhelmed by the impacts of the weather event.

There were concerns about exposure of emergency responders and the community to contaminated water. The SA Country Fire Service Volunteer Association raised concerns regarding contamination.

EPA was asked to assess and advised that due to the vast quantities of water involved any contaminants would be diluted to such an extent as to be of no danger to responders or the community.

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*The glasshouses at Virginia are unregulated and there were containers everywhere. There was toxicity in the soil including waste water, sewerage systems. There was a bad smell and something in the water wasn't right. No one measured the chemical content and there are going to be plants growing in that soil*

*(EPA).*

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Meetings of the Local Recovery Committee (LRC) were held to discuss major issues and priorities. These include de-watering, and waste management issues such as garbage, debris, green waste, septic tanks and biohazard waste.

## **14.9 Waste management**

The State Recovery Committee established a Waste Management Working Group (chaired by SAFECOM) which met for the first time on 7 October 2016. The group primarily focused on specific agricultural waste management issues in the vicinity of Virginia.

A key focus was the issue of waste management in the market gardens in northern Adelaide. Options to address waste included collection and disposal to licensed landfill, collection and processing of organic material at licensed composting operations.

PIRSA assumed responsibility for the working group which includes representation from the EPA, Green Industries SA, local councils and operators of relevant waste facilities.

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*There is a view within local government that management of disaster waste requires a more coordinated approach. ... if Waste to Resources Fund is to be used for disaster remediation costs then there needs to be a clear and transparent process to effect the distribution of the funds*

*(LGA, 2016)*

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The current arrangements and responsibilities for various aspects of disaster waste management are not clear. A defined process is required including which agencies need to be involved, what they are responsible for and how the function of disaster waste management is activated and coordinated.

A study commissioned by Zero Waste, reviewed the status of disaster waste management in South Australia. It found that there was no set framework for managing disaster waste but that traditionally it had been carried out through joint efforts of several organisations and individuals. Waste is largely managed and disposed/recycling using local government resources (Rawtec, 2015).

It was observed in the report that if SA experienced a major disaster 'that greater challenges would arise requiring more centralised management and additional resources beyond local government capacities'.

**Recommendation 59.**

Develop a Disaster Waste Management Plan to form part of the State Emergency Management Plan which describe participating agencies and responsibilities for various aspects of waste management during and after emergencies.

#### **14.10 Natural Disaster Relief and Recovery Arrangements**

On 10 October 2016, the Department of Treasury and Finance (DTF) requested government agencies to provide expenditure costs associated with the extreme weather event for a Natural Disaster Relief and Recovery Arrangements (NDRRA) submission.

The Commonwealth Government was notified of a potential claim under the NDRRA.

A common issue raised by government agencies, councils and the Local Government Association concerned the NDRAA.

There were many comments about the complexity and difficulty in accessing the funding. The seemingly uncoordinated and inconsistent manner in which claims were made by government agencies and councils was potentially resulting in millions of dollars of eligible disaster funding not being claimed. There was a feeling that the intention of the process was to inhibit the submission of claims.

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*Thirteen councils have indicated to the LGA that their road infrastructure has suffered considerable damage, which will likely see a repair cost exceeding \$15 million. Roads are generally regarded as 'uninsured' infrastructure. The cost of remediation is deemed an 'eligible measure' under the Local Government Disaster Recovery Assistance Arrangements (LGDRRA). These arrangements largely reflect the Natural Disaster Relief and Recovery Arrangements (NDRRA) that are in place between the Federal and State Governments. In South Australia, financial assistance to a council is subject to a threshold test based on a council's rate revenue at the amount of 2% of rate revenue or \$150 000- whichever is greater. An independent engineering assessment is required to verify the road damage sustained when making an application for financial assistance for the restoration of essential public assets. A separate category exists for 'counter disaster operations' that are in effect response activities that protect or sustain the community during and immediately after a disaster. However, this type of assistance is limited to councils with rate revenue of less than \$10 000 000. In effect this means that all metropolitan councils and larger rural councils are excluded from accessing this type of assistance. The issue of prompt and adequate asset damage assessment, and interpretation and application of the assistance guidelines (LGDRRA) has been on-going with councils. The LGA is of the view that the current arrangements require review so that a more seamless approach is achieved.*

*(LGA, 2016)*

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The 2014 Local Government Disaster Recovery Assistance Guidelines (LGDRAG) were developed to provide a more sustainable means of supporting SA local government whilst ensuring alignment with the Commonwealth's Natural Disaster Relief and Recovery Arrangements (NDRRA). In October 2015, the Commonwealth Minister for Justice approved NDRRA Determination 2012, Version 2.0. The new arrangements provide few variations but aim to reduce complexity in comparison to earlier versions.

South Australia rarely reaches NDRRA threshold levels to enable State claims to be made for Category B expenditure (primarily restoration of assets). The reason for this is two-fold:

1. South Australia is impacted less frequently and less severely when compared to other Australian jurisdictions such as Queensland.
2. The relatively low level of NDRRA eligible disaster grants and financial reimbursements paid to local government by the State, limits the potential for Commonwealth prescribed threshold levels to be reached.

In terms of NDRRA eligibility South Australia has been well below threshold levels in recent years with the exception of 2007-08. Initial data indicates that threshold levels will be exceeded following the storm and flood events of September, October and November 2016.

South Australia would likely reach Commonwealth thresholds more frequently if support was provided to local government and if more effective State and local government cost capture measures were applied.

Currently DTF manage the LGDRAG. Anecdotally there are councils with little or no knowledge of the funding and most councils have limited expertise to enable them to collect the right type of impact/damage data in a timely manner to develop an 'eligible' claim.

Following the 28 September 2016 event SAFECOM organised for representatives from the Queensland Reconstruction Authority (QRA) to visit South Australia. In Queensland QRA coordinates recovery, provides extensive support to local government, develops systems to support data collection and claim development, conducts training etc.

QRA's observations about South Australia's relief and recovery arrangements included that coordination and governance could be improved, that State Government should be providing more

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support to local government and that SA lacks systems and training. In their view these factors result in South Australia 'missing out on millions of NDRRA Commonwealth dollars' that the jurisdiction is legitimately entitled to.

According to the SEMP, Annex B (Natural Disaster Relief and Recovery Arrangements) the key roles and responsibilities in South Australia for administering the NDRAA are:

The State Recovery Committee Finance Sub-committee, chaired by DTF is responsible for:

- The collection (from State agencies) and reporting (to Emergency Management Australia) of State Expenditure on Eligible Measures
- Provision of advice on approval requirements for expenditure, and where necessary the seeking of any appropriate approvals.
- Informing the communication between the jurisdiction and the Commonwealth in relation to the NDRRA.
- Overseeing and co-coordinating Cabinet Submissions.

Several agencies contribute to the development of NDRRA claims (e.g. DCSI/State Recovery Office, DPC, PIRSA, and DTF).

During an event, the SRC Finance Sub-committee may co-opt members from key agencies at a senior level.

The responsibilities of DTF include to: act as the primary liaison point for the Commonwealth, State agencies and interstate counterparts regarding NDRRA; notify EMA of an Eligible Event; administer the claim process to the Commonwealth; and, manage all claims for local government assistance on behalf of the Minister for Finance in consultation with the SRC - Local Government Disaster Assistance Sub-committee.

All State government agencies must establish systems and processes to enable expedient and accurate capturing, recording and reporting of NDRRA Eligible Measures.

The NDRRA arrangements described in the SEMP include a list of 'responsible' agencies and governance by committee which again highlights the need for clear lines of accountability and responsibility. Further, there is little evidence of a 'partnership' between councils and local and State government. Whilst DTF have a significant role, it should be more than to act as a 'gate-keeper' for the correct form of application and a processing centre.

The approach to gaining NDRAA funding should be seen as a collective submission by of councils, local and State government agencies to ensure that SA receives all that is legitimately claimable. Vesting this role and the associated responsibilities within an agency committed to emergency management is more likely to obtain improved results than the current arrangements.

An alternative model for Relief and Recovery arrangements is proposed in the final section of this report.

**Recommendation 60.**

Develop a State Relief and Recovery Plan as a distinct part of the State Emergency Management Plan which should include:

- a) potential locations for suitable facilities for relief and recovery centres which: are in locations safe from hazards such as flooding and bushfire; and, have appropriate access and suitable ablutions.
- b) formalisation of roles and capabilities of non-government organisations such as Red Cross.

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**Recommendation 61.**

Conduct a review into South Australia's arrangements for relief and recovery grant, Local Government Disaster Recovery Assistance Arrangements and Natural Disaster Relief and Recovery Arrangement claims, the review should include governance coordination and criteria for provision and processing of relief/recovery grants

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## 15. AN ALTERNATIVE MODEL FOR CONSIDERATION

The following is a suggested for an alternative model for emergency management in South Australia. This should be explored to assess its viability and potential to bring about a more cohesive, coordinated, effective and efficient way in which to deal with emergencies (including counter terrorism), thereby meeting all the objects and guiding principles of the *Emergency Management Act 2004*.

There are few positions dedicated to the strategic development of emergency management in SA. The number of positions consolidated in this model assists by offering efficiencies, but any model, even if the status quo is maintained, requires additional positions. This can be achieved by creating new positions, funding positions through grants or, a more collegiate approach might be to second people from other government agencies to the Office to be involved in the various strategic projects, approved by SEMC.

This model, provides the Premier and the State of SA with a more coordinated, governable and strategic approach together with clear accountability for the progress of emergency management. It should provide the impetus to finalise many issues which have been being worked on for years and more effectively progress key elements of emergency management such as resilience and meet the objectives of the SEMP.

It is proposed that two new offices be created within SAFECOM that bring together emergency management, relief and recovery practitioners from across various State government agencies. The two new offices proposed are the South Australian Emergency Management Officer and the State Relief and Recovery Office.

Under this arrangement the SAFECOM Chief Executive would assume responsibility and have accountability for, strategic development of emergency management in South Australia.

### 15.1 South Australian Emergency Management Office

It is proposed that a South Australian Emergency Management Office (SAEMO) be established within SAFECOM.

SAEMO would report to the Chief Executive of SAFECOM, have responsibility for State strategy, policy, training and exercising of emergency management in SA, and provide secretariat support to the EMC and all committees under the SEMP.

Features of the South Australian Emergency Management Office and supporting arrangements include:

1. A suitably qualified Director appointed to lead and manage SAEMO
2. The following positions be brought into SAEMO:
  - a. emergency management positions in DPC (with the exception of Office for Digital Government positions)
  - b. positions within SAFECOM currently working on strategic emergency management projects
  - c. positions relating to Zone Emergency Management currently within SES
  - d. the positions that previously existed, being the State Emergency Management Project Officer and State Emergency Management Training Officer be re-established and appointed within SAEMO
  - e. grant and/or new and/or seconded (people from other agencies) positions to work on the multitude of strategic and policy emergency management issues
3. SAEMO would be responsible for:
  - a. outcomes of all tasks being undertaken by the various State level committees and working groups

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- b. development of the SEMP and ensuring that State level plans (those associated with Hazards and Control Agencies) are current and accurate
  - c. implement an Assurance Framework and facilitate the assurance process
  4. The Minister for Emergency Services is responsible for the *Emergency Management Act 2004*
  5. The Premier of South Australia retains the role of Chair of the Emergency Management Council
  6. SAPOL continue to be represented on the Australia-New Zealand Counter Terrorism Committee (ANZCTC) by the Deputy Commissioner
  7. The Chief Executive of SAFECOM represents the Government of SA on the ANZCTC and the ANZEMC in lieu of representatives from DPC
  8. SAPOL provides the second representative to ANZEMC (e.g. Assistant Commissioner of the Security and Emergency Management Service) as the representative of the State Coordinator (Police Commissioner)
  9. The Chief Executive of SAFECOM chairs the State Emergency Management Committee (SEMC)
  10. The SAEMO Director chairs the various Advisory Groups to SEMC

## **15.2 State Relief and Recovery Office**

It is proposed that an alternative model for Relief and Recovery arrangements be considered to increase the effectiveness and efficiency in which emergency relief and recovery in SA is managed and to consolidate arrangements and responsibilities.

It is proposed that a South Relief and Recovery Office (SRRO) be established within SAFECOM. SRRO would report to the Chief Executive of SAFECOM, have responsibility for State strategy, policy, training and exercising of relief and recovery arrangements in SA,

Features of the SRRO and supporting arrangements could include:

1. Appointment of a permanent State Recovery Coordinator (SRC) who is responsible for strategic management and coordination of State Recovery in South Australia and takes on the operational aspect of the SRC role during emergencies (previously the Assistant State Coordinator Recovery)
2. Consolidate SA government Relief and Recovery positions and functions into the SRRO in SAFECOM, including:
  - a. the Manager and staff of the (existing) State Recovery Office who would report to the SRC and be responsible for strategy, policy, planning, training, and support the SRC during operations
  - b. Emergency Relief strategy, policy, planning and training and existing Housing SA positions dedicated to emergency relief
  - c. DCSI would continue to support and contribute to emergency relief and recovery operations
  - d. The responsibility and accountability for coordinating and submitting NDRAA claims would be managed by the SRC and the SRRO
3. The Minister for Emergency Services will be the responsible Minister for the SRRO (as it sits in SAFECOM).
4. Update the *Emergency Management Act 2004*, include:
  - a. the roles and responsibilities of the State Recovery Coordinator

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- b. criteria to establish a State level recovery operation and any necessary powers thereby eliminating the requirement for an emergency declaration by the SRC to activate an Assistant State Coordinator (Recovery) (this position and section could then be removed from the Act)
  - c. when the SRC declares an event a State recovery operation, appropriate persons from those government agencies involved can be seconded to the operation for its duration or until their role is complete, this would eliminate the need to appoint additional Local Recovery Coordinators
5. Develop a State Emergency Relief and Recovery plan which describes (amongst other key elements) the various levels of recovery and responsibilities for same to ensure a consistent approach to recovery operations.

SAFECOM would then comprise of four components:

1. function support to the ESS areas of finance, ICT, capability, HR, WHS and PIAW (AlertSA/Emergency Alert/SEICC)(current roles)
2. strategic and policy development for MFS, CFS and SES (current)
3. South Australian Emergency Management Office (new), and
4. State Relief and Recovery Office (new).

**Recommendation 62.**

Explore alternative emergency management models including the alternative model proposed above to establish a South Australian Emergency Management Office and State Relief and Recovery Office within the South Australian Fire and Emergency Services Commission, to ensure that all the objects and guiding principles of the *Emergency Management Act 2004*, and State Emergency Management Plan are addressed efficiently and effectively.

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*'congratulations to all the emergency personnel who  
looked after us so well during the crisis'*

*'THANK YOU. You were awesome in the middle of the chaos  
thanks to all of you because the work you've done made us to be  
safe everywhere we went (in) those days'*

*Submissions to the Review*

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## **18. ATTACHMENTS**

**Attachment 1 – SA Health Flinders Medical Centre Standby Power Electrical Systems Post-incident Review, AURECON**

**Attachment 2 – Port Augusta Generator Failure Investigation Report, Systems Solutions Engineering**

**Attachment 3 – Australian Government, Bureau of Meteorology, Severe thunderstorm and tornado outbreak South Australia 28 September 2016**

**Attachment 4 – Submission to Independent Review of the Extreme Weather Event South Australia 28 September – Dennis Mulronev and Peter Schar**