NSW STATE EMERGENCY SERVICE

Forbes LGA

Local Flood Emergency Sub Plan

FloodSafe

FORBES SHIRE COUNCIL FLOOD EMERGENCY SUB PLAN

A Sub Plan of the Local Emergency Management Plan (EMPLAN)

Volume 1 of the Forbes Shire Local Flood Plan

Endorsed by the Forbes Shire Council Emergency Management Committee

Version 3.0 - November 2021

AUTHORISATION

The Forbes Shire Council Flood Emergency Sub Plan is a sub plan of the Forbes 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)**.

Authorised

NSW SES Local/Unit Commander

Date: 25-11-21

Endorsed

Chair, Local Emergency Management Committee

Date: 25-11-21

VERSION HISTORY

Version Number	Description	Date
1.0	Forbes Shire Local Flood Plan	September 2002
2.0	Forbes Shire Local Flood Plan	August 2013

AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

Community Planning and Engagement
NSW State Emergency Service
PO Box 6126, Wollongong NSW 2500
nswses.communityplanning@ses.nsw.gov.au

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

Amendment Number	Description	Updated by	Date

DISTRIBUTION LIST

Available for general use and distribution on the following website - www.ses.nsw.gov.au

This plan is Attribution (CC BY) under the Creative Commons licensing system, unless otherwise indicated. Copyright resides with the State of New South Wales, NSW State Emergency Service unless otherwise indicated.

Contents

1 OUTLINE AND SCOPE

1.1 PURPOSE

1.1.1 The purpose of this plan is to set out the multi-agency arrangements for the emergency management of flooding in the Forbes Shire Council Local Government Area (LGA).

1.2 AUTHORITY

1.2.1 This plan is written and issued under the authority of the *State Emergency and Rescue Management Act 1989* (NSW) ('SERM Act'), the *State Emergency Service Act 1989* (NSW) ('SES Act') and the NSW State Emergency Management Plan (EMPLAN).

1.2.2 This plan is a sub plan to the Forbes Shire Council Local Emergency Management Plan (EMPLAN) and is endorsed by the Forbes Shire Council Emergency Management Committee (LEMC).

1.3 ACTIVATION

1.3.1 This plan does not require activation. The arrangements set out in this plan are always active.

1.3.2 The Forbes Shire Council Local Emergency Management Plan (EMPLAN) is active at all times in anticipation of the need to coordinate support and resources requested by combat agencies, including the NSW State Emergency Service (NSW SES).

1.4 SCOPE

1.4.1 The area covered by this plan is the Forbes Shire Council LGA. The Forbes Shire Council LGA and its principal towns, villages, rivers and creeks are shown in Appendix A.

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

1.4.3 The plan sets out the Forbes Shire Council level emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Forbes Shire Council LGA. Hazard and Risk information can be found in Volume 2 of this document, and NSW SES Response Arrangements can be found in Volume 3.

1.4.4 In this plan a flood is defined as a 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 (including tsunami) overtopping coastline defences.

1.4.5 This plan outlines the local level arrangements for the management of downstream consequences of flooding due to dam failure, however it does not

cover the management of flooding of an underground mine by inrush or other cause, which should be covered by the Mine Sub Plan for the respective mine.

1.5 GOALS

1.5.1 The primary goals for flood emergency management in NSW are:

a. Protection and preservation of life.

b. Establishment and operation of flood warning systems.

c. Issuing of community information and community warnings.

d. Coordination of evacuation and welfare of affected communities.

e. Protection of critical infrastructure and community assets essential to community survival during an emergency incident.

f. Protection of residential property.

g. Protection of assets and infrastructure that support individual and community financial sustainability and aid assisting a community to recover from an incident; and

h. Protection of the environment and conservation values considering the cultural, biodiversity and social values of the environment.

1.6 KEY PRINCIPLES

1.6.1 The protection and preservation of human life (including the lives of responders and the community) is the highest priority.

1.6.2 Evacuation is the primary response strategy for people impacted by flooding.

1.7 ROLES AND RESPONSIBILITIES

1.7.1 General responsibilities of emergency service organisations and functional areas are set out in the NSW State EMPLAN and NSW State Flood Plan.

1.7.2 Specific roles and responsibilities for agencies, functional areas and organisations in relation to flooding within Forbes Shire Council are detailed within this plan, Appendix B and Appendix C.

1.7.3 Any agency with agreed responsibilities in this plan that are temporarily, or no longer able to fulfil their responsibilities must as soon as possible notify the:

a. NSW SES Incident Controller (for local or zone level responsibilities during response operations).

b. NSW SES Zone Duty Commander (for regional level responsibilities outside of response operations).

1.8 PLAN MAINTENANCE AND REVIEW

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

a. Ensuring that all supporting emergency services and functional areas, 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:

- When there are changes which alter agreed plan arrangements.
- When changes to land use strategic plans and policies increase the population at risk.
- After a flood including from after action reviews, reports, or inquiries; and
- As determined by the NSW SES Commissioner.

d. The plan is to be reviewed no less frequently than every five years or after a significant flood event.

1.9 SUPPLEMENTARY DOCUMENTS

1.9.1 Supplementary material published in previous versions of the Local Flood Plan is now maintained on the NSW SES website at: https://www.ses.nsw.gov.au/about-us/flood-storm-and-tsunami-plans/ including:

a. Flood Plan Glossary.

b. NSW SES Dam Failure Notification Flowchart.

c. NSW SES Resupply Flowchart.

2 OVERVIEW OF NSW FLOOD HAZARD AND RISK

2.1 THE FLOOD THREAT

2.1.1 The NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Forbes Shire Council LGA. This is outlined in Volume 2 – Hazard and Risk in Forbes Shire Council.

2.1.2 Declared dams in or upstream of the Forbes Shire Council Local Government Area.

Dam Name	Owner	High Risk Dam
Wyangala Dam	Water NSW	No

3 PREVENTION/ MITIGATION

3.1 INTRODUCTION

3.1.1 The Floodplain Development Manual outlines the NSW Government's Flood Prone Lands Policy which details the framework for managing flood prone land in New South Wales. Incorporation of floodplain risk management into land use planning is one of the key means to limit the exposure to flood risks to our communities and help build long term resilience to future flood events.

3.2 LAND USE PLANNING

3.2.1 **Strategy:** Work with landuse planning and consent authorities to advocate that the risks arising from floods are considered so as to prevent the creation of intolerable impacts of these hazards on the community.

Actions:

a. NSW SES will provide strategic input about land use planning matters which have or will create significant flood risk.

b. NSW SES will provide responses to land use planning proposal referrals that have or will create significant flood risk.

3.3 FLOODPLAIN RISK MANAGEMENT

3.3.1 **Strategy**: NSW SES advocates for the recognition of emergency management considerations through participation in the floodplain risk management program.

Actions:

a. NSW SES will provide coordinated and consistent emergency management advice to Councils and other agencies in relation to the management of land that is subject to flooding or coastal inundation; and

b. NSW SES will provide advice, support and technical resources for NSW SES representatives to contribute effectively to local Floodplain Management Committees.

4 PREPARATION

4.1 INTRODUCTION

4.1.1 Preparation includes arrangements or plans to deal with an emergency or the effects of an emergency.

4.2 FLOOD EMERGENCY PLANNING

4.2.1 **Strategy**: NSW SES develop, review and maintain Flood Emergency Sub Plans

4.2.2 **Actions**:

a. Develop and review this NSW SES Local Flood Plan as required. Local Flood Plans outline the specific arrangements for management of flood events within an LGA, and may include cross boundary arrangements; and

b. Review plans as per Section 1.8.

4.2.3 Local EMPLAN Consequence Management Guides (CMG) for flood are not required for communities covered by NSW SES Local Flood Plans.

4.3 FLOOD INTELLIGENCE SYSTEMS

4.3.1 **Strategy**: NSW SES develop and maintain a flood intelligence system to identify flood behaviour, its impact on the community and required response actions.

Actions:

a. Gather and assess flood information for the full range of flood types and severities.

b. Collect, collate, and assess information on the characteristics of communities at risk and the potential effects of flooding on communities at risk; and

c. Share flood intelligence information with supporting agencies.

4.4 DEVELOPMENT OF WARNING SYSTEMS

4.4.1 **Strategy**: Develop, maintain and prepare systems for the provision of flood warnings and associated warning services.

Actions:

a. All levels of government work in partnership to develop and maintain flood warning infrastructure.

b. NSW SES maintains a list of the requirements for flood warnings for flood gauges in NSW (including flood classifications, warning times required and key statistics) and can be found in the supplementary document to the NSW State Flood Plan (see Section 1.9). Gauges of relevance within the Forbes Shire Council LGA are also listed in Volume 3 of this plan.

c. The NSW SES will recommend new warning services and changes to warning alert levels for gauges to the NSW Flood Warning Consultative Committee.

d. The State Government, in partnership with Local Government, is responsible for developing and maintaining flash flood warning systems for local catchments where required.

e. Dam Owners will provide Dam Failure Warning Systems (where required) and consult NSW SES on alert levels and messaging. Alert level definitions are listed in Dam Emergency Plans.

f. NSW SES maintains a dedicated dam failure hotline and procedures to ensure priority dissemination of dam failure warnings.

g. NSW SES develops and maintains warning and flood information products by:

- Utilising flood intelligence data.
- Developing pre-written warning and flood information products.
- Continuously reviewing warning and flood information products; and
- Consulting with affected communities, key stakeholders, Dam Safety NSW and the NSW Flood Warning Consultative Committee; and maintain Operational Readiness.

4.5 BRIEFING, TRAINING AND EXERCISING

4.5.1 **Strategy**: Ensure NSW SES, supporting agencies, functional areas and the community are prepared and familiar with the strategies and arrangements within the Flood Sub Plan and supporting documents.

Actions:

a. NSW SES will consult stakeholders throughout the development of plans.

b. NSW SES will inform stakeholders of content changes after revisions.

c. NSW SES will ensure their facilities and resources are maintained and operationally ready.

d. NSW SES will train personnel for their expected flood operation roles; and

e. NSW SES will regularly brief stakeholders on the exercise arrangements contained in the NSW Flood Emergency Sub Plan.

4.6 COMMUNITY RESILIENCE TO FLOODING

4.6.1 **Strategy**: NSW SES provides and maintains a flexible volunteer workforce to support community resilience.

Actions:

a. Ensure ongoing recruitment and training of a diverse range of volunteers.

b. Ensure pre-planning to facilitate the management of spontaneous volunteers and community members during a flood.

4.6.2 **Strategy**: NSW SES works with individuals, communities, businesses and government agencies to build flood resilience.

Actions:

a. Work with communities to understand and manage the risks associated with floods, including providing business continuity guidance (NSW SES Business FloodSafe), family preparedness (NSW SES Home FloodSafe) and other engagement strategies.

b. NSW SES will collate, assess and disseminate flood information to the community.

c. Collaborate with individuals, businesses, government agencies and communities when developing flood intelligence, preparedness and response information.

d. Plan for floods collaboratively with communities through community and stakeholder participation and engagement.

5 RESPONSE

5.1 INTRODUCTION

5.1.1 Flood response operations will begin:

a. On receipt of a Bureau of Meteorology (BoM) Severe Weather Warning or Thunderstorm Warning that includes heavy rain or storm surge; or

b. On the receipt of a BoM Flood Watch or Flood Warning; or

c. On receipt warnings for flash flood; or

d. On receipt of a dam failure alert; or

e. When other evidence leads to an expectation of flooding.

5.2 INCIDENT MANAGEMENT ARRANGEMENTS

5.2.1 **Strategy**: Maintain effective control of flood operations across New South Wales.

Actions:

a. The NSW SES uses the Australasian Inter-service Incident Management System (AIIMS) to manage the flood response.

b. Control of flood response will be at the lowest effective level and may be scaled to suit the incident.

c. The NSW SES State Duty Commander will appoint Incident Controllers and establish Incident Control Centres at NSW SES Facilities.

d. The Incident Controller, in consultation with participating supporting emergency services and Functional Areas will determine the appropriate breakdown of an incident area into Divisions and/or Sectors in accordance with the principles of AIIMS as well as the predefined Divisions and Sectors outlined within the NSW SES Intelligence System

5.2.2 **Strategy**: Maintain Incident Control Centre(s).

Actions:

a. NSW SES will operate Incident Control Centre(s) as required.

b. The NSW SES Incident Control Centre(s) will:

- Control resources from NSW SES and coordinate resources of supporting emergency services and functional areas.
- Manage Request for Assistance (RFA) tasking and ensure they are actioned in a timely manner.
- Undertake response planning and determine future resourcing requirements; and
- Coordinate information flow, including warnings, public information and social media.

5.2.3 **Strategy**: Provide effective liaison between the NSW SES and supporting agencies or functional areas in accordance with Local EMPLAN.

Actions:

a. Supporting emergency services and Functional Areas should provide Liaison Officers to NSW SES Incident Control Centre(s) and/or Emergency Operation Centres as required; and

b. NSW SES will provide Liaison Officer(s) to Emergency Operations Centres as required.

5.2.4 **Strategy**: Coordinate resources and logistics support to ensure operational effectiveness.

Actions:

a. The NSW SES Incident Controller will notify agencies of potential access issues between locations, for the consideration of pre-deploying of resources.

b. The NSW SES may request resources and logistics support directly from a supporting emergency service or Functional Area.

c. Wherever possible, supporting organisations are to provide their own logistic support in consultation with NSW SES where appropriate.

d. The NSW SES Incident Controller will control air support operations and may utilise supporting agencies in the management of aircraft.

5.3 USE OF INFORMATION AND COLLECTION OF INTELLIGENCE

5.3.1 **Strategy**: Ensure flood information is effectively communicated and collected during a flood.

Actions:

a. Information relating to the consequences of flooding, response strategies, situational awareness and operational updates will be distributed by NSW SES to supporting emergency services and Functional Areas listed under this Plan.

b. All supporting emergency services and Functional Areas will accurately record and report information relevant to their activities and any real time flood information (including road closure information) to the NSW SES Incident Controller. This may be in the form of a combined Emergency Operations Centre (EOC) report, or direct from agencies where an EOC has not been established.

c. The NSW SES may establish and operate a Joint Intelligence Unit to coordinate the collection, collation, interpretation, mapping, actioning and dissemination of information; and

d. Reconnaissance, mapping, damage assessments, intelligence validation and post flood evaluation will be coordinated by NSW SES. This may occur post impact and continue into the recovery phase.

5.3.2 **Strategy**: Ensure flood intelligence is incorporated into operational decision-making.

Action: The NSW SES will use flood intelligence and official forecasts and warnings, to undertake an assessment of the predicted impact of a flood and to inform operational decision-making.

5.4 PROVISION OF INFORMATION AND WARNINGS TO THE COMMUNITY

5.4.1 **Strategy**: Timely and effective warnings are distributed to the community.

Actions:

a. The BoM issues public weather and flood warning products before and during a flood. These may include:

- Severe Thunderstorm Warnings with reference to heavy rainfall
- Regional Severe Thunderstorm Warnings with reference to heavy rainfall
- Detailed Severe Thunderstorm Warnings (for Sydney / Newcastle / Wollongong) with reference to heavy rainfall,

- Severe Weather Warnings with reference to heavy rainfall and/or storm surge,
- Flood Watches, and
- Flood Warnings.

b. Dam Owners will utilise Dam Failure Warning Systems to provide warnings and information to NSW SES and communities (where appropriate).

c. NSW SES Incident Controllers or Zone Duty Commanders will issue the following NSW SES flood information products incorporating warnings from the above, expected consequences and safety messages:

- Livestock and Equipment (including pumps) Warnings
- Local Flood Advices
- Flood Bulletins
- NSW SES Evacuation Warning
- NSW SES Evacuation Order
- NSW SES All Clear

d. NSW SES liaises with the Bureau of Meteorology to discuss the development of flood warnings as required.

e. NSW SES provides alerts and deliver flood information to affected communities using a combination of the following methods:

- Mobile and fixed public address systems.
- Two-way radio.
- Emergency Alert (SMS and voice message alerting system).
- Telecommunications (including Auto dial systems).
- Facsimile
- Standard Emergency Warning Signal.
- Doorknocking.
- Mobile and fixed sirens.
- Variable message signs.
- Community notices in identified hubs.
- Distribution through established community liaison networks, partnerships and relationships; and
- NSW SES social media and website.

f. NSW SES may request supporting agencies redistribute NSW SES alerts and information, including through the provision of doorknocking teams.

g. Road closure information will be provided to the community through the following agencies/methods:

- Local Government Council websites; and

- My Road Info
- Transport for NSW 'Live Traffic' website: www.livetraffic.com or 'Transport InfoLine': 131 500. VMS messaging on roadways may also be used to advise motorists.

h. The Public Information and Inquiry Centre will be established by the NSW Police Force where required to provide information regarding evacuees and emergency information. Contact details will be broadcast once the centre is established.

i. The Disaster Welfare Assistance Line will be established by Disaster Welfare Services where required to provide information on welfare services and assistance. Assistance line contact details will be broadcast once Disaster Welfare Services commence.

5.5 PROTECTION OF PROPERTY

5.5.1 **Strategy**: Coordinate the protection of property from destruction or damage arising from floods.

Action: NSW SES, supporting agencies, and community volunteers will assist the community (where resources are available, feasible and safe to do so) in:

a. The protection of properties through flood protection systems (e.g. sandbagging) to minimise entry of water into buildings; and

b. The raising or moving of household furniture and commercial stock/equipment.

5.6 ROAD AND TRAFFIC CONTROL

5.6.1 **Strategy**: Coordinate the closing and re-opening of flood affected roads.

Actions:

a. Forbes Shire Council will coordinate the closure and reopening of Council managed roads once inspections have been carried out by the relevant authority.

b. The Transport Management Centre (TMC) in coordination with Transport for NSW will coordinate the closure and reopening of the state road network.

c. The NSW Police Force may close and re-open roads but will normally only do so (if the Forbes Shire Council or Transport for NSW have not already acted and if public safety requires such action;

d. NSW SES will assist with erecting road closure signs and barriers when time and resources permit.

5.6.2 **Strategy**: Coordinate traffic control measures in flood affected areas.

a. The NSW SES Incident Controller may direct the imposition of traffic control measures into flood affected areas in accordance with the provisions of the *State Emergency Service Act, 1989* and the *State Emergency Rescue Management Act, 1989.*

b. The NSW SES Incident Controller may request the Local Emergency Operations Controller provide suitable personnel to assist with traffic coordination.

5.7 PROTECTION OF ESSENTIAL SERVICES

5.7.1 Arrangements for the protection of local assets are outlined in Volume 3 of this NSW SES local Flood Plan. In addition, Local and Region EMPLAN's contain infrastructure inventories.

5.7.2 **Strategy**: Minimise disruption to the community by ensuring protection of infrastructure and supply of essential energy and utility services.

Actions:

a. Transport Services Functional Area will keep the NSW SES informed of the status of transport network infrastructure.

b. The Energy and Utility Services Functional Area is to coordinate the assessment and restoration of essential energy and utility services (not including telecommunications).

c. The Telecommunications Services Functional Area is to coordinate the assessment and restoration of telecommunications and the Government Radio Network.

d. The Engineering Services Functional Area is to coordinate the assessment and restoration of critical public buildings for example hospitals; and

e. Functional Areas will keep the NSW SES informed of the status of utilities and infrastructure.

5.8 EVACUATION

5.8.1 Evacuation is the NSW SES's primary response strategy for managing the population at risk of flooding.

5.8.2 Community specific evacuation arrangements are located in Volume 3 of this Plan.

5.8.3 **Strategy**: Conduct planning to ensure all evacuation constraints are considered.

Actions:

a. Evacuations will take place when there is a risk to public safety. Circumstances may include:

- Evacuation of people when their homes or businesses are likely to flood.
- Evacuation of people who are unsuited to living in isolated circumstances, due to flood water closing access; and
- Evacuation of people where essential energy and/or utility services are likely to fail or where buildings have been or may be made uninhabitable; and

b. The NSW SES will consider the following in evacuation decisions:

- Duration of evacuation.
- Characteristics of the community.

- Numbers requiring evacuation.
- Availability of evacuation routes and transport.
- Time available for evacuation.
- Evacuee management requirements; and
- Resources and delivery of evacuation information.

c. NSW SES Incident Controllers, and flood planners will carefully consider the risks involved in conducting evacuations.

d. All evacuation decisions will be made as per the current NSW SES policies and procedures, and consistent with the NSW Evacuation Management Guidelines.

e. Potential Evacuation Centres are located in Volume 3 / Local EMPLAN; and

f. The NSW Police Force will coordinate the provision of overall security for evacuated areas.

5.8.4 **Strategy**: Evacuate people pre-emptively from dangerous or potentially dangerous places and or locations created by the flood hazard to safe locations away from the hazard.

a. NSW SES will control and coordinate the evacuation of affected communities.

b. The NSW SES Incident Controller will warn communities to prepare for a possible evacuation, where circumstances allow such lead time.

c. The NSW SES Incident Controller will order any necessary evacuations and provide information to the community about when and how to evacuate.

d. Support to evacuation operations may be requested from other emergency services and supporting agencies using arrangements in the local EMPLAN and supporting plans.

e. Health Services Functional Area will coordinate the evacuation of hospitals, health centres and aged care facilities (including nursing homes) in consultation with the NSW SES and Welfare Services.

f. School administration offices (Government and Private) will coordinate the evacuation of schools in consultation with the NSW SES and Welfare Services, if not already closed.

g. Caravan Park proprietors will inform the NSW SES Incident Controller when caravan park evacuations have been completed.

h. People who are reluctant or refuse to comply with any Evacuation Order will be referred to the NSW Police Force.

5.9 EVACUEE MANAGEMENT AND WELFARE

5.9.1 Research and experience in flood operations shows that most evacuees go to family, friends and commercial accommodation outside the impact area.

5.9.2 **Strategy**: Maintain the welfare of communities and individuals affected by the impact of a flood.

Actions:

a. NSW SES will provide initial welfare for evacuees where required but will hand the responsibility over to the Welfare Services Functional Area as soon as possible. In these cases, the NSW SES will brief the Welfare Services Functional Area at the earliest opportunity regarding the level of assistance required.

b. Welfare Services Functional Area will manage evacuation centres for affected residents and travellers in accordance with the Welfare Services Functional Area Supporting Plan.

c. Schools Administration (Government and Private) will manage the safety of students directly affected by flooding and will work with the NSW SES in the temporary closure of schools and will coordinate with NSW SES Transport and Welfare Services in the management of school evacuees.

d. Disaster Victim Registration will be controlled and coordinated by the NSW Police Force with the assistance of NSW SES and Welfare Services Functional Area.

e. NSW SES will provide details of all residents assisted in evacuations to the Welfare Services Functional Area as early as possible.

f. Where the expected remaining number of evacuees and the duration of evacuation is assessed to be beyond the capability and capacity of the established evacuation centre arrangements the SEOCON may establish Major Evacuation Centres or Mass Care facilities; and

g. The decision to establish Major Evacuation Centres or Mass Care Facilities will be made by the NSW SES and SEOCON in consultation with members of the State Emergency Management Committee.

5.9.3 **Strategy**: Coordinate available and accessible health services for flood affected communities.

Action: The provision of environmental health advice, assessment of public health risks and coordination of immediate mental health support will be provided by Health Services Functional Area.

5.9.4 **Strategy**: Coordinate maintenance of food supplies for flood affected communities.

Actions: All matters relating to the primary production, manufacturing, processing and handling of all food from primary industries to retail, inclusive of all restaurants, food services and catering businesses should be referred to the NSW Food Authority through the Agriculture and Animal Services Functional Area.

5.9.5 **Strategy**: Maintain the welfare of animals impacted by a flood.

Actions:

a. Agriculture and Animal Services Functional Area will coordinate the welfare of livestock, pets, companion animals and wildlife including support to primary producers, animal holding establishments and community members; and

b. Agriculture and Animal Services Functional Area role will assist with evacuation, emergency care of animals and assessment, humane destruction and disposal

of affected animals, and supply of emergency fodder, water and aerial support where necessary.

5.10 FLOOD RESCUE

5.10.1 **Strategy**: Control and coordinate flood rescue of people and domestic animals.

Actions:

a. NSW SES will perform flood rescue, where training and equipment is suitable and where a risk assessment has indicated that the risk to rescuers is acceptable.

b. Flood rescue operations will be conducted in accordance with the State Rescue Board Land Rescue Policy and the NSW State Rescue Board Flood Rescue Policy which sets out the framework, governance, responsibilities and requirements for the management and conduct of flood rescue in NSW.

c. NSW SES may request other supporting emergency services to undertake flood rescues on behalf of the NSW SES. Agencies must be authorised/accredited to undertake flood rescue operations in accordance with State Rescue Board requirements, as prescribed by NSW SES. Supporting emergency services must supply information regarding rescues performed to the NSW SES. Notification arrangements with NSW Police Force are outlined in the NSW State Rescue Board Flood Rescue Policy; and

d. Rescue agencies will conduct rescue of domestic small and large animals as per the State Rescue Board Land Rescue Policy (and may include Large Animal Rescue of family horses and cows at a residence or property). The rescue of livestock (which includes commercial animals found on farming and breeding enterprises) will be coordinated through Animal and Agriculture Services Functional Area.

5.11 RESUPPLY

5.11.1 **Strategy**: Coordinate resupply to towns and villages isolated by flooding to minimise disruption to the community.

Actions:

a. NSW SES will advise communities and businesses if flood predictions indicate that areas are likely to become isolated, and indicative timeframes where possible.

b. Retailers should be advised to ensure sufficient stock is available for the duration of the flood.

c. When isolation occurs, NSW SES will establish loading points where retailers can instruct suppliers to deliver goods.

d. NSW SES will endeavour to deliver mail to isolated communities but may not be able to do so according to normal Australia Post timetables.

e. NSW SES will assist hospitals with resupply of linen and other consumables where able.

f. NSW SES may request resupply assistance from supporting agencies.

5.11.2 **Strategy**: Coordinate resupply to rural properties isolated by flooding.

Actions:

a. When requested, NSW SES will establish a resupply schedule and coordinate the resupply for isolated rural properties.

b. NSW SES will provide local suppliers with designated loading points. Resupply items are to be packaged by the supplier; and

c. Isolated households unable to afford resupply items will be referred to Welfare Services Functional Area for assistance.

5.12 ALL CLEAR AND RETURN

5.12.1 **Strategy**: Coordinate the safe return of communities to flood affected areas when the immediate danger to life and property has passed.

Actions:

a. NSW SES Incident Controller will determine when it is safe to progressively return in consultation with the relevant Emergency Operations Controller and supporting agencies, considering the impact on the following:

- Access and egress
- Communications
- Power supply
- Gas supply
- Infrastructure damage
- Hazardous materials; and
- Public health risks (including sewerage)

b. NSW SES Incident Controller will specify the level of access to affected communities as the following:

- Not suitable for access.
- Limited access by emergency services and response agencies.
- Limited access by residents and/or business operators; or
- Full access

c. NSW SES Incident Controller will issue an 'All Clear' message when the immediate danger to life and property has passed for areas assessed as safe; and

d. The NSW SES will facilitate the return of evacuees to their homes.

5.13 END OF RESPONSE OPERATIONS

5.13.1 **Strategy**: Conclude response operations.

Actions:

a. Response operations will conclude when:

- The physical impact of the flood has ceased.
- All requests for assistance related to the flood have been completed;
- The need for warning and evacuation no longer exist.
- There is no further likelihood of rescuing people.
- Resupply is no longer required (resupply operations may occur concurrently with the recovery phase).
- Response to fire and hazardous material incidents have concluded (not including subsequent clean-up of contaminated sites); and
- All affected areas have had an 'All Clear' issued.

5.14 POST IMPACT ACTIONS

5.14.1 **Strategy**: Learnings from the event are used to inform recovery and future events.

Actions:

a. NSW SES will continue to engage with communities after significant floods through convening one or more community forums, workshops or other opportunities to provide communities a chance to provide feedback, address any concerns and provide input into the recovery process. These will typically include other agencies such as the Bureau of Meteorology, Welfare Services, Resilience NSW and Forbes Shire Council representatives.

b. NSW SES will ensure that damage assessment information is provided to the relevant Emergency Operations Controller to inform the recovery impact assessment.

c. NSW SES will conduct After Action Reviews, wherever possible, within three weeks of the end of response operations, which will involve all stakeholders. Findings will be shared and incorporated into improved disaster resilience planning.

d. NSW SES will undertake/coordinate a comprehensive review of intelligence and plans following significant flood events.

5.14.2 **Strategy:** Participate in post flood data collection analysis.

Actions: NSW SES will work with the NSW Department of Planning, Industry and Environment (DPIE) and Forbes Shire Council Council(s) on post flood data collection analysis including review of flood intelligence where necessary.

6 RECOVERY OPERATIONS

6.1 INTRODUCTION

6.1.1 Recovery is the process of returning an affected community to its proper level of functioning after an emergency. It will generally commence simultaneously with the Response phase.

6.1.2 Recovery operations will be initiated and conducted as outlined in the NSW State EMPLAN and as further detailed in the NSW Recovery Supporting Plan.

6.2 NSW SES RECOVERY ROLE

6.2.1 **Strategy**: NSW SES will support recovery operations and established Recovery Committees.

6.2.2 **Actions**:

a. NSW SES will provide representation to Recovery Committees as required and may have an ongoing role in the Recovery phase.

b. NSW SES roles on Recovery Committees may include providing information about any continuing response, guidance on mitigation strategies and general advice and assistance to the committee as a subject matter specialist and or expert.

c. NSW SES will provide information to Resilience NSW to support applications to Treasury for Natural Disaster Relief and Recovery Arrangements.

d. The NSW SES, in conjunction with a Recovery Committee, will provide a service to support the information needs of a community immediately following a flood; and

e. NSW SES and where required supporting agencies will assist with clean-up operations after floods, where possible when resources and personnel permit.

7 ABBREVIATIONS

For a full list of abbreviations refer to the NSW State Flood Plan - Abbreviations

8 GLOSSARY

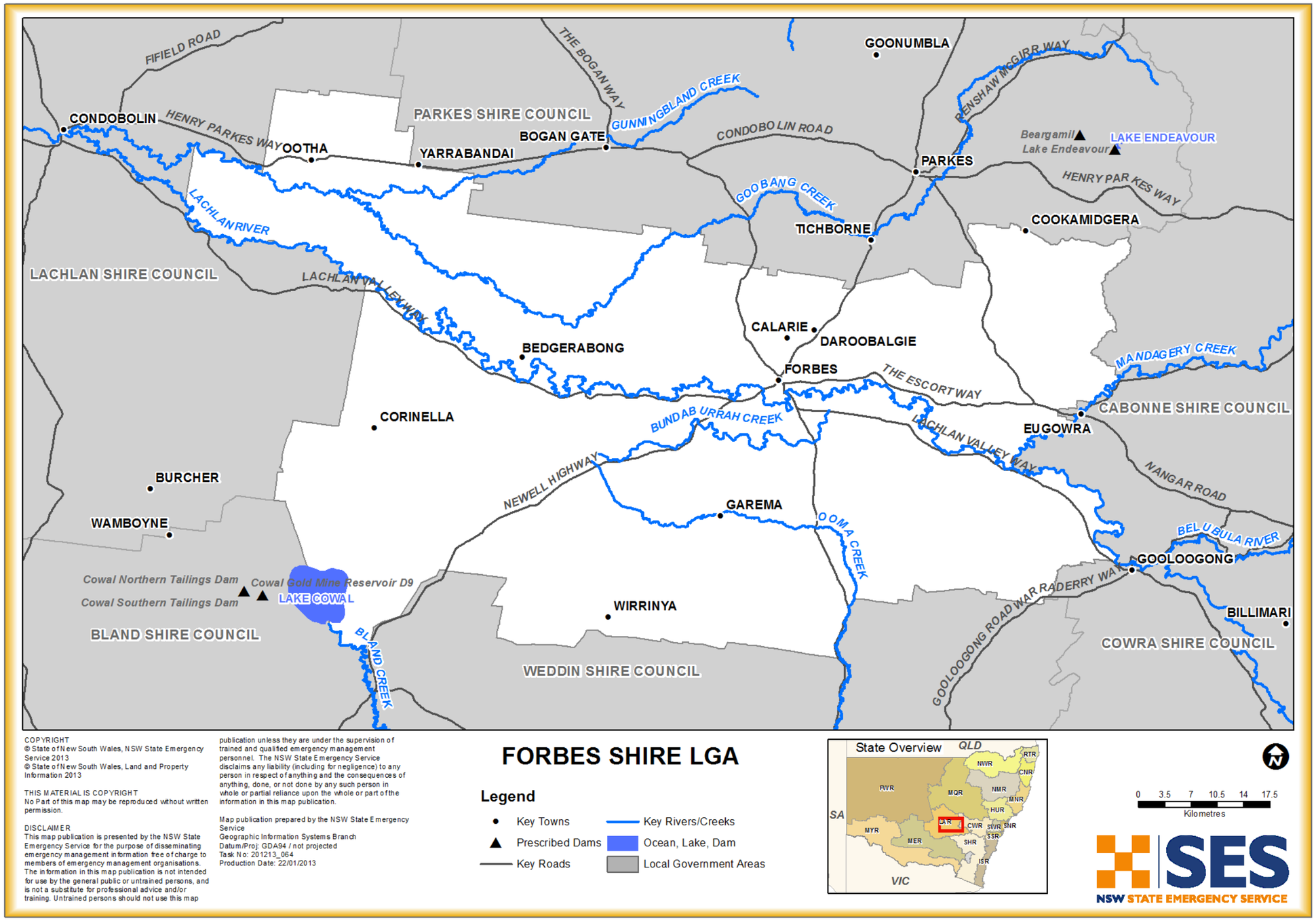
Common emergency service terminology can be found within the Australian Disaster Resilience Glossary.

Readers should refer to EMPLAN Annex 9 – Definitions.

Refer to the NSW State Flood Plan for a complete glossary of terminology used throughout this plan and within NSW SES Flood Plans.

For a full list of definitions refer to the Supporting Document - State Flood Plan Glossary https://www.ses.nsw.gov.au/media/2650/glossary.pdf

1 Appendix A – Map of Forbes Shire Council Area



1 Appendix B – Roles and Responsibilities

AGENCY	RESPONSIBILITIES
NSW State Emergency Service	The NSW SES is the designated Combat Agency for floods, storms and tsunami and controls response operations. NSW SES roles and responsibilities in relation to floods are detailed within the New South Wales State Flood Plan.

AGENCY	RESPONSIBILITIES
Agriculture and Animal Services Functional Area	The roles and responsibilities for Agriculture and Animal Services are outlined in the Agriculture and Animal Services Supporting Plan Roles and responsibilities in addition to the Supporting Plan are: • Disseminate briefing information to participating agriculture and animal services and related stakeholders. • When activated the Agriculture and Animal Services will coordinate the provision of required services which may include: – Coordinate response for animal welfare including pets, livestock and wildlife. – Supply and delivery of emergency fodder. – Emergency water replacement in certain circumstances; and – Financial, welfare and damage assessment assistance to flood affected primary producers. • Support recovery arrangements including: – Administer transport subsidies to primary producers.
Australian Government Bureau of Meteorology	The roles and responsibilities of the Australian Government Bureau of Meteorology (BoM) are outlined in the NSW State Flood Plan.
Forbes Shire Council	**Preparedness** • Establish and maintain Floodplain Risk Management Committees and ensure that key agencies are represented. • Develop and implement Floodplain Risk Management Plans in accordance with the NSW Government's Flood Prone Land Policy and the Floodplain Development Manual. • Provide Levee Studies, Flood Studies and Floodplain Management Studies to the NSW SES. • Maintain Council-owned flood warning networks and flood mitigation works. • Participate in NSW SES-led flood emergency planning meetings, to assist in the preparation of Flood Sub-Plans.

AGENCY	RESPONSIBILITIES
	• Maintain a plant and equipment resource list for the Council area. • Contribute to community engagement activities. **Response** • Subject to the availability of Council resources, assist the NSW SES with flood operations including: – Traffic management on Council managed roads. – Provision of assistance to the NSW SES (plant, equipment and personnel where able and requested). – Property protection tasks including sandbagging. – Assist with the removal of caravans from caravan parks – Warning and/or evacuation of residents and other people in flood liable areas. – Provision of back-up radio communications – Resupply of isolated properties; and – Technical advice on the impacts of flooding. – Close and reopen Council roads (and other roads nominated by agreement with Transport for NSW) and advise the NSW SES, the NSW Police Force and people who contact the Council for road information. – Assist the NSW SES to provide filled sandbags and filling facilities to residents and business in areas which flooding is expected. • Assist with making facilities available for domestic pets and companion animals of evacuees during evacuations. • Operate flood mitigation works including critical structures such as detention basins and levees and advise the NSW SES regarding their operation. • Manage and protect Council-owned infrastructure facilities during floods. • 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. • Advise the Environmental Protection Agency of any sewerage overflow caused by flooding. • Work with the NSW SES and DPIE to collect flood related data during and after flood events. **Recovery** • Provide for the management of health hazards associated with flooding including removing debris and waste.

AGENCY	RESPONSIBILITIES
	• Ensure premises are fit and safe for reoccupation and assess any need for demolition. • Provide services, assistance and advice to State Government in accordance with the State Recovery Plan.
Caravan Park Proprietor(s)	• Prepare a Flood Emergency Plan for the Caravan Park; • 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 and displaying this notice and emergency management arrangement within the park. • 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 manager of the caravan park with a contact address and telephone number in case of an emergency; and – 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). • 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. – Listen to a local radio station for updated flood information; and – Prepare for evacuation and movable dwelling (cabins) relocation. • Ensure that owners and occupiers of caravans are aware of what they must do to facilitate evacuation and movable dwelling relocation when flooding occurs. • 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 the park managers. • Secure any movable dwellings that are not able to be relocated to prevent floatation; and • 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.
Childcare Centres and Preschools	• When notified of possible flooding or isolation, childcare centres and preschools should.

AGENCY	RESPONSIBILITIES
	– 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; and – Assist with coordinating the evacuation of preschools and childcare centres.
Dams Safety NSW	The roles and responsibilities of the Dams Safety NSW (formerly NSW Dam Safety Committee) are outlined in the NSW State Flood Plan.
Department of Defence	Arrangements for Defence Assistance to the Civil Community are detailed within the State EMPLAN (section 448).
Department of Industry	The roles and responsibilities for the Department of Industry (Crown Lands and Water Division) are outlined in the NSW State Flood Plan.
Energy and Utilities Services Functional Area	The roles and responsibilities for Energy and Utilities Services are outlined in the Energy and Utility Services Supporting Plan (EUSPLAN). Roles and responsibilities in addition to the Supporting Plan are: • Assist NSW SES with identification of infrastructure at risk of flood damage where resources are available. • Facilitate local utility service distribution providers (electricity, gas, water, wastewater) to: – Provide advice to the NSW SES of any need to disconnect power/gas/water/wastewater supplies or of any timetable for reconnection. – Advise the NSW SES of any hazards from utility services during flooding and coastal erosion/inundation. – Advise the public with regard to electrical hazards during flooding and coastal erosion/inundation, and to the availability or otherwise of the electricity supply. – Clear or make safe any hazard caused by power lines or electricity distribution equipment. – Reconnect customers' electrical/ gas/ water/wastewater installations, when certified safe to do so and as conditions allow. – Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.
Engineering Services Functional Area	The roles and responsibilities for Engineering Services are outlined in the Engineering Services Supporting Plan.
Environmental Services Functional Area	The roles and responsibilities for Environmental Services are outlined in the Environmental Services (ENVIROPLAN) Supporting Plan.
Floodplain Management Australia	The roles and responsibilities of Floodplain Management Australia are outlined in the New South Wales State Flood Plan.

AGENCY	RESPONSIBILITIES
Fire and Rescue NSW (as per NSW State Flood Plan)	**Preparedness** • Identify and notify the NSW SES of any locations at risk of fire (within Fire Districts (13) or hazardous materials that pose a significant threat to surrounding populations due to the impact of a flood for incorporation into NSW SES flood intelligence and planning; and **Response** • Meet the agreed arrangements described in the NSW SES and Fire and Rescue NSW Mutual Aid Agreement. • Provide Incident Management personnel and Liaison Officers to the NSW SES where required. • When requested by NSW SES, provide support to the NSW SES in response to flood emergencies across the State. • 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. • Provision of Land Based and In Water Flood Rescue Operators as required. • Provision of appropriately trained personnel to perform Down the Wire (DTW) functions as required. • Conduct Hazmat operations including asbestos risks, rising from flood emergencies in coordination with the SES Incident Controller. • Decontamination of Flood Rescue Operators as required. • 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. • Provide trained staff to support a joint intelligence unit, if established by NSW SES, including Remotely Piloted Aircraft System (RPAS) pilots to assist with field observations. • Assist the NSW SES to undertake damage assessment including structural collapse risks.

AGENCY	RESPONSIBILITIES
	• Coordinate the pre-deployment of fire resources to communities within NSW Fire Districts if access is expected to be lost, in consultation with the NSW SES; and • Coordinate the deployment of the FRNSW High trans Pump to locations in consultation with NSW SES. **Recovery** • Participate in After Action Reviews as required.
Forestry Corporation of NSW	**Response** • Close and reopen Forestry Corporation of NSW roads when affected by flood waters and advise the NSW SES of its status. • Manage traffic on Forestry Corporation of NSW roads. • Facilitate the safe reliable access of emergency resources on Forestry Corporation managed roads. • Assist the NSW SES with identification of road infrastructure at risk of flooding. • Assist the NSW SES with the communication of warnings and information provision to the public through variable message signs and other appropriate means; and • Close and relocate people from camping grounds at risk of flooding in State Forest managed areas.
Health Services Functional Area	The roles and responsibilities for Health Services Functional Area are outlined in the Health Services (HEALTHPLAN) Supporting Plan. Roles and responsibilities in addition to the Supporting Plan are: • Ensure that appropriate business continuity plans are developed for essential health infrastructure and are activated during floods.
Local Emergency Operations Controller (LEOCON)	• Monitor flood operations. • If requested, coordinate support for the NSW SES Incident Controller.
Local Emergency Management Officer (LEMO)	• If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.
Manly Hydraulics Laboratory (MHL)	The roles and responsibilities of Manly Hydraulic Laboratory are outlined in the NSW State Flood Plan.
Marine Rescue NSW (as per NSW State Flood Plan)	**Response** • When requested by NSW SES, assist in flood operations when training and equipment are available and suitable including assistance with: – Warning and/or evacuation of at-risk communities. – Providing communications personnel.

AGENCY	RESPONSIBILITIES
	– Property protection tasks including sandbagging; and – Flood rescue operations.
NSW Ambulance	The roles and responsibilities for NSW Ambulance are outlined in the Health Services (HEALTHPLAN) Supporting Plan.
NSW Department of Education	**Preparedness** • 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); • Ensure that evacuation plans for flood liable schools have arrangements for flooding; and • Assist NSW SES with community engagement and capacity building programs. **Response** • Assist with the coordination of the evacuation of schools and the immediate welfare of students until returned to the appropriate carer. • Pass information to school bus drivers/companies and/or school principals on expected or actual impacts of flooding; and • Provide space in schools for evacuation centres where necessary.
NSW Department of Industry, Planning and Environment (as per NSW State Flood Plan)	**Prevention** • Oversee the delivery of the NSW Flood Prone Land Policy including financial support through the Floodplain Management Program. Provide technical advice to Councils and state agencies including assistance with the identification of risks, the preparation and implementation of Floodplain Risk Management Plans and associated mitigation and management actions and understanding flood mitigation schemes including levees. • Work with the NSW SES on the Flood Data Access Program to improve the provision of flood information through the NSW Flood Data Portal. • Assist the Department of Industry-Water in the preparation of rural floodplain management plans under the *Water Management Act 2000* (NSW); and • Provision of strategic technical advice to support floodplain risk management and environmental water management in rural areas of the Murray Darling Basin. **Preparedness** • Assist the NSW SES in the exercising of Flood Sub Plans.

AGENCY	RESPONSIBILITIES
	• Management of the state government's water level gauges for the flood warning network in tidal areas in NSW (Manly Hydraulic Laboratory operates this system as a service provider on behalf of DPIE.). • Advise NSW SES about conditions which may lead to coastal inundation or retarded river drainage near the coast. **Response** • Provide related advice on flood risks to the NSW SES on request; and • Work with the relevant local Council and NSW SES to collect flood related data during and after flood events. **Recovery** Support recovery committees as required.
NSW Food Authority	The roles and responsibilities for NSW Food Authority are outlined in the Food Industry Emergency Sub Plan.
NSW National Parks and Wildlife Services (as per NSW State Flood Plan)	**Preparedness** • Assist the NSW SES with identification of road infrastructure in National Parks at risk of flooding. **Response** • Close and reopen National Parks and Wildlife Service roads when affected by flood waters and advise the NSW SES of its status. • Facilitate the safe reliable access by emergency resources on National Parks and Wildlife Service managed roads. • Assist the NSW SES with the communication of warnings and information provision to the public through variable message signs and other appropriate means; and Close and direct people to leave camping grounds at risk of flooding in National Parks and Wildlife Service managed areas.
NSW Police Force (as per NSW State Flood Plan)	**Preparedness** • Participate in NSW SES briefings, training and exercises as required. **Response** • Provide a Liaison Officer to the NSW SES Operation Centre if required. • When requested by NSW SES, in flood operations when training and equipment are available and suitable. – Assist with warning and/or evacuation of at-risk communities. – Assist with monitoring / reconnaissance of flood prone areas. – Assist with flood rescue operations.

AGENCY	RESPONSIBILITIES
	• Conduct road and traffic control operations in conjunction with Council and/or Transport NSW. • Coordinate searches for missing people within flood affected areas. • Coordinate security of supply lines evacuated and damaged areas. • Manage Disaster Victim Registration; and • Operate the Public Information and Inquiry Centre, if requested or otherwise needed during flood events. **Recovery** • Participate in After Action Reviews as required.
NSW Rural Fire Service (as per NSW State Flood Plan)	**Preparedness** • Participate in NSW SES briefings, training and exercises as required; and • Meet the agreed arrangements described in the NSW SES/NSW RFS Memorandum of Understanding. **Response** • Provide a Liaison Officer to the NSW SES Operation Centre or Emergency Operations Centre as required. • Provide Incident Management Personnel when requested. • Provide trained staff to support a joint intelligence unit, if established by NSW SES. • Provide aviation support, management and advice as requested through the State Air Desk. • Provide speciality aircraft and appropriately trained personnel to perform Down the Wire (DTW) functions as required. • Assist with Damage Assessments; and • Provide Strike Teams during flood operations when requested by NSW SES. This may include assistance with: – Warning and/or evacuation of at-risk communities. – Monitoring / reconnaissance of flood prone areas. – Property protection tasks including sandbagging. – Pumping flood water out of buildings and from low-lying areas. – Back-up radio communications. – Clean-up operations, including the hosing out of flood affected properties. – Deploying resources to communities within Rural Fire Districts where access is expected to be lost in consultation with the NSW SES. – The resupply of isolated communities and/or properties; and

AGENCY	RESPONSIBILITIES
	– Decontamination of NSW SES Flood Rescue Operators as required. **Recovery** • Participate in After Action Reviews as required.
NSW Volunteer Rescue Association (as per NSW State Flood Plan)	**Response** • Where requested by the NSW SES, assist in flood operations when training and equipment are available and suitable, including assistance with: – The warning and/or evacuation of at-risk communities. – Flood rescue operations. – Monitoring / reconnaissance of flood prone areas. – Resupply of isolated communities and/or properties; and – Property protection tasks including sandbagging.
Owners of Declared Dams within or upstream of the LGA (as per NSW State Flood Plan)	**Preparedness** • Assist the NSW SES with community engagement programs. • Provide NSW SES with information necessary for response planning and warning distribution. • Assist the NSW SES identify correlations between water level and/or discharges at the dam for use in flood response operations (warning and evacuation); and • Consult with the NSW SES State Headquarters in the development of Dam Emergency Plans, including the development of dam failure alerts, in accordance with the Dam Safety Committee Guidelines. **Response** • Where water level monitoring or other instrumentation allows, provide NSW SES with flood advices as per pre-agreed thresholds for use in downstream flood response operations (warnings). • Notify NSW SES of potential or actual dam failures in accordance with the Dam Emergency Plan and Dam Safety NSW Guidelines. • Close at-risk camping grounds / recreational areas within their managed areas. • In the case of declared dams whose risks are intolerable, assist the NSW SES in planning to warn and evacuate people at risk of dam failure and maintain and operate any special Dam Failure Warning Systems and/or automatic telemetered monitoring devices to assist with early detection of incidents which are installed until such time that the risks have been lowered to an acceptable level; and Owners of gated dams:

AGENCY	RESPONSIBILITIES
	• Provide all available information to the BoM and the NSW SES on storage levels and actual and prospective water releases and their likely impacts on downstream river levels. • Advise the downstream community of prospective and actual water releases, except in those circumstances where the BoM would issue flood warnings; and • Where possible actively work with NSW SES and the BoM to reduce the impacts of flooding on communities through management of water releases within identified safe parameters and within statutory licencing provisions under the *Water Management Act 2000* and *Water NSW Act 2014*.
Public Information Services Functional Area	The roles and responsibilities for Public Information Services are outlined in the Public Information Services Supporting Plan. Roles and responsibilities in addition to the Supporting Plan are: • On receipt of advice from NSW SES of any weather event likely to result in significant multi agency operational activity, the Public Information Functional Area Coordinator PIFAC determines if a daily multi-agency teleconference is required to ensure that the information needs of each agency are being met and to address any issues. These teleconferences continue through the response phase into the recovery phase.
Rail Corporation NSW and the Australian Rail Track Corporation	• Close and reopen railway lines affected by flood waters and advise the NSW SES Incident Controller.
Resilience NSW	• The roles and responsibilities of Resilience NSW are outlined in the NSW State Flood Plan.
SEOCON/SEOC	The roles and responsibilities of the SEOCON/SEOC are outlined in the New South Wales State Flood Plan.
Telecommunications Services Functional Area	The roles and responsibilities for Telecommunications Services are outlined in the Telecommunications Services (TELCOPLAN) Supporting Plan.
Transport for NSW	• Transport for NSW coordinates information on road conditions for emergency services access. • Transport for NSW coordinates the management of the road network across all modes of transport. • Transport for NSW in conjunction will assist the NSW SES with the evacuation of at-risk communities by maintaining access and egress routes.

AGENCY	RESPONSIBILITIES
	• TMC will assist the NSW SES with the communication of flood warnings and information provision to the public through Live Traffic and Social Media according to the VMS protocols and procedures. **Assist the NSW SES with identification of road infrastructure at risk of flooding.**
Transport Services Functional Area	The roles and responsibilities for Transport Services are outlined in the Transport Services Supporting Plan. Roles and responsibilities in addition to the Supporting Plan are: • Participate in risk management studies. • Assist the NSW SES to identify transport infrastructure at risk of flood damage for incorporation into planning and intelligence; and • Coordinate the provision of traffic and transport operations as consistent with the roles of Transport organisations.
Water NSW	The roles and responsibilities for Water NSW are outlined in the New South Wales State Flood Plan.
Welfare Services Functional Area	The roles and responsibilities for Welfare Services are outlined in the Welfare Services Functional Area Supporting Plan.

2 Appendix C – Community Specific Roles and Responsibilities

Community Members	**Preparedness** • Understand the potential risk and impact of flooding. • Prepare homes and property to reduce the impact of flooding. • Understand warnings and other triggers for action and the safest actions to take in a flood. • Households, institutions and businesses develop plans to manage flood risks, sharing and practicing this with family, friends, employees and neighbours. • Have an emergency kit; and • Be involved in local emergency planning processes. **Recovery** • Assist with community clean-up if required and able to do so. Participate in After Action Reviews if required.
Yoorana Gunya Family Healing Centre Aboriginal Coroporation	• 40-70 Church Street, Forbes, NSW Telephone: (02) 6850 1222 (Donna@yooranagunya.com.au) • Act as the point of contact between the NSW SES and the Indigenous community of Forbes. • Disseminate flood information, including flood and evacuation warnings, to the Indigenous community of Forbes.
Jemalong Irrigation Limited (Irrigation Landholders)	• Provide flood information to the NSW SES Incident Controller. • Distribute flood warnings and flood information provided by the NSW SES Incident Controller.

NSW STATE EMERGENCY SERVICE

HAZARD AND RISK IN FORBES SHIRE

Volume 2 of the Forbes Shire Local Flood Plan

Last Update: August 2017

FloodSafe

AUTHORISATION

The Hazard and Risk in Forbes 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: 24 August 2017

CONTENTS

LIST OF TABLES

LIST OF FIGURES

VERSION LIST

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

Description	Date
Forbes Shire Local Flood Plan Annex A and Annex B	September 2002
Forbes Shire Local Flood Plan Volume 2	November 2016

AMENDMENT LIST

Suggestions for amendments to this Volume should be forwarded to:

The Forbes 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	2016 post flood update	E. O'Shannessy	17/02/2017

Document Issue: V2-28032014

1 THE FLOOD THREAT

1.1 LANDFORMS AND RIVER SYSTEMS

1.1.1 The Lachlan River Valley covers an area of 84,700 square kilometres and stretches westward from the Great Dividing Range for 560 kilometres as a long narrow basin. The river passes from a relatively high rainfall area near its headwaters in the east (which has an average annual rainfall of 760 to 900 millimetres) to low rainfall areas in the west (with average annual rainfall of about 300 millimetres). As a consequence, the Lachlan River and its upper tributaries produce most of the source of floodwaters in the Forbes Local Government Area (LGA). These tributaries include (1):

a. The Abercrombie River, which flows into Wyangala Dam (as does the Lachlan River).

b. The Booroowa River which enters the Lachlan River approximately 15 kilometres below the dam.

c. The Belubula River which joins the Lachlan River approximately 15 kilometres north of Gooloogong.

d. The Mandagery Creek which enters the Lachlan River between Gooloogong and Forbes.

e. Yarrabandai Creek which rises north east of Trundle.

f. Ooma Creek and its tributary Pinnacle Creek, which rise in the Piney range upstream of Garema.

1.1.2 Upstream of Forbes, the Lachlan River travels in a south westerly direction before swinging to the south, just east of Forbes. The course of the river then diverts to the west before swinging north again downstream of Forbes, effectively surrounding the town on three sides (1), as shown in Map 2.

1.1.3 Lake Forbes forms an anabranch of the Lachlan River that runs through the town Forbes. The local watercourse feeding the lake has a catchment area of approximately 260 square kilometres (1). Lake Forbes eventually flows into the recreation area in the south west of Forbes before re-joining the Lachlan River downstream of the town (2).

1.1.4 Lake Cowal is located south west of Jemalong Gap. It is a large natural basin fed by a number of northward flowing creeks, including the Caragabal (Barbingal), and Barmedman (Back) creeks, which merges into the Bland Creek at Marsden affecting a large area of the floodplain south of the Lachlan River. Lake Cowal has an area of approximately 14,600 hectares and once full, the lake has been known to retain water for periods of up to 10 years (1).

1.1.5 Downstream of Forbes, 24 kilometres downstream (west) of Forbes, the Jemalong and Corradgery Mountain Ranges form a natural barrier to flood flows (2). Goobang Creek rises in the Harvey ranges north east of Parkes and

flows into Forbes Shire on its northern boundary, just east of the Corradgery Range, then through Coglans Gap into the Gunning Gap area (1).

1.1.6 There is a significant proportion (87%) of the LGA used for crops and livestock within the Council area (3).

1.2 STORAGE DAMS

Wyangala Dam

1.2.1 The Wyangala Dam is located on the Lachlan River, approximately 48 kilometres upstream of Cowra, near the junction of the Lachlan and Abercrombie Rivers. This dam is regulated by State Water as an irrigation resource for the Lachlan Valley (4).

1.2.2 Wyangala Dam does not mitigate the largest floods and is not considered a flood mitigation measure (2), especially due to the effects of inflows to the Lachlan River from downstream tributaries (2).

1.2.3 Although the Wyangala Dam is currently in good condition, it is recognised that an unsafe emergency condition could occur at any time due to extreme natural or man-made events. It is considered that the travel time of the spill from Wyangala Dam to the Forbes Iron Bridge gauge is approximately 76 hours as shown in Table 1 below (4).

Table 1: Details of Wyangala Dam

Wyangala Dam	
Owner / Operator	State Water Corporation
Description of Dam	Earth and rockfill embankment with central impervious clay core and radial gate controlled spillway. FSL 1 220 000 Mega litres (ML) (Relative Level (RL) 378.85m AHD) Maximum height of 85 metres, Crest level of RL 384.95 metres Australian Height Datum (AHD) Spillway level of RL 366.662m AHD
Location	Wyangala, Lachlan River, 48 kilometres upstream of Cowra
Communities Downstream	Wyangala, Cowra, Gooloogong, Forbes, and Condobolin.
Monitoring System	Piezometers and on-site monitoring occurs
Warning System	NSW SES warn the downstream communities of inundation and potential isolation upon receipt of alerts from the dam owner.
Other	Warning times to Forbes are a few days. Releases from the dam strongly influence the level of flooding downstream, but this relationship also depends on inflows from the tributaries. In 2012 Wyangala releases reached 65000ML (peaking at 10.55 metres) and in 2016 it reached 55000ML (reaching a peak of 10.76 metres). In August 1990 it reached 170 000ML (reaching a peak of 10.64 metres at Forbes) (5).

1.3 WEATHER SYSTEMS AND FLOODING

1.3.1 The majority of the rainfall in the Forbes Shire occurs in the winter and early spring, and this is when flooding is most likely. Three-quarters of the flood peaks above the major flood level (10.55 metres), recorded at the Forbes Iron Bridge gauge since 1916 have occurred between July and October as shown in Figure 1 below (2).

1.3.2 Approximately 75% of the major flood peaks recorded at the Cottons Weir and Jemalong Weir (downstream) gauges have also occurred at the same time of year (1).

1.3.3 Flooding in the Forbes Shire usually results from one of the following three weather mechanisms (1):

a. **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.

b. **East coast low-pressure systems**. These systems develop off the NSW coast, usually during the cooler months. They direct moist winds onto the coast and across the Great Dividing Range, often producing very heavy rain.

c. **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.

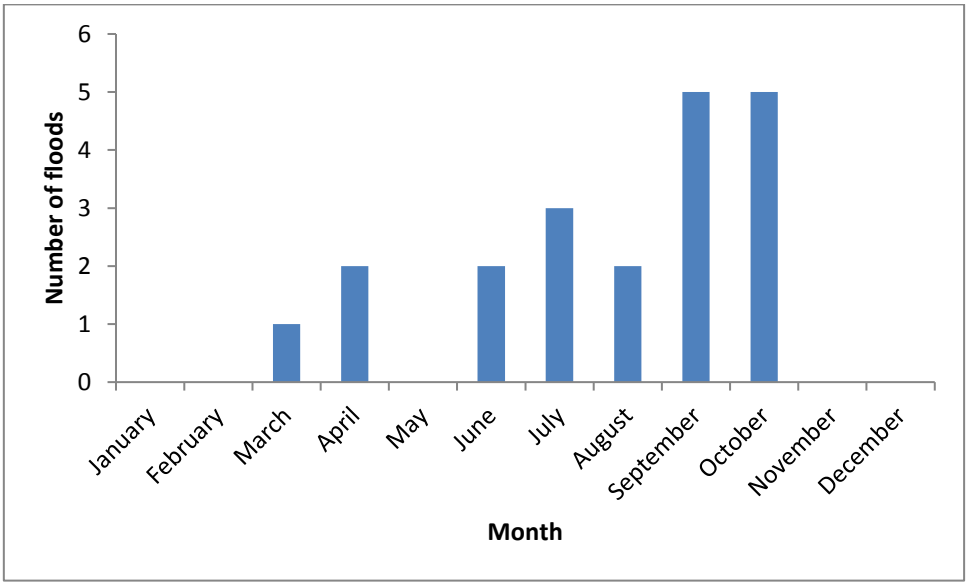


Figure 1: Forbes Iron Bridge, floods above Major flood level (10.55 metres) from 1916 to 2016 by month

1.3.4 The moderate level flooding which occurred during October 1996 is believed to have been caused by an ex-tropical cyclone which travelled across from Western Australia (1).

1.4 CHARACTERISTICS OF FLOODING

1.4.1 Upstream of Cowra, flooding is generally confined to the stream channels and small pockets of adjacent floodplain and flood peaks travel relatively rapidly along this section of the river. In the vicinity of Cowra, the river flows out of the 'slopes' and into the 'plains' (1). Below Cowra, inundation of low-lying areas is more extensive but flood waters tend to subside reasonably quickly and inundation periods do not generally exceed a week (1).

1.4.2 By the time the river reaches Gooloogong, a progressive reduction in main channel capacity has started. As a consequence, significant overbank spillage occurs between Gooloogong and Forbes, and flood waters begin to spread over wide areas of the floodplain. Much of this water finds its way into natural depressions and billabongs that interconnect and form active flood runners. The floodplain at Forbes is approximately 10 kilometres wide and floods in this reach of the river tend to have a flat peak, often extending for several days. Flooding can be made significantly worse here by inflow from the Belubula River, much of which moves across its own floodplain even during moderate flood flows (1).

1.4.3 History has shown that any of the tributaries can cause minor floods and have been jointly responsible for major floods when combined with the main river, especially in the reach below the Wyangala Dam (2).

1.4.4 Flood conditions on the floodplain in the Forbes LGA are very complex and conditions from one flood to another may be markedly different for the same flood level on the Forbes Iron Bridge gauge. It depends largely on the volume of flow carried by the flood channels which leave the river upstream of the town and outflows from Wyangala Dam (controlled and uncontrolled) (2).

1.4.5 Depths of flooding are generally in the order of one metre, with the main water flow capacity being reduced by the flow into Bundaburrah Creek to the south, the Lachlan River itself, and Lake Forbes and Battye Street (flowing along Lawler Street and back into the lake on the other side of town) floodways which pass through Forbes the town itself can also reach these depths (1).

1.4.6 The flow is also dependant on vegetation, and therefore travel times vary. On average, flow commences in Battye Street floodway when the Iron Bridge gauge reaches 10.55 metres. However, this occurred at 10 metres in 2010 and did not occur at all in 2016, with a peak of 10.76 metres. If the levee along the river breaches, the flood pattern would change particularly for the regions outside the residential areas. Similarly, rural levees are frequent and can impact on the flood behaviour, as well as the outflow from the dam as previously mentioned (2).

Flooding in Forbes

1.4.7 Lake Forbes has an important role during times of flood and is estimated to have carried approximately 26% of the total peak flow in both the June 1952, September 1974 and probably the March 2012 floods (2). Naturally Lake Forbes is fed by rainfall from the north-east of Forbes (in the Back Yamma State Forest area); however in times when the Lachlan River is in flood, the Lake can be fed from breakouts from the Lachlan River to the east of Forbes from Bathurst Street breakouts and Southern Cross breakouts as described below.

1.4.8 Local minor flooding can occur as a result of high intensity storms and riverine flooding (6). During riverine flooding, the lake is fed by separate Lachlan River breakouts from around 8.4 metres at Forbes Iron Bridge. The first originates from the area to the north east of Forbes, and the second occurs at the southern end of Forbes as described below. There is also a breakout that occurs upstream of Forbes (to the east) that feeds into Bundaburrah Creek (2):

a. **The 'Southern Cross breakout'**. Water breaks out from the north bank of the Lachlan River in the vicinity of the locality known as the 'Southern Cross', approximately 16 kilometres upstream of Forbes. As flows from this breakout increase, flood waters flow north from the river, crossing the Forbes-Eugowra Road (MR 377E) to the 'Southern Cross flood runner'. Further breakouts along the northern bank of the Lachlan River may occur at various points between the Southern Cross and Forbes to combine with the major flow from the Southern Cross flood runner. The main flood runner then flows in a south-easterly direction, parallel to the main channel, before feeding into the northern end of Lake Forbes through the railway viaduct.

b. **The Bathurst Street breakouts**. In Forbes, the river overtops its bank adjacent to the railway bridge at Bathurst Street and flows north west along the railway line entering Lake Forbes through two viaducts. The larger viaduct spans across Lake Forbes itself and the smaller is adjacent to Herbert Street. Flow from the smaller viaduct crosses Hill Street and enters Lake Forbes just upstream of the Camp Street Bridge. Flood waters from the Bathurst Street breakout may also enter the southern end of town and inundate the lower portions of Ooma, Oxford and Bandon Streets. Further breakouts from this section of the river also flow south to the Wongajong area and west through the old Botanical Gardens to lower Wambat Street. There is also a Lower Bathurst Street breakout to the east, which flows from Lower Bathurst Street northward along Torig Street across the Escort Way and north-west into Lake Forbes.

c. The **Dukes Crossing breakout** leaves the southern bank of the Lachlan River about five kilometres upstream of Forbes. It flows across Wandary Lane via a culvert towards Dukes Crossing and Lachlan Valley Way, and then into Bundaburrah Creek. This creek flows west and eventually

returns floodwater to the Lachlan River immediately to the east of Jemalong Gap through Bundaburrah Cowal and Jemalong Creek (6).

1.4.9 As the amount of water flowing into Lake Forbes from the Southern Cross and Bathurst Street breakouts increases, flood waters eventually begin to flow out of Lake Forbes and cross into Dowling Street, via the town drainage system. Past events have shown that this does not usually occur until major prolonged flows are experienced across the Forbes-Eugowra Road (MR 377E) in the vicinity of the Southern Cross breakout (2).

1.4.10 The overflow in Dowling Street then enters the Battye Street floodway which flows past the swimming pool and through the Memorial Park before re-joining the Lake near the"King George V" park. The Battye Street floodway plays an important part in relieving flood flows in Lake Forbes and is estimated to have carried approximately 7% of the total flood passing Forbes in the September 1974 event (2). In 2016, there was less flooding in Lake Forbes and Battye Street floodway was not active. More flooding was observed along the Lachlan River (7).

1.4.11 Once the Battye Street floodway is active, flood levels in Forbes have usually reached the major flood level (around 10.55 metres or greater on the Forbes Iron Bridge gauge). Shortly after this height is reached, the town is then divided into the following three areas by flood waters, as occurred in the August 1990 event, noting the height this occurs varies and did not occur in 2016 (2):

a. The northern and north western parts of town.

b. The Central Business District (CBD) which becomes an island as the road north is cut at Dowling Street where the Battye Street flood runner overtops the road.

c. The southern residential area (Camp Hill) which also becomes an island.

1.4.12 The separation of the town into three sections for several days can cause a great amount of social and economic disruption (1).

1.4.13 With further increases in flows, the water in the Battye Street floodway and Lake Forbes tends to rise faster than the river itself. For example, the 1952 flood was only 0.16 metres higher than the 1990 flood, however the difference in flood levels in the Lake Forbes and Battye Street areas between these two floods was about one metre. In that area, this difference in flood heights would make a major difference to the severity of the flood (1). At higher floods, the water level again rises at the iron bridge and floodwater spreads out from the river and floodways link up and cover the whole floodplain (2).

1.4.14 Flood peaks in the Lachlan River and Lake Forbes do not occur at the same time, the peak in Lake Forbes usually lagging behind Lachlan River peaks by 24-48 hours. If the peak of the flood stays high for many days, as occurred in August 1990, then flooding can be more serious than a short duration peak.

Flood waters may also back up in the vicinity of the Lachlan River/Lake Forbes confluence leading to higher flood levels in Forbes (6).

Caragetel Swamp

1.4.15 A number of breakouts from the south bank of the Lachlan River upstream of Forbes, in the vicinity of the Cumbijowa Forest (near 'Kindimindi') and Wandary, carry flood waters into Bundahburrah Creek. This water bypasses Forbes flooding a large area to the south of the town and flowing south west towards the Caragetel Swamp. Water from Ooma Creek, which rises in the Weddin ranges and flows north into Forbes Shire in the vicinity of Ooma North, then west through Garema, also flows into the swamp. Water from this flood storage area eventually flows back into the river via Jemalong Creek upstream of Jemalong Weir. Anywhere from 15 to 80 percent of flows measured at the Nanami Gauge at Gooloogong can bypass Forbes and travel by these routes (2).

The Lachlan River downstream of Forbes

1.4.16 Flood waters from a wide expanse of area upstream of the Jemalong and Corradgery Mountain Ranges (the floodplain is approximately 10 kilometres wide here) are concentrated to pass through Jemalong Gap, which is only one kilometre wide. Consequently, the flood peak downstream of the Gap is often markedly reduced whilst flood levels upstream are increased and drainage of inundated areas, particularly adjacent to Jemalong Creek, is delayed (2). Water in the Jemalong Gap region is sourced from the Bundaburrah Creek, Lachlan River and is also sourced from rainfall in the Pinnacles area and all of this water backs up against the Jemalong Ranges.

1.4.17 To the west of Jemalong Gap, flood waters can also spread over a wide area through numerous flood runners which often carry far greater flows than the main channel during major floods. Some of these channels return to the river downstream, but the tendency is for the floodwaters to follow a north-westerly path towards the river (6).

1.4.18 In the larger floods, backup water from Jemalong Gap may flow north along the Corradgery Range and pass through a second break in the range, known as Gunning Gap (or Gulgans Gap). This water then joins the Goobang Creek system before flowing back into the Lachlan River near Condobolin. The area between the Goobang Creek and the river is riddled by depressions, billabongs and anabranches which fill during floods and channel water towards Goobang Creek (1).

1.4.19 From here, the water generally flows west and north west. In major flooding, Goobang creek also spreads to the north to join the Gunningbland Creek. These flood waters eventually join the Lachlan River at Condobolin. These two creeks can also cause flooding independently of any Lachlan River overflow (1).

Lake Cowal

1.4.20 In minor floods, flood waters may not reach the lake and remain ponded on the floodplain for long periods (1).

1.4.21 In addition, flood waters move south west, along relatively defined routes towards Lake Cowal, from two large breakouts on the Lachlan River west of Jemalong Gap. These are commonly known as the '17 mile' and the '21 mile' breakouts (1).

1.4.22 Large quantities of water are temporarily stored on the floodplain in this way and slowly drain from the northern end of the lake via Manna Creek and then through Bogandillion Swamp and Willamundry and Wallaroi creeks to join the Lachlan River downstream of Condobolin (near Kiacatoo) (1).

1.4.23 Peak travel times between gauging stations can vary significantly from event to event for a number of reasons. In particular, in periods of very severe flooding, it should be noted that flow times might be shorter than shown in the table below. Also, when large volumes of water suddenly enter a river with low flows, faster flows will tend to occur than in situations where the build-up of water is gradual. Flood travel times along the Lachlan River between Wyangala Dam and Forbes can also vary depending on the flows in the Belubula and Booroowa Rivers. The times listed in the following table need to be regarded, therefore, as approximations only (1).

Table 2: Indicative flow travel time for the Lachlan River

Locations	Travel Time	Cumulative Travel Time
Wyangala Dam to Cowra	8-12 hours	8-12 hours
Cowra to Nanami	21 hours	29-33 hours
Nanami to Mulyandry	26 hours	55-59 hours
Mulyandry to Forbes Iron Bridge	22 hours	77-81 hours
Forbes Iron Bridge to Cottons Weir	4 hours	81-85 hours
Cottons Weir to Jemalong Weir (downstream)	24*	105-109 hours

***NOTE:** The flow time relationship between the peak height at the Forbes Iron Bridge gauge and the Jemalong Weir (downstream) gauge, is dictated by the amount of flood water that leaves the river before Forbes and re-enters the river at Jemalong Gap via Jemalong Creek.

1.5 FLOOD HISTORY

The Lachlan River at Forbes

1.5.1 Approximately 21 flood events exceeding the current 'major' flood level of 10.55 metres have been recorded at the Iron Bridge gauge in the town of Forbes since 1887 (Figure 2), roughly equivalent to a major flood every seven years (2). Flood history is summarised in Table 3.

Table 3: Flood history at Forbes

Historical Flood	Height (m)	Notes
June 1952	10.8	Flood of record. Approximately a 1% AEP. The flood resulted in extensive damage to Stockingbal-Parkes railway line and Australia's first mass helicopter rescue of 27 people (2). It is estimated that approximately 500 homes in Forbes would be flooded if a similar level of flooding were to occur today (1).
October 1950	10.64	Second highest *discharge*, but 6th highest flood level.
August-September 2016	10.76	Second *highest* recorded flood and most recent flood. The floodwater behaved differently to previous floods. It saw more flooding adjacent to the Lachlan River, less flooding on Lake Forbes and the Battye Street floodway was not active. This resulted in large amounts of rural produce losses and isolation of smaller communities for several days to weeks such as Bedgerebong, Corinella, Waroo, Wirrinya, Jemalong, Garema, Fairholme, Lake Cowal and rural properties in Forbes. There were around 50 local roads flooded as well as the major transport routes Lachlan Valley Way, Newell Highway, Escort Way and Henry Parkes Way. Around seven commercial and 28 residential dwellings were flooded (7).
August 1990	10.65	Occurred after two preceding events, in April and July of the same year, which also exceeded the major flood level. This is estimated to have an AEP of 4%. However, local markers indicate that the 1990 flood was potentially the fourth highest flood through Forbes and in some sections of the town, the water was not as high as the September 1974 flood (which reached 10.62 metres on the Forbes Iron Bridge gauge and an estimated AEP of 2.5%) but had similar impacts on the town (1). It is estimated that between 233 and 265 houses were affected (inundated or surrounded) by flood waters (1).
March 2012	10.55	AEP of 3%. Access was cut to central Forbes in the 2012 event, when floodwater from the Lachlan River backed up along the old stock route and inundated properties along the eastern side of Ferry Street. In this event, the Southern Cross, Bathurst Street and Dukes Crossing breakouts were active and backwater flooding of the stormwater resulted in shallow inundation of the eastern Lower Rankin Street, Bathurst and Ferry Street intersection and Flint Street south of Bathurst Street (2).
December 2010	10.16	Peaked below the Major flood level AEP of 25%. The December 2010 flood resulted in minor flooding; however the March 2012 event caused widespread flooding in rural and urban areas of Forbes, with at least 16 residences reported to have experienced above floor flooding (2).

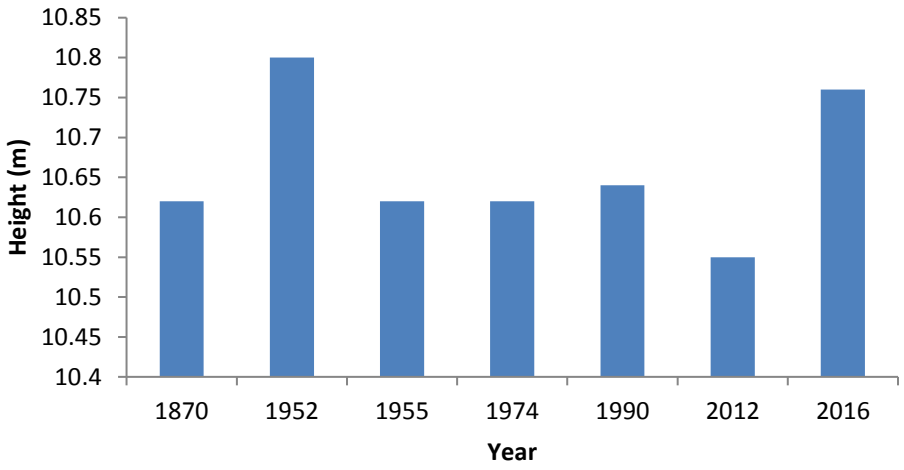


Figure 2: Forbes Iron Bridge, floods above major flood level (10.55 metres)

1.5.2 The frequency of major flooding at Forbes has been very variable (Figure 2). There have been extended periods where major floods have been rare or non-existent, for example, between 1916 and 1950 and between 1978 and 1990. At the other extreme, there have been periods where major flooding has occurred several times in the space of a few months – for example, 1952, 1974 and 1990, with three major floods occurring in each of these years (1).

The Lachlan River at Cotton's Weir

1.5.3 Accurate records of the heights achieved at the Cotton's Weir gauging station have only been kept since 1950. Since that year there have been 21 occasions that the height has exceeded the major flood classification of 6.60 metres as shown in Figure 3 (2).

1.5.4 The flood of record at the Cotton's Weir gauge (7.49 metres) was recorded in October 1950 (1).

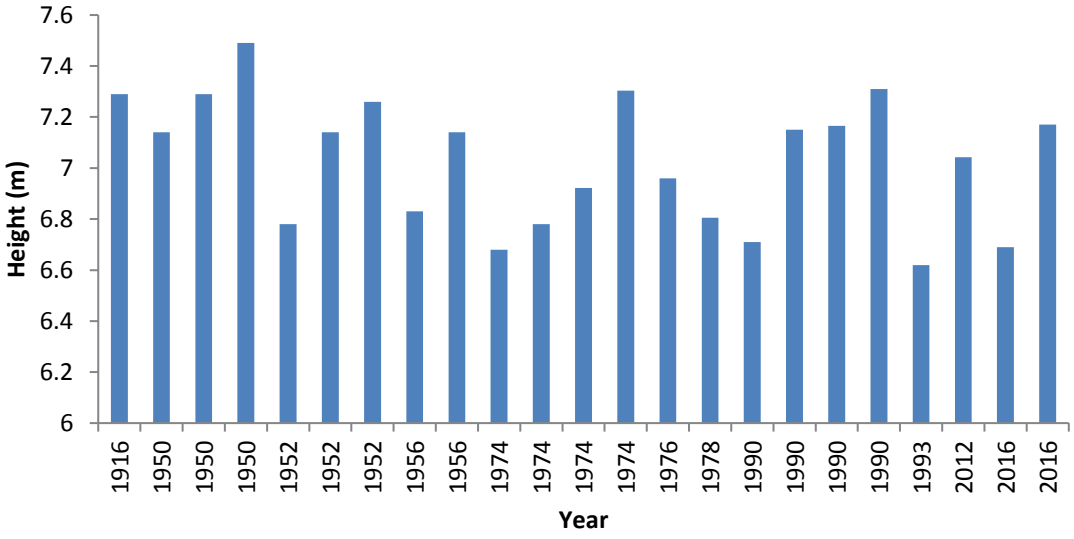


Figure 3: Cottons Weir, floods above major flood level (6.60 metres)

The Lachlan River at Jemalong Weir (Downstream)

1.5.5 As with Cotton's Weir, accurate records are only available since 1950. There have been 26 occasions that the peak height has exceeded the major flood classification of 7.70 metres since that time, as illustrated in Figure 4. The flood of record (8.89 metres) occurred at this gauge in June 1952. Four major flood peaks were recorded at the Jemalong Weir (downstream) gauge during 1990 and three major peaks were recorded during the years 1950, 1952, 1974 and 1976. In comparison, the period between 1952 and 1964 there was minimal flood intelligence at this gauge. The December 2010 flood reached 7.76 metres (2).

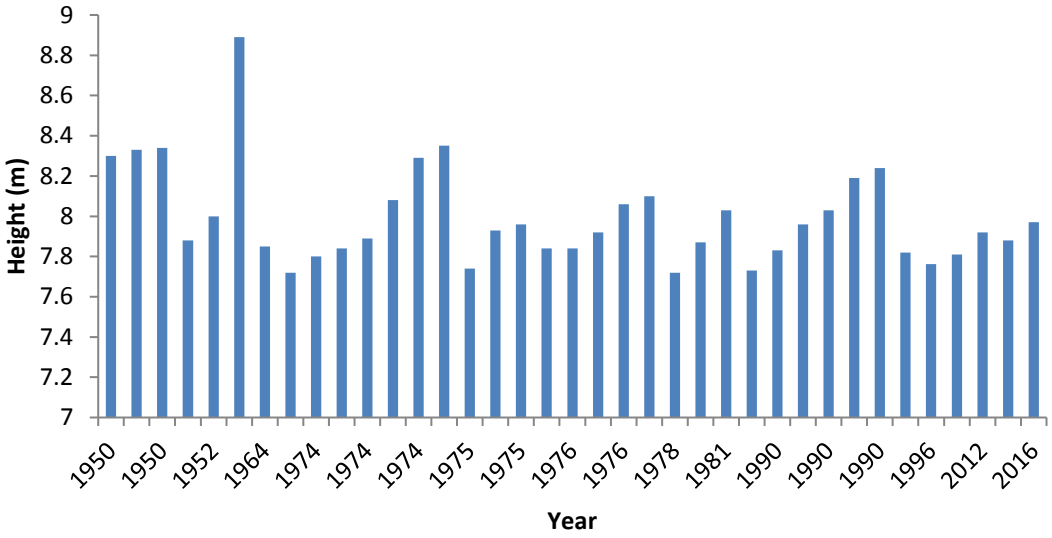


Figure 4: Jemalong Weir (downstream), floods above major flood level (7.70 metres)

1.5.6 The higher frequency of major flooding recorded at this gauge compared to the Forbes Iron Bridge gauge is due, in part, to the location of the Jemalong Weir (downstream) gauge at Jemalong Gap. The gap acts as a natural dam, impeding the progress of flood water and causing a build-up flows in the more severe events (2).

1.5.7 Another factor that contributes to the higher number of major peaks at the Jemalong Weir (downstream) gauge, is that flood water that left the river before Forbes re-enters the river via Jemalong Creek at this point and contributes to a larger volume of water arriving at this location (2).

1.6 FLOOD MITIGATION SYSTEMS AND HUMAN INFLUENCES ON FLOOD PATTERNS

1.6.1 Rural levees are mainly constructed to protect cropland and other agricultural pursuits and levee heights along the FMP floodway network are restricted up to the flood level resulting from the adopted 15 year ARI event. High level floodways are included in the FMP so that flood events larger than the design event can be passed with minimum obstruction. In the event of floods larger

than the design event, the rural levees will be overtopped and the natural flood pattern restored (8).

1.6.2 Changes in land use, particularly increased irrigation, have the potential to provide wetter ground conditions than might have historically occurred and hence increase flood flows. The intensification of irrigation activities has led to a considerable redistribution of flood flows at some locations (2).

1.6.3 The major impacts of human development on the patterns of flooding in Forbes are (2):

a. Irrigation development, flood levees and crop development on each side of the Lachlan River upstream of Forbes. From Gooloogong to Jemalong Gap and Jemalong Gap to Condobolin, flows are conveyed in an engineered system of levees and floodways which are aimed at protecting agricultural land, while restoring the natural pattern of flow which existed under pre-development conditions.

b. The Stockingbal to Parkes railway line.

c. Wyangala Dam.

1.7 EXTREME FLOODING

1.7.1 The worst floods ever recorded in the Forbes Shire since European settlement should not be considered to be the most serious that will ever occur in the area. The 1952 flood of record at the Forbes Iron Bridge gauge (10.80 metres) is estimated to be approximately only a 1% AEP event (or an event that occurs once in 100 years on average) (1).

1.7.2 When genuinely severe floods occur, they often reach much greater heights than was true of previous recorded floods. Moreover, they are generally both faster to rise and more dangerous, in terms of depth and velocity of flood water, than any previously known events. It must be realised that should a Probable Maximum Flood (PMF) event occur, the extent of the area of inundation and therefore the impact of flooding on the town of Forbes would be much greater than has ever occurred previously (1).

1.7.3 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) (1).

1.7.4 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 (1).

Table 4: Summary of flood heights at Forbes Iron Bridge (metres) (421901)

Gauge	Min	Mod	Maj	20%	10%	5%	1%	PMF
Forbes Iron Bridge (421901)	8.8	9.5	10.55	10.2	10.4	10.5	10.8	n/a

2 EFFECTS ON THE COMMUNITY

2.1 COMMUNITY PROFILE

Table 5: Census of Housing and Population data (2011) (9)

Census Description	Forbes (A)	Forbes
Total Persons	9,170	7,550
Aged 0-4 yrs	633	516
Aged 5-14 yrs	1,297	1,058
Aged 65 + yrs	1,787	1,553
Of Indigenous Origin	883	839
Who do not speak English well	10	6
Have a need for assistance (profound/severe disability)	543	488
Living alone (Total)	1,075	940
Living alone (Aged 65+)	474	449
Residing in caravans, cabins or houseboats or improvised dwellings	48	53
Occupied Private Dwellings (Households)	3,560	2,989
No Motor Vehicle	258	240
Caravan, cabin, houseboat or improvised dwelling	31	30
Rented via State or Housing Authority	163	161
Rented via Housing Co-Op or Community Church Group	16	20
No Internet Connection	1,198	1,041
Unoccupied Private Dwellings	499	374
Average persons per occup dwelling	2.4	2.3
Average vehicles per occup dwelling	1.8	1.6

SPECIFIC RISK AREAS - FLOOD

Lachlan River Valley

2.1.1 Forbes Shire is located on the Lachlan River within the central western slopes and plains of NSW. The Shire has an area of approximately 4,800 square kilometres and a population of approximately 9170 people (9).

2.1.2 The district is a cropping area of wheat and similar crops. The area between Lake Forbes and the Newell Highway is mainly residential.

2.2 FORBES

2.2.1 Forbes is the major urban centre in the Forbes LGA. It is located on the Newell Highway between Parkes and West Wyalong. It has a population of approximately 7500 people (9). Demographics of Forbes is summarised in Table 5.

2.2.2 Following the 2010 and 2012 floods, residents identified concern with evacuation of residential homes which had not historically been inundated (2). In 2016, despite flood levels exceeding those from the 1990 flood, a large number of dwellings that had flooded previously did not flood (7).

Cultural and Linguistic Diversity

2.2.3 Forbes has a significant population of Indigenous persons, of approximately 800 (9).

Schools and childcare centres

2.2.4 The following schools and childcare centres are at risk of flooding and/or isolation, although heights and depths are not known (8).

a. **Schools**

- Red Bend Catholic College – College Road, Forbes (in the southern residential area). The college caters for over 200 boarders as well as day students. This used to become isolated around 10.6m, however a new culvert has been put in place to alleviate the more frequent floods.
- North Forbes Primary School – Thompson Street Forbes.
- St Lawrences Primary School – 2 Dalton Street Forbes.
- Forbes High School – 18 Wyndham Avenue Forbes.
- Forbes Public School – Lachlan Street Forbes (CBD).
- TAFE NSW, Western Institute Forbes Campus, Cnr Browne and Harold Street, Forbes (CBD).

b. **Childcare centres**

- Forbes Learning Ladder – 155 Farnell Street, Forbes.

- Forbes Pre-School Kindergarten – Bogan Street, Forbes.
- A.B.C Developmental Learning Centre, 81-83 York Street, Forbes.
- Bright Beginnings – 9 Lot 23, Attlee Street, Forbes.

Facilities for the aged and/or infirm

2.2.5 The following facilities are at risk of flooding and/or isolation:

a. Mater Aged Care – 1 Prince Street, Forbes.

b. Forbes District Hospital (in the southern residential area).

c. District Hospital Nursing Home (in the southern residential area).

Utilities and Infrastructure

2.2.6 The following utilities and infrastructure are at risk of flooding (8):

a. Forbes aerodrome may remain open for flood relief up to floods in the order of 10.8 metres on the Forbes Iron Bridge gauge (as it was in 1952). It may become inundated in higher floods.

b. During major flooding the Forbes-Parkes railway line may be flooded.

c. A number of sites on the periphery of the town including the racecourse, showground, cemetery, riflerange, golf course, Lachlan Vintage Village, sewerage treatment works and Nature Reserve may also be affected to varying degrees by flood waters (1).

2.2.7 There are four caravan parks in the town of Forbes, all of which may be affected to varying degrees by flood waters depending on the peak height and duration of flooding. Inundation of low-lying caravan park residents may occur even in minor events at around 9.3 metres (Apex Caravan Park). The caravan park adjacent to the Lachlan River near the Iron Bridge in Forbes is inundated by floodwaters at heights of 10.20 metres and above on the Forbes Iron Bridge gauge. Flood waters can remain on the floodplain in these areas for a number of days (1). Caravan Parks are further detailed in Volume 3, Chapter 4 of this Local Flood Plan (SES Caravan Park Arrangements).

Classification of Floodplain

2.2.8 South Forbes (Camp Hill) historically becomes a high flood island around the Hospital, with further inundation possible up to a PMF. This area can become an island when roads to the north linking with the Camp Street Bridge are inundated and a short length of Oxford Street, where it meets the Newell Highway, is also becomes flooded (1).

2.2.9 Wongajong becomes a low flood island around 10.8 metres, after becoming isolated around 10.5 metres in some floods.

2.2.10 North Forbes has rising road access to the north west via The Bogan Way.

2.2.11 Historically, to the east of the railway line is a low flood island, becoming isolated by road and bound by the railway line. There is the potential for the area to become completely inundated up to a PMF (1).

2.2.12 The CBD becomes a high flood island as the road north is cut at Dowling Street where the Battye Street flood runner overtops the road. Floodwaters are particularly hazardous in this area due to fast flowing flood waters moving from Lake Forbes into the floodway (1). This becomes a low flood island by the time a 1% AEP flood is reached (10.8 metres on the Forbes Iron Bridge gauge).

Inundation

2.2.13 This community utilises the Forbes Iron Bridge Gauge (refer to Table 4 for design flood levels).

2.2.14 Low lying areas start becoming inundated in a minor flood (from 9.1 metres on the Forbes Iron Bridge gauge) (1). The northern residential region is predominantly flood free except for the older established sections of the industrial area and the lower portions of a number of residential streets (1).

2.2.15 The number of properties affected during floods is variable in Forbes, even with floods of the same height (or higher). This is further detailed in the following paragraphs.

2.2.16 During the August 1990 flood (10.64 metres), water crossed the Newell Highway and surrounded businesses on the northern side of the railway line and sections of the golf course. 265 properties were flooded above floor level. This consisted of 196 residential, 33 rural and 36 commercial/industrial properties, including those on Dowling, Sherriff and Cross Streets (in the CBD) were inundated by floodwaters (1). In preceding floods in the same year, reaching 10.61 and 10.59 metres, 140 properties (consisting of 100 residential, 20 commercial and 20 rural) and around 60 properties (consisting of 30-40 residential, 10 commercial and 10 rural) were flooded, respectively (10).

2.2.17 In 2016 (10.76 metres), it is estimated that only 36 buildings were inundated. Residential dwellings impacted were on Racecourse Road, River Road, Wambat Street (worst affected with over a metre in the dwelling), Lachlan Valley Way, College Road, Flint Street, Bathurst Street, Wandary Lane, Church Street, Stokes Street, Wambat Street, Ferry Street, Hill Street, Templar Street, Browne Street and Gum Swamp Road (worst affected with over a metre in the dwelling). Business/commercial buidlings affected were located on Newell Highway, Warrul Road, Reymond Street, Lower Rankin Street and Templar Street. A number of secondary buildings were also impacted including sheds on Bathurst Street, Ferry Street, Ooma Street and playing field toilet blocks (7).

2.2.18 With the exception of caravan parks, the initial dwellings that start to inundate have been in Rifle Range Road, Hill Street, Mole Lane, and Rankin Street (2).

2.2.19 Areas prone to flooding in South West Forbes (Lake Forbes to Newell Hwy) include Elizabeth Street, Farnell Street, Forester Street, Hilda Street, Junction Street, Lachlan Street, Marcia Street, Racecourse Road, Show Street, Thelma Street and Warrul Street which were inundated to various extents in 1990 and 2012 (10.64 and 10.55 metres respectively) (1). In 2012, Elizabeth Street, Hilda Street, Thelma Street, Mona Place and Margret Street did not flood (2).

2.2.20 Areas prone to flooding in North Forbes and the CBD are Battye Street, Bedgerebong Road, Browne Street, Camp Street, Clear Street, Cross Street, Farnell Street, Farrand Street, Grenfell Street, Johnson Street, North Circle Drive, Dowling Street, Parkes Road, Rankin Street, Renfree Street, Sam Street, Sherriff Street, Spring Street and Templar Street which were inundated to various extents in 1990 and 2012 (10.64 and 10.55 metres respectively) (1). In 2012, Farrand Street did not flood (2). The entire CBD is at risk of inundation in a 1% AEP flood (10.8 metres), although a few commercial properties were not inundated in 1952 around the Court House. This area may already isolated by 10.55 metres (2).

2.2.21 Areas prone to flooding in Eastern residential area are Bandon Street, Barwin Street, Bridge Street, Church Street, Clark Street, Ferry Street, Flint Street, Herbert Street, Hill Street, James Street, Ooma Street, Orange Road, Oxford Street, Rifle Range Road, Sandhills Road, Twogood Lane and Young Street which were inunadated to various extents in 1990 and 2012 (10.64 and 10.55 metres respectively) (1). In 2012, Bandon, Church and Young Street did not flood (2).

2.2.22 Areas prone to flooding in South Forbes (including Wongajong) are Bathurst Street, Blackwood Street, Cargo Lane, Church Street, Claret Street, College Road, Forbes – Cowra Road, Mole Lane, Moselle Street, Muscat Street, Reymond Street, River Road, Stacey Street, Wambat Street, and Wandary Lane which were inunadated to various extents in 1990 and 2012 (10.64 and 10.55 metres respectively) (1). In 2012, Church Street, Stacey Street, Wambat Street and Koala Place did not flood (2).

2.2.23 Flooding in the order of 10.8 metres (similar to the 1952 flood) may inundate approximately 500 properties (1000 people), depending on the flood behaviour which can vary significantly between floods (1).

2.2.24 The NSW SES Local Controller maintains a list of individual residential and commercial properties affected in a major flood (10.55 metres and above on the Forbes Iron Bridge gauge) (1).

Isolation

2.2.25 In minor floods (approximately 9 metres on the Forbes Iron Bridge gauge) Forbes Gooloogong Road (Lachlan Valley Way), Forbes Wirrinya Road at Dog and Duck Crossing on Bundaburrah Creek (Black Marsden Road), and Forbes Grenfell Road at Muddy Creek on Bundaburrah Creek (Henry Lawson Way) may flood (1).

2.2.26 From 10 metres on the Forbes Iron Bridge gauge, backwater flooding in the local stormwater drainage system and spread of floodwater may result in shallow flooding of a number of roads including (1):

a. Eastern end of Lower Rankin Street;

b. Intersection of Bathurst Street and Ferry Street;

c. Flint Street south of Bathurst Street;

d. Eastern end of Browne Street.

2.2.27 Vehicles in the Forbes CBD may still be able to travel south along the Newell Highway as far as the Fitzgeralds Bridge but the road is inundated on the south of the Lachlan River, often even before the minor flood level is reached (1). Once the Newell Highway is cut near the golf course, access from the northern section of Forbes to the Newell Highway and then Parkes may still be available via Wyndham Avenue (1).

2.2.28 In past events, at heights of 10.45 metres or greater on the Forbes Iron Bridge gauge, Bedgerebong Road has been closed by flood waters and access to the airport has been lost. This road has recently been upgraded however, the airport will still be inaccessible from Forbes in major flooding (10.55 metres and above on the Forbes Iron Bridge gauge) due to road closures within Forbes itself (1).

2.2.29 During major flooding (from 10.55 metres):

a. Water from the Lachlan River generally breakouts in the vicinity of Bathurst Street may flow south to the Wongajong area, located just south of Forbes, isolating and then inundating a number of residential blocks of Lachlan Valley Way, Wandary Road, Muscat Street, Moselle Street, Reisling Street and Claret Street (1).

b. The CBD area and the Camp Hill area may become isolated (2). If this occurs, road access between the three sections of town in major floods is not possible and people may be isolated from their places of work and the hospital for up to a week (1).

c. Residents on Rifle Range Road may also be isolated, depending on the flood conditions (1).

d. All roads crossing Bundaburrah Creek downstream of Dukes Crossing breakout may be cut. In 2010, this did not include Wirrinya/Wongajong Road at River Bend despite historically becoming flooded around 9.3 metres (2).

e. The section of the Forbes-Parkes railway line in the vicinity of Daroobalgie (north of Forbes) may be closed. During the flood of record in June 1952 (10.80 metres on the Forbes Iron Bridge gauge), the railway line was closed at the Forbes Railway Station and extensive damage to the railway line was caused when the embankment was overtopped by flood waters (1).

Characteristics of flooding

2.2.30 The river flows in a westerly direction. The flow is dependent on vegetation, and therefore travel times vary (2).

2.2.31 Forbes generally experiences relatively shallow flooding and low velocity flood flows, except in the vicinity of Marcia Street and Spooner Oval, and depths may exceed 2.2 metres in Dowling Street (2).

2.2.32 When the level at Forbes Iron Bridge reaches about 8-10 metres, flow commences from the river into flood channels upstream of the town; one is to the northern side of the river (Southern Cross break out) and connects with Lake Forbes. The other is on the southern side and connects with Bundaburrah Creek. As the flood flow increases, waters from Lake Forbes break into the Battye Street floodway (which can occur from around 10.5 metres or higher), and the town is divided into three areas. With an increase in flow, water levels rise in the floodways but do not increase at Forbes Iron Bridge. At higher floods, the water level again rises at the iron bridge and floodwater spreads out from the river and floodways link up and cover the whole floodplain (2).

2.2.33 In general, the flood problem is most severe in the vicinity of the Battye Street floodway and Lake Forbes. At heights above approximately 10.50 metres and above on the Forbes Iron Bridge gauge the town can cut into three areas by flood waters (1).

2.2.34 Isolation and inundation may be between a few days to five weeks as the flood waters take time to recede (1).

2.2.35 During prolonged flooding, the extent of flood damages experienced in the community of Forbes may be greater than in floods of shorter duration. For example, whilst the difference between the peak heights recorded for the three major flood events in 1990 was only five centimetres, the number of properties inundated in each event varied significantly. Approximately 140 properties (residential, commercial and rural) were flooded in the April 1990 event, 50-60 in the July 1990 event and up to 265 in the August 1990 flood. This difference can be attributed, in part, to the duration of flooding from the Southern Cross breakout – approximately five days in August compared to around two days in the two earlier events (3).

2.2.36 A large part of the town of Forbes is flood prone and existing development obstructs floodways to a substantial degree (1).

2.2.37 Refer to section 1.4 for further detail on the flooding characteristics.

Flood Mitigation Systems

2.2.38 Flood levees and crop development on each side of the Lachlan River upstream of Forbes. If the levees breaches, the flood pattern would change particularly for the regions outside the residential areas (2).

2.2.39 The Red Bend college levee runs along the river bank bend, protecting the college. No design heights are available for the levee, but is said to have been constructed above the record flood level of 10.8 metres (7).

Dams

2.2.40 The effects of Wyangala Dam are detailed in Volume 3, Chapter 3. Dam failure has the potential to cut numerous roads and inundate a significant amount of residential and commercial properties in Forbes and surrounding localities (4).

Other Considerations

2.2.41 River Arts Festival, Spring Races and National BBQ championships are held in October, causing a larger influx of tourists.

2.3 RURAL COMMUNITIES AND VILLAGES

2.3.1 Rural areas and villages within the Forbes Shire are affected to varying degrees by flood waters depending on their proximity to the river and floodways. These include (9):

a. Bedgerebong, which is located downstream of Forbes on the Lachlan River and comprised of approximately 100 dwellings (9).

b. Garema (population of approximately 290), which is located to the south of Forbes on Ooma Creek.

c. Ootha (population of approximately 90), which is located to the north of Forbes.

d. Wirrinya.

e. Corinella.

f. Waroo.

Cultural and Linguistic Diversity

2.3.2 Outside of Forbes, there are few persons of indigenous origin (approximately 50) and limited cultural and linguistsic diversity (9).

Schools and childcare centres

2.3.3 The following schools and childcare centres are at risk of flooding and/or isolation within the rural areas of Forbes (8).

a. **Schools**

- Bedgerabong Public School – 7 Golding Avenue, Bedgerabong

b. **Childcare centres**

- No childcare centres are identified as at risk of flooding and/or isolation.

Facilities for the aged and/or infirm

2.3.4 No facilities for the aged and/or infirm are identified as at known risk of flooding in rural areas within Forbes.

Utilities and Infrastructure

2.3.5 No utilities or infrastructure are identified as at known risk of flooding in the rural areas of the Forbes Local Government Area.

2.3.6 Caravan Parks are listed in Volume 3, Chapter 4 of this Local Flood Plan (SES Caravan Park Arrangements).

Classification of Floodplain

2.3.7 The rural areas become a series of high flood islands in major floods, with the potential to become low flood islands in extreme floods however information is not currently available to confirm.

Inundation

2.3.8 Historically a number of homesteads outside of town have been inundated towards Tichborne (2).

2.3.9 No further details of rural property inundation is available.

Isolation

2.3.10 The village of Bedgerebong, can become totally isolated at heights of 10.65 metres or greater on the Forbes Iron Bridge gauge. In the August 1990 flood, the village was inaccessible for five weeks. In 2012 and 2016, there were approximately 100 properties that were isolated (by usual means to Forbes) in Bedgerabong for several weeks requiring resupply. These were located on Bedgerabong Road, Browns Road, Copeland Parade, Darcy's Lane, Grudgery Lane, Hodges Road, Kaloola Lane, Monwonga Road, Noakes Road, North Condobolin Road, Rodgers Street, Roseleigh Lane, Slimbridge Road, Wattlebower Lane and Yarrabandai Road (11).

2.3.11 Garema, Waroo (approximately five houses), Corinella and Jemalong (approximately 16 houses) may also be isolated from Forbes during major flooding (approximately 7.8 metres on the Jemalong Weir gauge or 10.65 metres on the Forbes Iron Bridge gauge) for up to five weeks. These villages required outside assistance for supplies and some services (2).

2.3.12 Wirrinya, Grenfell and West Wyalong (outside the Forbes Shire) can also become cut off from Forbes for a few days up to two weeks, for example during the August 1990 and 2016 floods (1).

2.3.13 A number of other tributaries in the Forbes Shire can affect rural properties as follows (1):

a. The Goobang Creek can isolate a number of properties and threaten some houses in the Gunning Gap area.

b. In major floods, Ooma Creek may close the Forbes-Grenfell Road near the Forbes Shire boundary, but the major threat from this creek is to the village at Garema where a number of houses between Garema and the Caragetel Swamp may become isolated. Flood waters from Pinnacle Creek, which joins Ooma Creek upstream of Garema, may cut roads and cause additional rural isolations.

c. Gunningbland Creek can isolate some properties south east of Yarrabandai.

d. In major floods, Yarrabandai Creek cuts the Parkes-Condobolin Road and has on previous occasions washed out the Parkes-Condobolin Railway

Line east of Ootha. The creek can also isolate some rural properties for short periods of time.

2.3.14 A number of outlying roads around Forbes have also been flooded (for example in 1990 of 10.64 metres) including Dowra, Possums, Tamworth, Warwee and Wilbertroy Lanes and Greens, South Lead and Yarrabandai Roads (1).

Characteristics of flooding

2.3.15 The Lachlan River flows from Forbes in a westerly direction 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 square kilometres which, during wet years, fills and overflows down its escape to the Lachlan River and its tributaries (1).

2.3.16 The flow is dependent on vegetation, and therefore travel times vary, however flows are generally slow moving. If the levee along the river breaches, the flood pattern would change particularly for the regions outside the residential areas (1).

Flood Mitigation Systems

2.3.17 Flood levees and crop development exist on each side of the Lachlan River upstream of Forbes.

2.3.18 The historical Jemalong School levee is overtopped at approximately 7.62 metres on the Jemalong Weir gauge placing the community school, local farms and several farmhouses at risk, for example in the 2012 flood (2).

Dams

2.3.19 The impacts of Wyangala Dam are outlined in Volume 3, Chapter 3. Large dam releases and failure have the potential to cut numerous roads and inundate a significant amount of residential and commercial properties in Forbes and surrounding localities (4).

Other Considerations

2.3.20 River Arts Festival, Spring Races and National BBQ championships are held in October, causing a larger influx of tourists.

ROAD CLOSURES AND ISOLATED COMMUNITIES

2.4 ROAD CLOSURES

2.4.1 Table 6 lists roads liable to flooding in the Forbes Shire LGA.

Table 6: Roads liable to flooding in Forbes Shire LGA.

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
Bedgerebong Road	Water closes road at "Little Plains"		Via Noakes Road to 'Five Ways' and then to Forbes	7.1-7.2m Jemalong Weir (d/s) Gauge and 9.9m Forbes Iron Bridge Gauge
Bogan Gate (MR 350)	May be closed by either Goobang Creek or Crooked Creek			n/a
The Bogan Way	Crossing of Crooked Creek			Heavy rainfall in the Goobang Creek catchment north of Forbes
Burrawang Road west	Downstream of Gunning Ridge. Road inundated over 10.5 km length extending west from Goobang Creek bridge crossing.			Heavy rainfall in the Goobang Creek catchment north of Forbes
Connells Lane	Extending about 2.6 km north of Burrawang Road intersection			Heavy rainfall in the Goobang Creek catchment north of Forbes
Corridgery Road			Via The Bogan Way	n/a
Dukes Road	between Wandary Road and Forbes-Gooloogong Road (MR56) (Lachlan Valley Way)			Flooded in 2010
The Escort Way (Eugowra-Forbes Road) (SR 90)	Southern Cross Breakout over distance of 3.5 km extending west of			10.3m Mulyandry Gauge

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
	Waugan Road intersection. Road also inundated at location of sag immediately west of Bathurst Street.			
Henry Lawson Way (MR 236) at Grenfell	Road closed at Muddy Lagoon Road cut at Lachlan River and Ooma Creek.		New Grenfell Road.	9.3m Forbes Iron Bridge Gauge
Lachlan Valley Way (MR 56)	Road closed at Dukes Crossing 12 km extending east from Dukes Crossing (Parkes GR 092011) to Cumbijowa. Road also inundated over 0.5 km length about 350 m east of Mulyandry Creek bridge crossing	Forbes to Gooloogong access is restricted	Via Eugowra or Grenfell.	9.3m Forbes Iron Bridge Gauge
Lachlan Valley Way (MR 56)	Road closed at the archery club across from 'Kindimindi'		Via Eugowra or Grenfell.	10.3m Mulyandry Gauge
Lachlan Valley Way	Road closed at Jemalong School for up to 10km (for 12 days in 1974).		Via Bogan Gate	7.2 - 7.7m Jemalong Weir (d/s) Gauge
Lachlan Valley Way	2.5 km length immediately east (upstream) of Jemalong Ridge adjacent to East Mountain Road. 2.2 km length immediately west (downstream) of Jemalong Ridge at intersection with Kevin Lane. 2.7 km length about 2.7 km west of Grudgery lane. Over 1.7 km length immediately east of			From 5.6m on the Cottons Weir gauge

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
	Waree Lane.			
Littles Road	Between The Escort Way and Forest Road. Road inundated at four separate locations.			Flooded in 2010
Newell Highway (SH 17)	Road closed, 6km from Forbes at the South Condobolin Road turn off. If Battye Street is closed, the Highway can be closed from Fitzgeralds Bridge to Bareenong/Garema turn and again at Caragabal. If Lake Cowal overfills, the Highway can also be closed just north of Marsden for some time. Newell Highway also closes at the Forbes golf course in major flooding		May be available via Condobolin	10.5m Forbes Iron Bridge Gauge
Newell Highway	north of railway crossing at Tichborne			Heavy rainfall in the Goobang Creek catchment north of Forbes
Newell Highway	Along a 700 m length at the Crooked Creek crossing north of Forbes			Due to heavy rain over the catchment (e.g. in March 2012)
New Grenfell Road	Water crosses road south of Gordon Duff Bridge near Turners Road		Via Marsden	9.8m Forbes Iron Bridge Gauge
Paytens Bridge Road			Via The Escort Way	10.4m Mulyandry Gauge

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
Racecourse Road	downstream end of Lake Forbes			Flooded in 2010
Salisbury Road	Crossing of Lake Forbes			
Sandhills Road	Toms Lagoon and immediately west of Littles Road.			Flooded in 2010
Sheriff Street	Crossing of Lake Forbes			Flooded in 2010
Show Street	Crossing of Lake Forbes			Flooded in 2010
Turners Road	At creek crossing			Bundaburrah Creek System
Wandary Lane	approximately 300 m east and 1.2 km west of Dukes Road			Flooded in 2010
Warregal Road	3.5 km length extending west from Newell Highway to "Allengrove" property. Crooked Creek crossing			Heavy rainfall in the Goobang Creek catchment north of Forbes
Waugan Road (Tichbourne)	via Escort Way, Road closed at several locations extending 2.5 km south of intersection			Flooded in 2010
Wongajong Road	Road Closed at Bundaburrah creek			9.3m Forbes Iron Bridge Gauge
Yarrabandai Road	Closes at "Four Ways"		Via Henry Parkes Way	n/a
Local service road running north of Warregal Road opposite "Allengrove" property				Heavy rainfall in the Goobang Creek catchment north of Forbes

2.4.2 The following table indicates roads that were flooded in 1990 and 2012. A number of roads in the outlying areas around the town of Forbes were also affected by flood waters during the August 1990 event including Dowra, Possums, Tamworth, Warwee and Wilbertroy lanes and Greens, South Lead and Yarrabandai roads (2).

Table 7: Streets in the Town of Forbes Affected During the August 1990 Flood (* indicates not flooded in the 2012 floods)

1. South west Forbes (Lake Forbes to Newell Highway).	2. North Forbes and the CBD.	3. Eastern residential area.	4. South Forbes.
Elizabeth Street*	Battye Street	Bandon Street*	Bathurst Street
Farnell Street (lower end)	Bedgerebong Road	Barwin Street	Blackwood Road
Forester Street	Browne Street	Bridge Street	Cargo Lane
Hilda Street*	Camp Street	Church Street*	Claret Street
Junction Street	Clear Street	Clark Street	College Road
Lachlan Street	Cross Street	Ferry Street	Forbes – Cowra Road
Marcia Street	Dowling Street	Flint Street	Moselle Street
Racecourse Road	Farnell Street	Herbert Street	Muscat Street
Show Street	Farrand Street*	Hill Street	Reymond Street
Thelma Street*	Grenfell Street	James Street*	River Road
Warrul Road	Johnson Street	Ooma Street	Stacey Street*
	North Circle Drive	Orange Road (Forbes – Eugowra Road)	Wandary Lane
	Parkes Road (Newell Highway)	Oxford Street	Wambat Street (lower end)*
	Rankin Street	Riflerange Road	
	Renfree Street	Sandhills Road	
	Sam Street	Twogood Lane	
	Sherriff Street	Wambat Street	
	Spring Street	Young Street*	
	Templar Street		

2.5 SUMMARY OF ISOLATED COMMUNITIES AND PROPERTIES

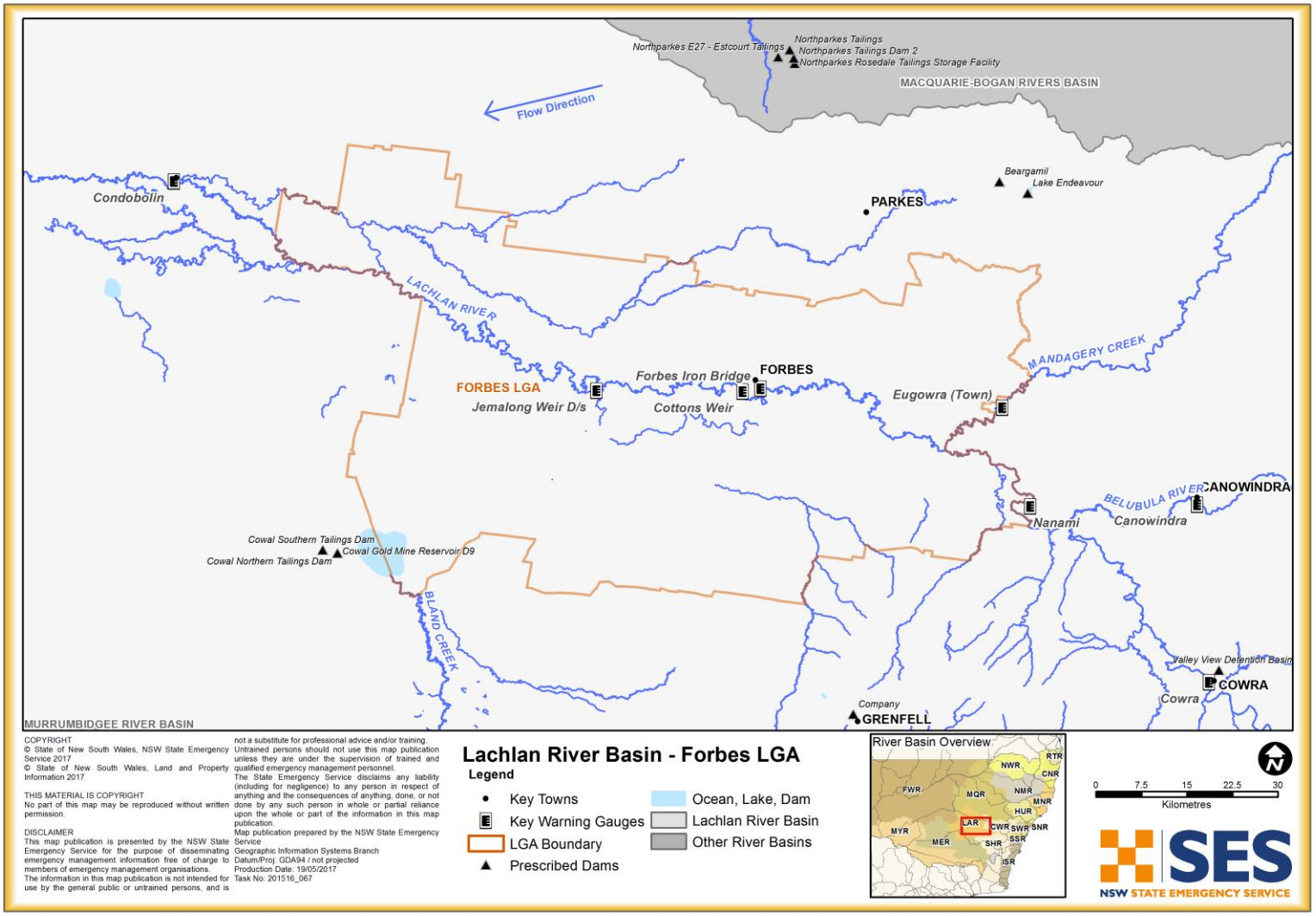
2.5.1 Table 8 lists communities liable to isolation and potential periods of isolation. Information presented here is based on historical events and does not reflect the duration of isolation expected in larger and extreme events.

Table 8: Potential Periods of Isolation for communities in the Forbes Shire LGA during a major flood.

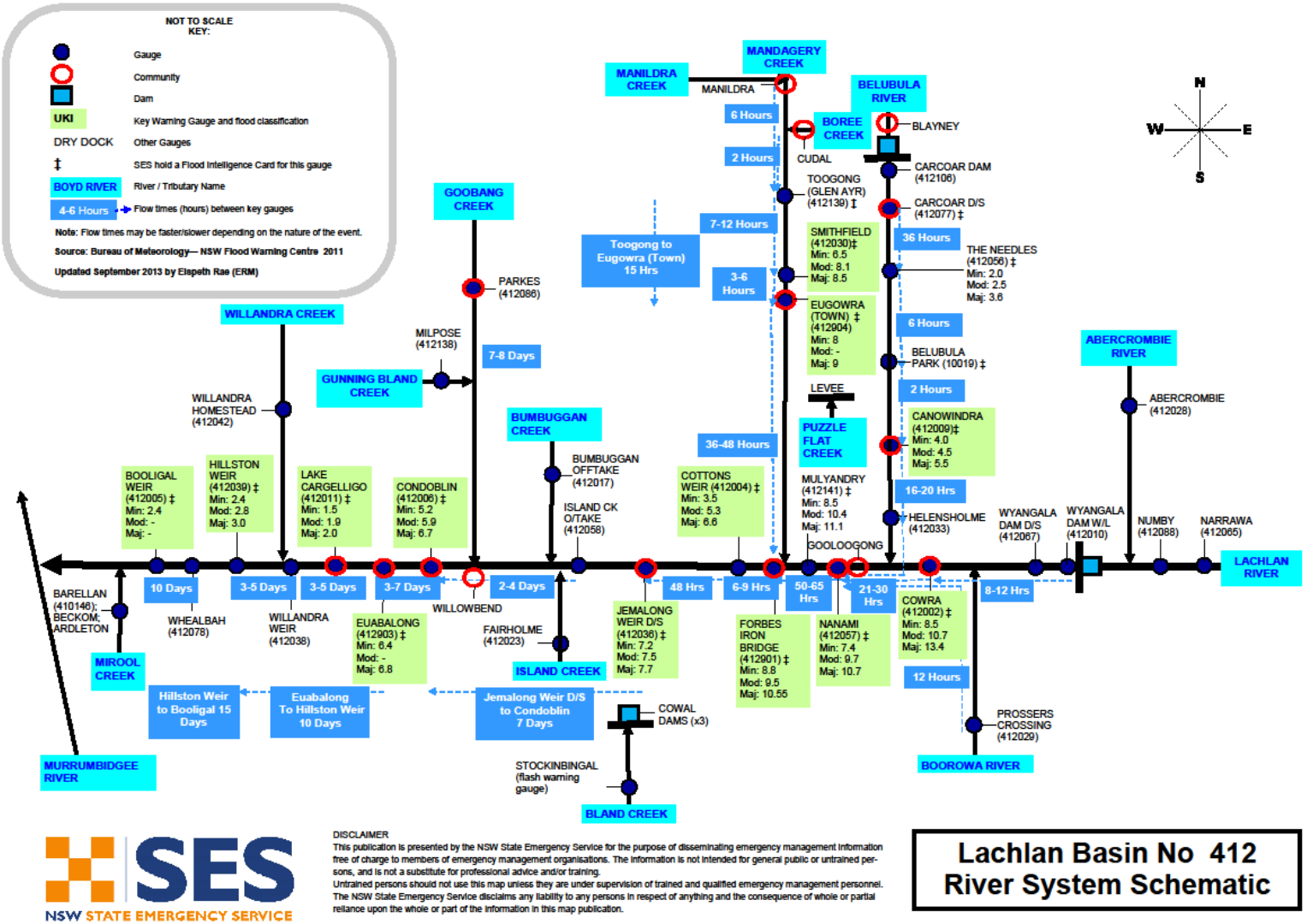
Town / Area (River Basin)	Population/ Dwellings	Flood Affect Classification	Approximate period isolation	Weeks								NOTES
				1	2	3	4	5	6	7	8	
Bedgerebong	20 houses	High flood island	3-5 weeks									Resupply likely to be required after 5 days
Waroo/Garema	5 houses	High Flood island	1-5 weeks									Resupply likely to be required after 5 days
Corinella	5 rural properties	High flood island	1-5 weeks									Resupply likely to be required after 5 days
Jemalong	16 houses	High flood island	3-5 weeks									Resupply likely to be required after 5 days
Wirrinya	9 houses	High Flood Island	2 days-3 weeks									
Forbes rural	Approximately 100	High and Low Flood Islands	2-5 weeks									

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.

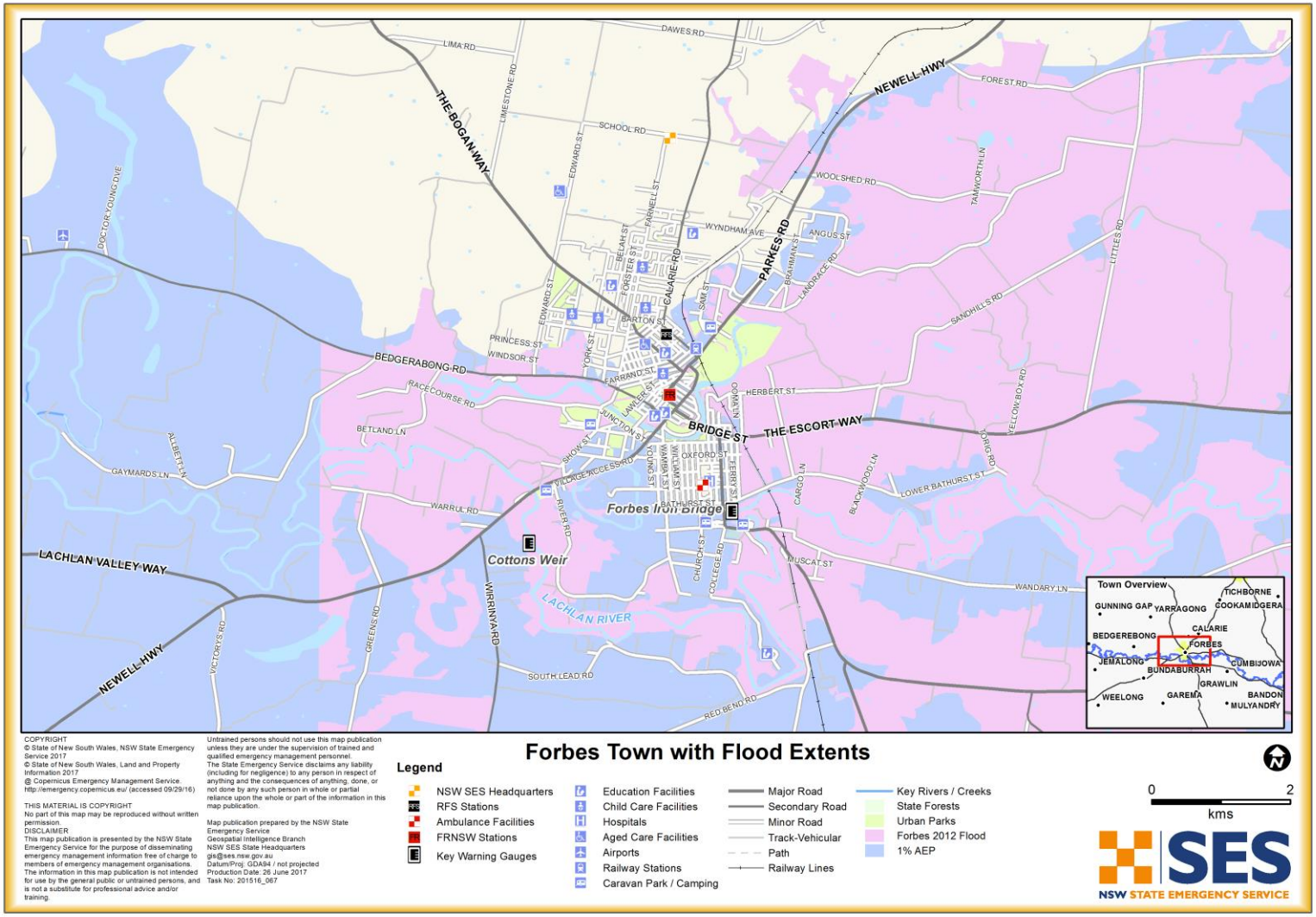
MAP 1 - LACHLAN RIVERBASIN



ANNEX 1: LACHLAN RIVER BASIN SCHEMATIC



MAP 2 - FORBES TOWN MAP



COPYRIGHT
© State of New South Wales, NSW State Emergency Service 2017
© State of New South Wales, Land and Property Information 2017
@ Copernicus Emergency Management Service. http://emergency.copernicus.eu/ (accessed 09/29/16)

THIS MATERIAL IS COPYRIGHT
No part of this map may be reproduced without written permission.
DISCLAIMER
This map publication is presented by the NSW State Emergency Service for the purpose of disseminating emergency management information free of charge to members of emergency management organisations. The information in this map publication is not intended for use by the general public or untrained persons, and is not a substitute for professional advice and/or training.

Untrained persons should not use this map publication unless they are under the supervision of trained and qualified emergency management personnel.
The State Emergency Service disclaims any liability (including for negligence) to any person in respect of anything and the consequences of anything, done, or not done by any such person in whole or partial reliance upon the whole or part of the information in this map publication.

Map publication prepared by the NSW State Emergency Service
Geospatial Intelligence Branch
NSW SES State Headquarters
gis@ses.nsw.gov.au
Datum/Proj: GDA94 / not projected
Production Date: 26 June 2017
Task No: 201516_067

LIST OF REFERENCES

1. **SES, NSW.** Forbes Local Flood Plan. 2013.

2. **Lyall and Associates.** *Flood intelligence report, Lachlan Valley December 2010 and March 2012 floods - draft April 2013.* April 2013.

3. **SKM.** *Lachlan Floodplain Risk Management Study.* 2003.

4. **State Water Corporation.** *Wyangala Dam Interim Dam Safety Emergency Plan.* 2013.

5. **Don Tisdell.** *A summary of Lachlan River flood readings between Wyangala Dam and Jemalong Weir and eyewitness accounts of early flooding.* Unknown.

6. **SKM.** *Forbes Floodplain Management Report and Draft Floodplain Management Plan. Volumes 1 and 2.* s.l. : Sinclair Knight Mertz, 1994.

7. **NSW SES.** *2016 Lachlan Flood observations.* 2016.

8. **DECCW.** *Lachlan River Gooloogong to Jemalong Gap Floodplain Management Plan.* Sydney : Department of Environment, Climate Change and Water NSW, 2011.

9. **Bureau of Statistics.** *Census 2011.* 2011.

10. **Department of Water Resources New South Wales.** *Forbes flood damage survey: August 1990 flood.* 1992.

11. **NSW SES.** *2012 Flood Isolations Table.* 2012.

12. **Lyall and Associates.** *Flood Intelligence Report: Lachlan Valley - December 2010 and March 2012 Floods.* April 2013 Draft 2.0.

SES RESPONSE ARRANGEMENTS FOR FORBES SHIRE

Volume 3 of the Forbes Shire Local Flood Plan

CONTENTS

VERSION LIST

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

Description	Date
Forbes Shire Local Flood Plan – Annex C, Annex D, Annex E, Annex F and Annex G	September 2002

AMENDMENT LIST

Suggestions for amendments to this Volume should be forwarded to:

The Forbes 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

FORBES SHIRE: FLOOD WARNING SYSTEMS AND ARRANGEMENTS

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

(NSW SES Response Arrangements for Forbes Shire)

Last Update: **August 2017**

AUTHORISATION

Forbes 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: 24 August 2017

Document Issue: 3.1-07042014

CONTENTS

LIST OF TABLES

1. GAUGES MONITORED BY THE NSW SES FORBES LOCAL HEADQUARTERS

Table 1: Gauges monitored by the NSW SES Forbes Local Headquarters

Gauge Name	Type	AWRC No.	Bureau Gauge No.	Stream	Flood level classification in metres			Special Reading Arrangements	Owner
					MIN	MOD	MAJ		
Nanami*‡	Automatic	412057	565007	Lachlan River	7.4	9.7	10.7		NSW Office of Water
Mulyandry‡	Automatic	412141		Lachlan River	8.5	10.4	11.1		Forbes Shire Council
Forbes Iron Bridge*‡	Automatic	412901	65088	Lachlan	8.8	9.5	10.55		Forbes Shire Council
Cotton's Weir*‡	Automatic	412004	565003	Lachlan River	3.5	5.3	6.6		NSW Office of Water
Jemalong Weir (d/s)*	Automatic	412036	565000	Lachlan River	7.2	7.5	7.7		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 TV	Orange
WIN TV	Wollongong
Capital TV	Canberra

Radio Stations:

Station	Location	Frequency	Modulation
2GZ	Orange	105.1	FM
2CR ABC Central West	Orange	549	AM
2PK/ROK 95.5 FM	Parkes	95.5	FM
CADYAR 100.7 FM Community Radio	Cowra	100.7	FM
2LF ABC	Young	1350	AM
2LVR – Valley FM	Forbes	97.9	FM
2PK	Parkes	1404	AM

Newspapers:

Name	Location
Forbes Advocate	Forbes
The Champion Post	Parkes
The Land	Dubbo

Other Agencies:

As listed in Volume 1 of this Local Flood Plan.

FORBES SHIRE: NSW SES LOCALITY RESPONSE ARRANGEMENTS

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

(NSW SES Response Arrangements for Forbes Shire)

Last Update: August 2017

AUTHORISATION

NSW SES Locality Response Arrangements in Forbes 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: 2-8-17

Approved

NSW SES Lachlan Region Controller

Date: 31.07.17

Tabled at LEMC Date: 24 August 2017

Document Issue: V3.2-07042014

CONTENTS

LIST OF TABLES

SECTOR OVERVIEW

Table 1: Overview of Sectors in the Forbes Shire LGA.

Sector Name	Community	Sector Basis	Total properties	Properties potentially at risk
Forbes – south sub sector	South Forbes (Muscat Street, Moselle Street and Wandary Lane/Road area) and Wongajong	Low flood island	Approximately 60 rural/semi-rural Approximately 200 urban properties	Approximately 60 at risk or inundation or isolation Approximately 35 at risk of inundation in a major flood, all at risk in a 1% AEP flood (10.8 metres)
Forbes – east sub sector	East of the railway line	Low flood island	Approximately 150 urban and rural	Approximately 150 urban and rural at risk of inundation
Forbes – west sub sector	Forbes West	Rising road access	Approximately 200 urban	Approximately 200 urban at risk of inundation
Forbes – north sub sector	North Forbes CBD	Rising road access and potentially high flood island in an extreme event High flood island	Approximately 500 urban residential and commercial	Approximately 400 urban residential and commercial at risk of inundation
Forbes - Camp Hill Sub Sector (high flood island area on map)	Camp Hill	High flood Island	Approximately 250	Sector at risk of isolation

1. FORBES SECTOR

1.1. FORBES RESPONSE ARRANGEMENTS

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

Sector Description	Forbes is located on either side of the Lachlan River and Lake Forbes. Almost 75% of the Forbes Shire population reside within the town of Forbes itself (1).		
Hazard	Riverine flooding from the Lachlan River. Areas surrounding the township are prone to overland flooding.		
Flood Affect Classification	South Forbes (Muscat Street, Moselle Street and Wandary Lane/Road area) - low flood island. North Forbes – rising road access and potentially high flood island. East of the railway line - low flood island Camp Hill - high flood island Forbes West – rising road access CBD - high flood island.		
At risk properties	>500	**Total number of properties within Sector/Community**	2989
Sector Control	Small-scale evacuations will be controlled by the NSW SES Forbes Local Controller. Should the evacuation 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)
Forbes Iron Bridge	412901	8.8	9.5	10.55
Cottons Weir	412004	3.5	5.3	6.6

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	The key consequence in Forbes is the inundation of up to 500 properties. Flooding can be variable. The main transport routes are also prone to flooding and often results in a large number of flood rescues of people driving into the floodwater. Floodwaters are particularly hazardous in the Battye Street floodway area due to fast flowing flood waters moving from Lake Forbes into the floodway via Lawler Street.
Information and Warnings	On the receipt of flood warnings predicting peak heights of 9.30 metres and above at the Forbes Iron Bridge gauge; the Forbes SES Local Controller will consult as necessary to determine the level of the threat and the need to consider. As soon as possible after the decision to evacuate is made, the Forbes SES Local Controller (or Incident Controller) will

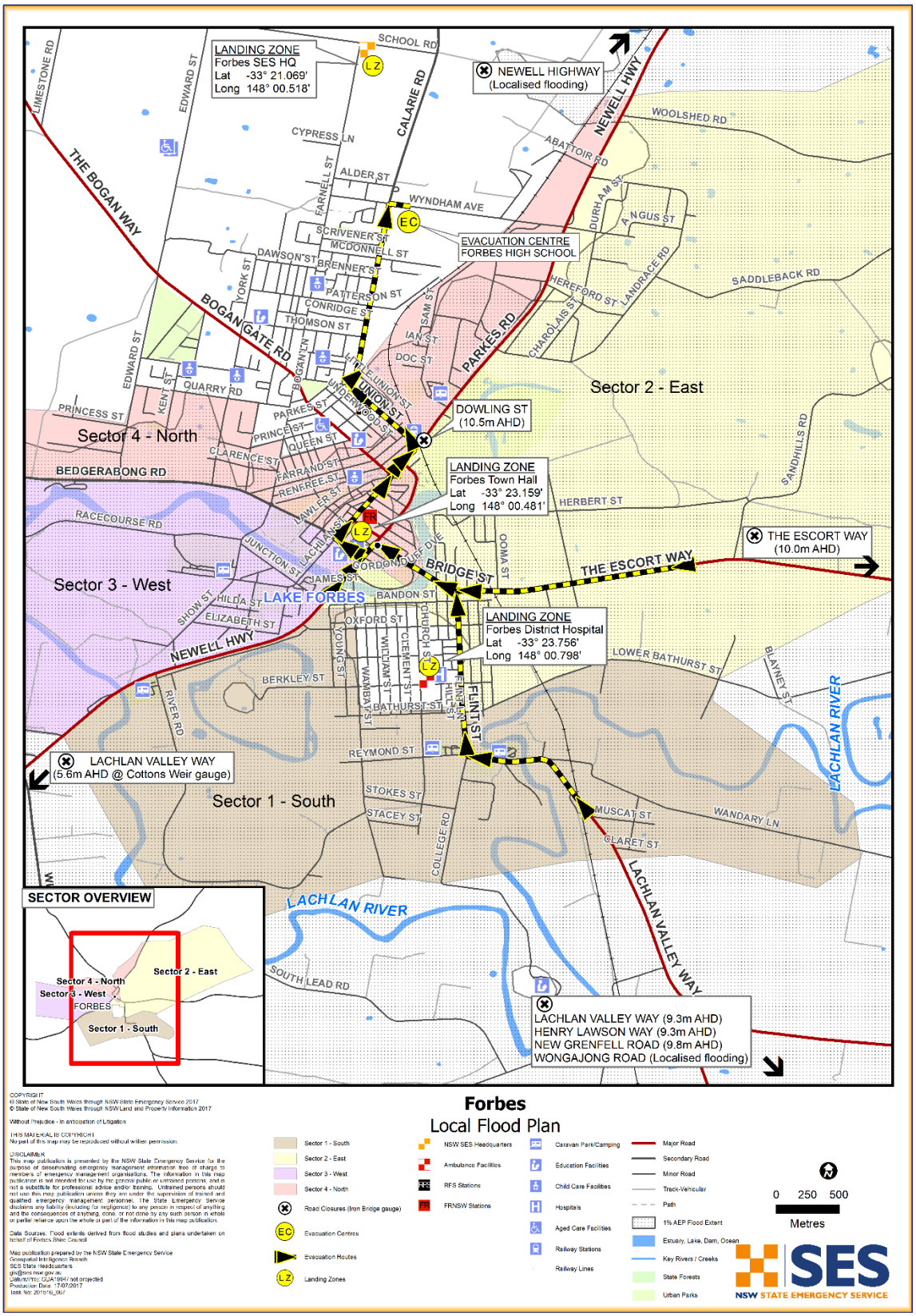
	issue evacuation warnings to the 'at risk' residents, indicating what people should do before evacuating and when actually doing so. In most events, flood travel times between Wyangala Dam and Forbes average about three days. Consequently, accurate river height predictions at the Iron Bridge gauge can usually be made up to two days in advance. 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.
	Doorknocking will be the principle means of informing residents of the need to evacuate. This will be supported by the use of Emergency Alert and media.
	The Forbes Shire Council has an SMS "opt in" arrangement with the local residents (if residents choose to subscribe). Local Forbes NSW SES can request the use of the use of this system to assist residents in receiving official information via SMS other than evacuation products via Emergency Alert.
Property Protection	***Specific property protection measures:*** NSW SES Forbes Unit assists elderly and infirm residents in need of assistance. A sandbagging facility is also established at the Unit Headquarters in School Road, Forbes for Forbes community to pick up sandbagging resources.
	Protection of essential infrastructure: Council arranges for protection of essential infrastructure in the Forbes community.
Evacuation and/or Isolation Triggers	Historical evidence of flooding in Forbes indicates that: • **Prediction to reach and/or exceed 9.3 metres:** Generally, the first area requiring evacuation within the Shire would be the caravan park located adjacent to the Lachlan River near the Forbes Iron Bridge. Some vans may need to be moved from low-lying areas in the park to higher ground at gauge heights of 9.30 metres or greater on the Forbes Iron Bridge gauge. Inundation of this caravan park begins at 10.20 metres. If a peak of 10.20 metres or greater is predicted, evacuation of the entire caravan park must be completed before this height is reached. (Note: Further evacuations may be required from low-lying areas in the three remaining caravan parks within Forbes). A property opposite the Caravan Park on Reymond Street also become isolated and inundated at around 9.3 metres, requiring evacuation (Forbes South Sub Sector). • **9.3 metres, if prediction to reach and/or exceed 10.4 metres**: Some evacuations may be required from the South Forbes (Muscat Street, Moselle Street and Wandary Lane/Road) and Wongajong (which can be isolated by Bundaburrah Creek) areas if a peak of 10.40 metres or greater is predicted.

	Residents wishing to evacuate from this area to Forbes will need to be complete their movements before the Lachlan Valley Way and Wongajong Road closes at approximately **9.30 metres** on the Forbes Iron Bridge gauge (Forbes South Sub Sector). • **Prediction to reach and/or exceed 10.35 metres**: If peak heights of 10.35 metres or greater are expected, evacuations may be required from a number of properties in Rifle Range Road, Forbes (Forbes East Sector). • **Prediction to reach and/or exceed 10.38 metres**: Residents in low-lying properties in Cowra Road, the bottom of Browne Street, Hill Street and Lower Rankin Street may need to be evacuated if a peak flood height of 10.38 metres or greater is predicted. • **Prediction to reach and/or exceed 10.4 metres:** Partial evacuations may also be required from a number of properties in Ferry Street, Clark Street (both Forbes East Sub Sector), Mole Lane (Forbes South Sub Sector) and other low-lying streets in the town if a peak height of 10.40 metres or above is expected. • **Prediction to reach and/or exceed 10.5 metres:** Major inundation of the town usually occurs once flows commence in the Battye Street floodway at heights of approximately 10.50 metres or greater on the Forbes Iron Bridge gauge, requiring evacuation of many businesses in the central business district. Evacuations from this area and the section of Forbes between Lake Forbes and the Newell Highway will need to be completed before water commences to flow across Dowling Street (Forbes North Sub Sector). • **Prediction to reach and/or exceed 10.7 metres:** The area to the west of Forbes, including Racecourse Road, Warrul Road, River Road and Gum Swamp Road may require evacuation (Forbes West Sub Sector). • **Prediction to reach and/or exceed 10.8 metres:** If peak heights of 10.80 metres or greater are predicted at the Forbes Iron Bridge gauge, the evacuation of up to 500 homes throughout the Shire may be required. Caution should be taken, as not all floods are the same and the consequences at this height are variable (e.g. dam outflow, vegetation, land use changes, rural levees etc.) (all sub sectors).
Sequencing of evacuation	During major flooding the town of Forbes can be divided into three areas by flood waters (above 10.55 metres or greater on the Forbes Iron Bridge gauge, variable between floods). Access between these sections of town is usually only possible by flood boat or rotary wing aircraft, although heavy truck and Australian Defence Force vehicles appropriate for partial submersion have been used in the past.
Evacuation Routes	Formal evacuation routes will be established at the time of flooding as there are multiple routes available for residents to the evacuation centre, including: • **South Forbes:** Along Lachlan Valley Way, Reymond Street, Flint Street, Bridge Street, Newell Highway, Browne Street, Lachlan Street and Dowling Street to North Forbes • **East Forbes:** The Escort Way, Bridge Street, Newell Highway, Browne Street, Lachlan Street and Dowling Street to North Forbes • **Forbes CBD:** Browne Street, Lachlan Street and Dowling Street to North Forbes • **West Forbes:** Newell Highway, Browne Street, Lachlan Street and Dowling Street to North Forbes Note: due to the variability of flooding, these routes are subject to change.
Evacuation Route Closure	• The Newell Highway may be closed in the vicinity of the Golf Course by major flooding. If this occurs, evacuees from the northern and north western parts of Forbes may still have access to the Highway and Parkes via Wyndham Avenue, until the highway is closed by Billabong Creek water at Tichbourne. Access to the evacuation centre at Forbes High School, North Forbes is still available for these residents.

	• The section of town between Lake Forbes and the Battye Street floodway becomes an island when the road north is cut at Dowling Street (NOTE: the Newell Highway is usually already closed on the southern side of the Lachlan River at minor flood levels). Evacuations from this area would need to be completed before water commences to flow across Dowling Street (at any time after the major flood level at the Forbes Iron Bridge gauge is reached). • Residents in the area between the Newell Highway and Lake Forbes would also need to complete any necessary evacuations before water commences to flow over Dowling Street due to the closure of the Newell Highway to the south. • The southern residential area (Camp Hill) can also become an island when roads to the north linking with the Camp Street Bridge are inundated. The Forbes – Gooloogong Road closes at Dukes crossing at heights of 9.3 metres or above on the Forbes Iron Bridge gauge and the Orange Road to Eugowra closes at the Southern Cross. In addition, the section of Oxford Street where it intersects with the Newell Highway also becomes un-trafficable due to flood waters. Residents from south Forbes wishing to evacuate to areas outside of Forbes will therefore need to complete evacuation early if major flooding is predicted in Forbes. • Wongajong residents will need to complete evacuations before access to Forbes is lost when water crosses the Forbes – Wongajong Road at the Dog and Duck crossing at heights of approximately 9.3 metres or above on the Forbes Iron Bridge gauge. • Residents in the Muscat Street, Moselle Street and Wandary Lane/Road area will need to complete evacuation prior to floodwater cutting Wandary Lane/Road and Lachlan Valley Way. • The roads from Forbes to Grenfell, Condobolin, Marsden and Bogan Gate will also progressively close as flood levels increase.
Method of Evacuation	Self-evacuation, with residents using their own transport is the primary means of evacuation in the Forbes community. Assistance for elderly and infirm is arranged through the EOC.
Evacuation Centre/Assembly Point	Any or all of the following sites may be used as evacuation centres: • Forbes High School, Wyndham Avenue, Forbes (in North Forbes). • Bedgerebong Community Hall, Bedgerebong.
Large scale evacuations	Large scale evacuations are unlikely in Forbes.
Rescue	The main roads surrounding Forbes become flood rescue hot spots, including Henry Lawson Way (at Muddy Lagoon), Lachlan Valley Way (at Dukes Crossing), Yarrabandai Road (at four ways) and The Escort Way (Southern Cross breakout).
	As floodwater can be quite wide and shallow, flood boat operation can be challenging and most flood rescues are performed by flood technicians entering the water by foot with the ArkAngel.
Resupply	Flood waters can remain in the Forbes Shire for several weeks in a major flood event.
	During major flooding, the villages and localities of Bedgerebong, Warroo, Jemalong and Corinella may be isolated by road for periods of up to five weeks as occurred during the flood of August 1990, requiring resupply. Road closures can also cut access between Forbes and the localities of Wirrinya, Garema, Grenfell and West Wyalong for up to two weeks, which may require resupply - noting Grenfell and West Wyalong are in the Bland and Weddin Shire LGA's. The town of Forbes itself may also be divided into three separate sections restricting vehicular access between north Forbes, the central business district and south Forbes. During such periods, there will be a requirement for the resupply of essential supplies.

	Table 2, in Volume 2 provides information about isolated communities in the Forbes 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: ▪ NSW SES Local Headquarters, Cnr of Farnell Street and School Road, Forbes (S33° 21.069'; E148°00.518') ▪ Forbes District Hospital in Elgin Street (S33°23.756'; E148°00.798) ▪ The Town Hall in Harold Street (S33°23.159'; E148°00.481') ▪ Near the Community Hall at Bedgerebong (S33° 21'48'', E147° 41'37''). ***Airports:*** ▪ Parkes Airport is located approximately 36 kilometres to the north east of Forbes (-33.136741°N; 148.231345°E). Access may be lost in a major flood if the Newell Highway between Forbes and Parkes is cut. ▪ Forbes Airport can be utilised until access is lost during floods (when Bedgerebong Road is cut – from around 10.44 metres).
Other	River Arts Festival, Spring Races and National BBQ championships are held in October, causing a larger influx of tourists.

1.2. FORBES SECTOR MAP



FORBES SHIRE NSW SES
CARAVAN PARK ARRANGEMENTS

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

(NSW SES Response Arrangements for Forbes Shire)

Last Update: August 2017

AUTHORISATION

The Forbes 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: 2-8-17

Approved

NSW SES Lachlan Region Controller

Date: 31.07.17

Tabled at LEMC Date: 24 August 2017

Document Issue: V3.3-21102014

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. Big4 Forbes Holiday Park

b. Country Club Caravan Park

c. Apex Riverside Tourist Park

d. Forbes River Meadows 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 Forbes Shire Local Controller will ensure that the managers of caravan parks are advised of Flood Information (described in Volume 1 of the Forbes 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 Tables 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 Forbes 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 Forbes Shire Local Controller when the evacuation of the caravan park has been completed.

f. Provide the NSW SES Forbes 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 Forbes Shire 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, with gauge heights relative to the Forbes Iron Bridge gauge (FIB).

Name	Address/ Location description	Town/ Sector	Number of sites	Risk	Evacuation route closure	Moveable dwelling relocation location	Evacuation centre	Notes
Big4 Forbes Holiday Park	141 Flint Street	Forbes South sub sector	14 cabins 26 powered sites 6 unpowered sites	At risk of inundation in a 1% AEP flood (10.8 metres at FIB)	When Battye Street floodway is active (variable heights from 10.5 metres)	Relocate away from Forbes (for example Parkes)	Evacuation Centre established at North Forbes High School	No peak seasons
Country Club Caravan Park	33/37 Sam Street	Forbes East sub sector	19 cabins 20 powered sites 5 unpowered sites	Low lying areas at risk of flooding from 9.3 metres including around 11 cabins, with the remainder from around 10.2 metres (variable height). About a 30cm of water was through the caravan park in 2016	All evacuation roads may be closed in a 1% AEP flood (10.8 metres)	Relocate away from Forbes (for example Parkes)	Evacuation Centre established at North Forbes High School	No peak seasons
Apex Riverside Tourist Park	88 Reymond Street	Forbes South sub sector	4 cabins 7 motel rooms 45 powered sites 15 unpowered	9.1 metres (at FIB) low lying areas of the caravan park flooded. 10.2 metres (at FIB) further areas flooded.	When Battye Street floodway is active (variable heights from 10.5 metres)	Relocate away from Forbes (for example Parkes)	Evacuation Centre established at North Forbes High School	No peak seasons
Forbes River Meadows Caravan Park	Cnr Newell Highway and River Road	Forbes West sub sector	14 cabins 25 powered sites 20 unpowered sites	At risk of inundation in a 1% AEP flood (10.8 metres at FIB). 30cm of water out the front of the property was held back by sandbags in 2016	All evacuation roads may be closed in a 1% AEP flood (10.8 metres)	Relocate away from Forbes (for example Parkes)	Evacuation Centre established at North Forbes High School	No peak seasons

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.