August 2020

To be reviewed no later than August 2022

COWRA SHIRE FLOOD EMERGENCY SUB PLAN

A Sub-Plan of the Cowra Shire Council

Local Emergency Management Plan (EMPLAN)

Volume 1 of the Cowra Shire Local Flood Plan

AUTHORISATION

The Cowra Shire Flood Emergency Sub Plan is a sub plan of the Cowra Shire Council Local Emergency Management Plan (EMPLAN). It has been prepared in accordance with the provisions of the ***State Emergency Service Act, 1989*** **(NSW)** and is endorsed by the Local Emergency Management Committee in accordance with the provisions of the ***State Emergency and Rescue Management Act, 1989*** **(NSW)**.

Recomended

G. KARL MILIC

NSW SES Cowra Local Commander

Date: 09 Mar 21

Endorsed

Chair, Local Emergency Management Committee

Date: 9.3.2021

CONTENTS

LIST OF TABLES

DISTRIBUTION LIST

This Local Flood Plan is distributed through the NSW State Emergency Service in electronic format and is maintained on the NSW SES FloodSafe (www.floodsafe.com.au) website.

VERSION HISTORY

The following table lists all previously endorsed versions of this plan.

Description	Date
Cowra Shire Flood Emergency Sub Plan - Volume 1	**March 2013**

AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

The Zone Commander
Southern Zone
NSW State Emergency Service
206 Fernleigh Road
Wagga Wagga NSW 2650

Amendments promulgated in the amendments list below have been entered in this plan.

Amendment Number	Description	Updated by	Date
001	**Review and Update Plan**	**Craig Ronan**	**21/08/2020**

Document Issue: 31082020

LIST OF ABBREVIATIONS

The following abbreviations have been used in this plan:

AAR	After Action Review
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AIIMS	Australasian Inter-service Incident Management System
ARI	Average Recurrence Interval (Years)
ALERT	Automated Local Evaluation in Real Time
AWRC	Australian Water Resources Council
BOM	Australian Government Bureau of Meteorology
CBR	Chemical, Biological and Radiation
DCF	Dam Crest Flood
DSNSW	Dams Safety NSW
DPIE	Department of Planning, Industry and Environment (formerly Office of Environment and Heritage)
DSEP	Dam Safety Emergency Plan
DVR	Disaster Victim Registration
EMPLAN	Emergency Management Plan
FRNSW	Fire and Rescue NSW
GIS	Geographic Information System
GRN	Government Radio Network
IAP	Incident Action Plan
ICC	Incident Control Centre
IFF	Imminent Failure Flood
LEMC	Local Emergency Management Committee
LEOCON	Local Emergency Management Controller

LGA	Local Government Area
MHL	Manly Hydraulics Laboratory
NSW RFS	NSW Rural Fire Service
NSW SES	NSW State Emergency Service
PMF	Probable Maximum Flood
PMR	Private Mobile Radio
PMP	Probable Maximum Precipitation
PIIC	Public Information and Inquiry Centre
REMC	Region Emergency Management Officer
RECON	Region Emergency Operations Controller
RMS	Roads and Maritime Services, Transport for NSW
SEOCON	State Emergency Operations Controller
SERCON	State Emergency Recovery Controller
SEWS	Standard Emergency Warning Signal
WNSW	WaterNSW

GLOSSARY

Annual Exceedance Probability (AEP). The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. For example, if a peak flood level (height) has an AEP of 5%, there is a 5% chance (that is, a one-in-20 chance) of such a level or higher occurring in any one year (see also Average Recurrence Interval).

Assistance Animal. A guide dog, a hearing assistance dog or any other animal trained to assist a person to alleviate the effect of a disability (Refer to Section 9 of the Disability Discrimination Act 1992).

Australian Height Datum (AHD). A common national surface level datum approximately corresponding to mean sea level.

Average Recurrence Interval (ARI). The long-term **average** number of years between the occurrence of a flood as big as, or larger than, the selected event. For example, floods reaching a height as great as, or greater than, the 20 year ARI flood event will occur **on average** once every 20 years.

Catchment (river basin). The land area draining through the main stream, as well as tributary streams, to a particular site. It always relates to an area above a specific location.

Coastal Erosion. The loss of land along the shoreline predominantly by the offshore movement of sand during storms.

Dambreak Study. A Dambreak Study is undertaken to determine the likely downstream inundation areas in case of a dam failure. Modelling is undertaken for a range of dam breach possibilities and design floods. The dambreak study includes information such as the extent of flooding, flood travel times and flood water velocities. The study can assist dam owners, regulators, and emergency agencies in the preparations of evacuation plans, dam break and other flood warning systems, and hazard classification of affected areas.

Dam Failure. The uncontrolled release of a water storage. The failure may consist of the collapse of the dam or some part of it, or excessive seepage or discharges. The most likely causes of dam failure are:

- **Flood Induced Dam Failure**: Dam failure caused by flood, either due to overtopping erosion or by subsequent structural failure.

- **Sunny Day Dam Failure**: Dam Failure as a result of factors other than flood i.e. other than flood flow into the reservoir. Causes of "Sunny Day" dam failure can include internal erosion, landslide, piping, earthquake or sabotage.

Dam Safety Emergency Plan (DSEP). A DSEP outlines the required actions of owners and their personnel at dams in response to a range of possible emergency situations. The NSW Dam Safety Committee requires a quality controlled DSEP, with associated dambreak warning procedures to be prepared for prescribed dams where persons may be at risk downstream, if the dam failed.

Design flood (or flood standard). A flood of specified magnitude that is adopted for planning purposes. Selections should be based on an understanding of flood behaviour and the associated flood risk, and take account of social, economic and environmental considerations. There may be several design floods for an individual area.

Emergency Alert. A national telephony based alerting system available for use by emergency service agencies to send SMS and voice messages to landlines and/or mobile telephones (by billing address) in times of emergency.

EMPLAN (Emergency Management Plan). The object of an EMPLAN is to ensure the coordinated response by all agencies having responsibilities and functions in emergencies.

Essential services. Those services, often provided by local government authorities, that are considered essential to the life of organised communities. Such services include power, lighting, water, gas, sewerage and sanitation clearance.

Evacuation. The temporary movement of people from a dangerous or potentially dangerous place to a safe location, and their eventual return. It is a safety strategy which uses distance to separate people from the danger created by the hazard.

Evacuation Order. Notification to the community, authorised by the NSW SES, when the intent of an Incident Controller is to instruct a community to immediately evacuate in response to an imminent threat.

Evacuation Warning. Notification to the community, authorised by the NSW SES, when the intent of an Incident Controller is to warn a community of the need to prepare for a possible evacuation

Flash flooding. Flooding which is sudden and often unexpected because it is caused by sudden local or nearby heavy rainfall. It is sometimes defined as flooding which occurs within six hours of the rain that causes it.

Flood. Relatively high water level which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences, including Tsunami.

Flood classifications. Locally defined flood levels used in flood warnings to give an indication of the severity of flooding (minor, moderate or major) expected. These levels are used by the State Emergency Service and the Australian Government Bureau of Meteorology in flood bulletins and flood warnings.

Flood intelligence. The product of collecting, collating, analysing and interpreting flood-related data to produce meaningful information (intelligence) to allow for the timely preparation, planning and warning for and response to a flood.

Flood fringe. The remaining area of flood prone land after floodway and flood storage have been defined

Flood liable land (also referred to as flood prone land). Land susceptible to flooding by the Probable Maximum Flood. (PMF) event. This term also describes the maximum extent of a **floodplain** which is an area of a river valley, adjacent to the river channel, which is subject to inundation in floods up to this event.

Flood of record. Maximum observed historical flood.

Floodplain Management Plan. A plan developed in accordance with the principles and guidelines in the New South Wales Floodplain Development Manual. Such a plan usually includes both written and diagrammatic information describing how particular areas of flood prone land can be used and managed to achieve defined objectives.

Flood Plan. A response strategy plan that deals specifically with flooding and is a sub-plan of an Emergency Management Plan. Flood plans describe agreed roles, responsibilities, functions, strategies and management arrangements for the conduct of flood operations and for preparing for them. A flood plan contains information and arrangements for all floods whereas an IAP is for a specific flood/event.

Flood Rescue. The rescue or retrieval of persons trapped by floodwaters.

Flood storage areas. Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. The extent and behaviour of flood storage areas may change with flood severity, and loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation.

Floodway. An area where a significant volume of water flows during floods. Such areas are often aligned with obvious naturally-defined channels and are areas that, if partially blocked, would cause a significant redistribution of flood flow which may in turn adversely affect other areas. They are often, but not necessarily, the areas of deeper flow or the areas where higher velocities occur.

Flood Watch. A Flood Watch is a notification of the potential for a flood to occur as a result of a developing weather situation and consists of short generalised statements about the developing weather including forecast rainfall totals, description of catchment conditions and indicates streams at risk. The Bureau will also attempt to estimate the magnitude of likely flooding in terms of the adopted flood classifications. Flood Watches are normally issued 24 to 36 hours in advance of likely flooding. Flood watches are issued on a catchment wide basis.

Flood Warning. A Flood Warning is a gauge specific forecast of actual or imminent flooding. Flood Warnings specify the river valley, the locations expected to be flooded, the likely severity of flooding and when it will occur.

Functional Area. A category of services involved in the preparations for an emergency, including the following:

- Agriculture and Animal Services;
- Telecommunication Services;
- Energy and Utility Services;
- Engineering Services;
- Environmental Services;
- Health Services;
- Public Information Services;
- Transport Services; and
- Welfare Services.

Geographic Information System (GIS). A geographic information system (GIS) integrates hardware, software, and data for capturing, managing, analysing, and displaying all forms of geographically referenced information.

Incident Action Plan (IAP). An action plan for managing a specific event. Information from the Local Flood Plan is used to develop the flood IAP.

Indirect Effect. Indirect effects are generally a consequence of infrastructure damage or interruption of services and can affect communities distant from the actual flood

footprint i.e. floodplain. Indirect effects can also refer to indirect losses due to disruption of economic activity, both in areas which are inundated or isolated. Indirect effects are one of the three primary sources of risk in the context of flooding (the other two are inundation and isolation).

Inundation. See definition for Flood.

Isolation. Properties and/or communities where flooding cuts access to essential services or means of supply. Isolation is one of the three primary sources of risk in the context of flooding (the other two are inundation and indirect effects).

Local overland flooding. Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.

Major flooding. Flooding which causes inundation of extensive rural areas, with properties, villages and town's isolated and/or appreciable urban areas flooded.

Minor flooding. Flooding which causes inconvenience such as closing of minor roads and the submergence of low-level bridges. The lower limit of this class of flooding, on the reference gauge, is the initial flood level at which landholders and/or townspeople begin to be affected in a significant manner that necessitates the issuing of a public flood warning by the Australian Government Bureau of Meteorology.

Moderate flooding. Flooding which inundates low-lying areas, requiring removal of stock and/or evacuation of some houses. Main traffic routes may be covered.

Peak height. The highest level reached, at a nominated gauging station, during a particular flood event.

Prescribed Dam. Prescribed Dams are now called 'Declared Dams' and are described in Part 3 of the Dams Safety Act 2015 No 26 (NSW). Dams Safety NSW will 'declare'dams that have a potential to threaten downstream life, or cause major property, environmental or public welfare damage.

Probable Maximum Flood (PMF). The largest flood that could conceivably be expected to occur at a particular location, usually estimated from probable maximum precipitation. The PMF defines the maximum extent of flood prone land, that is, the floodplain. It is difficult to define a meaningful Annual Exceedance Probability for the PMF, but it is commonly assumed to be of the order of 10^4 to 10^7 (once in 10,000 to 10,000,000 years).

Runoff. The amount of rainfall which ends up as stream flow, also known as ‘rainfall excess’ since it is the amount remaining after accounting for other processes such as evaporation and infiltration.

Spontaneous Volunteers. Spontaneous Volunteers are community members who mobilise during periods of significant flooding or severe storms to support NSW communities. Spontaneous Volunteers are coordinated by the NSW SES in a range of roles that generally do not require training or previous experience, and there is no expectation of an ongoing volunteer commitment. Spontaneous volunteers provide the NSW SES with additional capacity to support preparedness, response and recovery operations and/or activities.

Stage height. A level reached, at a nominated gauging station, during the development of a particular flood event.

Stream gauging station. A place on a river or stream at which the stage height is routinely measured, either daily or continuously, and where the discharge is measured from time to time so as to develop a relationship between stage and discharge or rating curve.

Total Flood Warning System. A flood warning system is made up of components which must be integrated if the system is to operate effectively. Components of the total flood warning system include monitoring rainfall and river flows, prediction, interpretation of the likely impacts, construction and dissemination of warning messages, response by agencies and community members, and review of the warning system after flood events.

PART 1 - INTRODUCTION

1.1 PURPOSE

1.1.1 This plan covers preparedness measures, the conduct of response operations and the coordination of immediate recovery measures from flooding within the Cowra Shire Council area. It covers operations for all levels of flooding within the Council area.

1.2 AUTHORITY

1.2.1 This plan is issued under the authority of the State Emergency and Rescue Management Act 1989 and the State Emergency Service Act 1989. It has been approved by the NSW SES Cowra Local Commander and the NSW SES Zone Commander for Southern Zone as a NSW SES plan and endorsed by the Cowra Shire Council Local Emergency Management Committee as a sub plan of the Local EMPLAN.

1.3 AREA COVERED BY THE PLAN

1.3.1 The area covered by the plan is the Cowra Shire Council area which includes: the township of Cowra plus the villages of Billimari, Broula, Darbys Falls, Gooloogong, Holmwood, Morongla Creek, Noonbinna, Walli, Wattamondara, Woodstock and Wyangla plus numerous rural properties.

1.3.2 The council area and its principal rivers and creeks are shown in Attachment 3.

1.3.3 The council area is in the NSW SES Southern Zone and for emergency management purposes is part of the Central West Emergency Management Region.

1.4 DESCRIPTION OF FLOODING AND ITS EFFECTS

1.4.1 The NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Cowra Shire Council area.

1.5 RESPONSIBILITIES

1.5.1 The general responsibilities of emergency service organisations and supporting services (functional areas) are listed in the Local and State Emergency Management Plans (EMPLAN). Some specific responsibilities are expanded upon in the following paragraphs. The extent of their implementation will depend on the severity of the flooding.

1.5.2 **NSW SES Cowra Local Commander.** The NSW SES Cowra Local Commander is responsible for dealing with floods as detailed in the NSW State Flood Plan, and will:

Preparedness

a. Maintain a Local Headquarters at Cowra and a Unit Headquarters at Gooloogong in accordance with current NSW SES Policies and Procedures.

b. Ensure that NSW SES members are trained to undertake operations in accordance with current current NSW SES Policies and Procedures.

c. Coordinate the development and operation of a flood warning service for the community.

d. Participate in floodplain risk management initiatives organised by the Cowra Shire Council.

e. Coordinate a community engagement and capability building program regarding local flood issues and associated risks to assist communities in building resilience to floods.

f. Identify and monitor people and/or communities at risk of flooding.

g. Ensure that the currency of this plan is maintained.

Response

h. NSW SES will appoint an appropriate **Incident Controller** in accordance with current NSW SES Policies and Procedures to undertake flood response roles. The Incident Controller will;

- Control flood and storm response operations. This includes;
  - ♦ Directing the activities of the NSW SES Units operating within the Council area.
  - ♦ Coordinating the activities of supporting agencies and organisations and ensuring that liaison is established with them.
  - ♦ Contribute to preparation of Zone Incident Action Plan (IAP).
- Coordinate the provision of information services in relation to:
  - ♦ Flood heights and flood behaviour.
  - ♦ Road conditions and closures.
  - ♦ Advice on methods of limiting property damage.
  - ♦ Confirmation of Evacuation Warnings and Evacuation Orders.
- Direct the conduct of flood rescue operations.
- Direct the evacuation of people and/or communities.
- Provide immediate welfare support for evacuated people.

- Coordinate the provision of emergency food and medical supplies to isolated people and/or communities.
- Manage and support Spontaneous Volunteers.
- Coordinate operations to protect property, for example by:
  - Arranging resources for sandbagging operations.
  - Raising or moving household furniture.
  - Raising or moving commercial stock and equipment.
- Arrange for support (for example, accommodation and meals) for emergency service organisation members and volunteers assisting them.
- Ensure that the managers of caravan parks are advised of flood warnings and the details of any evacuation order.
- If NSW SES resources are available, assist with emergency fodder supply operations conducted by Agriculture and Animal Services.
- If NSW SES resources are available, assist the NSW Police Force, RMS and Council with road closure and traffic control operations.
- Exercise financial delegations relating to the use of emergency orders as laid down in the NSW SES Controllers' Guide.
- Coordinate the collection of flood information for development of intelligence.
- Submit Situation Reports to the NSW SES Southern Zone Headquarters and agencies assisting within the council area. These will contain information on:
  - Road conditions and closures.
  - Current flood behaviour.
  - Current operational activities.
  - Likely future flood behaviour.
  - Likely future operational activities.
  - Probable resource needs.
- Keep the Local Emergency Operations Controller advised of the flood situation and the operational response.
- Issue the 'All Clear' when flood operations have been completed.

Recovery

i. Ensure that appropriate After Action Reviews are held after floods.

j. NSW SES will provide appropriate representation to the Recovery Committee for the duration of the response phase of an event and as agreed during the recovery phase.

1.5.3 **NSW SES Cowra and Gooloogong Unit Commanders:**

a. Assist the NSW SES Cowra Local Commander with flood preparedness activities, including:

- Flood planning.
- Training of unit members.
- The development of flood intelligence.
- The development of warning services.
- Floodplain risk management initiatives.
- Public education.

b. Conduct flood operations within the Cowra Shire Council area as directed by the NSW SES Cowra Local Incident Controller.

c. Submit Situation Reports to the NSW SES Cowra Local Headquarters, the NSW SES Southern Zone Headquarters and agencies assisting within the local area.

1.5.4 **NSW SES Cowra and Gooloogong Unit Members:**

a. Carry out flood response tasks. These may include:

- The management of the NSW SES Incident Control at the Cowra Unit and Gooloogong Unit, Division or Sector Command Centre.
- Assist in the collection of flood information for the development of intelligence.
- Flood rescue.
- Evacuation.
- Providing immediate welfare for evacuated people.
- Delivery of warnings and information.
- Resupply.
- Sandbagging.
- Lifting and/or moving household furniture and commercial stock.
- Animal rescue.
- Assisting with road closure and traffic control operations.
- Assisting with emergency fodder supply operations.

b. Assist with preparedness activities.

c. Undertake training in flood and storm response operations.

1.5.5 **Agriculture and Animal Services Functional Area:**

a. When requested by NSW SES:

- Activate the Agriculture and Animal Services Supporting Plan as required and coordinate the provision of required services which may include:
  - Supply and delivery of emergency fodder.
  - Coordinate the management of livestock and farm animals.
  - Advice on dealing with dead and injured farm animals.
  - Financial, welfare and damage assessment assistance to flood affected farmers.
  - Operation of animal shelter compound facilities for the domestic pets and companion animals of evacuees.

1.5.6 **NSW Ambulance**:

a. Assist with the evacuation of at risk communities (in particular elderly and/or infirm people).

b. Deploy ambulance resources to appropriate locations if access is expected to be lost.

c. Assist the NSW SES with flood rescue operations.

1.5.7 **Australian Government Bureau of Meteorology (BOM):**

a. Provide Flood Watches for the Lachlan River Basin.

b. Provide Flood Warnings, incorporating height-time predictions, for Cowra (412002) and Nanami (412057) gauges.

c. Provide severe weather warnings when flash flooding is likely to occur.

1.5.8 **Caravan Park Owners and or Managers**:

a. Prepare a Flood Emergency Plan for the Caravan Park.

b. Ensure that owners and occupiers of movable dwellings are aware that the Caravan Park is flood liable by;

- Providing a written notice to occupiers taking up residence. The notice will indicate that the Caravan Park is liable to flooding and designate the location of flood liable land within the park.
- Displaying this notice and the emergency arrangements for the Caravan Park prominently in the park.

c. Ensure that owners and occupiers of movable dwellings are aware that if they are expecting to be absent for extended periods, they should:

- Provide the Management of the Caravan Park with a contact address and telephone number in case of an emergency.

- Leave any movable dwelling in a condition allowing it to be relocated in an emergency (i.e. should ensure that the wheels, axles and draw bar of the caravans are not removed, and are maintained in proper working order).

d. Ensure that occupiers are informed of Flood Information. At this time, occupiers should be advised to;

- Ensure that they have spare batteries for their radios, as part of their Emergency Kit.
- Listen to a local radio station for updated flood information.
- Prepare for evacuation and movable dwelling relocation.

e. Ensure that owners and occupiers of caravans are aware of what they must do to facilitate evacuation and movable dwelling relocation prior to flooding occurring.

f. Coordinate the evacuation of people and the relocation of movable dwellings when floods are rising and their return when flood waters have subsided. Movable dwellings will be relocated back to the Caravan Park(s) by owners or by vehicles and drivers arranged by park management.

g. Secure any movable dwellings that are not able to be relocated to prevent floatation.

h. Inform the NSW SES of the progress of evacuation and/or movable dwellings relocation operations and of any need for assistance in the conduct of these tasks.

1.5.9 **Child Care Centres and Preschools**:

a. Childcare Centres are to be contacted by the NSW SES in the event of possible flooding or isolation.

b. When notified the child care centres and preschools should:

- Liaise with the NSW SES and arrange for the early release of children whose travel arrangements are likely to be disrupted by flooding and/or road closures.
- Assist with coordinating the evacuation of preschools and child care centres.

1.5.10 **Department Planning, Industry and Environment (DPIE)**:

a. Assist the NSW SES gain access to relevant studies regarding flooding, including Flood Studies and Floodplain Risk Management Studies undertaken under the Floodplain Management Program.

b. Assist the NSW SES in obtaining required outputs from Flood Studies and Floodplain Risk Management Studies under the Floodplain Management

Program which assist the NSW SES in effective emergency response planning and incorporating information into the NSW Floods Database.

c. Coordinate the collection of post event flood data, in consultation with the NSW SES and or Council.

d. Provide specialist advice to the NSW SES on flood related matters to the identification of flood risks.

e. Provide data to the Bureau of Meteorology and NSW SES real-time or near real-time access to river height gauges and height data for the development of official flood warnings (through a contract with MHL as described in the Response section of this plan).

f. Assist the NSW SES in the exercising of this Flood Sub Plan.

g. **NSW Parks and Wildlife Service:**

- Close and reopen Parks and Wildlife Service roads when affected by flood waters and advise the NSW SES of its status.
- Facilitate the safe reliable access of emergency resources on National Parks and Wildlife Service managed roads.
- Assist the NSW SES with identification of road infrastructure at risk of flooding.
- Manage traffic on Parks and Wildlife Service roads.
- Assist the NSW SES with the communication of warnings and information provision to the public through variable message signs and other appropriate means.

1.5.11 **Energy and Utility Services Functional Area:**

a. When requested by NSW SES:

- Implement the Energy and Utilities Services Functional Area Supporting Plan.
- Where required, coordinate energy and utility services emergency management planning, preparation, response and recovery, including the restoration of services following a flood event.
- Coordinate advice to the NSW SES of any need to disconnect electricity, gas, water or wastewater services.
- Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.
- Identify interdependencies between flooding and utility services due to secondary impacts of flooding and advise the NSW SES.
- Assist the NSW SES with advisory notices relating to hazards from utility services during flooding.

- Coordinate with utilities on restoration of services, including advisory notices relating to estimated time for restoration and mandatory safety checks prior to reconnection. Advise the NSW SES and the relevant recovery committee and coordinator of the timetable for restoration.

b. Local Providers (electricity, gas, water, waste water) Essential Energy:

- Provide advice to the NSW SES Incident Controller of any need to disconnect power/gas/water/waste water supplies or of any timetable for reconnection.
- Advise the NSW SES of any hazards from utility services during flooding.
- Advise the public with regard to electrical hazards during flooding and to the availability or otherwise of the electricity supply.
- Clear or make safe any hazard caused by power lines or electrical reticulation equipment.
- Inspect, test and reconnect customers' electrical/ gas/ water/waste water installations as conditions allow.
- Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

1.5.12 **Engineering Services Functional Area**:

a. When requested by NSW SES:

- Provide engineering advice regarding the integrity of damaged structures.
- Assist the NSW SES with damage assessment.
- Acquire and/or provide specialist technical engineering expertise.
- Assist the NSW SES and councils with the assessment and operation of flood protection levees when requested.
- Assist with property protection, including the construction or repair of levees.
- Coordinate the restoration of critical public facilities.
- Establish recovery centre facilities.

1.5.13 **Environmental Services Functional Area**:

a. When requested by NSW SES:

- Implement the Environmental Services Functional Area (Enviroplan) Supporting Plan if required.
- Activate the Hazmat/CBR Emergency Sub Plan if required.

1.5.14 **Forestry Corporation of NSW**:

a. Close and evacuate at risk camping grounds in State Forest managed areas.

b. Close and reopen Forestry Corporation of NSW roads when affected by flood waters and advise the NSW SES of its status.

c. Facilitate the safe reliable access of emergency resources on Forestry Corporation managed roads.

d. Assist the NSW SES with identification of road infrastructure at risk of flooding.

e. Manage traffic on Forestry Corporation roads.

f. Assist the NSW SES with the communication of warnings and information provision to the public through variable message signs and other appropriate means.

1.5.15 **Health Services Functional Area**:

a. When requested by NSW SES;

- Activate Healthplan if required.
- Ensure that appropriate business continuity plans are developed for essential health infrastructure and are activated during floods.
- Provide medical support to the NSW SES.
- Establish health surveillance in affected areas.
- Assess potential public health risks that either acutely endanger the health of human populations or are thought to have longer term consequences.
- Provide environmental health advice.
- Provide public health warnings and advice to affected communities.
- Provide psychological counselling support to the community and emergency response workers impacted, via NSW Health Mental Health Division.
- Assist the NSW SES with the warning and coordination of evacuation of public hospitals, private hospitals and residential aged care facilities.
- Undertake the assessment of vulnerable members of the community for mental health and drug and alcohol dependant persons, dialysis, community health clients and oxygen dependant persons in the community, known to the health service.

1.5.16 **Fire and Rescue NSW, Cowra:**

a. FRNSW responsibilities are primarily confined to the FRNSW Fire District. Any deployment of FRNSWresources to assist NSW SES in flood events rests with the respective FRNSW Commander which must be a Senior Officer.

b. The FRNSW Commander will assess the capability of FRNSW to assist NSW SES in the following tasks:

- Assist the NSW SES with the warning and/or evacuation of at risk communities.
- Assist the NSW SES with the monitoring / reconnaissance of flood prone areas.
- Assist the NSW SES with the resupply of isolated communities and/or properties.
- Assist the NSW SES with property protection tasks including sandbagging.
- Provide resources for pumping flood water out of buildings and from low-lying areas.
- Assist with clean-up operations, including the hosing out of flood affected properties.
- Coordinate the deployment of fire resources to communities within Fire and Rescue NSW Fire Districts if access is expected to be lost in consultation with the NSW SES.

c. FRNSW will use its best endeavours to deploy appliances and or resources into locations where access is expected to be lost.

d. NSW SES may request additional resources from FRNSW through the NSW SES Strategic Coordination Centre for deployment to an area of operations under the provisions of the NSW State Flood Plan.

1.5.17 **WaterNSW:**

a. Collect and maintain flood data including data relating to flood heights, velocities and discharges.

b. Provide the Bureau of Meteorology and NSW SES real-time or near real-time access to river height gauges and height data for the development of official flood warnings.

c. Provide flow rating charts for river height gauges.

d. Manage (with technical support from OEH) the approval process under the Water Act 1912 and Water Management Act 2000 for flood control works (earthworks, embankments and levees which can affect the distribution of floodwaters) including:

- Assessment and approval of flood control works (including flood mitigation works) in rural areas designated under the Acts.
- Use of floodplain management plans prepared by OEH in rural areas designated under the Acts to assess flood control work approvals.

- Giving the NSW SES access to relevant studies regarding flooding and studies supporting floodplain management plans prepared by OEH including flood studies, floodplain risk management studies and flood behaviour investigations.

1.5.18 **NSW Police Force, Chifley Police District:**

a. Assist the NSW SES with the delivery of evacuation warnings and evacuation orders.

b. Assist the NSW SES with the conduct of evacuation operations.

c. Conduct road and traffic control operations in conjunction with Council and/or RMS.

d. Coordinate the registration of evacuees.

e. Secure evacuated areas.

1.5.19 **NSW Rural Fire Service (RFS Canobolas):**

a. Provide personnel in rural areas and villages to:

- Inform the NSW SES Incident Controller about flood conditions and response needs in their own communities, and
- Disseminate flood information.

b. Provide personnel and high-clearance vehicles for flood related activities.

c. Assist the NSW SES with the delivery of evacuation warnings and evacuation orders.

d. Assist the NSW SES with the conduct of evacuations.

e. Provide equipment for pumping flood water out of buildings and from low-lying areas.

f. Assist with the removal of caravans.

g. Provide back-up radio communications.

h. Assist with 'clean-up' operations, including the hosing of flood affected properties.

i. Deploy fire resources to appropriate locations if access is expected to be lost.

j. NSW SES may request additional resources from NSW RFS through the NSW SES Strategic Coordination Centre for deployment to an area of operations under the provisions of the NSW State Flood Plan.

1.5.20 **Public Information Services Functional Area:**

a. When requested by NSW SES:

- Assist the NSW SES in the establishment and operation of a Joint Media Information Centre.

1.5.21 **Rail Corporation New South Wales and the Australian Rail Track Corporation (ARTC)** will:

- Close and reopen railway lines affected by flood waters and advise the NSW SES.

1.5.22 **Roads and Maritime Services (Transport for NSW)** will:

- Close and reopen the Lachlan Valley Way, Mid-Western Highway and Olympic Way, or liaise with Cowra Shire Council to undertake this task when these roads are affected by flood waters and advise the NSW SES of their status.
- Facilitate the safe reliable access of emergency resources on RMS managed roads.
- Assist the NSW SES with identification of road infrastructure at risk of flooding.
- Manage traffic.
- Assist the NSW SES with the communication of warnings and information provision to the public through variable message signs.

1.5.23 **School Administration Offices (including Catholic Education Office Diocese of Bathurst, Department of Education & Communities and Private Schools):**

a. Liaise with the NSW SES and arrange for the early release of students whose travel arrangements are likely to be disrupted by flooding and/or road closures (or where required, for students to be moved to a suitable location until normal school closing time).

b. Pass information to school bus drivers/companies and/or other schools on expected or actual impacts of flooding.

c. Assist with coordinating the evacuation of schools when flooding or isolation is expected to occur

d. Provide space in schools for evacuation centres where necessary.

1.5.24 **Telecommunication Services Functional Area**:

a. When requested by NSW SES:

- Coordinate the restoration of telephone facilities damaged by flooding.
- Coordinate additional telecommunications support for the NSW SES Headquarters as required.
- Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

1.5.25 **Transport Services Functional Area:**

a. When requested by NSW SES:

- Assist with the coordination of transport for evacuation purposes.
- Assist with the resupply of isolated communities and/or properties

1.5.26 **Welfare Services Functional Area:**

a. When requested by NSW SES:

- Establish and manage evacuation centres, and provide disaster welfare services from recovery centres.
- Administer the Personal Hardship and Distress component of the NSW Disaster Relief Scheme established to provide financial assistance to people affected by emergencies.

1.5.27 **Cowra Shire Council Local Emergency Operations Controller (LEOCON):**

a. Monitor flood operations.

b. Coordinate support to the NSW SES Cowra Local Commander if requested to do so.

1.5.28 **Cowra Shire Council Local Emergency Management Officer:**

a. Provide executive support to the LEMC and LEOCON in accordance with the Cowra Shire Council Local Emergency Management Plan.

b. At the request of the NSW SES, advise appropriate agencies and officers of the start of response operations.

1.5.29 **Cowra Shire Council:**

Preparedness

a. Develop and implement Floodplain Risk Management Plans in accordance with the NSW Government's Flood Prone Land Policy and the Floodplain Development Manual.

b. Establish and maintain Floodplain Risk Management Committees and ensure that key agencies are represented on such committees.

c. Provide Levee Studies, Flood Studies and Floodplain Management studies to the NSW SES.

d. Inspect and maintain all levees.

e. Carry out emergency repairs to levees if required.

f. Maintain a plant and equipment resource list for the Council area.

g. Work with NSW SES on the development and implementation of a community engagement and capability building program.

Response

h. At the request of the NSW SES Cowra Local Incident Controller, deploy personnel and resources for flood related activities.

i. Close and reopen council roads (and other roads nominated by agreement with the RMS) and advise the NSW SES Incident Controller and the Police.

j. Provide information on the status of roads.

k. Provide regular information to the NSW SES about the status and integrity of all levees.

l. Provide filled sandbags to urban and village areas in which flooding is expected.

m. Assist with the removal of caravans from Caravan Parks.

n. Provide back-up radio communications.

o. In the event of evacuations, assist Agriculture and Animal Services Functional Area with making facilities available for the domestic pets and companion animals of evacuees.

p. Provide advice to the NSW SES and the Health Services Functional Area during floods about key council managed infrastructure such as sewerage treatment and water supply.

q. Advise the NSW Environmental Protection Authority (EPA) of any sewage overflow casued by flooding.

r. Work with the NSW SES and Department of Planning, Industry and Environment (DPIE) to collect flood related data during and after flood events.

Recovery

s. Provide for the management of health hazards associated with flooding. This includes removing debris and waste post flooding.

t. Ensure premises are fit and safe for reoccupation and assess any need for demolition.

u. Arrange for the safe and secure storage of evacuees' furniture as required.

v. Provide assistance, advice and services to NSW Government in accordance with the NSW State Recovery Plan.

1.5.30 Owners of Prescribed Dams within or upstream of Cowra

Dam	Owner
Wyangala Dam	**Water NSW**
Valley View Detention Basin	**Cowra Shire Council**

a. Maintain and operate the Dam Failure Warning System for their Dam(s).

b. Contribute to the development and implementation of a public education program on flooding within the council area.

c. Consult with NSW SES on the determination of dam failure alert levels and notification arrangements when developing Dam Safety Emergency Plans.

d. Maintain a Dam Safety Emergency Plan and provide copies to the NSW SES.

e. Provide information on the consequences of dam failure to the NSW SES for incorporation into planning and flood intelligence.

f. Close and evacuate at risk camping grounds/recreational areas within their managed areas.

1.5.31 **Cowra Aboriginal Land Council:**

a. Act as the point of contact between the NSW SES and the Erambie community.

b. Inform the NSW SES Incident Controller about flood conditions and response needs.

c. Disseminate flood information, including Flood and Evacuation Warnings, to the Erambie community.

1.5.32 **River Flood Warning Phone Tree Network:**

a. Provide flood information to the NSW SES Incident Controller.

b. Distribute flood warnings and flood information provided by the NSW SES Incident Controller.

PART 2 - PREPAREDNESS

2.1 MAINTENANCE OF THIS PLAN

2.1.1 The NSW SES will maintain the currency of this plan by:

a. Ensuring that all agencies, organisations and officers mentioned in it are aware of their roles and responsibilities.

b. Conducting exercises to test arrangements.

c. Reviewing the contents of the plan:

- After each flood operation.
- When significant changes in land-use or community characteristics occur.
- When new information from flood studies become available.
- When flood control or mitigation works are implemented or altered.
- When there are changes that alter agreed plan arrangements.

2.1.2 The plan is to be reviewed no less frequently than every five years.

2.2 FLOODPLAIN RISK MANAGEMENT

2.2.1 The NSW SES Cowra Local Commander will ensure that:

a. NSW SES participates in local Floodplain Risk Management Committee activities when those committees are formed, in accordance with the protocols outlined in the NSW SES Controllers Guide.

b. The NSW SES Southern Zone Headquarters is informed of involvement in floodplain risk management activities.

2.3 DEVELOPMENT OF FLOOD INTELLIGENCE

2.3.1 Flood intelligence describes flood behaviour and its effects on the community.

2.3.2 The NSW SES maintains a centralised flood intelligence system.

2.4 DEVELOPMENT OF WARNING SYSTEMS

2.4.1 The NSW SES may establish a total flood warning system for areas affected by flooding. This requires:

a. An identification of the potential clients of flood warning information at different levels of flooding (i.e. who would be affected in floods of differing severities).

b. Available information about the estimated impacts of flooding at different heights.

c. Identification of required actions and the amounts of time needed to carry them out.

d. Appropriate means of disseminating warnings to different clients and at different flood levels.

2.5 PUBLIC EDUCATION

a. The NSW SES Cowra Local Commander, with the assistance of the Cowra Shire Council, the NSW SES Southern Zone Headquarters and NSW SES State Headquarters, is responsible for ensuring that the residents of the council area are aware of the flood threat in their vicinity and how to protect themselves from it.

2.5.2 Specific strategies to be employed include:

a. Dissemination of flood-related brochures and booklets in flood liable areas.

b. Talks and displays orientated to community organisations, businesses and schools.

c. Publicity given to this plan and to flood-orientated NSW SES activities through local media outlets, including articles in local newspapers about the flood threat and appropriate responses.

d. Use of social media i.e. Facebook and Twitter to promote awareness of the flood threat.

2.6 TRAINING

2.6.1 Throughout this document there are references to functions that must be carried out by the members of the NSW SES Cowra and NSW SES Gooloogong Units. The NSW SES Cowra Local Commander is responsible for ensuring that the members are:

a. Familiar with the contents of this plan.

b. Trained in the skills necessary to carry out the tasks allocated to the NSW SES.

2.7 RESOURCES

2.7.1 The NSW SES Cowra Unit Commander is responsible for maintaining the condition and state of readiness of NSW SES equipment and the NSW SES Cowra Local Headquarters.

2.7.2 The NSW SES Gooloogong Unit Commander has similar responsibilities in relation to the Gooloogong Unit Headquarters and equipment.

PART 3 - RESPONSE

CONTROL

3.1 CONTROL ARRANGEMENTS

3.1.1 The NSW SES is the legislated Combat Agency for floods and is responsible for the control of flood operations. This includes the coordination of other agencies and organisations for flood management tasks.

3.1.2 The Local EMPLAN will operate to provide support as requested by the NSW SES Local Incident Controller.

3.2 OPERATIONAL MANAGEMENT

3.2.1 NSW SES utilises the Australasian Inter-service Incident Management System (AIIMS), which is based on five principles:

a. Flexibility;

b. Functional management;

c. Management by objectives;

d. Unity of Command; and

e. Span of control.

3.2.2 AIIMS provides for different incident levels based on the complexity of management.

3.2.3 The Local Government Area of Cowra may be included into an Area of Operations based on the classification of the incident as a Level 1, 2 or 3 incident.

3.2.4 Sectors and Divisions may be based on floodplain classifications, geographical, physical or functional boundaries. An LGA, town, city or suburb may be one Sector or split into several Sectors and Divisions.

3.3 START OF RESPONSE OPERATIONS

3.3.1 This plan is always active to ensure that preparedness actions detailed in this plan are completed.

3.3.2 Response operations will begin:

a. On receipt of a Bureau of Meteorology Flood Watch, Preliminary Flood Warning, Flood Warning, Severe Thunderstorm Warning or a Severe Weather Warning for flash flooding.

b. On receipt of a dam failure alert.

c. When other evidence leads to an expectation of flooding within the council area.

3.3.3 Contact with the Bureau of Meteorology to discuss the development of flood warnings will normally be through the NSW SES Southern Zone Headquarters and/or the NSW SES State Headquarters.

3.3.4 The following persons and organisations will be advised of the start of response operations regardless of the location and severity of the flooding anticipated:

a. NSW SES Southern Zone Headquarters.

b. NSW SES Cowra and Gooloogong Unit Commanders.

c. NSW SES Cowra and Gooloogong Units.

d. Cowra Shire Council Local Emergency Operations Controller (for transmission to the NSW Police Force District Headquarters).

e. Cowra Shire Council Local Emergency Management Officer (for transmission to appropriate Council Officers and Departments, and LEMC members).

f. Cowra Shire Council Mayor.

g. Other agencies listed in this plan will be advised by the Local Emergency Management Officer on the request of the NSW SES Cowra Local Incident Controller and as appropriate to the location and nature of the threat.

3.4 RESPONSE STRATEGIES

3.4.1 The main response strategies for NSW SES flood operations include:

a. Information Provision and Warning

- Provision of warnings, information and advice to communities.
- Inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for flooding.
- Provide timely and accurate information to the community.

b. Property protection

- Protect the property of residents and businesses at risk of flood damage.
- Assistance with property protection by way of sandbagging and the lifting or transporting of furniture, personal effects, commercial stock and caravans.
- Assistance with the protection of essential infrastructure.

c. Evacuation

- The temporary movement of people from a dangerous or potentially dangerous place to a safe location, and their eventual return. It is a safety strategy which uses distance to separate people from the danger created by the hazard.

d. Rescue

- The rescue or retrieval of persons trapped by floodwaters.

e. Resupply

- Minimise disruption upon the community by resupplying towns and villages which have become isolated as a consequence of flooding.
- Ensure supplies are maintained to property owners by coordinating the resupply of properties which have become isolated as a consequence of flooding.

3.4.2 The NSW SES Cowra Local Incident Controller will select the appropriate response strategy to deal with the expected impact of the flood in each sector and/or community. The impact may vary so a number of different strategies may to be selected and implemented across the whole operational area. The available strategies for each sector and/or community are maintained by the NSW SES.

3.4.3 Supporting strategies may include:

a. Protect the community from incidents involving fire and hazardous materials

b. Maintain the welfare of communities and individuals affected by the impact of a flood.

c. Minimise disruption to the community by ensuring supply of essential energy and utility services.

d. Ensure coordinated health services are available to and accessible by the flood affected communities.

e. Maintain the welfare of animals affected by the impact of a flood.

3.5 INCIDENT CONTROL CENTRES (ICC):

3.5.1 The NSW SES Cowra Incident Control Centre is located at the Emergency Shed, Airport Road, Cowra.

3.5.2 The NSW SES Gooloogong Incident Control Centre is located at Main Street, Gooloogong.

3.5.3 Supporting Emergency Operations Centres (EOC) are located at:

A. The Cowra Shire Council Emergency Operations Centre is located at Waugoola House Multi-Purpose Room (Adjacent to Art Gallery Entrance), Cnr Kendal & Darling Streets, Cowra.

3.6 LIAISON

3.6.1 Any agency with responsibilities identified in this plan may be requested by the NSW SES to provide liaison (including a Liaison Officer where necessary) to the relevant NSW SES ICC, or designated Emergency Operations Centre.

3.6.2 In accordance with NSW EMPLAN, Liaison Officers will;

a. Maintain communication with and convey directions/requests to their organisation or functional area;

b. Provide advice on the status, resource availability, capabilities, actions and requirements of their organisation or functional area, and

c. Where appropriate, have the authority to deploy the resources of their parent organisation at the request of the NSW SES Incident Controller.

3.7 END OF RESPONSE OPERATIONS

3.7.1 When the immediate danger to life and property has passed the NSW SES Incident Controller will issue an 'All Clear' message signifying that response operations have been completed. The message will be distributed through the same media outlets as earlier evacuation messages.

The relevant Incident Controller will also advise details of recovery coordination arrangements, arrangements made for 'clean-up' operations prior to evacuees being allowed to return to their homes, and stand-down instructions for agencies not required for recovery operations.

PLANNING

3.8 COLLATING SITUATIONAL INFORMATION

Strategy

3.8.1 The NSW SES maintains and records situational awareness of current impacts and response activities.

Actions

3.8.2 The NSW SES Cowra Incident Control Centre (ICC) collates information on the current situation in the Cowra Shire Council LGA and incorporates this into Situation Reports.

3.8.3 The NSW SES Southern Zone Incident Control Centre (ICC) collates Zone-wide information for inclusion in Zone NSW SES Situation Reports.

3.8.4 Sources of situational information during times of flooding are:

a. **Agency Situation Reports**. Agencies and functional areas provide regular Situation Reports (SITREPs) to the NSW SES.

b. **Active Reconnaissance**. The NSW SES Cowra Local Incident Controller is responsible for coordinating the reconnaissance of impact areas, recording and communicating observations. Reconnaissance can be performed on the ground and using remote sensing. The NSW SES monitors the following problem areas;

- The NSW SES Cowra Unit monitors;
  - Darbys Falls bridge on the Darbys Falls Rd.
  - Morongola Creek Bridge on the Cowra-Booroowa Rd (Lachlan Valley Way).
  - Waugoola Creek area on the Sydney Road (Mid Western Highway) and Darbys Falls roads.
  - Cowra-Booroowa Rd (Lachlan Valley Way) and the Cowra-Young Rd (Olympic Way) at the Golf Course.
  - Cowra-Grenfell Rd (Mid-Western Highway) at the Cowra main traffic bridge.
  - Business premises and the Cowra Council Caravan Park on the eastern side of the river in Lachlan and Taragala streets, Cowra.
  - Redfern St, Cowra.
  - North Logan Rd below 'Chernco Engineering' (old cannery) and towards Billimari.
  - Bang Bang Creek on the Cowra-Young Rd (Olympic Way) at Koorawatha.
  - Other locations along the Cowra-Gooloogong Rd (Lachlan Valley Way) including the Merriganowry Bridge.
- The NSW SES Gooloogong Unit monitors;
  - The Gooloogong-Cowra Rd (Lachlan Valley Way) at the Kangarooby Creek bridge, 1km south-east of Gooloogong; and also approximately 18km from Gooloogong.
  - The Gooloogong-Forbes Rd (Lachlan Valley Way) at Goonigal Creek bridge, approximately 10km from Gooloogong.
  - Peyton's Bridge and approaches on the Bandon-Eugowra Rd.
  - The Gooloogong-Canowindra Rd at the Gooloogong Bridge and Goonigal Creek.
  - Gooloogong-Grenfell Rd at the unnamed creek crossings, approximately 2km and 10km from Gooloogong.
  - The Gooloogong-Eugowra Rd west of Gooloogong.

c. The **Bureau of Meteorology's Flood Warning Centre** provides river height and rainfall information, data is available on the website http://www.bom.gov.au/nsw/flood/

d. **NSW Office of Water Office**. This office advises flow rates and rates of rise for the Lachlan River. Daily river reports containing information on gauge heights and river flows are available from the website: http://waterinfo.nsw.gov.au/

e. **Wyangala Dam Storage Monitoring System.** This system provides information on Wyangala Dam.

f. **NSW SES Southern Zone Headquarters**. The Zone Headquarters provides information on flooding and its consequences, including those in nearby council areas (this information is documented in Flood Bulletins and Situation Reports).

g. **Cowra Shire Council.** The Cowra Shire Council provides information on the Cowra Shire road closures and conditions and other flood related information through regular updates on their website.

3.8.5 During flood operations sources of information on roads closed by flooding include:

a. Cowra Shire Council (website and/or telephone service).

b. Chifley Police District.

c. Live Traffic NSW (Roads and Maritime Services, Transport for NSW) at https://www.livetraffic.com/ or by calling 13 27 01.

d. NSW SES Southern Zone Headquarters.

e. NSW SES Cowra Unit Heaadquarters.

f. NSW SES Goolongong Unit Headquarters.

3.8.6 Situational information relating to consequences of flooding in relation to the closure of roads should be used to verify and validate existing NSW SES Flood Intelligence records.

3.9 PROVISION OF FLOOD INFORMATION AND WARNINGS

Strategy

3.9.1 The NSW SES Cowra Unit Headquarters provides advice to the NSW SES Southern Zone Headquarters on current and expected impacts of flooding in the Cowra Shire Council LGA.

3.9.2 The NSW SES Southern Zone Headquarters issues NSW SES Flood Bulletins, NSW SES Livestock and Equipment Warnings, Evacuation Warnings and Evacuation Orders to media outlets and agencies on behalf of all NSW SES Units within Southern Zone.

Actions

3.9.3 The **NSW SES Incident Controller** will ensure that the NSW SES Zone Incident Controller is regularly briefed on the progress of operations.

3.9.4 **NSW SES Cowra Unit and Gooloogong Unit Incident Control Centre Staff** will be briefed regularly so that they can provide information in response to inquiries received in person or by other means such as phone or email.

3.9.5 **Bureau of Meteorology Severe Thunderstorm Warning**. These are issued direct to the media by the BOM when severe thunderstorms are expected to produce dangerous or damaging conditions such as strong winds and heavy rain that may lead to flash flooding. Severe thunderstorms are usually smaller in scale than events covered by Flood Watches, Flood Warnings and Severe Weather Warnings.

3.9.6 **Bureau of Meteorology Severe Weather Warnings for Flash Flooding**. These are issued direct to the media by the BOM and provide a warning of the possibility for flash flooding as a result of intense rainfall. These warnings are issued when severe weather is expected to affect land-based communities with 6 to 24 hours. Severe Weather Warnings may also include other conditions such as Damaging Winds.

3.9.7 **Bureau of Meteorology Flood Watches**. Flood Watches are issued by the BOM to advise people of the potential for flooding in a catchment area based on predicted or actual rainfall. Flood Watches will be included in NSW SES Flood Bulletins issued by the NSW SES Southern Zone Headquarters.

3.9.8 **Bureau of Meteorology Flood Warnings.** The NSW SES Southern Zone Headquarters will send a copy of BOM Flood Warnings to the NSW SES Wagga Wagga City Unit. On receipt the NSW SES Incident Controller will provide the NSW SES Southern Zone Headquarters with information on the estimated impacts of flooding at the predicted heights for inclusion in NSW SES Zone Flood Bulletins

3.9.9 **NSW SES Livestock and Equipment Warnings**. Following heavy rain or when there are indications of significant creek or river rises (even to levels below Minor Flood heights), the NSW SES Incident Controller will advise the NSW SES Southern Zone Headquarters which will issue NSW SES Livestock and Equipment Warnings.

3.9.10 **NSW SES Local Flood Advices**. The NSW SES Incident Controller may issue Local Flood Advices for locations not covered by Bureau Flood Warnings. They may be provided verbally in response to phone inquiries but will normally be incorporated into NSW SES Zone Flood Bulletins.

3.9.11 **NSW SES Flood Bulletins**. The NSW SES Southern Zone Headquarters will regularly issue NSW SES Flood Bulletins which describe information on the estimated impacts of flooding at the predicted heights (using information from Bureau Flood Warnings and NSW SES Local Flood Advices) and public safety information to members of the community, Council, media outlets, emergency services and agencies.

3.9.12 **NSW SES Evacuation Warnings and Evacuation Orders**. These are usually issued to the media by the NSW SES Southern Zone Commander on behalf of the NSW SES Incident Controller.

3.9.13 **Dam Failure Alerts**. Dam failure alerts are issued to NSW SES by the dam owner, in accordance with arrangements in the Dam Safety Emergency Plan (DSEP), the system involves the Dam Owner notifying NSW SES State Operations Centre (SOC), who in turn distributes the warning to the NSW SES Zone Headquarters and NSW SES Unit Headquarters.

3.9.14 A flow chart illustrating the notification arrangements for potential dam failure is shown in Attachment 2.

3.9.15 Dam failure alert levels are set in consultation with the NSW SES and are used to trigger appropriate response actions. The conditions that define each of the alert levels are listed in the relevant DSEP. Responses escalate as the alert level migrates from white to amber to red. Table 1 briefly outlines example defining conditions and appropriate NSW SES responses associated with each alert.

Alert Level	Example Defining Condition	NSW SES Response	NSW SES Warning Product
White	**May be a structural anomaly.** **May be increased monitoring in response to a heavy rainfall event**	**Implements notification flowchart.** **Check operational readiness.**	**This is a preliminary alert to assist the NSW SES in its preparation. This is not a public alert.**
Amber	**Failure possible if storage level continues to rise or structural anomaly not fixed**	**Implements notification flowchart.** **Warn downstream population at risk to prepare to evacuate**	**NSW SES Evacuation Warning**
Red	**Failure imminent or occurred**	**Implements notification flowchart.** **Evacuation of downstream populations**	**NSW SES Evacuation Order**

Table 1: Dam Failure Alert Levels

Note: Some DSEPs will have alert levels that proceed directly from White to Red. This is the case if adequate time does not exist between the three alert levels to evacuate the downstream population at risk. The decision to omit the Amber Alert level, and the general setting of Alert levels should be undertaken in consultation with the NSW SES.

3.9.16 The NSW SES / Dam Owner will disseminate warnings to the population at risk of dam failure (these arrangements are specific to each dam, are negotiated between the Dam Owner and NSW SES, and are documented in the DSEP).

3.9.17 Special arrangements apply in the case of severe flooding that may have the potential to cause the failure of Wyangala Dam. Details of these arrangements are maintained by the NSW SES.

3.9.18 **Standard Emergency Warning Signal (SEWS).** This signal may be played over radio and television stations to alert communities to Evacuation Warnings, Evacuation Orders, Special Warnings or Dam-Failure Warnings. Approval to use the signal is associated with who approves the warning/order message.

3.9.19 **The Public Information and Inquiry Centre (PIIC)** (operated by the NSW Police Force) will answer calls from the public regarding registered evacuees and provide authorised emergency information to the public.

3.9.20 **The Disaster Welfare Assistance line** is a central support and contact point for disaster affected people inquiring about welfare services advice and assistance. This normally operates during business hours, but can be extended when required.

3.9.21 **The RMS Transport Information Line** will provide advice to callers on the status of roads. The RMS website also lists road closure information.

3.9.22 **Cowra Shire Council** will provide information on the status of roads.

3.9.23 Collation and dissemination of road information is actioned as follows:

a. As part of Situation Reports, the NSW SES Incident Controller provides road status reports for main roads in the Council area to the NSW SES Southern Zone Headquarters or NSW SES Strategic Coordination Centre.

b. The NSW SES Southern Zone Headquarters distributes information on main roads to NSW SES Units, media outlets, emergency services and agencies as part of NSW SES Flood Bulletins.

OPERATIONS

3.10 AIRCRAFT MANAGEMENT

3.10.1 Aircraft can be used for a variety of purposes during flood operations including evacuation, rescue, resupply, reconnaissance (aerial remote sensing) and emergency travel.

3.10.2 Air support operations will be conducted under the control of the NSW SES Southern Zone Headquarters, which may allocate aircraft to NSW SES Units if applicable.

3.10.3 NSW SES maintains the following information for the Cowra Council area;

a. Locations of suitable helicopter landing points.

b. Locations of suitable airports and records detailing aircraft size and type that can land at airports.

c. Intelligence on when access to these locations is expected to be lost.

3.11 ASSISTANCE FOR ANIMALS

3.11.1 Matters relating to the welfare of livestock, companion animals and wildlife are to be referred to Agriculture and Animal Services Functional Area.

3.11.2 Requests for emergency supply and/or delivery of fodder to stranded livestock, or for livestock rescue, are to be referred to Agriculture and Animal Services Functional Area.

3.11.3 Requests for animal rescue should be referred to the NSW SES.

3.12 COMMUNICATION SYSTEMS

3.12.1 The primary means of communications between fixed locations is by telephone, email and facsimile.

3.12.2 The primary means of radio communication to and between deployed NSW SES resources is by NSW SES Private Mobile Radio (PMR) Network.

3.12.3 All Liaison Officers will provide their own communication links back to their parent agencies.

3.12.4 All other organisations will provide communications as necessary to their deployed field teams.

3.12.5 Back-up communications are provided as follows:

a. The Cowra Shire Council operates a UHF radio network which provides communication to deployed vehicles and plant.

b. The NSW Rural Fire Service (RFS) operates a dedicated UHF radio network, which provides communication to all local brigades and their deployed vehicles.

c. Fire and Rescue NSW operate a dedicated UHF radio network to deployed vehicles.

3.13 PRELIMINARY DEPLOYMENTS

3.13.1 When flooding is expected to be severe enough to cut road access to villages, towns, and/or rural communities within the Cowra LGA, the NSW SES Incident Controller will ensure that resources are in place for the distribution of foodstuffs and medical supplies to the areas that could become isolated.

3.13.2 When access between locations is expected to be cut, the NSW SES Incident Controller will advise appropriate agencies so that resources (including

sandbags, firefighting appliances, ambulances, etc.) are deployed to ensure that operational capability is maintained.

3.14 ROAD AND TRAFFIC CONTROL.

3.14.1 A number of roads within the council area are affected by flooding. NSW SES maintains details of these roads.

3.14.2 The council closes and re-opens its own roads and other roads in its capacity as a agent of RMS.

3.14.3 The NSW Police Force has the authority to close and re-open roads but will normally only do so (if the Council or the RMS have not already acted) if public safety requires such action.

3.14.4 When resources permit, the NSW SES assists Council, RMS or the NSW Police Force by erecting road closure signs and barriers.

3.14.5 In flood events, the NSW SES Incident Controller may direct the imposition of traffic control measures. The entry into flood affected areas will be controlled in accordance with the provisions of the State Emergency Service Act, 1989 NSW (Part 5, Sections 19, 20, 21 and 22) and the State Emergency Rescue Management Act, 1989 NSW (Part 4, Sections 60KA, 60L and 61).

3.14.6 NSW Police Force, RMS or Council Officers closing or re-opening roads or bridges affected by flooding are to advise the NSW SES Cowra Unit ICC, which will then provide a road information service to local emergency services, the public and the NSW SES Southern Zone Headquarters. All such information will also be passed to the NSW Police Force, RMS and the Council.

3.15 STRANDED TRAVELLERS

3.15.1 Flood waters can strand travellers. Travellers seeking assistance will be referred to the Welfare Services Functional Area for the arrangement of emergency accommodation.

3.16 MANAGING PROPERTY PROTECTION OPERATIONS

Strategy

3.16.1 Protect the property of residents and businesses at risk of flood damage.

Actions

3.16.2 The NSW SES is the responsible agency for the coordination of operations to protect property.

3.16.3 Property may be protected from floods by:

a. Raising or moving of household furniture.

b. Raising or moving commercial stock and equipment.

c. Sandbagging to minimise entry of water into buildings.

3.16.4 The NSW SES maintains stocks of sandbags.

3.16.5 Property protection options are however very limited in the Cowra Shire Council Area due to the large number of properties that can be affected and the depth of floodwaters arising from severe flooding on the Lachlan River.

3.17 MANAGING FLOOD RESCUE OPERATIONS

Strategy

3.17.1 Rescue of people from floods.

Actions

3.17.2 The NSW SES Incident Controller controls flood rescue in the Cowra Shire Council LGA.

3.17.3 Flood rescues, may be carried out by accredited units in accordance with guidelines contained in the NSW SES State Rescue Policy, 4th Edition, November 2018.

3.17.4 Additional flood boats and crews can be requested through the NSW SES Southern Zone Headquarters.

3.17.5 There may be some residual population which did not evacuate during the early stages of flooding and which require rescue.

3.18 MANAGING EVACUATION OPERATIONS

Strategy

3.18.1 When there is a risk to public safety, evacuation is the primary strategy. Circumstances may include:

a. Evacuation of people when their homes or businesses are likely to flood.

b. Evacuation of people who are unsuited to living in isolated circumstances, due to flood water closing access.

c. Evacuation of people where essential energy and utility services are likely to fail, have failed or where buildings have been made uninhabitable.

Actions

3.18.2 The evacuation operation will have the following stages:

a. Decision to evacuate.

b. Mobilisation (mobilisation may begin prior to the decision to evacuate).

c. Evacuation Warning delivery.

d. Evacuation Order delivery.

e. Withdrawal.

f. Shelter.

g. Return.

3.18.3 During floods evacuations will be controlled by the NSW SES. Small-scale evacuations will be controlled by the NSW SES Incident Controller. Should the

scale of evacuation operations be beyond the capabilities of local resources control may be escalated to the next operational command level.

Decision to evacuate

3.18.4 In most cases the decision to evacuate rests with the NSW SES Commissioner who exercises his/her authority in accordance with Section 22(1) of The State Emergency Service Act 1989 NSW. However, the decision to evacuate will usually be made after consultation with the NSW SES Southern Zone Commander and the LEOCON.

3.18.5 All evacuation decisions will be made as per the NSW SES Communication and Dissemination of Evacuation Decisions Standard Operating Procedure.

3.18.6 Evacuation operations are to be consistent with the NSW Evacuation Management Guidelines.

3.18.7 Some people will make their own decision to evacuate earlier and move to alternate accommodation, using their own transport. This is referred to as self-managed evacuation.

Mobilisation

3.18.8 The NSW SES Incident Controller will mobilise the following to provide personnel for doorknock teams for designated Sectors/locations:

a. NSW SES Cowra Unit members,

b. Local RFS members,

c. Fire and Rescue NSW members, and

d. Local Police Force Officers.

3.18.9 The NSW SES Southern Zone Commander will request any additional personnel required to assist with doorknock teams using;

a. NSW SES members from the NSW SES Southern Zone and surrounding NSW SES Zones.

b. FRNSW personnel arranged via the FRNSW Liaison Officer.

c. NSW RFS personnel arranged via the NSW RFS Liaison Officer.

3.18.10 The NSW SES Incident Controller will request the Chairperson of the LEMC to provide Council personnel to assist with traffic coordination within Sector(s)/Community.

3.18.11 The NSW SES Incident Controller will arrange liaison officers for Sector Command Centres.

3.18.12 The NSW SES Incident Controller will mobilise the required number of buses for Sectors via the Transport Services Functional Area Coordination Centre.

Delivery of Evacuation Warnings and Evacuation Orders

3.18.13 The NSW SES will advise the community of the requirements to evacuate. The NSW SES will issue an **Evacuation Warning** when the intent of an NSW SES Incident Controller is to warn the community of the need to prepare for a possible evacuation.

3.18.14 The NSW SES will issue an **Evacuation Order** when the intent of the NSW SES Incident Controller is to instruct a community to immediately evacuate in response to an imminent threat.

3.18.15 The NSW SES Cowra Local Incident Controller will distribute Evacuation Warnings and Evacuation Orders to:

a. Sector/Division Command Centres (where established).

b. Cowra Shire Council Local Emergency Operations Centre.

c. Cowra Shire Council.

d. Chifley Police District.

e. Canobolas Rural Fire Service Control Centre.

f. Radio Stations.

g. Other local agencies and specified individuals.

3.18.16 The NSW SES Incident Controller will distribute Evacuation Warnings and Evacuation Orders to:

a. The NSW SES State Strategic Coordination Centre.

b. Affected communities via dial-out warning systems where installed or applicable.

c. Relevant media outlets and agencies.

3.18.17 Evacuation Warnings and Evacuation Orders may be delivered through:

a. Radio and television stations.

b. Doorknocking by emergency service personnel.

c. Public address systems (fixed or mobile).

d. Telephony-based systems (including Emergency Alert).

e. Social Media i.e. Facebook and Twitter.

f. Two-way Radio.

g. Direct access to local Radio Stations.

3.18.18 The Standard Emergency Warning Signal (SEWS) may be used to precede all Evacuation Orders broadcast on Radio Stations.

3.18.19 Doorknock teams will work at the direction of:

a. The Sector Commander if a Sector Command Centre is established; or,

b. The relevant Division Commander where a Sector Command Centre has not been established; or

c. The Incident Controller.

3.18.20 Field teams conducting doorknocks will record and report back the following information to their Sector Commander/Division Commande/Incident Controller;

a. Addresses and locations of houses doorknocked and/or evacuated.

b. The number of occupants.

c. Details of support required (such as transport, medical evacuation, assistance to secure house and/or property and raise or move belongings).

d. Details of residents who refuse to comply with the Evacuation Order.

3.18.21 Refusal to evacuate. Field teams should not waste time dealing with people who are reluctant or refuse to comply with any Evacuation Order. These cases are to be referred to the NSW Police Force.

Withdrawal

3.18.22 Evacuations will generally be carried out in stages starting from the lowest areas, low flood islands and low trapped perimeters; and progressively from higher areas.

3.18.23 The most desirable method of evacuation is via road using private transport. This may be supplemented by buses for car-less people. However, other means of evacuation may also be used if available and as necessary (e.g. by foot, rail, air).

3.18.24 Evacuees who require emergency accommodation or disaster welfare assistance will be directed to designated evacuation centres. Evacuees who have made their own accommodation arrangements will not be directed to evacuation centres. It is not possible to determine in advance how many will fall into this category.

3.18.25 Evacuees will:

a. Move under local traffic arrangements from the relevant Sectors/Community via managed evacuation routes;

b. Continue along the suburban/regional/rural road network to allocated Evacuation Centres.

3.18.26 **Health Services**. The Health Services Functional Area will coordinate the evacuation of Hospitals, Health Centres, and Aged Care Facilities (including Nursing Homes).

3.18.27 **Schools.** School administration offices (Department of Education and Communities, Catholic Education Office and Private Schools) will coordinate the evacuation of schools if not already closed.

3.18.28 If there is sufficient time between the start of response operations and the evacuation of communities, the NSW SES Southern Zone Commander will discuss the temporary closure of appropriate schools with the Regional Director, Western NSW Region, Department of Education and Communities. This will enable pupils to stay at home or be returned home so they can be evacuated (if required) with their families.

3.18.29 Note that in the Cowra Shire Council LGA, school principals may close some schools affected by flooding in the early stages of flooding.

3.18.30 **Caravan parks**. When an evacuation order is given occupiers of movable dwellings should:

a. Isolate power to moveable dwellings.

b. Collect personal papers, medicines, a change of clothing, toiletries and bedclothes.

c. Raise the other contents in any remaining dwellings as high as possible.

d. Move to friends, relatives or a designated Evacuation Centre if they have their own transport, or move to the Caravan Office to await transport.

e. If undertaking self-managed evacuation, register their movements with the caravan park management upon leaving the park.

3.18.31 Where possible, dwellings that can be moved will be relocated by their owners. Park managers will arrange for the relocation of mobile vans whose owners do not have a vehicle. Council and NSW SES personnel may assist if resources permit.

3.18.32 Caravan Park Managers will ensure that their caravan park is capable of being evacuated in a timely and safe manner.

3.18.33 Advise the NSW SES Incident Controller of:

a. The number of people requiring transport.

b. Details of any medical evacuations required.

c. Whether additional assistance is required to effect the evacuation.

3.18.34 Check that all residents and visitors have been accounted for.

3.18.35 Inform the NSW SES Incident Controller when the evacuation of the Caravan Park has been completed.

3.18.36 Provide the NSW SES Incident Controller with a register of people that have been evacuated.

3.18.37 **Assistance Animals, Pets and Companion Animals of Evacuees:** Assistance animals (guide dogs, hearing assistance animals, etc.) will remain in the care of their owners throughout the evacuation. This includes transport and access into Evacuation Centres etc.

Where possible owners should take their companion animals with them when they are asked to evacuate. Due to safety restrictions, it may not be possible

to allow companion animals to accompany their owners when being transported via aircraft or flood rescue boat. In such circumstances Agriculture and Animal Services will coordinate separate arrangements for evacuation and care of companion animals.

3.18.38 **Transport and storage:** Transport and storage of furniture from flood threatened properties will be arranged if time and resources permit.

3.18.39 **Security:** The NSW Police Force will coordinate the provision of overall security for all evacuated areas.

3.18.40 The NSW SES Incident Controller is to provide the following reports to the NSW SES Southern Zone Headquarters:

a. Advice of commencement of the evacuation of each Sector;

b. Progress reports (by Sectors) during evacuations;

c. Advice of completion of the evacuation of each Sector.

3.18.41 **Assembly Areas**: An assembly area is a designated location used for the assembly of emergency-affected persons before they move to temporary accommodation or a nominated Evacuation Centre. As such these areas do not provide welfare assistance nor are they used for long term sheltering or provision of meals. An assembly area may also be a prearranged, strategically placed area, where support response personnel, vehicles and other equipment can be held in readiness for use during an emergency.

3.18.42 **Evacuation Centres:** Evacuees will be advised to go to friends or relatives, or else be taken to the nearest accessible Evacuation Centre, which may initially be established at the direction of the NSW SES Incident Controller, but managed as soon as possible by Welfare Services.

3.18.43 The following locations are suitable for use as Flood Evacuation Centres, however these will be reviewed during the incident by the planning team and in accordance with the NSW Evacuation Management Guideline:

a. Police Citizens Youth Club, Binni Creek Rd, Cowra.

b. Cowra Services Club, Brisbane St, Cowra.

c. Cowra Bowling Club, Brougham Street, Cowra.

d. The Gooloogong Country Club, Gooloogong.

3.18.44 **Registration:** The NSW Police Force will facilitate the requirement of Disaster Victim Registration (DVR) for people evacuated to designated Evacuation Centres.

3.18.45 **Animal shelter compounds:** Facilities to hold and care for companion animals of evacuees will be coordinated by Agriculture and Animal Services if required. If required, Agriculture and Animal Services will also coordinate refuge areas for livestock (e.g. horses) where feasible.

Return

3.18.46 The NSW SES Cowra Local Incident Controller will advise when return to evacuated areas is safe after flood waters have receded and reliable access is available.

3.18.47 The NSW SES Incident Controller will determine when it is safe for evacuees to return to their homes in consultation with:

a. The Recovery Coordinating Committee (if established),

b. Welfare Services Functional Area Coordinator (welfare of evacuees),

c. Engineering Services Functional Area Co-coordinator (electrical safety of buildings, structural integrity of levees/dams),

d. Health Service Functional Area Coordinator (public health),

e. Transport Services Functional Areas Coordinator (arrangement of transport),

f. The Cowra Shire Council LEOCON,

g. The Cowra Shire Council,

h. NSW SES Southern Zone Commander,

i. Other appropriate agencies/functional areas as required (mitigation and advice regarding identified risks resulting from the flood event).

3.18.48 Once it is considered safe to do so, the NSW SES Incident Controller will authorise the return of evacuees.

3.18.49 The return will be controlled by the NSW SES Incident Controller and may be conducted, at their request, by the Recovery Coordinator.

3.19 MANAGING RESUPPLY OPERATIONS

3.19.1 The NSW SES is responsible for the coordination of the resupply of isolated communities and properties.

3.19.2 If isolation is expected to occur, residents should be encouraged to consider their needs and suitability for an unknown period of isolation.

3.19.3 If properties/communities are going to remain in locations expected to become isolated, households/retailers should be encouraged to stock up on essential supplies.

3.19.4 Where practicable, once supplies are delivered to the NSW SES designated loading point, the NSW SES Incident Controller will arrange for the delivery of essential foodstuffs, fuels or urgent medical supplies required by an isolated property or community.

3.19.5 All reasonable effects will be made to deliver supplies, however where necessary the NSW SES will prioritise the delivery of items.

Resupply of Isolated Towns and Villages

Strategy

3.19.6 Minimise disruption upon the community by resupplying towns and villages which have become isolated as a consequence of flooding.

Actions

3.19.7 The NSW SES is responsible for the coordination of the resupply of isolated communities.

3.19.8 If flood predictions indicate that areas are likely to become isolated, the NSW SES Incident Controller should advise retailers that they should stock up.

3.19.9 When isolation occurs, retailers will be expected to place orders with suppliers where they have a line of credit and to instruct those suppliers to package their goods and deliver them to loading points designated by the NSW SES.

3.19.10 The NSW SES is prepared to deliver mail to isolated communities but may not be able to do so according to normal Australia Post timetables.

3.19.11 The NSW SES will assist hospitals with resupply of linen and other consumables where time and resources permit.

Resupply of Isolated Properties

Strategy

3.19.12 Ensure supplies are maintained to properties by coordinating the resupply of properties which have become isolated as a consequence of flooding.

Actions

3.19.13 The resupply of isolated properties is a common requirement during floods and coordination can be difficult because requests can emanate from a variety of sources. Isolated properties may call their suppliers direct, place their orders through their own social networks or contact the NSW SES.

3.19.14 The principles to be applied when planning for the resupply of isolated properties are:

a. The NSW SES will coordinate resupply and establish a schedule.

b. Some isolated households will not have the ability to purchase essential grocery items due to financial hardship. If an isolated household seeks resupply from the NSW SES and claims to be, or is considered to be, in dire circumstances, he/she is to be referred to Welfare Services for assessment of eligibility. Where financial eligibility criteria are met, Welfare Services will assist with the purchase of essential grocery items. Welfare Services will deliver the essential grocery items to the NSW SES designated loading point for transport.

c. Local suppliers will liaise with the NSW SES regarding delivery of resupply items to the designated loading point.

d. Local suppliers are responsible for packaging resupply items for delivery.

3.19.15 A flowchart illustrating the Resupply process is shown in Attachment 1. Please note that the flowchart outlines the resupply process but does not encompass all potential situations and/or outcomes.

PART 4 - RECOVERY

4.1 RECOVERY COORDINATION AT THE LOCAL LEVEL

4.1.1 The NSW SES Incident Controller will ensure that planning for long-term recovery operations begins at the earliest opportunity, initially through briefing the Cowra Local Emergency Management Committee (LEMC). As soon as possible the LEMC will meet to discuss recovery implications including the need for a Local Recovery Committee. The LEMC will consider any impact assessment in determining the need for recovery arrangements. This is conveyed in the first instance to the State Emergency Operations Controller (SEOCON) for confirmation with the State Emergency Recovery Controller (SERCON).

4.1.2 Once the need for recovery has been identified, the SERCON, in consultation with the SEOCON, may recommend the appointment of a Local Recovery Coordinator and nominate an appropriate candidate to the Minister for Emergency Services.

4.1.3 The SERCON may send a representative to the LEMC and subsequent recovery meetings to provide expert recovery advice and guidance.

4.1.4 The NSW SES Incident Controller and Local Emergency Operations Controller (LEOCON) attend recovery meetings to provide an overview of the emergency response operation.

4.1.5 The NSW SES Southern Zone Commander, the Regional Emergency Management Officer (REMO) and appropriate Regional Functional Area Coordinators will be invited to the initial local meeting and to subsequent meetings as required.

4.1.6 The Recovery Committee will:

a. Develop and maintain a Recovery Action Plan with an agreed exit strategy,

b. Monitor and coordinate the activities of agencies with responsibility for the delivery of services during recovery,

c. Ensure that relevant stakeholders, especially the communities affected, are involved in the development and implementation of recovery objectives and strategies and are informed of progress made,

d. Provide the SERCON with an end of recovery report, and

e. Ensure the recovery is in line with the National Principles of Disaster Recovery and the NSW tenets.

4.2 RECOVERY COORDINATION AT THE REGION AND STATE LEVEL

4.2.1 In the event that an emergency affects several local areas, a Region Emergency Management Committee (REMC) will meet to discuss recovery implications including the need for a Region Recovery Committee. This is conveyed in the first instance to the SEOCON for confirmation with the SERCON.

4.2.2 In the event of an emergency which affects multiple Regions, or is of state or national consequence, or where complex, long term recovery and reconstruction is required, it may be necessary to establish a State Recovery Committee and the appointment of a State Recovery Coordinator.

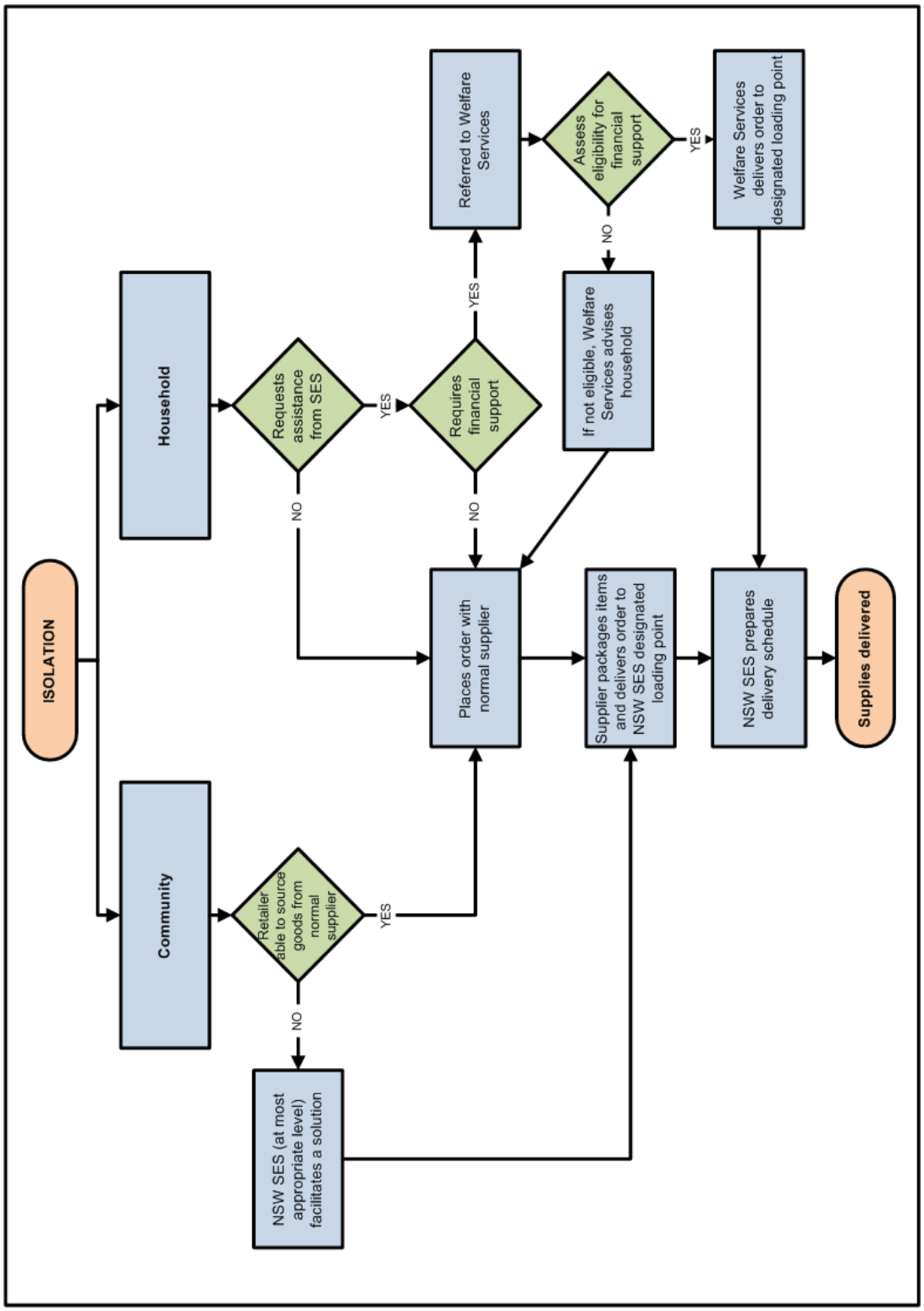
4.3 ARRANGEMENTS FOR DEBRIEFS / AFTER ACTION REVIEWS

4.3.1 As soon as possible after flood response operations have concluded, the NSW SES Cowra Local Commander will advise participating organisations of arrangements for an After Action Review (AAR).

4.3.2 The NSW SES Cowra Local Commander will ensure that adequate arrangements are in place to record details of the AAR and each item requiring further action is delegated to an organisation or individual to implement.

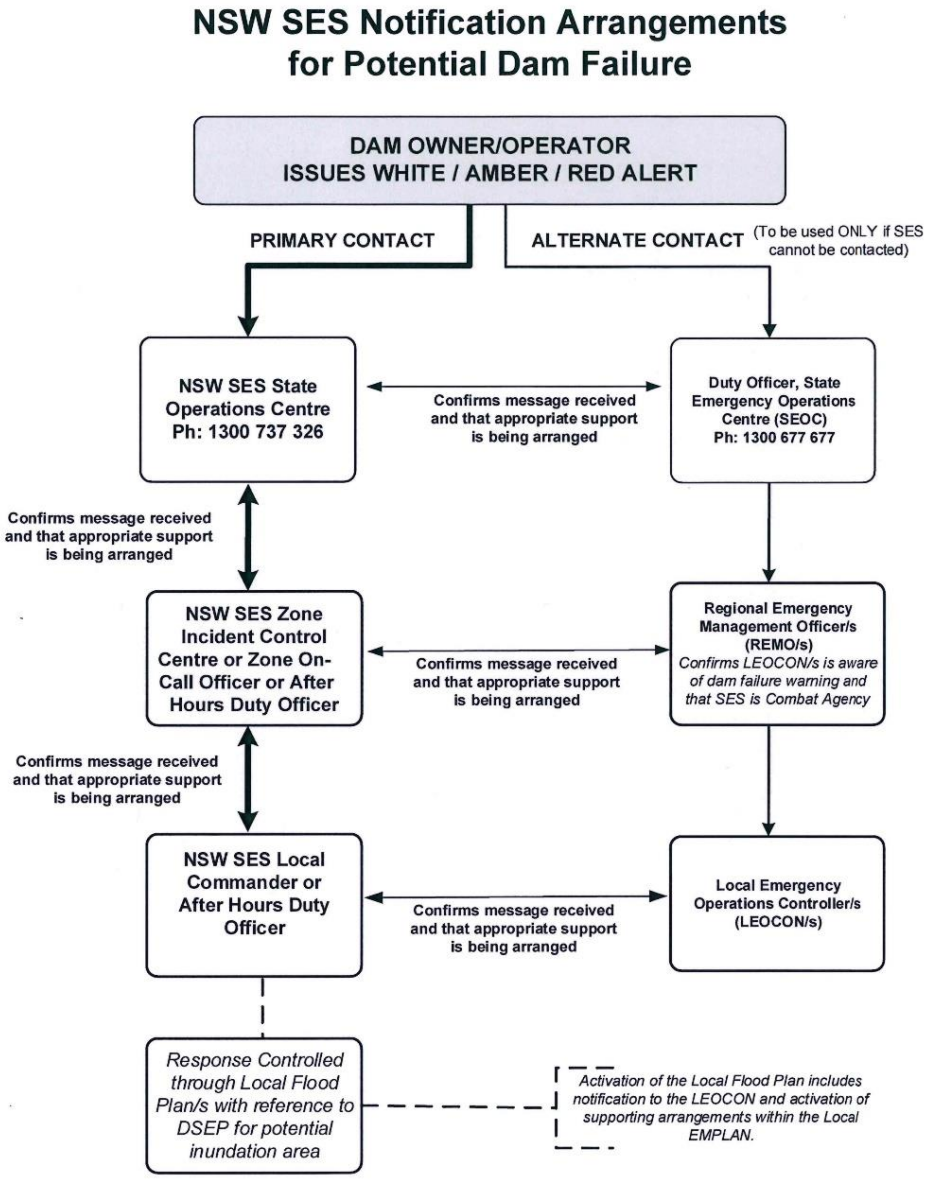
4.3.3 Follow-up to ensure the satisfactory completion of these actions will be undertaken by the Cowra Local Emergency Management Committee.

ATTACHMENT 1 - RESUPPLY FLOWCHART



Please Note: **The chart outlines the resupply process, but does not encompass all potential situations and outcomes.**

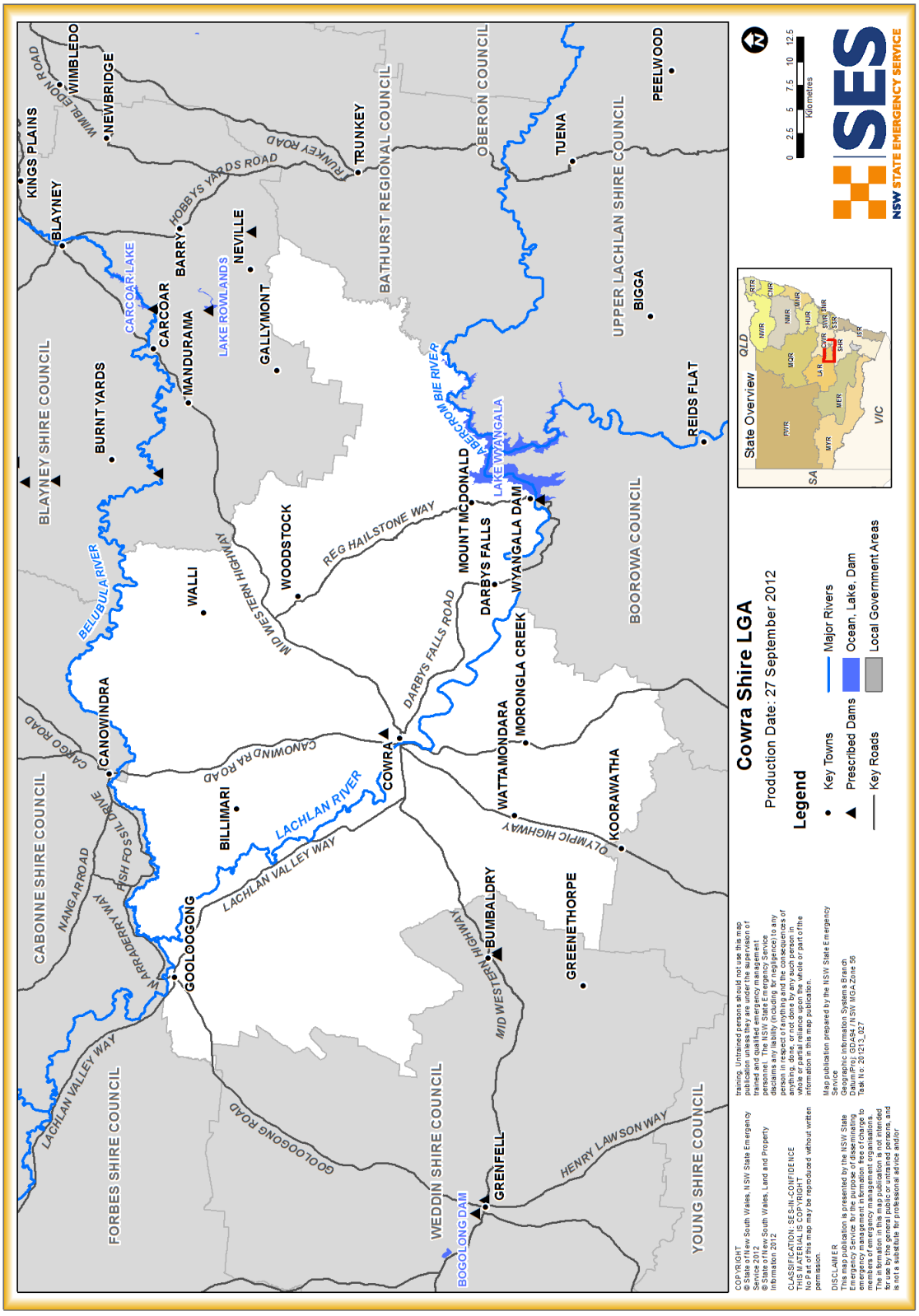
ATTACHMENT 2 - DAM FAILURE ALERT NOTIFICATION ARRANGEMENTS FLOWCHART



NOTES: (As at 1 May 2019)

1. Dam owners should only contact the SEOC if the NSW SES State Operations Centre (SOC) cannot be contacted.
2. The first priority for notification is to contact the NSW SES State Operations Centre. If unavailable, contact the SEOC. At each level, the contacted agency should notify the alternate contact at the same level, before making contact further down the line.
3. The triple zero (000) number for emergency services should only be used if both the NSW SES and the SEOC cannot be contacted, as it is likely the triple zero (000) operators will have difficulty dealing with the very unusual case of potential or actual dam failure.
4. Dam owners should send their Draft DSEP to the NSW SES for review of the emergency management arrangements (nswses.communityplanning@ses.nsw.gov.au).

ATTACHMENT 3 - COWRA SHIRE COUNCIL LGA MAP



NSW STATE EMERGENCY SERVICE

Cowra Shire

Local Flood Plan

FloodSafe

NSW STATE EMERGENCY SERVICE

HAZARD AND RISK IN COWRA SHIRE

Volume 2 of the Cowra Shire Local Flood Plan

Last Update: August 2017

FloodSafe

AUTHORISATION

The Hazard and Risk in Cowra Shire has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process. The information contained herein has been compiled from the latest available technical studies.

Approved

Manager Emergency Risk Management

Date: 2-8-17

Approved

NSW SES Lachlan Region Controller

Date: 31.07.17

Tabled at LEMC Date: 12 September 2017

CONTENTS

LIST OF TABLES

LIST OF FIGURES

VERSION LIST

The following table lists all previously approved versions of this Volume.

Description	Date
Cowra Shire Local Flood Plan – Annex A and Annex B	September 2001
Hazard and Risk in Cowra Shire – Volume 2	August 2016

AMENDMENT LIST

Suggestions for amendments to this Volume should be forwarded to:

The Cowra Local Controller

NSW State Emergency Service

55 Matthews Street, Parkes, NSW, 2870

Amendments promulgated in the amendments list below have been entered in this Volume.

Amendment Number	Description	Updated by	Date
1	Post flood update	E. O'Shannessy	20/02/2017

Document Issue: Version 3-02052016

1 THE FLOOD THREAT

1.1 OVERVIEW

The Lachlan River Valley

a. The Lachlan River Valley is located in the central western region of New South Wales, lying between the Macquarie and Murrumbidgee River Valleys. The valley covers an area of 84,700 square (sq) kilometres (km) as a long and narrow basin. The Lachlan River rises on the Breadalbane Plain to the east of Gunning and flows initially westwards. Near Gunning the river veers northwards for some 120 km until it is joined by a major tributary, the Crookwell River, which rises near Crookwell in the south-east of the valley. The river then flows northward for about 64 km before entering the storage of Wyangala Dam. Another major tributary, the Abercrombie River, enters the Wyangala Dam storage after draining rugged sections east of the Kanangra-Boyd National Park (1).

b. Below Wyangala Dam, the Lachlan River veers north-west. It is joined from the south by Hovell's Creek and the Boorowa River before it reaches Cowra. Downstream of Cowra the river enters a broadening valley and is met by two major tributaries, the Belubula River and Mandagery Creek, both of which drain the high country along the northern boundary. The river then flows to Forbes and assumes a more westerly course to Condobolin. On this reach the course is characterised by extensive meanders and swampy depressions. South of this section is Lake Cowal which is fed by a catchment of about 9,800 sq km which, during wet years, fills and overflows down its escape to the Lachlan River (1).

c. About 60 km downstream from Condobolin the river turns south westerly and flows through flat country for about 800 km before joining the Murrumbidgee River approximately 35 km downstream of Maude (1).

1.2 LANDFORMS AND RIVER SYSTEMS

a. The Lachlan River passes from a relatively high rainfall area near its headwaters in the east (annual average rainfalls of 760 to 900 millimetres) to low rainfall areas in the west (annual average rainfall of about 300 millimetres). Consequently, the upper tributaries produce most of the flood water generated in the valley. These tributaries include the Booroowa River (which enters from the south some 15 km downstream of Wyangala Dam), the Belubula River (which enters from the north just upstream of Gooloogong) and the Mandagery Creek (which enters from the north between Gooloogong and Forbes in the Forbes Shire). Tributaries along the middle and lower reaches contribute only a small proportion of water to the main stream except in the more severe localised events (1).

1.3 STORAGE DAMS

a. Dam locations are shown on Map 1.

b. The following tables summarise information about the prescribed dams in Cowra Shire LGA.

Table 1: Prescribed Dams in Cowra Shire LGA; summary of information about each storage.

Wyangala Dam (1)	
Owner / Operator	Water NSW
Description of Dam	The dam has a storage volume of 1,220,000 megalitres at Full Supply level (FSL) and is constructed from rock & earth fill. The dam has a gate controlled spillway. The dam drains a catchment area of 8,300 square km (2).
Location	Wyangala Dam is situated on the Lachlan River approximately 48 km upstream of Cowra, downstream of the junction of the Lachlan and Abercrombie Rivers and forms part of the eastern boundary of the Cowra Shire.
Communities Downstream	Communities downstream of this dam include the Cowra LGA and township, the villages of Gooloogong and Darbys Falls, the rural community of Mulyandry and the town of Forbes (2).
Monitoring System	The dam uses instruments to monitor the dam remotely as well as surveillance.
Warning System	A dam safety emergency plan exists to manage potential failure, with white, amber and red flood emergency triggers starting at 45440 ML passing (minor flood level in Cowra).
Other	Travel time from Wyangala to Cowra is approximately 7 hours. The persons at risk, exceeds 8000. These are located between Wyangala and Forbes, including Wyangala village, Gooloogong, the majority of Cowra and West Cowra and a large number of rural residents between the towns. Dam discharges of 40, 000 megalitres per day or greater will close the Cowra-Darby's Falls Road at the Darby's Falls Bridge over the Lachlan River to all traffic, approximately one kilometre East of Darby's Falls. Alternate route is available from the dam to Darby's Falls and Cowra via Woodstock.

Carcoar Dam (1)	
Owner / Operator	Water NSW
Description of Dam	The dam is a concrete arch dam with an ungated spillway along the entire length of the arch. The dam holds 35,800 megalitres at Full Supply Level (FSL) (3).
Location	Carcoar Dam is located on the headwaters of the Belubula River, 6 km upstream from Carcoar and 12 km downstream of Blayney (in the Blayney LGA) (3).
Communities Downstream	Carcoar (Blayney Shire LGA), Canowindra (Cabonne Shire LGA), Gooloogong (Cowra LGA). A PMF dam failure scenario is likely to inundate dwellings adjacent to the Belubula River.
Monitoring System	Dam monitoring systems are not known.
Warning System	A dam safety emergency plan exists to manage potential failure, with white, amber and red flood emergency triggers.
Other	The dam is located within the Central West Region in the Blayney Shire (3).

Valley View Detention Basin	
Owner / Operator	Cowra Council
Description of Dam	It is designed to store water up to a 1:100 year ARI rainfall event to reduce the impact of more frequent flood events, to a volume of 10.2 ML.
Location	Corner Comerford Street and London Drive, North Cowra.
Communities Downstream	North Cowra, of approximately 24 residences are potentially at risk of dam failure.
Monitoring System	Routine inspections are performed.
Warning System	A dam safety emergency plan exists to manage potential failure, with white, amber and red flood emergency triggers at the spillway, 0.8m below the crest and at crest level respectively.
Other	The dam wall is in close proximity to downstream dwellings and therefore there is likely to be little warning time available.

1.4 WEATHER SYSTEMS AND FLOODING

a. The majority of the rainfall in the Shire occurs during the winter and early spring and this is when flooding is most likely. Approximately three-quarters of the flood peaks above the minor flood level (8.5 metres), recorded at Cowra since 1950 have occurred between June and October as shown in Figure 1. Most of the more serious floods have occurred during the same months but the worst flood ever recorded at Cowra occurred in January (1).

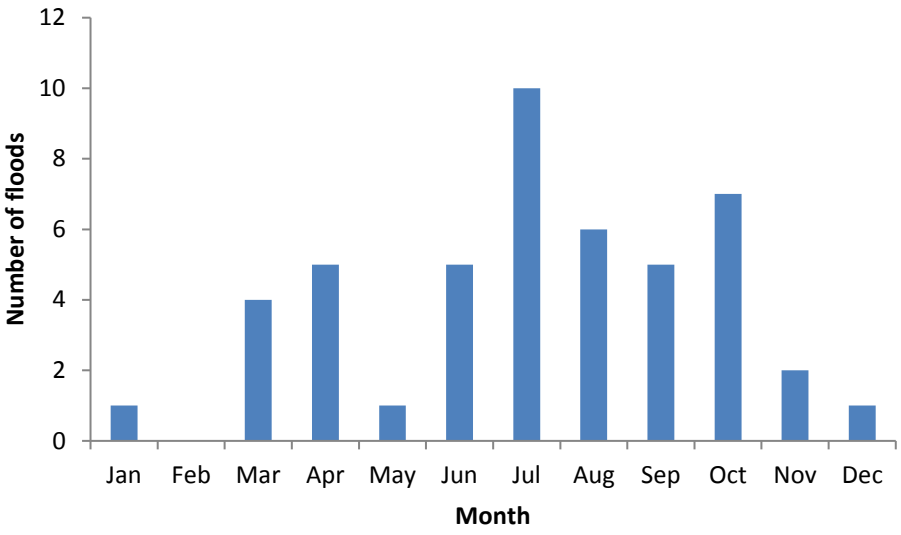


Figure 1: Flood Peaks above the Minor flood level (8.5 metres), recorded at the Cowra gauge (412002) from 1950 to 2016 by month (1).

b. A similar pattern of flooding has been recorded at the Nanami gauge, although slightly later in the year as shown in Figure 2. Since records commenced in 1970, over two thirds of the floods above minor flood level (7.4 metres) recorded at this gauge occurred between July and November, although again, some major floods have occurred earlier in the year including the most recent floods in December 2010 and March 2012 (1).

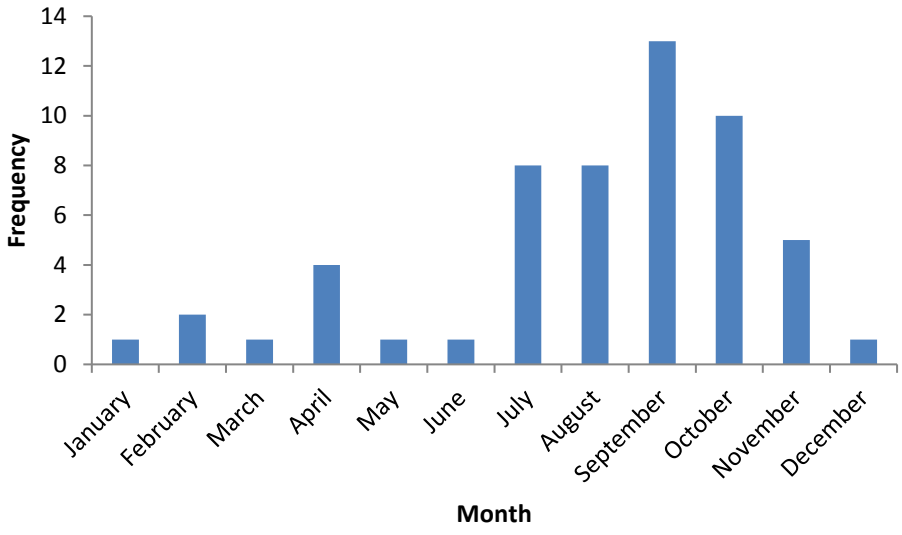


Figure 2: Flood Peaks above the Minor flood level (7.4 metres), recorded at the Nanami gauge (412057) from 1970 to 2016 by month (1)

c. Flooding in the Cowra Shire usually results from one of the following three mechanisms:

i. **Well-developed low-pressure troughs.** The most usual set of meteorological conditions causing flooding is a series of well-developed inland troughs associated with southern depressions crossing the council area from west to east. Sequences of such troughs can produce high rainfall totals over a period of weeks, usually in the winter months (1).

ii. **East coast low-pressure systems**. These systems develop off the State's coast, usually during the cooler months. They direct moist winds on to the coast and across the Great Dividing Range often producing very heavy rain (1).

iii. **Sequences of cold fronts**. Fronts crossing the State from west to east, can produce flooding in the Lachlan River catchment during the winter months. The individual fronts are not usually associated with very heavy falls but the cumulative effect of a series of them over a period of a few weeks may result in flooding (1).

d. The flood of October 1996 is believed to have been caused by an ex-tropical cyclone which travelled across from Western Australia (1).

1.5 CHARACTERISTICS OF FLOODING

a. Flooding on the Lachlan River is highly variable depending on where the rainfall has occurred in the catchment and which water courses are affected. A number of factors contribute to the peak flows and their probability of occurrence at Cowra including:

i. The flood inflow to Wyangala Dam.

ii. The storage level of the dam at the commencement of the flood.

iii. Flood flows from the tributary streams between the dam and Cowra.

iv. Local overland flooding occurring in the catchment area.

v. The temporary storage of floodwaters in the Lachlan River floodplain (4).

b. Upstream of Cowra, flooding is generally confined to the narrow river basin and small areas of adjacent floodplain. Flood peaks travel rapidly along this section of the river. In the vicinity of Cowra, the river flows out of the slopes and onto the plains. Immediately downstream of Cowra, inundation of low-lying areas occurs with flood waters tending to subside reasonably quickly, except in the more severe events (1).

c. At Cowra, breakouts usually occur from the channel of the Lachlan River onto the left (western) floodplain during moderate flood events. This flow is conveyed across the floodplain via two flood runners. Overbank flows into the first of these flood runners commence at a location just downstream of the railway bridge and are conveyed through the Golf Course, running parallel with the main channel. This runner is

known as the "left bank runner" (5). It then crosses the Mid-Western Highway (HW6) at a low spot between the Olympic Highway (HW78) and Bramall Street. In more severe events, a flood runner will eventually develop between a breakout at the showground and the flow from the Golf Course which then traverses the floodplain before re-entering the channel further downstream (1).

d. The second flood runner commences near Lyall Street and is known as "the far left bank runner" (5). It crosses Edgell Park in west Cowra and the Cowra-Grenfell Road in a low spot to the west of William Street, before re-joining the first flood runner near Commelia Road. This flood runner tends to operate only in major flood events (1).

e. Water also breaks the right (eastern) bank at the northern end of the Cowra Van Park. It then flows into the lower parts of Vaux Street, then under the eastern end of the main bridge and then into the Redfern Street area (1).

f. By the time the river reaches Gooloogong, a progressive reduction in main channel capacity has already begun. Significant overbank spillage occurs and flood waters begin to spread over wide areas of floodplain. Some of this water finds its way into natural depressions and billabongs, which interconnect and form active flood runners. Flooding can be made significantly worse here by inflow from the Belubula River and these floodwaters move across its floodplains even during moderate flood flows (1).

g. During the 1952 event, most of the flood flow was conveyed in the Lachlan River and its floodplain along the northern side of Gooloogong. However, it is likely that flood waters from the main river backed up Kangarooby Creek, which joins the Lachlan River about one kilometre upstream of the township. Together with local catchment flows, this creek run-off crossed East Street and flowed through the racecourse before re-joining the river downstream of Gooloogong. Flood waters may also inundate the left (western) floodplain between the Lachlan River and Main Street, Gooloogong and extend over the Lachlan Valley Way (MR56), west of Bank Street (1).

h. During major flooding, some of the flow approaching the Nanami gauging station escapes over the left bank and bypasses the gauge (1) (5).

i. Travel times are summarised in Table 2.

Table 2: Indicative flow travel time for the Lachlan River (1), depending on the releases from the dam and inflows from Prossers Crossing

Locations	Travel Time
Wyangala Dam to Cowra	8 to 12 hours
Cowra to Gooloogong	12-21 hours
Gooloogong to the Nanami gauge	1 hour

1.6 FLOOD HISTORY

1.6.1 Cowra

a. Flooding in the Cowra Shire is historically irregular. There have been long periods without floods, and in other periods, there may be several separate floods over a few weeks or months. For example, in 1950, there were seven separate peaks between March and October and in 1990 with five separate peaks between April and August (1).

b. Recording of river levels at the gauge on the road bridge at Cowra commenced in 1892. From archival information, dates and heights were established for several floods which occurred before this time, the earliest being on 1 January 1870. This flood reached a height of 15.93 metres and is thought to have approximated the 0.5% Annual Exceedance Probability (AEP). A slightly lower flood was recorded at 15.44 metres on 5 October 1916 (4) (1).

c. The most significant historical event in recent times is the June 1952 event which reached 15.24 metres on the Cowra gauge. This flood is estimated to have had an AEP of 1% (4). It inundated large areas of west Cowra and a number of businesses and residences in east Cowra. A number of rural residents on the outskirts of Cowra were isolated by this flood and most access roads to the town were closed (1).

d. Since the completion of Wyangala Dam in 1971, the highest flood recorded reached 13.46 metres on 6 September 1974. This flood inundated many businesses and properties in east Cowra although the effects on properties in west Cowra were less severe than the 1952 flood. Since 1974, there has not been a flood recorded above the major flood classification of 13.40 metres at the Cowra gauge; however some have come close with the flood of August 1990 reaching a similar gauge height of 13.32 metres (1). In the 1990 flood, the floodwater had one metre clearance under the main Cowra bridge, with the bridge approaches cut and within a metre of inundating the Visitor Information Centre (6).

e. Floods in 2010 and 2012 were less severe than previous major floods, but highlighted the issues of flooding for the Cowra community. These floods reached 12.3 meters (2012) and 11.95 meters (2010) at the Cowra gauge. The December 2010 flood at Gooloogong had an equivalent AEP of about 33% (or on average once every three years), whilst the March 2012 flood had an equivalent AEP of about 25% (or on average once every four years) (4).

f. Floods in September 2016 reached minor and moderate levels. During these consecutive floods, Lachlan Valley Way was flooded for over a month. Although detours were available, they were lengthy. A large amount of rural farmland was inundated for several weeks and several properties in Cowra and North Logan were isolated, with one in Cowra requiring resupply. Doorknocking of residents in low

lying parts of Cowra on the Lachlan River and Back Creek occurred, however only Cowra Caravan Park was issued with an evacuation warning and vans relocated to higher ground within the park. Both peaks in 2016 were sustained for over 24 hours (6).

1.6.2 Gooloogong

a. The highest flood on record at Nanami gauge reached 13.02 metres on 7 September 1974 (1). This event flooded properties fronting Main Street (Lachlan Valley Way) as well as residences on the western side of town. The town was also completely isolated by flood waters (1).

b. Since the installation of the Nanami gauge 11 km downstream of Gooloogong in 1970, flooding has been frequent with only 12 years in which no flooding above the minor flood level (7.40 metres) occurred. In some years, several separate floods above minor level have occurred in a period of weeks or months as in 1974 when six separate peaks occurred between May and October and in 1990 with six separate peaks between April and August (1).

c. During the 1990 floods, a height of 12.97 metres was reached on 4 August. This flood is estimated to be a 5% AEP (or once in 20 years) event in Gooloogong (1).

d. The 2010 and 2012 flood events reached heights of 10.973 meters and 11.538 meters respectively, but there was no impact on the village or infrastructure, other than a number of roads inundated (4).

e. In 2016, two major peaks occurred at Nanami (table 3). Refer to 1.6.1f for impacts of these flood events.

Table 3: Flood history above Major at Nanami Gauge (412057 - 10.7 Metres) and Cowra (412002 - 13.4 metres)

Date	Peak Height (m) at Nanami	Peak Height (m) at Cowra
01/01/1870		15.93
05/10/1916		15.44
22/06/1925		14.17
21/10/1950		13.47
17/06/1952		15.24
21/07/1974	11.36	
01/09/1974	11.15	
06/09/1974		13.46
07/09/1974	13.02	
27/10/1975	10.71	
20/10/1976	11.34	
10/09/1978	10.96	
30/07/1984	11.04	
21/09/1986	10.74	
16/04/1989	11.02	

Date	Peak Height (m) at Nanami	Peak Height (m) at Cowra
23/04/1990	11.64	
08/07/1990	11.27	
04/08/1990	12.97	
07/08/1990	11.84	
20/10/1996	11.36	
10/12/2010		11.95
12/12/2010	10.97	
05/03/2012		12.3
04/03/2012	11.45	
07/03/2012	11.54	
06/09/2016	11.15	
24/09/2016	11.86	

1.7 FLOOD MITIGATION SYSTEMS

a. There are no flood mitigation levees within the Cowra Shire LGA.

b. Refer to section 1.3 regarding Valley View Detention Basin, North Cowra.

c. In addition to the prescribed dams listed in 1.3, Cowra Council operate a number of smaller dams and detention basins. These are referred to as Hartley, Kollas, NCP, Arboretum, London 1 and 2, Pridham, Evans Street, SoilCon and Gower Hardy Circuit. The number of affected properties in dam break scenarios for NCP, Arboretum, London Drive 1 and 2 and SoilCon dams vary between 14 and 62, and potentially includes a school and industrial lots. The remaining basins have zero or less than five affected properties under dam break scenario. As at August 2016, these dams were yet to be included as prescribed dams by the Dams Safety Committee and do not have any warning systems in place (6).

d. Wyangala Dam is a major feature of the Lachlan River system, providing a significant storage for irrigation water for the lower Lachlan Valley. It does not, however, allow for any significant flood storage or flood mitigation capacity within its design or general operating procedures (5).

1.8 EXTREME FLOODING

a. The worst floods ever recorded in the Cowra Shire since European settlement should not be considered to be the most serious that will ever occur. It is possible for events exceeding the magnitude of flooding experienced in recorded history, however such flooding occurs very rarely. These events would inundate a significant amount of residences, streets and facilities and would be expected to have flood heights higher, faster rise times and be more dangerous because of the increased depth and velocity of the floodwaters (1).

b. The 1870 Flood of Record at Cowra (15.93 metres) is estimated to be approximately only a 0.5% AEP event (or once in 200 years) event (4).

c. For planning to be capable of being effective in all circumstances, it must take into account the worst floods that could occur. Information about the full range of possible flooding is obtained from studies. The greatest depth of rainfall possible over a given area in a nominated time period (e.g. 24 hours or 72 hours) is called the Probable Maximum Precipitation (PMP). The highest possible flood level is called the probable maximum flood (PMF).

d. Rainfall heavy enough to support the idea of PMP has been observed in various places around the world including Australia (Wollongong 1984 – 440 millimetres in six hours over a 100 square kilometre area). Flood records from around the world demonstrate that PMF events have occurred.

2 EFFECTS ON THE COMMUNITY

2.1 COMMUNITY PROFILE

Table 4: Census of Housing and Population data (2011)

Census Description	Cowra (LGA)	Cowra	Gooloogong
Total Persons	**12,147**	**9,473**	**295**
Aged 0-4 yrs	669	548	19
Aged 5-14 yrs	1,638	1,291	41
Aged 65 + yrs	2,643	2,118	71
Of Indigenous Origin	794	720	13
Who do not speak English well	20	18	-
Have a need for assistance (profound/severe disability)	804	652	-
Living alone (Total)	1,460	1,184	43
Living alone (Aged 65+)	691	576	-
Residing in caravans, cabins or houseboats or improvised dwellings	41	24	-
Occupied Private Dwellings (Households)	**4,743**	**3,694**	**129**
No Motor Vehicle	386	354	-
Caravan, cabin, houseboat or improvised dwell	23	25	-
Rented via State or Housing Authority	170	179	-
Rented via Housing Co-Op or Community Church Group	36	36	-
No Internet Connection	1,630	1,313	-
Unoccupied Private Dwellings	**815**	**442**	**14**
Average persons per occup dwelling	**2.3**	**2.3**	**2.3**
Average vehicles per occup dwelling	**1.7**	**1.6**	**1.8**

SPECIFIC RISK AREAS - FLOOD

The Lachlan River Basin Valley

2.2 COWRA

2.2.1 Community Overview

a. The town of Cowra is located on the Lachlan River, downstream of the Wyangala Dam and has a population of approximately 9730 people with a mean age of 44 years (1) (7). Demographics are listed in Table 4, which indicates a large number of persons with a disability, people living alone and people aged over 65 who may require special assistance during an emergency (7).

b. There is a large proportion of agricultural land surrounding the town (5).

2.2.2 Characteristics of flooding

a. Cowra is predominantly affected by riverine flooding from the Lachlan River (4).

b. The Lachlan River at Cowra tends to progress to more open floodplains with consequential widespread and slow moving flood waters (1).

c. The floodplain of the river has largely been preserved as open space in the form of a golf course, parks, the racecourse and showground (1). The depth of floodwater can become deep in these areas, for example the flooding on the showground during the 1952 flood reached 2.7 metres deep (1).

2.2.3 Flood Behaviour

a. Flooding on the Lachlan River is highly variable depending on where the rainfall has occurred in the catchment, the inflow to and storage in Wyangala Dam and which water courses are affected (refer to section 1.5) (4).

b. Immediately downstream of Cowra, inundation of low-lying areas occurs with flood waters tending to subside reasonably quickly, except in the more severe events (1).

c. At Cowra, breakouts usually occur from the channel of the Lachlan River onto the left (western) floodplain during moderate flood events. This flow is conveyed across the floodplain via two flood runners. Overbank flows into the first of these flood runners commence at a location just downstream of the railway bridge and are conveyed through the Golf Course, running parallel with the main channel. It then crosses the Mid-Western Highway (HW6) at a low spot between the Olympic Highway (HW78) and Bramall Street (1).

d. In more severe events, a flood runner will eventually develop between a breakout at the showground and the flow from the Golf Course which then traverses the floodplain before re-entering the channel further downstream (1).

e. A second flood runner commences near Lyall Street. It crosses Edgell Park in west Cowra and the Cowra-Grenfell Road in a low spot to the west of William Street, before re-joining the first flood runner near Commelia Road. This flood runner tends to operate only in major flood events (1).

f. Water also breaks the right (eastern) bank at the northern end of the Cowra Van Park. It then flows into the lower parts of Vaux Street, then under the eastern end of the main bridge and into the Redfern Street area. (1).

2.2.4 Classification of Floodplain

a. Cowra has rising road access.

b. Parts of Cowra west may become a low flood island from 13.4 metres.

c. Rural properties toward Billimari may become high flood islands.

2.2.5 Inundation

a. Cowra gauge (412002) provides warning for the Cowra village, with minor, moderate and major flood classification levels at 8.5, 10.7 and 13.4 metres respectively. There is a second telemetered stream gauge located 100 metres downstream of the manual gauge, which reads coincident flooding approximately 150 millimetres below the manual gauge due to their distance apart as demonstrated in the 2010 and 2012 floods (4).

b. Most of the town is on elevated country and is unaffected by minor flooding, with the exception of several roads closing (listed in section 2.4). A number of sections of the community are affected by moderate and major flooding. Large areas of west Cowra and a number of businesses and residences in east Cowra in the vicinity of Lachlan and Kendall Streets have flooded historically (4). These effects are described below.

c. There are a number of campsites along the Lachlan River, in 2016 some of these sites had around 1.5 metres of water over it (6).

Moderate flooding (10.7 to 13.4 metres)

i. Between 12.0 and 12.6 metres, the shops at the Riverside Markets (now used for storage) on Taragala Street (sandbagged in 2016), the Butchers shop and two to three houses along Taragala and Courallie Streets are at risk of inundation (1).

ii. A number of businesses in Vaux and Lachlan Streets may be inundated at gauge heights between 13.0 and 13.3 metres, as well as four flats in Lachlan Street (approximately 10 people) (1). The Visitor's Centre and McDonalds Restaurant on the corner of the Mid-Western and Olympic Highways may be inundated or surrounded by flood water from the flood runner that forms

between the breakouts at the Golf Course and the club house at the tennis courts when heights of 13.3 metres and above are reached (1).

iii. Approximately eight houses in Wellington Street, Grenfell Road, Comerford Street, Echuca Place, Kite Street and Lee Street are at risk of flooding from overland flow (4).

Major flooding (13.4 metres and above)

i. Approximately eight houses on Waugoola Creek near the Mid-Western Highway (incorporating residences on Campbell Street, Day Street, Main Street and Pack Street) may be inundated if peaks of 13.4 metres or higher are reached (1).

ii. In West Cowra, several properties are at risk of inundation above floor near the intersection of Canimbla Road and Gurney Road around 14 metres; these are isolated at earlier heights of 13.4 metres (4).

iii. A number of areas in Cowra are inundated by the 1% AEP flood (approximately 15.24 metres) or in floods similar to the 1952 flood (15.2 metres). It is estimated that 69 dwellings and 85 properties will be inundated in Cowra and 6 dwellings and 10 properties in West Cowra will be inundated by this height (5). Other estimates have indicated that up to 57 homes in West Cowra may be inundated as a consequence of drains and creeks in the area, with approximately 200 people in areas adjoining West Cowra Drain, low lying areas along Taragala Street and West Cowra Residential areas. This includes properties in Cowra-Young Road (Olympic Way), the Cowra-Grenfell Road (Mid Western Highway), Grenfell Road, Young Road, River Park Road, Cowra Road, William, Bramall, Shelley, Lyall, Hassan (including the 'Olive Groves'), Walker, Waratah, Courallie, Taragala, Haig, Vaux, Lachlan, Kendal and Commelia streets, Showground Lane and Ribands Way. Flood water can exceed window sill depth by this height. Up to 16 business premises located in this area may also be inundated by flood waters (1).

iv. More severe events than the 1952 flood are possible, with consequences currently not recorded.

2.2.6 Isolation

a. Residents and businesses along North Logan Road to Billimari, may become isolated (approximately six) from 12 metres (a moderate flood). Generally, in a major flood (13.4 metres and above), this road is inundated in a number of places including a section of road 7 km long commencing approximately 5 km from Cowra and Back Creek Road and Canimbla Road, west of Cowra (1).

b. In a moderate flood, around 12.3 metres, North Logan Road will be inundated by floodwater at a distance of about 10 km west of Cowra. This road is then subject to

long duration riverine flooding, with residents identifying flooding can occur for over four weeks (8) (4). It is the alternative route to the Lachlan Valley Way between Cowra and Gooloogong.

c. The effects of flooding on the western side of the main traffic bridge (Mid-Western Highway) are unknown since the completion of road works to raise the bridge and its approaches following the September 1974 event. There is a possibility that water from the break outs from the Visitor's Centre and behind the tennis courts may meet and close this section of the road at any time after heights of 13.46 metres on the Cowra gauge are reached. This would effectively cut all vehicular access between east and west Cowra. If this occurs, access to the Cowra Aerodrome, the Cowra SES Local Headquarters, the Cowra Ambulance Station and numerous residential properties and businesses in west Cowra would be lost (1).

d. In a major flood, the two parts of the town have historically been separated and the approaches to the highway bridge across the river can be covered by water for a distance of approximately 500 metres to a depth of up to two metres (4). Around 15.2 metres, the Ambulance Station in Shelley Street will become inaccessible by vehicle (1), rural residents on the outskirts of Cowra woud be isolated and most access roads to the town closed (1).

2.2.7 Flood Mitigation Systems

a. Refer to section 1.3 for information on Valley View Detention Basin, which has 24 dwellings in north Cowra at risk of inundation in failure circumstances.

b. Refer to section 1.7 which identifies a number of additional basins.

2.2.8 Dams

a. Wyangala Dam "Sunny Day" failure flood wave is estimated to reach Wyangala Village immediately and the Cowra township in seven hours (2) (refer to Section 1.3).

b. Depending on initial storage contents the dam can have a significant effect on flood flows at Cowra. Prior to the December 2010 flood (12.137 metres at the Cowra gauge), the dam was at a low level and stored all of the incoming flow. The flood peak at Cowra was based on high flows in the Boorowa River. Prior to the March 2012 flood (11.798 metres on the gauge) the dam was at a higher level and it released a substantial proportion of the inflow. Contributions from the Boorowa River to the flood peak were much less than in December 2010 (4).

2.2.9 At Risk Facilities

a. The facilities that are at risk of flooding and/or isolation within the Cowra LGA such as infrastructure and caravan parks are shown in Annex 2. This includes:

   i. The Ambulance Station from around 15.24 metres (10).

ii. The Cowra Van Park in Lachlan Street which may become inundated from around 12 metres on the Cowra gauge (1).

iii. The Visitor's Centre and McDonalds Restaurant on the corner of the Olympic Highway (HW78) may be isolated and possibly inundated from floods greater than 13.3 metres on the Cowra gauge (1).

iv. The Cowra Hotel and Australian Hotel from around 15.24 metres (10).

v. The Pioneer Concrete Batching plant near Waugoola Creek (1).

vi. Canimbla School House is at risk in floods from around 12 metres on the Cowra gauge (1).

vii. The Sewerage Treatment (pond 3) may be inundated from 15.9 metres.

2.2.10 Other Considerations

a. Cowra Show is held on the Cowra showground in mid-September, Wine Show in August, Festival of International Understanding in March and regular campdrafts, increasing the population substantially.

2.3 GOOLOOGONG

2.3.1 Community Overview

a. The village of Gooloogong is situated on the left bank of the Lachlan River, about 9 km downstream of its confluence with the Belubula River. It has a population of approximately 295 people (1). There are about 150 private dwellings in this community. Demographics are summarised in Table 4.

b. There are no identified communities with special needs that would be impacted by flooding in the Gooloogong village (7).

c. There are a large number of rural dwellings and agricultural properties in the area.

2.3.2 Characteristics of Flooding

a. Gooloogong is predominantly affected by riverine flooding from the Lachlan River (4) and Kangarooby Creek. The floodplain is wide and predominantly flat.

b. Rates of rise have historically been recorded at around 0.3 metres/hour, with early stages of flooding around 0.5 metres/hour (4).

2.3.3 Flood Behaviour

a. The Nanami Gauge (Gauge No 412057) is located on the Lachlan River about 11 km downstream of the Gooloogong village. It was established in 1958 and replaced a gauge at the Lachlan River bridge north of Gooloogong (4). There is limited information that establishes gauge heights to design flood heights for the Nanami gauge.

b. Key features of the flood behaviour at Gooloogong are (with reference to the Nanami Gauge):

   i. In the *5%* AEP flood event (approximately 13 metres), the floodplain is inundated up to Main Street and floodwaters extend over the Lachlan Valley Way (MR56) west of Bank Street (4).

   ii. Peak water levels in the 2% AEP flood event (approximately 14 metres at Nanami) are around 0.7 metres higher than for the *5%* AEP event (4).

   iii. For the 1% AEP flood event (approximately 16 metres), peak water levels are estimated to be around 16.0 metres at the Nanami gauge, which is 1 to 1.2 metres higher than for the *5%* AEP event (4).

   iv. In an extreme event, the water level is estimated to be around 3 to 3.5 metres above that of the 1% AEP event (5) (4).

   v. Backwater flooding extended about one kilometre upstream of the Lachlan Valley Way (MR56) along Kangarooby Creek during the December 2010 flood (4).

2.3.4 Classification of Floodplain

a. Rising road access to around 12 metres, thereafter becoming a high flood island.

2.3.5 Inundation

a. This community uses the Nanami gauge (412057) for flood warning. It has minor, moderate and major flood classifications of 7.4, 9.7 and 10.7 metres respectively.

b. No existing residential development in the village was impacted by either the December 2010, March 2012 and September 2016 floods (which reached 10.9, 11.5, 11.86 metres at Nanami gauge respectively). However water came close to inundating property located along the northern side of Main Street (Lachlan Valley Way (MR56)) near its intersection with Nanama Road during the 2012 event (4).

c. From around 11.0 meters on the Nanami gauge, water inundates the caravan park (1).

d. In a 2% AEP flood (approximately 14.0 metres at Nanami), Main Street is inundated between East and Bank Streets and two properties on the river side of Main Street between King and East Streets are flooded (4).

e. At approximately 14.6 metres on the Nanami gauge, water will begin to enter the Log Cabin Hall (1).

f. At 15.2 metres on the Nanami gauge, the old Post Office (now a private residence) will be inundated (1).

g. At around 16.0 metres, approximately a 1% AEP flood, Main Street, Gooloogong may be inundated between East and Bank streets and water enters one dwelling and 15 properties on the river side of Main Street (5). Other estimates indicate that around 16 metres, all of the properties on the river side of Main Street may be flooded and there are several more which may be flooded on the landward side of Main Street between King and East streets, equivalent to approximately 23 residential and eight public and commercial properties, including the NSW SES Gooloogong Unit (1).

2.3.6 Isolation

a. A number of road closures occur during floods around Gooloogong, as listed in section 2.4.

b. The town may become isolated at any time after a gauge height of 12.2 metres (Nanami Gauge) is reached depending on the flows in local creeks. During the August 1990 flood (13.0 metres), Gooloogong was completely isolated for two days when the Lachlan Valley Way (SR56) was closed by Goonigal Creek, which crosses the road about 10 km northwest of the town (1). Gooloogong also became isolated in 2016 for approximately two days (as the Lachlan Valley Way was cut east and west,

Warraderry Way was cut north and south and Casurina Drive was cut) (flooded at 11.86 metres on the Nanami gauge) (12).

c. Access to properties in low-lying areas along the river may be lost (1).

2.3.7 Flood Mitigation Systems

a. There are no flood mitigation systems in Gooloogong.

2.3.8 Dams

a. Wyangala Dam "Sunny Day" failure flood wave is estimated to reach Gooloogong in 28 hours, potentially inundating the entire township (2) (refer to section 1.3).

2.3.9 At Risk Facilities

a. The facilities that are at risk of flooding and/or isolation within the Gooloogong village are listed in Annex 2, and includes the NSW SES Unit Headquarters, Log Cabin Hall, the caravan park, the Gooloogong Hotel and the Gooloogong Public School.

2.3.10 Other Considerations

a. The old "Holman" Bridge over the Lachlan river has been replaced (in 2015/2016), which is likely to impact of flood behaviour; however the implications are not yet known (6).

b. Gooloogong Country Classic is a sporting event in October each year, increasing the population by approximately 100. Markets at the log cabin also occur throughout the year on weekends, increasing the population by 50-60.

2.4 LOCALITIES OUTSIDE OF COWRA LGA

2.4.1 Community Overview

a. Koorawatha (Hilltop Shire LGA) is located on Olympic Highway, and surrounded by Crowther and Bang Bang Creek. It has a population of approximately 250 (9).

b. Paytens Bridge, Boxfield Road (Forbes Shire LGA) is a small rural locality of several farming properties, including a dairy. It is located to north west of Gooloogong on flat farming land adjacent to Goonigal Creek.

c. Southern side of Canowindra (in Cabonne Shire LGA) (including Bangaroo, Rivers Road and can include the southern side of the Canowindra township) is located on the Belubula River.

2.4.2 Characteristics of Flooding

a. There is little information available regarding the pattern of flooding and historic flood levels in these areas.

2.4.3 Flood Behaviour

a. Koorawatha can experience flash flooding from Crowther Creek/Back Creek, Cat Gully and Bang Bang Creek (6).

b. Boxfield Road can experience flash flooding from Goonigal Creek (12).

c. The Belubula River can rise very rapidly (6).

2.4.4 Classification of Floodplain

a. Insufficient information currently available.

2.4.5 Inundation

a. Koorawatha experienced inundation in 2012, including the school in the middle of the town (which were sandbagged in 2016) (6).

b. Inundation in Boxfield Road is not currently known, however in 2016 a property (with a private levee) was supplied with sandbags (12).

c. The southern part of Canowindra is very high and historically has not experienced inundation (12).

2.4.6 Isolation

a. Koorawatha is isolated from Young in flooding, access to Cowra is still available (6).

b. Boxfield Road can experience inundation over large parts of the road, isolating the residents in this area. This can last up for more than a week (12).

c. The southern side of Canowindra can become isolated from the Canowindra township when the Belubula River floods. Access is generally still available to Cowra (however Rivers Road only has 4WD access), but the residents can become cut off completely in more severe floods (12).

2.4.7 Flood Mitigation Systems

a. There are a number of rural and private levees, with design details unknown.

2.4.8 Dams

a. No consequences of dam failure are known.

2.4.9 At Risk Facilities

a. The facilities that are at risk of flooding and/or isolation within the Gooloogong village are listed in Annex 2, including Koorawatha School.

2.4.10 Other Considerations

a. These areas are outside the Cowra LGA, but during flooding the Gooloogong and Cowra Units respond to these communities.

ROAD CLOSURES AND ISOLATED COMMUNITIES

2.5 ROAD CLOSURES

a. As flood waters rise, a number of roads to and from Cowra will close. Whilst alternate routes are usually available, these often add significant travel times to normal journeys causing increasing disruption to the community as the flood progresses (1).

b. Table 5 lists roads liable to flooding in the Cowra LGA.

Table 5: Roads liable to flooding in the Cowra LGA relating to the Cowra and Nanami gauges as indicated (1).

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height (metres)
Cowra (relating to Cowra gauge)				
The Lachlan Valley Way (MR56)	Morongola Creek bridge (approximately 5 km south of Cowra)		Alternative access to Booroowa is available via the Olympic Highway (HW78) to Young	8.5
The Lachlan Valley Way (MR56)	Bulkhead Road, 2 km south of intersection with Mid-Western Hwy (HW6)		Access to Cowra for residents of the Vineyard Estate is available via Olympic Highway (HW78)	10.3 – 10.7
The Lachlan Valley Way (MR56)	Approx. 18 km from Cowra	Closed by Lachlan River water	Alternative access is available via Grenfell or Canowindra	10.3 – 10.7
The Lachlan Valley Way (MR56)	Leigh Street to Morongola Creek bridge	Disrupts access between Cowra and Boorowa	Alternate access for residents of the Vineyard Estate is still available via Olympic Way	11.9
Darbys Falls Road	Darbys Falls, Approx. 1 km from Cowra	Closed by Waugoola Creek	Alternative access is available via Woodstock	11.8
North Logan Road	Closed between 6 and 10 km from Cowra	Access reduced between Billimari and Cowra	Residents of properties along this road may have overland access to Cowra via the Canowindra Road either by vehicle or foot.	12.0 to 12.6

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height (metres)
Canowindra Road	Water will begin to fill the low level viaduct into the Redfern Street area, cutting access.	Access between Cowra and Canowindra reduced	The only alternate route to Canowindra is via Grenfell and Gooloogong	13.0 to 13.3
Olympic Highway (SR78)	Koorawatha by the Bang Bang Creek	Limits access to and from the south west of Cowra, for up to two days	Potentially via Bulkhead Road or Boundary Road.	If local rain occurs in conjunction with riverine flooding (1).
Mid-Western Highway (HW6) – however, this section of road was relocated to higher ground in 1996 (1).	Over Waugoola Creek. There is a possibility that water from the break outs near the Visitor's Centre and behind the tennis courts may meet and close this section of the road	Inhibits vehicular access to the Cowra Aerodrome, the Cowra SES Local Headquarters, the Cowra Ambulance Station and numerous residential properties and businesses in west Cowra.		Due to a backup in the Lachlan River. Generally at any time after heights of 13.46 metres on the Cowra gauge are reached (1).
Belubula Way	Multiple locations	Limits access to Mandurama	Alternate route via Canowindra Road	If local rain occurs in conjunction with riverine flooding (1).
George Russell Drive Canowindra	About 8 km south east of Canowindra	Disrupts route between Canowindra and Mid Western Highway	Alternate route via Canowindra Road	If local rain occurs in conjunction with riverine flooding (1).
Gooloogong (relating to Nanami gauge)				
The Lachlan Valley Way (MR56)	18 km southeast of Gooloogong	The locations on this section of the road that will close next are the bridge over the unnamed creek at Merranowry Hall and at Goodwin's/Pipeclay Swamp. NOTE: If the Kangarooby Creek is also in flood, it could also encroach upon the Lachlan Valley Way well before any Lachlan	Alternative access is available via Grenfell or Canowindra	9.1

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height (metres)
		River water causes road closures.		
The Lachlan Valley Way (MR56)	1km on the eastern side of the Kangarooby Creek bridge, southeast of Gooloogong	NOTE: This section of road may close at a slightly lower height if the Belubula River and the Kangarooby Creek are also in flood	Detours are available via Crown and Grenfell or Cowra and Canowindra	9.7
The Lachlan Valley Way (MR56)	10 km northwest of Gooloogong, cut by Goonigal Creek	Gooloogong becomes isolated	No	From approximately 12.2
Casuarina Drive	North of Gooloogong Bridge (Lachlan River) – in Cabonne LGA	Disrupts route between Gooloogong and Eugowra	Alternative access to Cowra may still be available via Grenfell or Canowindra	10.7
Warraderry Way	About 13 km northeast of Gooloogong – in Cabonne LGA		Depending on local rainfall conditions, a detour may be available via the Kangarooby Mountain Road for light vehicles only.	11.3
Paytens Bridge Road	Paytens Bridge across the Lachlan River, about 20 km northwest of Gooloogong – in Forbes LGA		Detours are available via Canowindra. Access to Eugowra is still available via Nanami	8.6
Settlement Bridge Road	At Settlement Bridge over the Belubula River	Disrupts route between Gooloogong and Canowindra	Warraderry Way	If local rain occurs in conjunction with riverine flooding (1).
Merriganowry Road	Bridge over Lachlan River	Billimari becomes isolated from Gooloogong and Canowindra	Canowindra Road to Cowra	If local rain occurs in conjunction with riverine flooding (1).

2.6 SUMMARY OF ISOLATED COMMUNITIES AND PROPERTIES

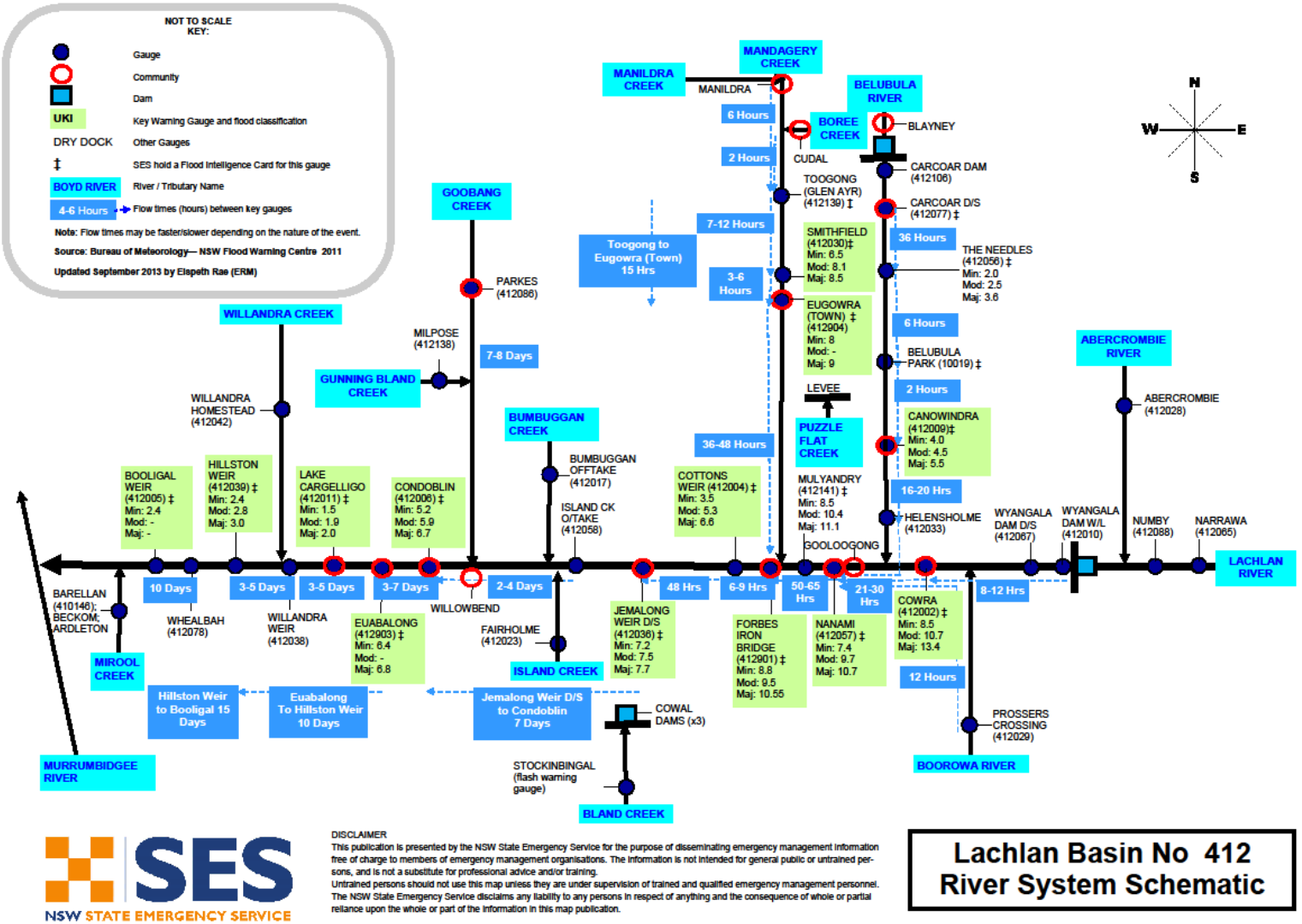
a. Table 6 lists communities liable to isolation and potential periods of isolation. Information presented here is based on historical and design events and does not reflect the duration of isolation expected in larger and extreme events.

Table 6: Potential Periods of Isolation for communities in the Cowra LGA during a Major flood.

Town / Area (River Basin)	Population/ Dwellings	Flood Affect Classification	Approximate period isolation	Days								NOTES
				1	2	3	4	5	6	7	8	
Gooloogong	Approx. Population in town is 295, with approximately 152 dwellings (7)	High Flood Island following closure of all access roads from 12.2 metres at Nanami	2-5 days									When floodwaters reach 12.2 m on Nanami gauge, resupply may be necessary.

Note: Periods of isolation are a guide only. Liaison with the Local Controller and communities/residents involved is essential during periods of potential and actual isolation.

ANNEX 1: LACHLAN RIVER BASIN SCHEMATIC

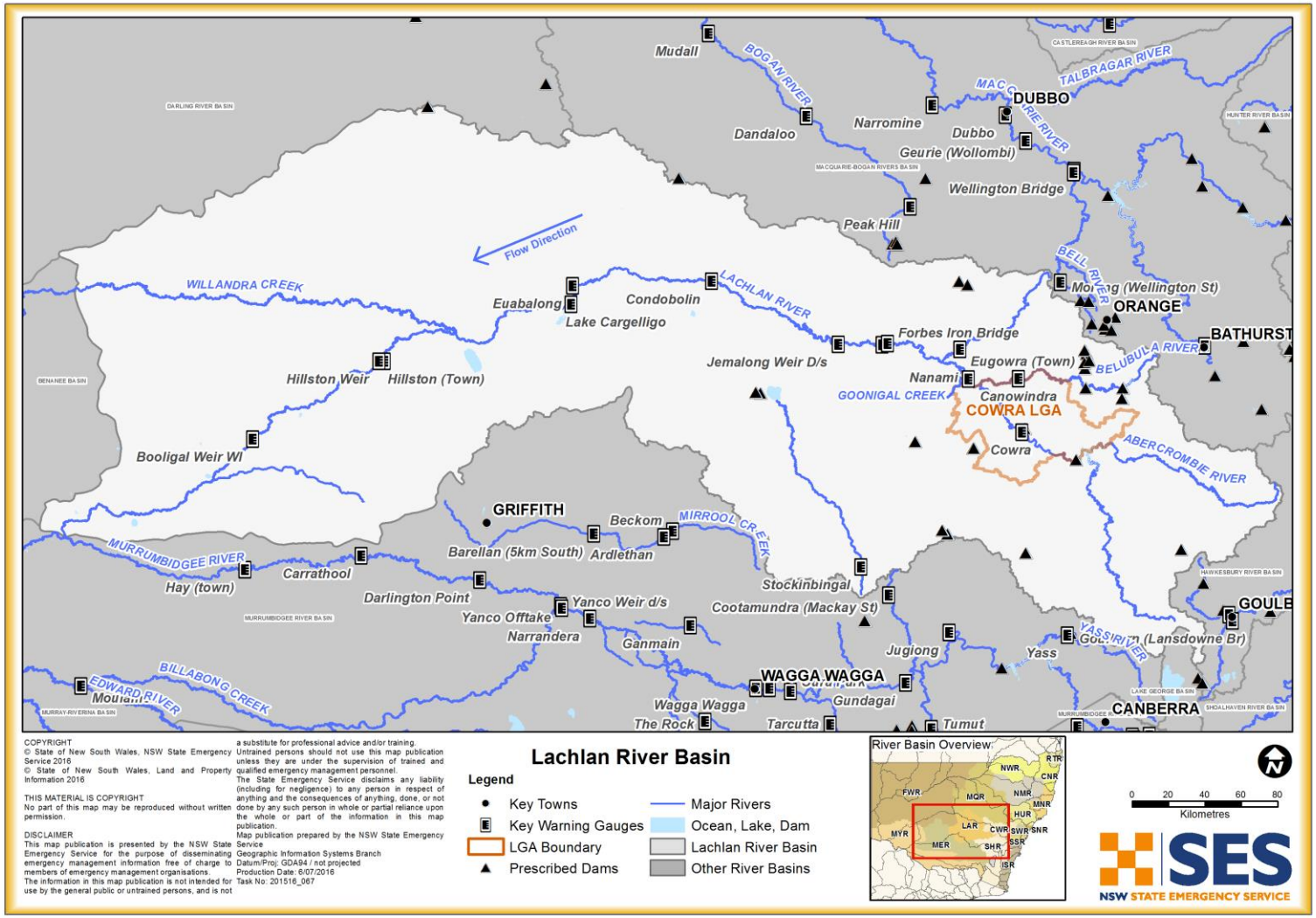


ANNEX 2: FACILITIES AT RISK OF FLOODING AND/OR ISOLATION

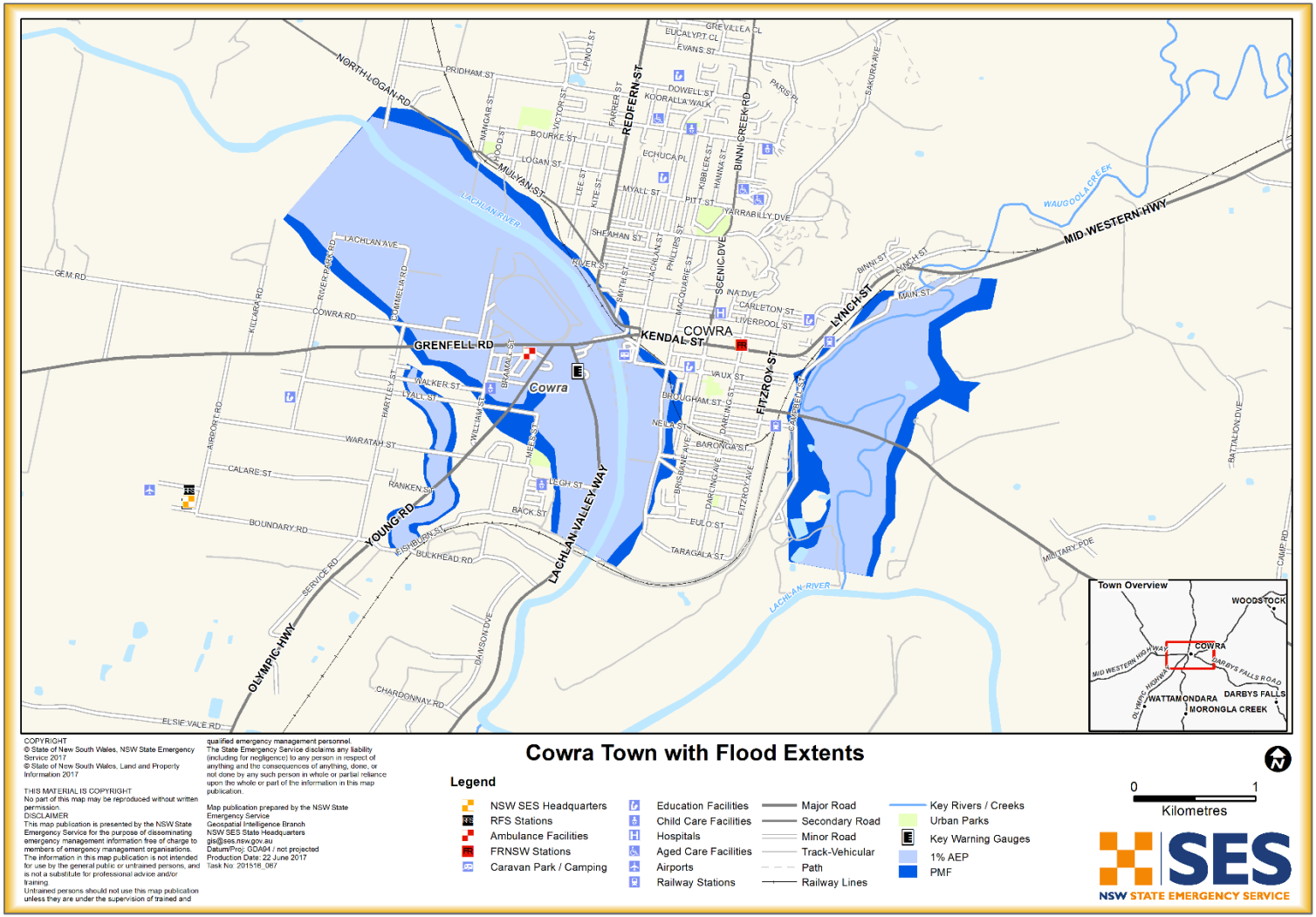
Lachlan River Valley

Facility Name	Street	Suburb	Comment
Schools			
Gooloogong Public School	King Street	Gooloogong	n/a
Koorawatha Public School	Crowther Street	Koorawatha	Located in Hilltop Shire LGA, with Cowra Unit as flood response
Child Care Centres			
Cowra Early Childhood Mobile Service	Williams Street	Cowra	Within the modelled flood extent
Cowra Early Childhood Mobile Service - Cowra	Morongla Show Hall – Boorowa Street	Cowra	Within the modelled flood extent
Cowra Early Childhood Mobile Service - Gooloogong	Gooloogong War Memorial Hall – Main Street	Gooloogong	Within the modelled flood extent
Nil			
Facilities for the aged and/or infirm			
Nil			
Utilities and infrastructure			
Visitor Information Centre & McDonalds Restaurant	Cnr Lachlan Valley Way (MR56) & Mid-Western Hwy (HW6)	West Cowra	Becomes isolated if flood height >13.4 m at the Cowra gauge (1).
Cowra Van park	Lachlan Street	Cowra	Tent sites inundated at a flood height > 11.5m and all vans > 12m at the Cowra gauge (1).
Gooloogong Caravan Park	Lachlan Valley Way (MR56)	Gooloogong	Will be flooded in a Major flood > 11.00 m.
Log Cabin Hall	Lachlan Valley Way (MR56)	Gooloogong	May have over ground flooding above 11.35m and over floor flooding above 14.6m on Nanami Gauge (1).
Sewerage Treatment (pond 3)	North Logan Road	Cowra	Inundated around 15.9 metres on the Cowra gauge
NSW SES Gooloogong Unit Headquarters	Main Street	Gooloogong	Inundated within a 1% AEP flood (approximately 16.0 metres)

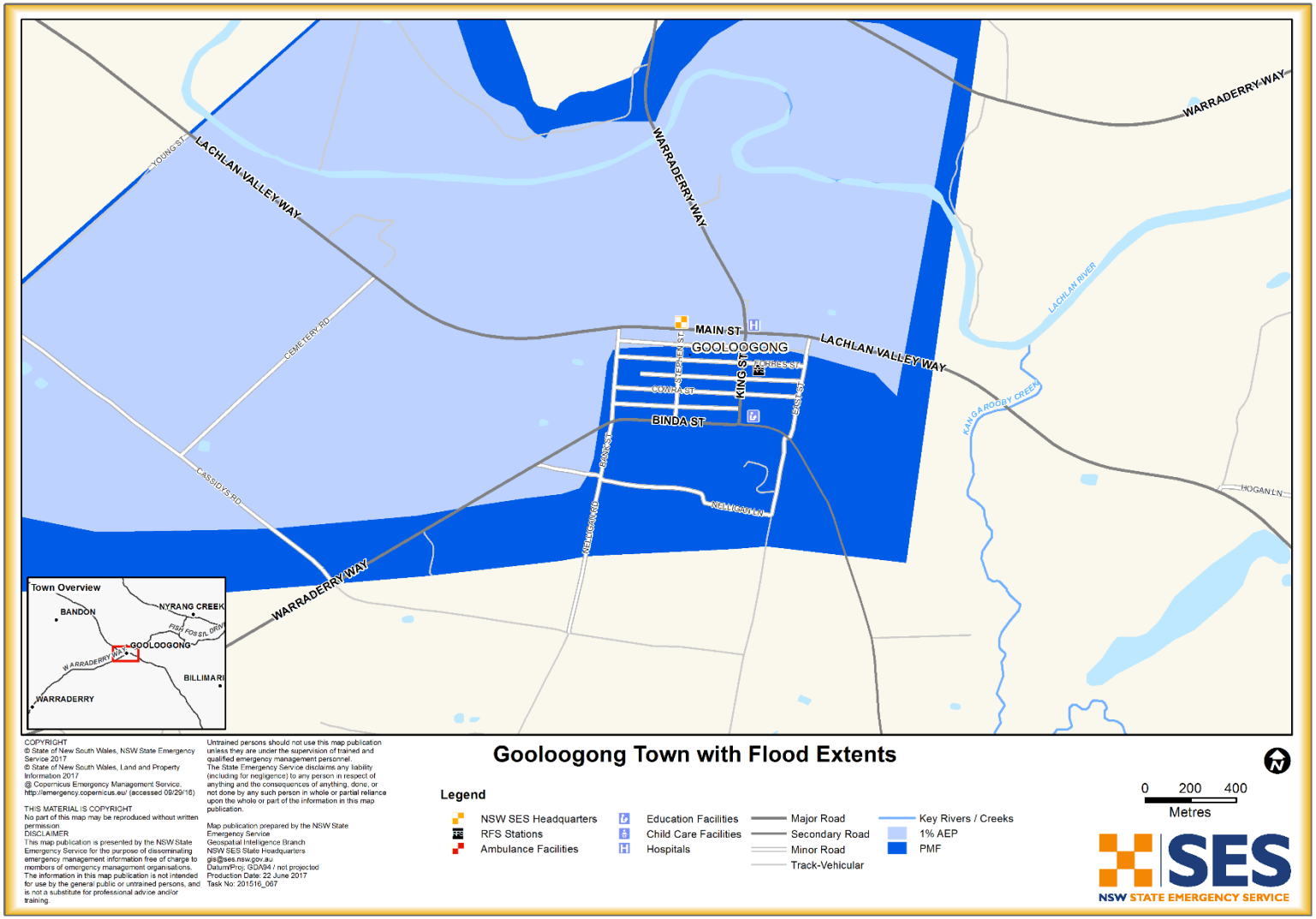
MAP 1: LACHLAN RIVERBASIN



MAP 2: COWRA TOWN MAP



MAP 3: GOOLOOGONG TOWN MAP



LIST OF REFERENCES

1. **NSW SES.** *Cowra Shire Local Flood Plan September 2001, Sub Plan of the Cowra Shire Local Disaster Plan.* s.l. : NSW SES, 2001.

2. **State Water Corporation NSW.** *Wyangala Dam Dam Safety Emergency Plan V1.0 Interim.* 2013.

3. —. *Carcoar Dam Dam safety Emergency Plan (draft).* 2005.

4. **Lyall & Associates.** *Flood Intelligence Report Lachlan Valley December 2010 and March 2012 Floods.* Sydney : Lyall & Associates, 2013.

5. **SMEC Australia Pty Ltd.** *Cowra and Gooloogong Floodplain Risk Management Study and Plan.* 2006.

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10. **SKM.** *Lachlan River Floodplain Risk Management Study.* s.l. : DEpartment of Natural Resources, 2007.

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12. **NSW SES Gooloogong Unit.** *Historical Observations.* 2017.

SES RESPONSE ARRANGEMENTS FOR COWRA SHIRE

Volume 3 of the Cowra Shire Local Flood Plan

CONTENTS

VERSION LIST

The following table lists all previously approved versions of this Volume.

Description	Date
Cowra Shire Local Flood Plan	September 2001

AMENDMENT LIST

Suggestions for amendments to this Volume should be forwarded to:

The Cowra Shire Local Controller

NSW State Emergency Service

55 Matthews Street, PARKES NSW 2870

Amendments promulgated in the amendments list below have been entered in this Volume.

Amendment Number	Description	Updated by	Date

NSW STATE EMERGENCY SERVICE

COWRA SHIRE: FLOOD WARNING SYSTEMS AND ARRANGEMENTS

Volume 3, Chapter 1 of the Cowra Shire Local Flood Plan

(NSW SES Response Arrangements for Cowra Shire)

Last Update: August 2017

FloodSafe

AUTHORISATION

Cowra Shire: Flood Warning Systems and Arrangements has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process.

Approved

Manager Emergency Risk Management

Date: 2-8-17

Approved

NSW SES Lachlan Region Controller

Date: 31.07.17

Tabled at LEMC Date: 12 September 2017

Document Issue: 3.1-07042014

CONTENTS

LIST OF TABLES

1. GAUGES MONITORED BY THE NSW SES COWRA SHIRE LOCAL HEADQUARTERS

Table 1: Gauges monitored by the NSW SES Cowra Shire Local Headquarters

Gauge Name	Type	AWRC No.	Bureau Gauge No.	Stream	Flood level classification in metres			Special Reading Arrangements	Owner
					MIN	MOD	MAJ		
Cowra*‡	Automatic	412002	63278	Lachlan River	8.5	10.7	13.4		NSW Office of Water
Nanami*‡	Automatic	412057	565007	Lachlan River	7.4	9.7	10.7		NSW Office of Water
Prossers Crossing	Automatic	412029	-	Belubula River	N/A	N/A	N/A		
Abercrombie	Automatic	412028	-	Abercrombie River	N/A	N/A	N/A	Provides information upstream of Wyangala Dam	NSW Office of Water
Narrawa	Automatic	412065	-	Lachlan River	N/A	N/A	N/A	Provides information upstream of Wyangala Dam	NSW Office of Water
Reids Flat	Automatic	412027	-	Lachlan River	N/A	N/A	N/A	Provides information upstream of Wyangala Dam	NSW Office of Water
Wyangala D/S	Automatic	412067	-	Lachlan River	N/A	N/A	N/A	Provides outflows of Wyangala Dam	NSW Office of Water
Crowthers at Watervale	Automatic	412002 (08)	-	Back Creek/ Crowther Creek	N/A	N/A	N/A		NSW Office of Water
Helensholme	Automatic	412033	-	Belubula River	N/A	N/A	N/A		NSW Office of Water

Notes: The Bureau of Meteorology provides flood warnings for the gauges marked with an asterisk (*).

NSW SES Local Flood Advices are provided for the gauges marked with a single cross (†).

The NSW SES holds a Flood Intelligence Card for the gauges marked with a double cross (‡).

2. DISSEMINATION OPTIONS FOR NSW SES FLOOD INFORMATION AND WARNING PRODUCTS

The NSW SES Lachlan Region Headquarters distributes NSW SES Flood Bulletins, NSW SES Evacuation Warnings and NSW SES Evacuation Orders to the following regional media outlets and agencies:

Television Stations:

Station	Location
Prime TV	Orange
ABC	Sydney
WIN TV	Orange
Capital TV	Orange

Radio Stations:

Station	Location	Frequency	Modulation
2GZ	Orange	105.1	FM
2CR ABC Central Wet	Orange	549	AM
2PK/ROK 95.5FM	Parkes	95.5	FM
2LF	Young	1350	AM
Roccy FM	Young	93.9	FM
2LVR Valley FM	Forbes	97.9	FM
2PK	Parkes	1404	AM

Newspapers:

Name	Location
Cowra Guardian	Cowra
Forbes Advocate	Forbes (Gooloogong)

Other Agencies:

Agencies as listed in Volume 1 of this Local Flood Plan.

COWRA SHIRE: NSW SES LOCALITY RESPONSE ARRANGEMENTS

Volume 3, Chapter 2 of the Cowra Shire Local Flood Plan

(NSW SES Response Arrangements for Cowra Shire)

Last Update: August 2017

AUTHORISATION

NSW SES Locality Response Arrangements in Cowra Shire has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process.

Approved

Manager Emergency Risk Management

Date: 10 - Aug - 2017

Approved

NSW SES Lachlan Region Controller

Date: 31.07.17

Tabled at LEMC

Date: 12 September 2017

Document Issue: V3.2-07042014

CONTENTS

LIST OF TABLES

SECTOR OVERVIEW

Table 1: Overview of Sectors in the Cowra LGA.

Sector Name	Community	Sector Basis	Total properties	Properties potentially at risk
Sector 1	Cowra	Geographical community	3694	>57 residential, 16 businesses
Sector 2	Gooloogong	Geographical community	129	23 residential 8 commercial and public

1. COWRA SECTOR

1.1. COWRA RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Cowra Shire for more information about this Sector

Sector Description	Cowra is located on the Lachlan River, downstream of the Wyangala Dam. It has a population of approximately 9730 people. Refer to Volume 2 of this local flood plan for further information on this community.		
Hazard	Riverine flooding from the Lachlan River, flash flooding from Back Creek/Crowthers Creek and flash flooding can also occur in the western side of the town from the drainage system.		
Flood Affect Classification	Rising Road Access.		
At risk properties	>57 residential, 16 businesses	**Total number of properties within Sector/Community**	3694

Sector Control

Small-scale evacuations will be controlled by the NSW SES Cowra Local Controller. Should the evacuations operations escalate beyond the capabilities of local resources control may be handed over to the NSW SES Lachlan Region Controller or appointed Incident Controller.

Sub Sectors will be established when the town is split into two.

Key Warning Gauge Name

Name	AWRC No.	Min (m)	Mod (m)	Maj (m)
Cowra Gauge	412002	8.5	10.7	13.4

General Strategy

- Manage operations in response to predicted heights indicating likely consequences that pre-empt appropriate actions.
- Issue of early warning of flood level impacts and potential isolation.
- Pre-deployment of sandbags to assist with property protection.
- Evacuation of at risk population:
  - Self-Evacuation to friends/family outside the impact area.
  - Establishment of an Assembly Area/Evacuations Centre in consultation with the Welfare Services Functional Area Coordinator.
  - Medical evacuation considerations.
- Establish resupply operations where isolation has continued for several days.
- Flood rescue where evacuation has failed, or where people have driven into floodwater.

Key Risks / Consequences

Significant roads are flooded in a minor flood, Inundation and isolation of properties starts from a moderate flood.

Information and Warnings

NSW SES Flood Bulletins will localise the consequences of the Bureau products on the sector. NSW SES Lachlan Region will issue timely, relevant and tailored information to the public in the following formats:

NSW SES Bulletins

Flood Watch

Flood Warning

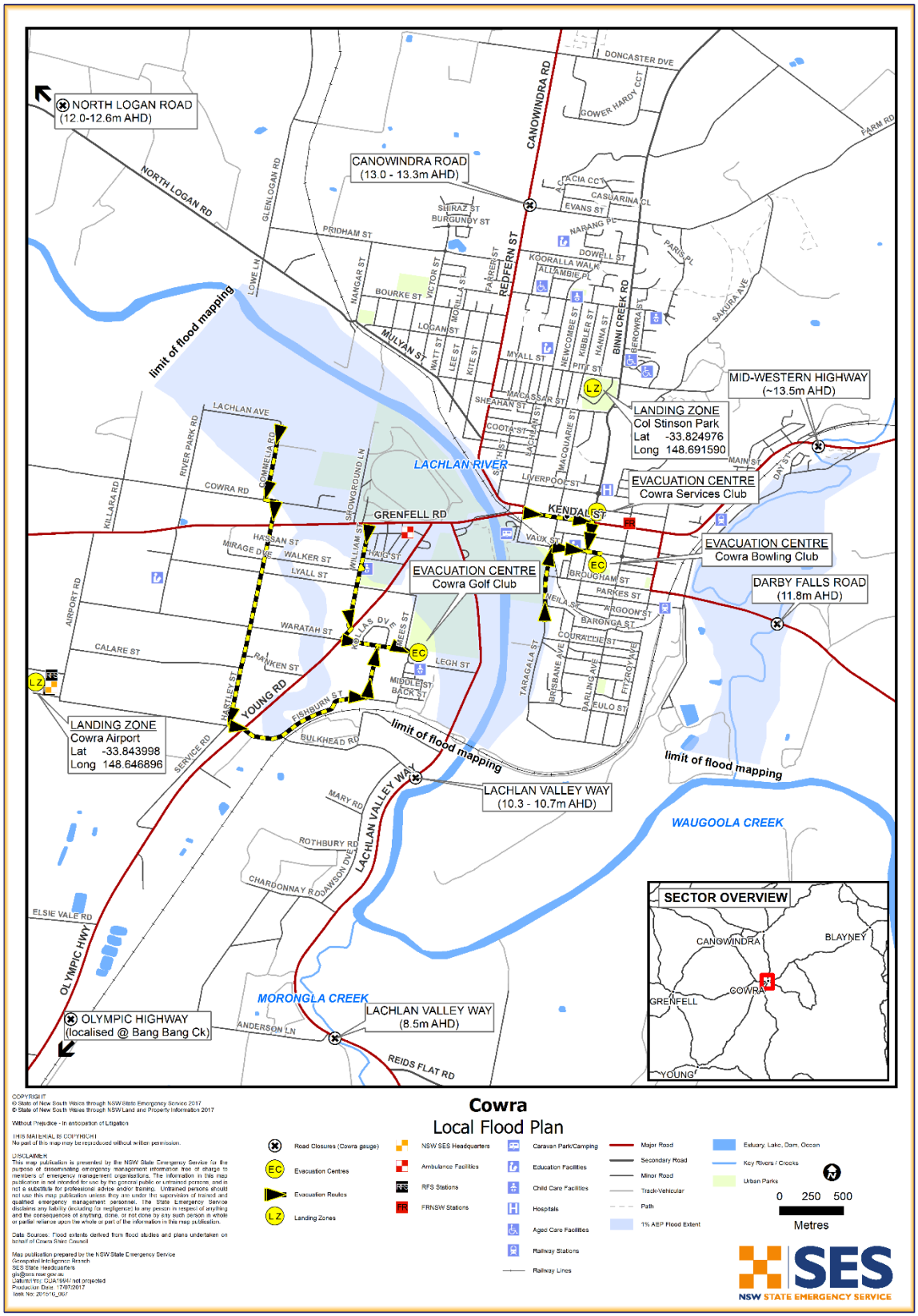
Equipment, Livestock and Aquaculture Warnings

	Media Release such as– Isolation Warnings Evacuation Warning Evacuation Order All Clear Sequenced door knocking Media briefing Interagency Local Emergency Management Committee (LEMC) briefings Bureau products, such as Flood Watches and Flood Warnings, will include NSW SES safety advice. Warning of free camp sites and Caravan Park (which have a plan in place) along the Lachlan River by NSW SES members visiting. Doorknocking residents at risk of inundation. Warnings are also provided on the unit Facebook page and other media as listed in Volume 3 Chapter 1. The use of Emergency Alert is likely to be used only be in the instance dam failure.
Property Protection	***Specific property protection measures:*** The NSW SES Cowra and Gooloogong Units maintain stocks of sandbags with back-up supplies being held at the NSW SES Lachlan Region Headquarters. The supply of emergency stores such as sandbags will be processed through the NSW SES Lachlan Region Headquarters. A motorised sandbagging machine is also available for use at the NSW SES Cowra Unit Headquarters.
	Assistance with property protection: Assistance with sandbagging is provided by the NSW SES Cowra Unit on request from residents.
	Protection of essential infrastructure: Nil
Evacuation and/or Isolation Triggers	In most flood events, few evacuations are necessary within Cowra Shire. The first area to require evacuation during moderate flooding is the Cowra Council Caravan Park which is affected between approximately 11.5 and 11.8 metres on the Cowra gauge (1). In more severe events, such as the flood of 17 June 1952 which reached 15.24 metres on the Cowra gauge, evacuations from up to 57 houses and 16 business premises in west Cowra and a number of properties in east Cowra may be required (1). A number of rural properties in and around Cowra and throughout the Shire may require evacuation during major floods (1). Evacuation will be considered when: ▪ 11.3m – Inundation commences of low lying parts of Caravan Park ▪ 11.7m – Properties (approximately 6) on North Logan Road are isolated by this height. ▪ 11.8m - The concrete caravan parking sites at the Cowra Council Caravan Park (NOTE: A number of permanent residents occupy the park however no mobile homes are permitted). ▪ 12.0 to 12.6m - A number of shops and up to three houses on Courallie and Taragala streets, Cowra. ▪ 13.0 to 13.3m - A number of businesses and four flats (approximately 10 people) in Lachlan St, Cowra. ▪ 13.0 to 13.3m - A number of businesses in Vaux St, Cowra.

	▪ 13.4m - Up to 8 homes on Waugoola Creek on the outskirts of Cowra. ▪ 15.2m - Up to 57 homes and 16 businesses in Cowra and West Cowra (1).
Sequencing of evacuation	A minimum of six hours warning time can be given of flooding at Cowra. The evacuation of people and the relocation of contents should be achievable within that time frame (1). On the receipt of flood warnings predicting peak heights of 11.5 metres and above at the Cowra gauge; the Cowra SES Local Controller will consult as necessary to determine the level of the threat and the need to consider evacuations. As soon as possible, after the decision to evacuate is made, the Cowra SES Local Controller will issue evacuation warnings to the 'at risk' residents (as above), indicating what people should do before evacuating and when actually doing so (1).
Evacuation Routes	Kendall Street and Brisbane Street to Services Club or Bowling Club. Olympic Highway to Lyall Street to the Golf Club. Grenfell Road to Olympic Highway and Lyall Street to the Golf Club.
Evacuation Route Closure	Evacuation route closure (out of Cowra) occurs by 15.24 metres (when Mid-Western Highway is cut).
Method of Evacuation	Self-evacuation is historically the predominant means of evacuation, using private vehicles, to family and friends.
Evacuation Centre/Assembly Point	Any or all of the following sites may be used as evacuation centres: ▪ Cowra services Club, Brisbane Street, Cowra. ▪ Cowra Bowling Club, 27 Vaux street, Cowra ▪ Cowra Golf Club, Mees Road, Cowra (for the western side of the Lachlan River)
Large scale evacuations	Large scale evacuations in Cowra are not likely.
Rescue	Lachlan Valley Way (north of Pipeclay Bridge over Back Creek/Crowthers Creek), Scrubby Rush Road, Reids Flat Road, Darbys Falls Road (near Wyangala) and Warrangong Road historically are flood rescue hot spots. Prepositioning of teams may occur at the Lachlan Valley Way hot spot.
	These areas are fast flowing, with the creek crossings with the potential to become quite deep.
Resupply	In moderate to major floods Canimbla hills area (to the west of Cowra, along Cowra-Gooloogong Road aka Lachlan Valley Way) requires resupply. It has a transient population occupying 80-100 properties. There are some six properties between 6 kilometres and 12 kilometres along North Logan Road, north west of Cowra, which may be isolated during a major flood. The village of Darbys Falls may be isolated by major flooding, as occurred in the 1952 event which reached a height of 15.24 metres on the Cowra gauge, and may require resupply depending on the duration of the event. Properties between this village and Waugoola Creek on the Cowra-Darbys Falls Road may also require resupply in a similar event. Along the reaches of the river and tributaries within the Cowra Shire, it is expected that individual properties in some locations apart from those described above could also require resupply.
	Table 2, in Volume 2 provides information about isolated communities in the Cowra area and potential periods of isolation. ▪ A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1

Aircraft Management	***Helicopter Landing Points:*** Suitable landing points are located at: ▪ Cowra Airport (-33.843998, 148.646896). ▪ Col Stinson Park (-33.824976, 148.691590)
	Airports: ▪ Cowra Airport is located to the west of Cowra (-33.843998, 148.646896). Access is lost from Cowra East when Mid-Western Highway floods.
Other	Cowra Show is held on the Cowra showground in mid-September, Wine Show in August, Festival of International Understanding in March and regular campdrafts, increasing the population substantially.

1.2. COWRA SECTOR MAP



2. GOOLOOGONG SECTOR

2.1. GOOLOOGONG RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Cowra Shire for more information about this Sector/Community.

Sector Description	The village of Gooloogong is situated on the left bank of the Lachlan River, about 9km downstream of its confluence with the Belubula River. It has a population of approximately 250 people (1). Refer to Volume 2 of this local flood plan for further information on this community.		
Hazard	Riverine flooding from the Lachlan River.		
Flood Affect Classification	Rising Road access to 12 metres, thereafter becoming a High Flood Island.		
At risk properties	23 residential 8 commercial and public	**Total number of properties within Sector/Community**	129

Sector Control	Small-scale evacuations will be controlled by the NSW SES Gooloogong Unit Controller (or NSW SES Local Controller depending on available access). Should the evacuations operations escalate beyond the capabilities of local resources control may be handed over to the NSW SES Lachlan Region Controller or appointed Incident Controller.

Key Warning Gauge Name

Name	AWRC No.	Min (m)	Mod (m)	Maj (m)
Cowra Gauge	412002	8.5	10.7	13.4
Nanami gauge	412057	7.4	9.7	10.7

General Strategy

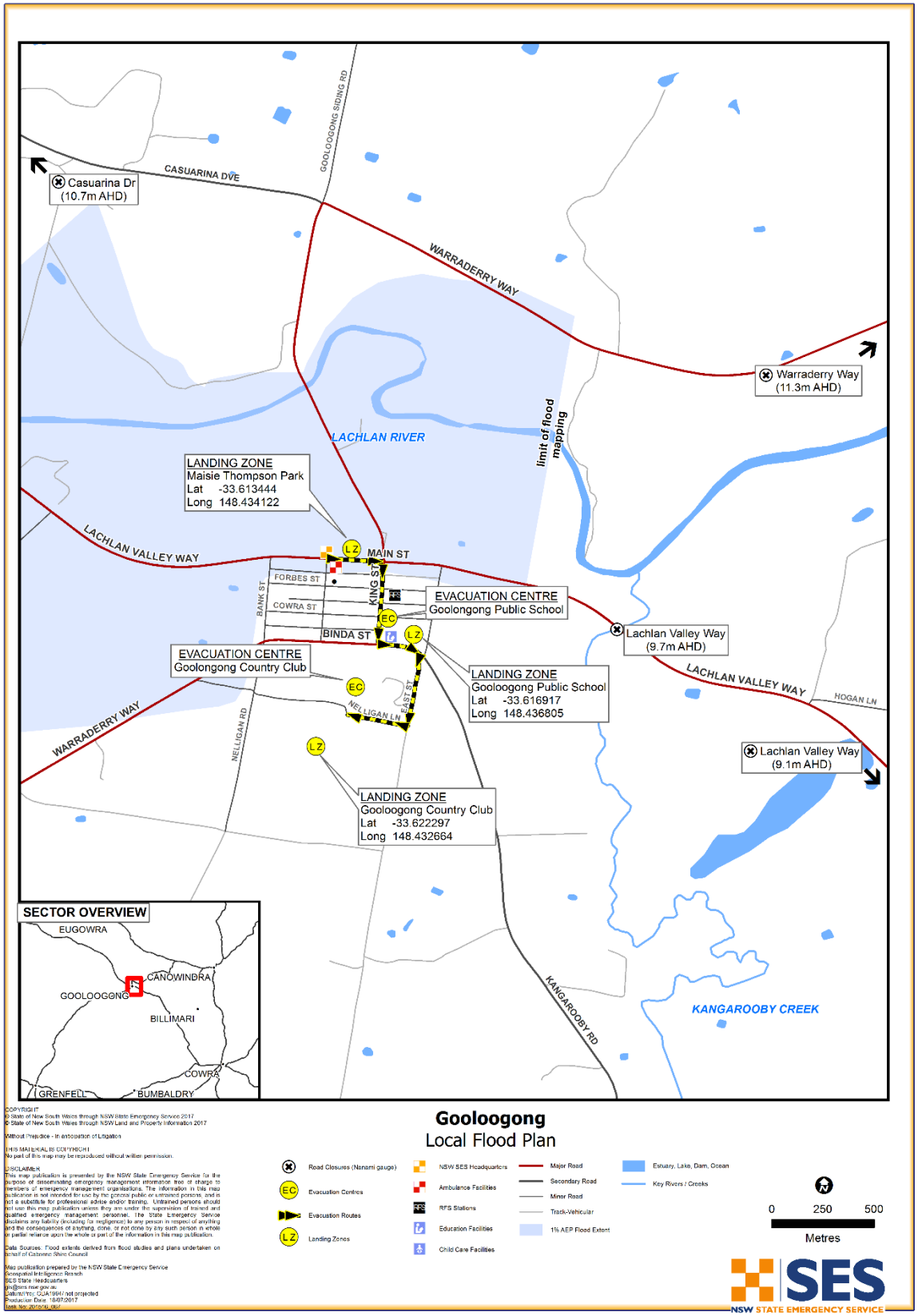
- Manage operations in response to predicted heights indicating likely consequences that pre-empt appropriate actions.
- Issue of early warning of flood level impacts and potential isolation.
- Pre-deployment of sandbags to assist with property protection.
- Evacuation of at risk population:
  - Self-Evacuation to friends/family outside the impact area.
  - Establishment of an Assembly Area/Evacuations Centre in consultation with the Welfare Services Functional Area Coordinator.
  - Medical evacuation considerations.
- Establish resupply operations where isolation has continued for several days (including Gooloogong township and properties).
- Flood rescue where evacuation has failed, or where people have driven into floodwater - performed by NSW SES Cowra Unit or other nearby units.

Key Risks / Consequences	The main risk at Gooloogong is the flooding of the main roads for weeks; however isolation may occur by 11.86 metres and around 20 properties may be at risk in major floods in the order of 16 metres.
Information and Warnings	NSW SES Flood Bulletins will localise the consequences of the Bureau products on the sector. NSW SES Lachlan Region will issue timely, relevant and tailored information to the public in the following formats: NSW SES Bulletins Flood Watch

	Flood Warning Equipment, Livestock and Aquaculture Warnings Media Release such as– Isolation Warnings Evacuation Warning Evacuation Order All Clear Sequenced door knocking Media briefing Interagency Local Emergency Management Committee (LEMC) briefings Bureau products, such as Flood Watches and Flood Warnings, will include NSW SES safety advice. Warning of free camp sites and Caravan Park along the Lachlan River by NSW SES members visiting. Doorknocking residents at risk of inundation. Warnings are also provided on the Cowra and Canowindra Unit Facebook page and other media as listed in Volume 3 Chapter 1. An information board is also located at the NSW SES Gooloogong Unit and flyers are provided to the pub, club and shop in Gooloogong. The use of Emergency Alert is likely to be used only be in the instance dam failure.
Property Protection	***Specific property protection measures:*** The NSW SES Cowra and Gooloogong Units maintain stocks of sandbags with back-up supplies being held at the NSW SES Lachlan region Headquarters. The supply of emergency stores such as sandbags will be processed through the NSW SES Lachlan Region Headquarters. Filled sandbags have historically been delivered by truck and helicopter.
	Assistance with property protection: Assistance with property protection is generally not feasible due to limited members available and size of the area.
	Protection of essential infrastructure: The National Broadband Network tower on Lachlan Valley Way to the west of Gooloogong may require assistance with access and protection.
Evacuation and/or Isolation Triggers	Up to 23 houses and eight public and commercial premises in Gooloogong may require evacuation during an event approaching the 1952 flood level (16.0 metres on the old Gooloogong Bridge gauge). During an event of this magnitude, approximately the 1% Annual Exceedance Probability (AEP) or once in 100 year event, it is likely that the entire town would be isolated by road and would require resupply (1).
Sequencing of evacuation	Elderly and infirm residents would be evacuated as a first priority.
Evacuation Routes	Lachlan Valley Way, King Street, Binda Street, Racecourse Road to the Gooloogong Country Club Lachlan Valley Way and King Street to the Gooloogong Public School
Evacuation Route Closure	Evacuation routes out of Gooloogong will be cut by 11.86 metres (which can be influenced by localised rainfall).
Method of Evacuation	Self-evacuation is historically the predominant means of evacuation, using private vehicles, to family and friends. The school bus can be utilised to assist with evacuation if required.

Evacuation Centre/Assembly Point	The Gooloogong Country Club, Racecourse Road, Gooloogong. Gooloogong Public School, King Street, Gooloogong.
Large scale evacuations	Large scale evacuations are unlikely in Gooloogong.
Rescue	Lachlan Valley Way (north of Pipeclay Bridge over Back Creek/Crowthers Creek) can become a flood rescue hot spot, with NSW SES Cowra Unit responding.
Resupply	At Gooloogong, in a flood exceeding 11.8 metres (which can be variable depending on the flood conditions and local rainfall), the village may become isolated. Along the reaches of the river and tributaries within the Cowra Shire, it is expected that individual properties in some locations apart from those described above could also require resupply.
	Table 2, in Volume 2 provides information about isolated communities in the Cowra area and potential periods of isolation. ▪ A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1
Aircraft Management	***Helicopter Landing Points:*** Suitable landing points are located at: ▪ Gooloogong Country Club (-33.622297, 148.432664) ▪ Maisie Thompson Park (-33.613444, 148.434122) ▪ Gooloogong Public School can be used as a secondary location (-33.616917, 148.436805)
	Airports: ▪ Cowra Airport is located to the west of Cowra (-33.843998, 148.646896). Access is lost when Lachlan Valley Way floods.
Other	Gooloogong Country Classic is a sporting event in October each year, increasing the population by approximately 100. Markets at the log cabin also occur throughout the year on weekends, increasing the population by 50-60. The old "Holman" Bridge over the Lachlan river has been replaced (in 2015/2016), which is likely to impact of flood behaviour (6).

2.2. GOOLOOGONG SECTOR MAP



COWRA SHIRE NSW SES
CARAVAN PARK ARRANGEMENTS

Volume 3, Chapter 4 of the Cowra Shire Local Flood Plan

(NSW SES Response Arrangements for Cowra Shire)

Last Update: August 2017

AUTHORISATION

The Cowra Shire NSW SES Caravan Park Arrangements have been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process.

Approved

Manager Emergency Risk Management

Date: 10-Aug-2017

Approved

NSW SES Lachlan Region Controller

Date: 31.07.17

Tabled at LEMC Date: 12 September 2017

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CONTENTS

LIST OF TABLES

1 ARRANGEMENTS FOR THE EVACUATION OF CARAVAN PARKS AND THE RELOCATION OF MOVABLE DWELLINGS

1.1 GENERAL

1.1.1 The following caravan parks are flood liable:

a. Cowra Council Caravan Park

b. Gooloogong Caravan Park

1.1.2 For more information on individual caravan parks see Table 1 at the end of this Chapter.

1.2 ADVISING PROCEDURES

1.2.1 Caravan Park proprietors will ensure that the owners and occupiers of movable dwellings are:

a. Made aware that the caravan park is flood liable by:

- Providing a written notice to occupiers taking up residence. The notice will indicate that the caravan park is liable to flooding and designate the location of flood liable land within the park (1).
- Displaying this notice and the emergency arrangements for the Caravan Park prominently in the park.

b. Made aware that if they are expecting to be absent for extended periods, they should:

- Provide the manager of the caravan park with a contact address and telephone number in case of an emergency.
- Leave any movable dwelling in a condition allowing it to be relocated in an emergency (i.e.: should ensure that the wheels, axles and draw bar of the caravans are not removed, and are maintained in proper working order).

c. Informed of Flood Warning Information. At this time, occupiers will be advised to:

- Ensure that they have spare batteries for their radios.
- Listen to a local radio station for updated flood information.
- Prepare for evacuation and movable dwelling relocation.

1.2.2 The NSW SES Cowra Shire Local Controller will ensure that the managers of caravan parks are advised of Flood Information (described in Volume 1 of the Cowra Shire Local Flood Plan).

1.3 EVACUATION OF OCCUPANTS AND RELOCATION OF MOVEABLE DWELLINGS

1.3.1 When an evacuation order is given caravan park occupants should follow the flood evacuation procedures for the park under the direction of the caravan park management. This should include advice to:

a. Isolate power to moveable dwellings.

b. Collect personal papers, medicines, a change of clothing, toiletries and bedclothes.

c. Lift the other contents in any remaining dwellings as high as possible.

d. Move to friends, relatives or a designated evacuation centre if they have their own transport, or move to the caravan office to await transport.

e. If undertaking self-managed evacuation, register their movements with the caravan park management upon leaving the park.

1.3.2 Where possible, movable dwellings that can be moved will be relocated by their owners. Park managers will arrange for the relocation of movable dwellings as required. Council and NSW SES personnel may assist if required. Vans are to be moved to the locations outlined in Table 1 at the end of this Chapter.

1.3.3 Caravan park managers will:

a. Secure any movable dwellings that are not able to be relocated to prevent floatation.

b. Ensure that their caravan park is capable of being evacuated in a timely and safe manner.

c. Advise the NSW SES Cowra Shire Local Controller of:

- The number of people requiring transport.
- Details of any medical evacuations required.
- Whether additional assistance is required to effect the evacuation.

d. Check that all residents and visitors are accounted for.

e. Inform the NSW SES Cowra Shire Local Controller when the evacuation of the caravan park has been completed.

f. Provide the NSW SES Cowra Shire Local Controller with a register of people that have been evacuated.

1.4 RETURN OF OCCUPANTS AND MOVEABLE DWELLINGS

1.4.1 The NSW SES Cowra Local Controller, using council resources as necessary, will advise when it is safe for the caravan parks to be re-occupied.

1.4.2 Moveable dwellings will be returned back to the caravan park(s) by owners or by vehicles and drivers arranged by the park managers.

1.4.3 Council and NSW SES personnel may assist by request where resources are available.

Table 1: Caravan Parks at risk of inundation and/or isolation from flooding.

Name	Address/Location description	Town/ Sector	Number of sites	Risk	Evacuation route	Evacuation route closure	Moveable dwelling relocation location	Evacuation centre	Notes
Cowra Council Caravan Park (Cowra Van Park)	Lachlan Street	Cowra	11 cabins 67 powered and unpowered sites	Sites are inundated at a flood height > 11.5m and all vans > 12m at the Cowra gauge	Refer to Council Plan	n/a	In moderate floods, vans can be moved to higher ground within the park, ready to drive out if required. Historically, Municipal Swimming Pool carpark – Taragala Street has been used as a relocation point historically (however this is at risk of inundation in severe floods)	Refer to Council Plan	Council has developed a plan for this Caravan Park
Gooloogong Caravan Park	Lachlan Valley Way (MR56)	Gooloogong	8 powered sites and an additional 4 unpowered sites	Can be flooded in a Major flood, above 11.5 metres (in 2016 of 11.86m, water did not enter the park but was very close)	Lachlan Valley Way, East Street, Racecourse Road to the Country Club	Evacuation out of the town cannot occur from around 11.8 metres when Gooloogong becomes isolated	Gooloogong Country Club, Racecourse Road	Gooloogong Country Club, Racecourse Road	A park management committee exists in the town. People often relocate here from other flood affected towns

LIST OF REFERENCES

1. **NSW Government.** *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005 Part 3 Division 3 Subdivision 7 Clause 123.* 2005.