

Narrabri Shire

Local Flood Emergency Sub Plan

NARRABRI SHIRE FLOOD EMERGENCY SUB PLAN

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

Volume 1 of the Narrabri Shire Flood Emergency Sub Plan

Version 3.0

AUTHORISATION

The Narrabri Shire Flood Emergency Sub Plan is a sub plan of the Narrabri Shire 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

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13th September 2023

Endorsed

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15 November 2023

VERSION HISTORY

Version Number	Description	Date
1.0	Narrabri Shire Local Flood Plan	April 2003
2.0	Narrabri Shire Local Flood Plan	August 2021
3.0	Narrabri Shire Local Flood Plan	October 2023

AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

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

Amendment Number	Description	Updated by	Date
01	Update of references to 'Flood Development Manual' – replaced with 'Flood Risk Management Manual'	Melissa Lloyd	
02	Update of wording in section 5.4 relating to flood warnings, to reflect the change to the Australian Warning System	Melissa Lloyd	
03	Update of wording from 'DPIE' to 'DPE'	Melissa Lloyd	
04	Recovery Operations – updated 6.22 reference from Resilience NSW to NSW Reconstruction Authority	Melissa Lloyd	
05	Insertion of text under Section 5.9.4 - "The roles and responsibilities for Agriculture and Animal Services are outlined in the Agriculture and Animal Services Functional Area Supporting Plan."	Melissa Lloyd	

DISTRIBUTION LIST

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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 Narrabri Shire 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 Narrabri Shire Council Local Emergency Management Plan (EMPLAN) and is endorsed by the Local 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 Narrabri Shire 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 Narrabri Shire LGA. The Narrabri Shire 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 North Western Zone and for emergency management purposes, is part of the New England Emergency Management Region.
- 1.4.3 The plan sets out the Narrabri Shire level emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Narrabri Shire 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 Emergency 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.
- 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 Sub Plan.

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

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

- a. The NSW SES Incident Controller (for local or zone level responsibilities during response operations).
- b. The NSW SES Zone Duty Commander (for regional level responsibilities outside of response operations).

1.8 PLAN MAINTENANCE AND REVIEW

- 1.8.1 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. Conduct a minimum of one exercise every five years or within two years of the plan being reviewed.
 - 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 recommendations from after action reviews, reports, or inquiries.
 - 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 and supporting material of the Local Flood Emergency Sub Plan is maintained on the [NSW SES website 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 NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Narrabri Shire LGA. This is outlined in Volume 2 – Hazard and Risk in Narrabri Shire.
- 2.1.2 Declared dams in or upstream of the Narrabri Shire Local Government Area.

Dam Name	Owner	High Risk Dam
Keepit Dam	Water NSW	No
Maules Creek Mine – MWD2	Aston Coal Pty Ltd	No
Maules Creek Mine – RWD2	Aston Coal Pty Ltd	No
Narrabri Coal Rail Loop Dams	Narrabri Rail	No

3 PREVENTION/ MITIGATION

3.1 INTRODUCTION

3.1.1 The Floodplain Risk Management Manual outlines the NSW Government's Flood Prone Land 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:** Effective land use planning is a key focus for minimising the impacts of flooding. NSW SES will work with land use planning and consent authorities to inform and influence the consideration of the risks arising from flood, storm and tsunami, 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 to life and/or property due to flooding.
- b. NSW SES will provide responses to land use planning proposal referrals that have or will create significant flood risk to life and/or property due to flooding.

3.3 FLOODPLAIN RISK MANAGEMENT

3.3.1 **Strategy:** Advocate for consideration of emergency management in decision making to reduce risks to the existing community and minimise the growth in future, continuing and residual risk due to development through input to the floodplain 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.
- b. NSW SES will provide advice, support, technical resources and training for NSW SES representatives to contribute effectively on 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.

Actions:

- a. Develop and review this NSW SES Local Flood Emergency Sub Plan as required. Local Flood Emergency Sub Plans outline the specific arrangements for management of flood events within an LGA, and may include cross boundary arrangements.
- b. Review plans as per Section 1.8.

4.2.2 Local EMPLAN Consequence Management Guides (CMG's) for flood are not required for communities covered by NSW SES Local Flood Emergency Sub Plans however may be utilised in place of Local Flood Emergency Sub Plan if agreed to by NSW SES.

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.
- 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 Narrabri Shire LGA are also listed in Volume 3 of this plan.
- c. NSW SES will recommend new warning services and changes to warning alert levels for gauges to the NSW and ACT 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 Emergency Plans (where required) and consult with 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 warning and flood information products.
 - Continuously reviewing warning and flood information products.
 - Consulting with affected communities, key stakeholders, Dam Safety NSW and the NSW and ACT Flood Warning Consultative Committee, and maintains Operational Readiness.
 - Participating in the development of public information and warning systems.
- h. Gauge owners adequately maintain flood warning gauges and systems, including those identified in the 'Service Level Specification' maintained by the Bureau of Meteorology (Bureau) and those identified in the 'Provision and Requirements for Flood Warning in New South Wales' maintained by NSW SES.

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 Emergency 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.
- 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. Partner with and engage 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. 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.
- e. Collaborate with community sector and recognise the needs of individuals within communities who have an increased susceptibility during floods.

5 RESPONSE

5.1 INTRODUCTION

5.1.1 Flood response operations will begin:

- a. On receipt of a Bureau Severe Weather Warning or Thunderstorm Warning that includes heavy rain or storm surge; or
- b. On the receipt of a Bureau Flood Watch or Flood Warning; or
- c. On receipt of 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 NSW.

Actions:

- a. 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 Controller (or delegate) will appoint Incident Controllers and establish Incident Control Centres (see NSW SES facilities on map in Appendix A).
- d. The NSW SES Incident Controller, in consultation with participating supporting emergency services and functional areas will determine the appropriate breakdown of an Area of Operations into Divisions and/or Sectors in accordance with the principles of AIIMS.

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.
 - Coordinate information flow, including warnings, public information and social media.

5.2.3 **Strategy:** Provide effective liaison between 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 (EOC) as required.
- b. NSW SES will provide Liaison Officer(s) to EOC as required.
- c. Where possible EOC to be co-located with NSW SES Incident Control Centres for Flood Emergency Response.

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. 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 utilised, communicated and collected during and after 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, functional areas and Council 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. NSW SES may establish and operate a Joint Intelligence Unit to coordinate the collection, collation, interpretation, mapping, actioning and dissemination of information.
- 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.
- e. NSW SES may request Engineering to assist with the gathering of flood intelligence including (not limited to) maximum flood extents, peak flood heights, recording major flood damage at key high velocity locations and preparation of After-Flood Report.

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

Action: NSW SES will use flood intelligence, official forecasts, warnings, and flood scenario products 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 Bureau issues public weather and flood warning products before and during a flood. These may include:
 - Severe Thunderstorm Warnings – Detailed - issued for all capital cities and surrounding areas when individual severe thunderstorms are within range of the capital city radars.
 - Severe Thunderstorm Warnings - Broad-based - issued for the entire Australian State or territories affected highlighting broad areas where severe storms may occur within the next 3 hours.
 - Severe Weather Warnings with reference to heavy rainfall and/or storm surge.
 - Flood Watches.
 - Flood Warnings.
- b. Dam Owners will utilise the Dam Emergency Plan to provide warnings and information to NSW SES and communities (where appropriate).
- c. NSW SES Incident Controllers will issue the following NSW SES Flood Warnings aligning to the Australian Warning System:
 - Advice.

- Watch And Act.
 - Emergency Warning.
- d. NSW SES liaises with the Bureau 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 public information.
 - 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.
 - Transport for NSW 'Live Traffic' website: <https://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 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 including critical infrastructure through flood protection systems (e.g. sandbagging) to minimise entry of water into buildings.
- 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. Narrabri Shire Council will coordinate the closure and reopening of council managed roads once inspections have been carried out by the relevant authority.
- b. Transport for NSW will coordinate the closure and reopening of the state road network.

- c. NSW Police Force may close and re-open roads but will normally only do so if the Narrabri 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.

Actions:

- 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 Emergency Sub 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, utility services and lifelines.

Actions:

- a. Transport Services Functional Area is to coordinate the provision of information about the assessment and restoration of transport network infrastructure.
- b. Energy and Utility Services Functional Area is to coordinate the assessment and restoration of essential energy and utility services (not including telecommunications).
- c. Telecommunications Services Functional Area is to coordinate the assessment and restoration of telecommunications and the Public Safety Network.
- d. Engineering Services Functional Area is to:
 - Coordinate the assessment and restoration of critical public buildings for example hospitals.
 - Assessment and operation of flood protection levees.
 - Protection of property.
 - Construction and repair of levees.
 - Dam safety assessment and dam stability.
 - Water supply and sewerage operations.
 - Other critical infrastructure.

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

5.8 EVACUATION

- 5.8.1 Evacuation is 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.
 - Evacuation of people where essential energy and/or utility services are likely to fail or where buildings have been or may be made uninhabitable.
- b. 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.
 - The ability for existing levees or other flood protection works to fulfil their intended function.
 - Time available for evacuation.
 - Evacuee management requirements.
 - Resources and delivery of evacuation information.
 - Length of isolation.
- c. NSW SES Incident Controllers, planning and intelligence officers 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 Local EMPLAN.
- f. 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.

Actions:

- a. NSW SES will control and coordinate the evacuation of affected communities.
- b. The NSW SES Commissioner (or delegate) will warn communities to prepare for a possible evacuation, where circumstances allow such lead time.
- c. The NSW SES Commissioner (or delegate) 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 NSW SES and Welfare Services.
- f. School administration offices (Government and Private) will coordinate the evacuation of schools in consultation with 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 Emergency Warning will be referred to 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 Welfare Services Functional Area as soon as possible. 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 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 NSW Police Force with the assistance of NSW SES and the 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.
- g. The decision to establish Major Evacuation Centres or Mass Care Facilities will be made by 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.

Actions: 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:** 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.
- b. Agriculture and Animal Services Functional Area role will coordinate the 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.

The roles and responsibilities for Agriculture and Animal Services are outlined in the [*Agriculture and Animal Services Functional Area Supporting Plan*](#).

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 NSW State 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 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 NSW SES. Notification arrangements with NSW Police Force are outlined in the State Rescue Board NSW State Rescue Policy.

- d. Rescue agencies will conduct rescue of domestic small and large animals as per the State Rescue Board NSW State 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 support the delivery of 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.
- g. NSW SES may conduct resupply operations as per the designated resupply plan for the event.
- h. Where additional supplies are required Engineering Services Functional Area be requested to coordinate the supply of goods and services in response to and recovery from the emergency.

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

5.12 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. The 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 ongoing risk to public safety.
- b. The NSW SES Incident Controller will specify the level of access to affected communities as the following:
 - Not suitable for access; or
 - Limited access by emergency services and response agencies; or
 - Limited access by residents and/or business operators; or
 - Full access.
- c. The NSW SES Incident Controller will issue an Advice Warning advising 'Reduced Threat: Return with Caution' when the immediate danger to life and property has passed for areas.
- d. 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:
 - There is a reduced likelihood of additional flooding within the Area of Operation and flood waters have receded.
 - 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).
 - All affected areas have had a 'Reduced Threat: Return with Caution' 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, Welfare Services and Narrabri Shire Council representatives.
- b. NSW SES will conduct After Action Reviews, at the conclusion of response operations, which will involve all stakeholders. Findings will be shared and incorporated into improved disaster resilience planning.
- c. NSW SES will provide information and data throughout the emergency response to inform community recovery. A report will be developed at the request of the SERCON at the conclusion of the response within an area. Should a response summary report be required it will include the following:
 - The emergency action plan in place at conclusion of the response emphasising any continuing activities including community meetings/ engagement activities.
 - Resources allocated to the emergency response and associated exit strategies.
 - Details of any areas or situations with potential to re-escalate the emergency.
 - A recommendation for the conclusion of NSW SES as lead agency to transition to NSW Reconstruction Authority as the lead agency for Recovery.
 - Any actions that are incomplete or outstanding.
 - Damage Assessment Data and Information obtained throughout the response phase which will further support the long-term recovery of communities.
- 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 works with relevant stakeholders and Narrabri Shire 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 NSW Reconstruction Authority to support applications to Treasury for Natural Disaster Relief and Recovery Arrangements.
 - d. NSW SES, in conjunction with a Recovery Committee, will provide a service to support the information needs of a community immediately following a flood.
 - e. NSW SES and where required supporting agencies will assist with clean-up operations after floods, where possible when resources and personnel permit.
 - f. NSW SES may coordinate immediate relief in collaboration with SEOCAN and SERCON.

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.

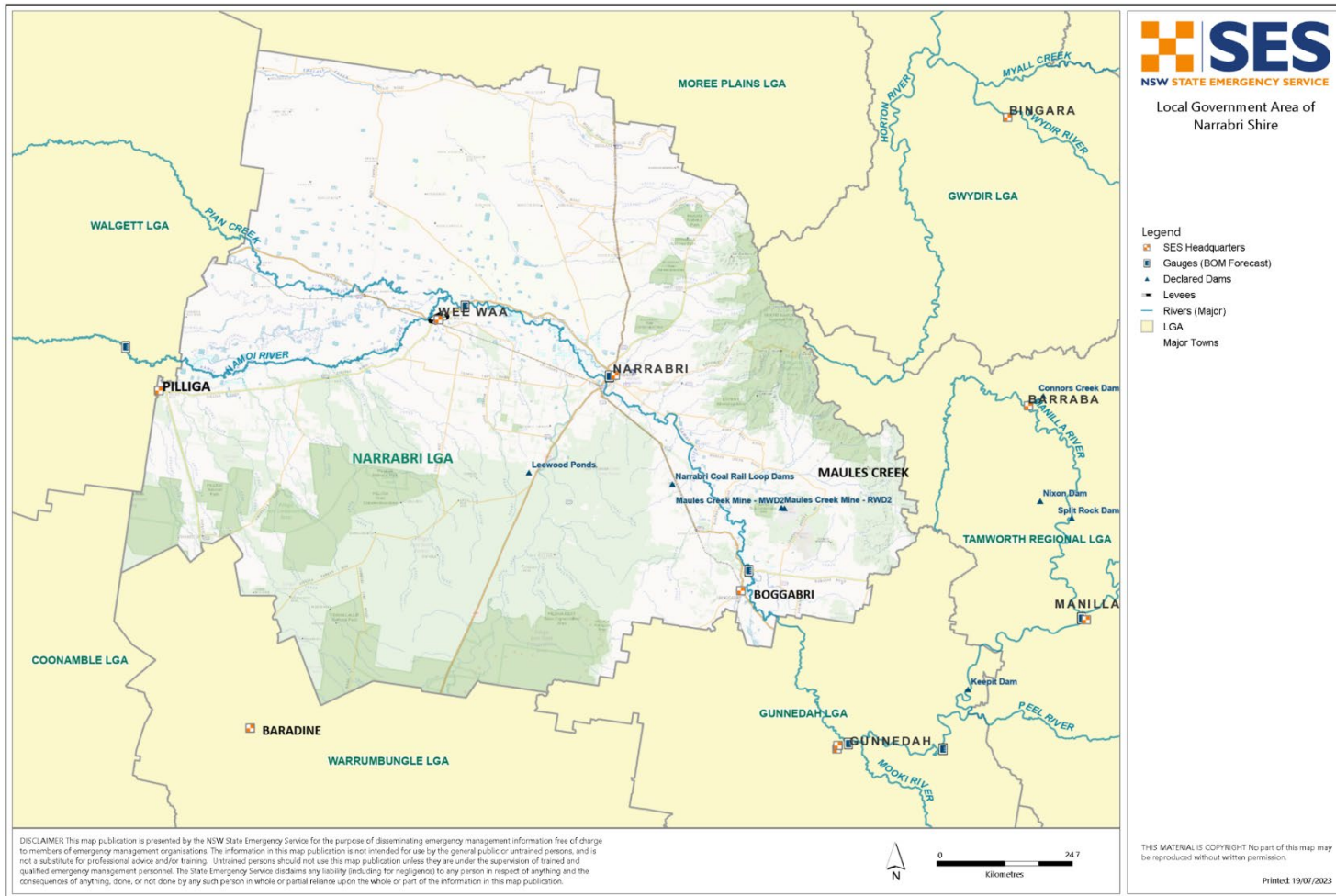
Readers should refer to EMPLAN Annex 9 – Definitions.

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>

9 Appendix A – Map of Narrabri Shire Council Area



10 Appendix B – Roles and Responsibilities

AGENCY	RESPONSIBILITIES
NSW State Emergency Service	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 outlined in the NSW State Flood Emergency Sub 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 and NSW State Flood Plan.
Australian Government Bureau of Meteorology	The roles and responsibilities for the Australian Government Bureau of Meteorology (Bureau) are outlined in the NSW State Flood Plan.
Caravan Park Proprietor(s)	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> – 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). • Ensure that occupiers are informed of Flood Information. At this time, occupiers should be advised to: <ul style="list-style-type: none"> – 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 (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

AGENCY	RESPONSIBILITIES
	<p>caravan park(s) by owners or by vehicles and drivers arranged by the park managers.</p> <ul style="list-style-type: none"> • Secure any movable dwellings that are not able to be relocated to prevent floatation. • Inform 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	<ul style="list-style-type: none"> • When notified of possible flooding or isolation, childcare centres and preschools should. <ul style="list-style-type: none"> – Liaise with NSW SES and arrange for the early release of children whose travel arrangements are likely to be disrupted by flooding and/or road closures. – Assist with coordinating the evacuation of preschools and childcare centres.
Dams Safety NSW	The roles and responsibilities for 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).
Energy and Utilities Services Functional Area	<p>The roles and responsibilities for Energy and Utilities Services are outlined in the Energy and Utility Services Supporting Plan (EUSPLAN).</p> <p>Roles and responsibilities in addition to the Supporting Plan are:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> – Provide advice to NSW SES of any need to disconnect power/gas/water/wastewater supplies or of any timetable for reconnection. – Advise 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 NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

AGENCY	RESPONSIBILITIES
Engineering Services Functional Area	The roles and responsibilities for Engineering Services are outlined in the Engineering Services Supporting Plan and NSW State Flood 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 for Floodplain Management Australia are outlined in the NSW State Flood Plan.
Fire and Rescue NSW	The roles and responsibilities for Fire and Rescue NSW are outlined in the NSW State Flood Plan.
Forestry Corporation of NSW	The roles and responsibilities for Forestry Corporation of NSW are outlined in the NSW State Flood Plan.
Health Services Functional Area	The roles and responsibilities for Health Services are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
Local Emergency Operations Controller (LEOCON)	<ul style="list-style-type: none"> • Monitor flood operations. • If requested, coordinate support for the NSW SES Incident Controller.
Local Emergency Management Officer (LEMO)	<ul style="list-style-type: none"> • If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.
Marine Rescue NSW	The roles and responsibilities for Marine Rescue NSW are outlined in the NSW State Flood Plan.
Narrabri Shire Council	<p>Preparedness</p> <ul style="list-style-type: none"> • Establish and maintain floodplain and coastal 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 Risk Management Manual. • Provide levee studies, flood studies and floodplain management studies to NSW SES. • Coordinate the development of warning services for catchments prone to flash flooding (small catchments), where appropriate. • 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. • Maintain a plant and equipment resource list for the council area. • Contribute to community engagement activities. <p>Response</p> <ul style="list-style-type: none"> • Subject to the availability of council resources, assist NSW SES with flood operations including:

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> – Traffic management on council managed roads. – Provision of assistance to 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. – Technical advice on the impacts of flooding. – Close and reopen council roads (and other roads nominated by agreement with Transport for NSW) and advise NSW SES, NSW Police Force and people who contact the council for road information. – Assist NSW SES to provide filled sandbags and filling facilities to residents and business in areas which flooding is expected. <ul style="list-style-type: none"> • Assist with making facilities available for domestic pets and companion animals of evacuees during evacuations. • Operate flash flood warning systems. • Operate flood mitigation works including critical structures such as detention basins and levees and advise NSW SES regarding their operation. • Manage and protect council-owned infrastructure facilities during floods. • Provide advice to 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 Authority of any sewerage overflow caused by flooding. • Work with NSW SES and NSW Department of Planning and Environment to collect flood related data during and after flood events. <p>Recovery</p> <ul style="list-style-type: none"> • Provide for the management of health hazards associated with flooding including removing debris and waste. • 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.

AGENCY	RESPONSIBILITIES
NSW Ambulance	The roles and responsibilities for NSW Ambulance are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission	The roles and responsibilities for NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission are outlined in the NSW State Flood Plan.
NSW Department of Planning and Environment (Environment and Heritage Group)	The roles and responsibilities for NSW Department of Planning and Environment (Environment and Heritage Group) are outlined in the NSW State Flood Plan (referred to as DPIE EES).
NSW Department of Planning and Environment (Water)	The roles and responsibilities for NSW Department of Planning and Environment (Water) are outlined in the NSW State Flood Plan.
NSW Food Authority	The roles and responsibilities for NSW Food Authority are outlined in the Food Safety Emergency Sub Plan.
NSW National Parks and Wildlife Services	The roles and responsibilities for NSW National Parks and Wildlife Services are outlined in the NSW State Flood Plan.
NSW Police Force	The roles and responsibilities for NSW Police Force are outlined in the NSW State Flood Plan.
NSW Reconstruction Authority	The roles and responsibilities for NSW Reconstruction Authority are outlined in the NSW State Flood Plan.
NSW Rural Fire Service	The roles and responsibilities for NSW Rural Fire Service are outlined in the NSW State Flood Plan.
Owners of Declared Dams within or upstream of the LGA	The roles and responsibilities for Owners of Declared Dams are outlined in the NSW State Flood Plan.
Public Information Services Functional Area	The roles and responsibilities for Public Information Services are outlined in the Public Information Services Supporting Plan and NSW State Flood Plan.
SEOCN/SEOC	The roles and responsibilities for the SEOCN/SEOC are outlined in the NSW State Flood Plan.
Surf Life Saving NSW	The roles and responsibilities for Surf Life Saving NSW are outlined in the NSW 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	<ul style="list-style-type: none"> • Transport for NSW coordinates information on road conditions for emergency services access.

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> • Transport for NSW coordinates the management of the road network across all modes of transport. • Transport for NSW in conjunction will assist NSW SES with the evacuation of at-risk communities by maintaining access and egress routes. • Assist 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 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 Functional Area Supporting Plan and NSW State Flood Plan.
VRA Rescue NSW	The roles and responsibilities for VRA Rescue NSW are outlined in the NSW State Flood Plan.
Water NSW	The roles and responsibilities for Water NSW are outlined in the NSW State Flood Plan.
Welfare Services Functional Area	The roles and responsibilities for Welfare Services are outlined in the Welfare Services Functional Area Supporting Plan and NSW State Flood Plan.

11 Appendix C – Community Specific Roles and Responsibilities (examples only)

<p>Community Members</p>	<p>Preparedness</p> <ul style="list-style-type: none"> • 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. • Be involved in local emergency planning processes. <p>Recovery</p> <ul style="list-style-type: none"> • Assist with community clean-up if required and able to do so. • Participate in After Action Reviews if required.
<p>Aboriginal organisations or groups</p>	<ul style="list-style-type: none"> • Act as the point of contact between NSW SES and the Kamilaroi community. • Inform the NSW SES Unit Commander about flood conditions and response needs. • Disseminate flood information, including flood and evacuation warnings, to the Kamilaroi community. • Narrabri Local Aboriginal Land Council – 02 6792 4228

HAZARD AND RISK IN NARRABRI SHIRE

Volume 2 of the Narrabri Shire Local Flood Plan

Last Update: April 2003

ANNEX A - THE FLOOD THREAT

The Namoi River Basin

1. The Namoi River is one of the major tributaries of the Barwon-Darling River system and drains an area of about 43,000 km² (approximately 6% of NSW) extending from near Walcha westward to Walgett. The main headwater tributaries are the Manilla and Peel Rivers and downstream, at Gunnedah, the Mooki River.
2. The Manilla and Namoi Rivers flow from the high mountainous country in the north of the catchment and combine upstream of Keepit Dam. The contributing catchment area to the dam measures approximately 5,700 km² and is capable of producing high runoff peaks. The Peel River drains the eastern portion of the catchment to join the Namoi between Keepit Dam and Carroll, contributing an additional 4,670 km² at Carroll Gap. The south-eastern portion of the catchment is drained by the Mooki River which quickly falls onto the flat terrain of the Liverpool Plains downstream of Quirindi. At Breeza, the Mooki catchment area is 3,630 km².
3. Downstream of Carroll and Breeza, the Namoi and Mooki Rivers flow onto an expansive floodplain before combining just upstream of Gunnedah. The total contributing catchment area at Gunnedah is approximately 17,100 km².
4. The Manilla and Peel Rivers both provide higher runoff than the Mooki although high flows from the Mooki catchment can severely influence flood conditions at Gunnedah and further downstream when coinciding with major flows in the Namoi itself.
5. The Coxs, Maules and Bohena Creeks all join the main river below Gunnedah.
6. A map of the Namoi River Basin (Basin No 419) is shown as Map 2.

The Namoi River

7. The Namoi rises as the MacDonalld River in the elevated New England Plateau until approximately 43 kilometres north-east of Manilla where it becomes the Namoi River and flows on to Walgett join the Barwon River at Walgett. The major tributaries of the Namoi drain from the New England Plateau in the east, the Nandewar Range in the north, and the Liverpool Range and the Warrumbungle Ranges in the south.

The Namoi and its Tributaries Upstream of Narrabri

8. An important tributary from the east, the Peel River, flows into the Namoi River below Keepit Dam. The Peel River rises in the southern portion of the Nundle Council area and emerges on to a flat to undulating plain, which, at Tamworth, is about twenty-four kilometres wide. It is joined by the Cockburn River; which flows through river flats about eight kilometres wide; Attunga Creek from the north and Goonoo Goonoo and Tangaratta Creeks from the south.

9. Below its junction with the Peel River, the Namoi flows west across the Liverpool Plains to Gunnedah. This area is subject to extensive local flooding plus extensive riverine flooding as the Namoi waters are joined from the south by those of the Mooki River. The Mooki and its tributaries, including Werris and Quirindi Creeks, drain the southern part of the Liverpool Plains and joins the Namoi just east of Gunnedah.

10. By this stage, the Namoi is carrying the waters of its three major tributary basins, the Manilla, the Peel and the Mooki. The Namoi River then flows north-west and then west towards the Barwon River, which it enters at Walgett. At Boggabri, the Namoi River is joined by Cox's Creek from the left and before reaching Narrabri is joined by Maules Creek from the right. A high flow in Cox's Creek where it joins the Namoi River at Boggabri will force floodwaters to the east into the Barber's Lagoon area. Once this area is full, the water flows to the north and rejoins the Namoi below the Iron Bridge on the Boggabri to Manilla Road. Just below this point (at Gin's Leap) the floodplain is constricted by high ground on both sides. This constriction results in a short reach of dangerous, fast-flowing floodwaters.

11. The Namoi River floodplain between Gunnedah and just downstream of Narrabri is quite flat and a small channel capacity means that low-lying overbank areas are generally susceptible to widespread and lengthy flooding.

The Namoi River at Narrabri

12. About 2.5 km upstream of the Narrabri town centre, the Namoi River divides into two branches: the Namoi River and Narrabri Creek. The two branches join back together about 10 km downstream of Narrabri. Under low flow conditions, all flow is carried by Narrabri Creek. A large sand and gravel bar in the Namoi River at its offtake from Narrabri Creek prevents water from entering the Namoi River until local low-level flooding from Narrabri Creek starts to occur. Each of these major flowpaths has a gauge. These two gauges do not give the same level for a particular flood nor do they have the same gauge zero. After the winter floods of July-August 1998, it was decided that all future warnings would be made for the Narrabri Creek gauge. SES flood intelligence for Narrabri is also based on the height at the Narrabri Creek gauge.

13. Flood problems in Narrabri are exacerbated by the following water courses that act as high-level flood runners that fragment the urban area at flood times:

- a. Lagoon Creek,
- b. Eathers Creek,
- c. O'Briens Creek,
- d. Doctors Creek,
- e. Mulgate Creek,
- f. Horsearm Creek, and

g. Long Gully.

14. Flood producing rain can originate from any of a number of sources, and each of the contributing catchments is quite large. Storm centres may be located over the upper eastern catchment boundary, over the Nandewar Range in the north-east, over the Liverpool Range in the south-east, over the Warrumbungle Range to the south or even over the middle of the plains as occurred in 1974.

15. The Narrabri Creek, which now acts as the main stream and the Namoi River, does not flow through the town until a height of 3.60 metres (measured at the Newell Highway on Narrabri Creek – the Narrabri Creek gauge). The Namoi River then flows with a higher peak level until about 5.0 metres when the two channels even out. This occurs because of the development of a number of other flood runners as follows.

16. O'Brien's Creek and Eather's Creek breakout from the left bank of the Namoi River at about 5.9 metres (Narrabri Creek gauge). They feed into the Narrabri Lake system to the south of Ugoa Street and then move back into the river.

17. A breakout then occurs on the right bank of the Namoi River, downstream of Eathers Creek flowing into the Dangar Village.

18. The next breakout is from the left bank of Narrabri Creek downstream of the Newell Highway. This develops into a flood runner, cutting Gibbons Street near the golf course and then flowing north across the Island Road.

19. The last flood runner to develop is Lagoon Creek. This leaves the left bank of Narrabri Creek upstream of the railway line (at about 8.30 metres on the Narrabri Creek gauge) and floods the Gibbons Street/Grace Street area, before moving across to the Namoi River near the Newell Highway Bridge.

20. These high level flood runners all start to develop during minor levels of flooding. Their future behaviour may be significantly affected by widening of the floodway under both the rail and road bridges over Narrabri Creek. As flood levels rise, more minor overbank flows develop until much of the town is inundated and divided by floodwaters into six distinct precincts. These flood runners can continue for significant periods of between three to 16 days (eg. 1955 - 3 days, 1971 – 16 days, 1974 – 6 days and 1976 – 4 days).

21. A further flood runner can develop to ease the flooding problem in the town. At about 8.5 metres (Narrabri Creek gauge), floodwaters can breakout from the right bank of Narrabri Creek above the railway line and flow through Horsearm Creek and Doctor's Creek and back into the Narrabri Creek downstream of the town. However, the capacity of this runner is dependent on whether or not the Nandewar Creeks are in flood.

The Namoi River Downstream of Narrabri

22. Below Narrabri, the river becomes a slow moving stream, which is joined by Bohena and Baradine Creeks on its left bank and by a number of watercourses that drain the Pilliga Scrub area. Although not contributing significantly to the flow of the

Namoi River in normal periods, these streams can cause extensive shallow flooding which can persist for up to ten days.

23. As far as Wee Waa, the flood pattern is largely dependent on the source of the runoff. If floodwaters originate in the upper catchment and are contained within the Namoi River flood plain itself, then major spreading of flood flows do not occur until about Myall Vale, some 10 kilometres upstream of Wee Waa. At this location, major outflow occurs on both banks of the river, most significantly on the northern bank.

24. The alternate flood pattern is caused by local runoff from the streams draining the south-western slopes of the Nandewar Range. Spring, Bobbiwaa and Galathera Creeks form the main drainage pattern of this region. All have quite small channels and when in flood, spread over wide areas of cultivated land. Most of these flood flows, do not join the Namoi River, but veer to the north-west, ultimately joining the Thalaba Creek system.

25. The floodwaters that move north from Myall Vale flood large tracts of land on the north-west floodplain, through Spring Plains to the Doreen area and eventually into Pian Creek.

26. The water breaking to the south from Myall Vale develops as a flood runner along the side of the Narrabri Road. It initially flows towards Wee Waa, then through O'Briens Creek and the Wee Waa Lagoon and back into the Namoi River, thus effectively isolating Wee Waa.

27. The Wee Waa to Pilliga Road can be cut by back-up flooding out of the Namoi River itself, although flooding from the Pilliga Scrub area (Bundock or Middle Creek and Nuble Creek) can produce high enough flooding in the Lagoon to cut this road.

28. Immediately above and below Wee Waa, flood flows leave the Namoi via a number of effluents, the most significant being Gunidgera and Pian Creeks. With the exception of high ridges adjacent to and to the north of Pian Creek, virtually all of the country west of Wee Waa is inundated during major floods. The floods in the river itself can be severely affected by high runoff that flows from the south out of the Pilliga Scrub to join the river both upstream and downstream of Wee Waa. In fact these flows can be of sufficient magnitude to create severe flooding problems themselves even if there is no significant flow in the river from upstream catchments.

29. The flat nature of the terrain in the western parts of the valley allows large quantities of waters to be temporarily stored on the flood plain and the small capacities of the major river and creek channels only allow very slow drainage of this water.

30. Floodwaters in the Pian Creek and Gunidgera Creek both rejoin the Namoi - the Gunidgera upstream of the village of Pilliga and the Pian just before the Namoi joins the Barwon River. Flooding in the lower riverine area can be extensive and last for up to 21 days. At the lower end of the valley, flood behaviour can also be significantly affected by flooding in the adjacent Gwydir and Castlereagh River Basins.

Keepit Dam

31. The largest storage on the Namoi River above Narrabri is Keepit Dam about 55km upstream of Gunnedah. Although the dam is for conservation storage it can have mitigating effects on some floods. Its effects on peak flood levels, however, are more noticeable close to the dam and less marked further down the river due to the contributing catchment area below the dam and the natural flattening of floodwaters moving downstream. It is usually possible to operate Keepit Dam so that peak releases from the dam do not coincide with Peel River peak flows. This provides a mitigating effect on downstream flood levels.

Weather Systems and Flooding

32. Historical records indicate that most common months for flooding in the Narrabri Shire are January, February and July.

33. The most severe floods recorded have mostly occurred in the summer months, particularly January and February when summer cyclonic weather systems often move south from Queensland and the Northern Territory. In these wetter months the catchment is often saturated and more liable to flooding.

34. Fronts passing the state from west to east, usually during the cooler months of the year, normally constitute the principle flood producing mechanisms of the southern inland parts of the state and winter flooding from frontal systems is less common in the more northern inland parts of the state. It can happen, however, and was experienced in 1998 on the Namoi River which had several flood peaks in quick succession between July and September as the result of rains from the passage of frontal systems.

Flood travel times

35. Some indicative peak flow timings are shown in the table below:

From	To	Travel Times
Keepit Dam	Gunnedah	18-21 hours
Gunnedah	Boggabri	24-30 hours
Gunnedah	Narrabri	45 hours (range 20-50 hours)
Tambar Springs	Boggabri	30 hours
Boggabri	Narrabri	20-24 hours
Tarrawan	Narrabri	6-12 hours
Narrabri	Mollee Weir/confluence with Bohena creek.	6 hours
Bohena Creek gauge (Newell Hwy)	Namoi River	20 hours

Figure 1 - Estimated peak flow travel times

36. **NB:** It must be stressed that these are indicative travel times only and may be significantly reduced during extreme events.

37. Recent changes in land use to high value, irrigated cropping have been accompanied by large-scale private construction of levee banks and raised canals, particularly on the plains downstream of Narrabri. Although a series of floodway restoration schemes have been undertaken, these activities still have the potential to significantly affect previously existing flood flow patterns.

Rate of rise of floodwaters.

38. The approximate rate of rise of floodwaters in Narrabri has been estimated as follows (Note: These are indicative timings only and can vary in big or extreme events):

- a. From minor to moderate flood levels (4.9 – 6.4 metres), about 6 – 12 hours.
- b. From moderate flood level to a 10% AEP level (6.4 – 7.1 metres), about 1 – 2 hours.
- c. It is likely that Narrabri would then have a minimum of about six hours for the flood height to reach the major flood level (6.7 metres) and then a minimum of another three hours to reach the 5% AEP level of 8.26 metres.

39. Above 8.26 metres, the time taken for the river peak could be expected to be about 9 – 12 hours for a ‘fast rising flood’ or about 24 – 36 hours for a ‘slow rising’ flood.

Flood history

40. **February 1955.** This was the largest flood to occur in the lower Namoi Basin. At Narrabri the peak height reached 9.4 metres on the Narrabri Creek gauge (8.56 metres on the Narrabri gauge on the Namoi River) and was rated as being approximately a once-in-50-years flood (2% AEP), while at Gunnedah it was about a once-in-100-years flood (1% AEP). At Wee Waa the flood reached 9.12 metres on the Wee Waa (Glencoe) gauge. Flow in the Namoi River was increased by high contributions from the Manilla and Mooki rivers but there were particularly high flows in the Peel River. Most of Narrabri, except for high ground in Narrabri West, was inundated to significant depths.

41. **February 1971.** The 1971 flood was not only a major event; it was very damaging because of its long duration. This combined contribution made this event the second highest flood at Gunnedah and Narrabri. A saturated Namoi Basin and continuing rainfall resulted in the largest flood volume ever measured at Narrabri. In addition to flooding from the Namoi River, very high rainfall in the Mulgate Creek catchment caused initial flooding in the north-east part of town. Peak flood levels in this area of Narrabri occurred about three days before the peak flood level from Namoi River flooding. Further downstream the flooding was worsened by concurrent flooding in the Pilliga streams and a moderate flood on the Barwon. This combination resulted in record levels at Goangra. Flooding below Mollee lasted for about three weeks.

42. **January 1974.** The 1974 flood differed again with little contribution from the Upper Namoi and only a moderate flood on the Manilla. Significant contributions came from the Peel and the Mooki with the latter being the major source. This combination led to a major flood at Gunnedah and Narrabri but somewhat less than 1971 flood levels. At Mollee there were two flood peaks. The creeks draining the Pilliga Scrub contributed significant runoff although this had largely drained by the time the main floods arrived. The first peak was primarily from Cox's Creek, whereas the second peak (two days later) was mainly from the upper catchment of the Namoi River.

43. **January 1976.** This flood was similar in peak level to the 1974 flood in Narrabri. Floodwaters originated mainly from the Peel and upper Namoi systems. There was a major flood in the Mooki River and contributions from the Manilla and Cockburn Rivers were also significant.

44. **January/February 1984.** Major flooding was experienced during late January and early February after above average rainfalls, which had saturated the catchment and promoted rapid rates of runoff when the flood producing rain occurred. The catchment in the vicinity of and downstream of Narrabri had experienced wet conditions right through the latter half of 1983 and into 1984. Flood problems were made worse by the arrival of significant inflows from Bohena Creek - filling the main channel of the Namoi River prior to the arrival of the main flood peak. Dense vegetation on the flood plain, the poor condition of many floodways and obstructions in the entrances to floodways all contributed to the unique behaviour of this flood. Breakouts were hampered, floodways did not being to operate until levels above those for which they were designed and some areas of the flood plain stored more floodwater than had been expected. These factors meant that in some areas higher than expected flood levels were experienced and an unusual redistribution of flood flows occurred. For example, almost 35 percent greater peak discharge than expected for a flood of this magnitude was experienced in the Wee Waa Lagoon and to the south west of Wee Waa. Although the flood was estimated to be only one third of the total volume of the 1971 flood, it produced similar flood heights in some locations such as immediately upstream of Collins Bridge.

45. **July/August 1984.** Moderate flooding occurred on the lower Namoi River during late July and Early August 1984. This flood was about 0.5 metres below the peak level recorded on the Glencoe gauge earlier in the year. A distinctive feature of this event was the speed at which it dissipated by comparison with the January - February flood event. This occurred because there was significantly less vegetation on the flood plain, obstructions had been removed from floodway entrances, and the floodway network operated much more effectively because floodways had been cleared, sown to wheat or just ploughed.

46. **July/September 1998.** A rain band with some unusually active thunderstorm activity for mid-winter crossed the central eastern parts of the country on the 18 July 1998. Heavy rain, partly from thunderstorms, continued to fall over the North West Slopes and Northern Tablelands saturating the catchment areas. As in the 1976 event, floodwaters originated mainly from the Peel and upper Namoi systems and combined with major flood in the Mooki River and contributions from the Manilla and Cockburn Rivers. Narrabri experienced four separate peaks above the minor flood classification over the period 24 July – 8 September 1998. The town was subjected to

flooding above major flood levels on 24 July 1998 and 8 September 1998. Wee Waa was isolated on four occasions over the same period when the town was subjected to four peak heights above the major flood classification. There was widespread rural flooding upstream of Narrabri and across the floodplain above and below Wee Waa. Boggabri, Pilliga and Cuttabri were also subjected to extensive flooding.

Flood mitigation systems

47. **Urban.** A nine-kilometre long ring levee around Wee Waa was completed in 1978 at an overall cost of \$637,000.00. The levee has a design level that is one metre above the 1971 flood (approximately 8.5 metres on the Wee Waa – Glencoe gauge). The minimum crest level is 192.0 metres AHD in the south-western corner and the maximum is 194.1 metres AHD in the north-east.

48. **Rural.** The change in land use to high value, irrigated cropping has been accompanied by large-scale private construction of levee banks and raised canals in the plains downstream of Narrabri. This construction was initially undertaken without regard to the overall effects of the works and in numerous cases banks caused, or had the potential to cause, serious disruption to previously existing flood flow patterns. Since then there has been considerable work done in an attempt to remove the worst effects of this development and natural floodways have been reopened as far as practicable.

Extreme flooding

49. Results of recent flood studies indicate that a once-in-100-years (1% AEP) flood (10.2 metres at the Narrabri Creek gauge) has the potential to inundate nearly 40% of residences (about 1,000) and 75% of businesses (about 280) in Narrabri above floor level, with all precincts except Narrabri West experiencing extensive flooding. The same studies estimate that an extreme flood in Narrabri could be more than two metres higher than these (ie approximately 12.2 metres at the Narrabri Creek gauge). The Narrabri Floodplain Management Study of September 1996 considered that this may be a conservative estimate of the probable maximum flood (PMF) in Narrabri.

ANNEX B - EFFECTS OF FLOODING ON THE COMMUNITY

Boggabri

1. Boggabri (population 803 – 2001 Census) has only minor flood problems in the town itself. In terms of flooding premises and evacuation of residents, Boggabri does not have a major flood problem. Even in the 1955 flood only a small number of homes had to be evacuated; in lesser floods it is only a matter of two or three homes. The main problems at Boggabri are the closure of the Kamilaroi Highway between Boggabri and Gunnedah (Trunk Road 72) and the isolation of the small residential area on the eastern side of the Creek (about 20 residents) from the main town area. Both these problems arise from the flooding of the Coxs Creek bridges. Numerous rural properties in the Boggabri district have to be evacuated, or become isolated in major floods.

Gwabegar

2. The village of Gwabegar (population – about 125) suffers shallow flooding from the Baradine Creek and local run-off and can be isolated for several weeks.

Narrabri

3. The name Narrabri is of aboriginal origin meaning “forked water” as the town is divided into three parts by the Namoi River and its anabranch Narrabri Creek.

4. Narrabri (population 6,245 – 2001 Census) is located within the floodplain of the Namoi River and Narrabri Creek about 600 km north-west of Sydney. The Nandewar Ranges lie to the north-east of Narrabri. Thunderstorm type rainfall with quick response times in creeks such as Horsearm and Mulgate Creeks can aggravate the flood situation at Narrabri.

5. **Effects of Flooding.** Flood Intelligence Maps were prepared for the Narrabri Shire Council as part of the September 1996 Floodplain Management Study conducted by Bewsher Consulting Pty Ltd and are held by the Narrabri Shire Council. The SES maintains a detailed flood intelligence card for the Narrabri Creek gauge. An abridged version of the card giving a brief description of the possible effects that may occur at various heights is shown in the following table:

Height (Metres)	Consequences
3.60	Namoi River begins to flow through town.
4.40	Water covers the Violet Street Bridge.
4.90	Water enters Cameron Park.
5.90	Water starts to inundate the southern end of the Narrabri Shire Council Caravan Park in Tibereena Street.
6.70	All of the high-level flood runners commence to flow and progressively fill in to divide Narrabri into six precincts.
6.80	Narrabri Shire Council Caravan Park is inundated and must be evacuated to the airport by this height.
7.10	10% AEP (once-in-10-years) flood level.
7.30	Wee Waa Road closed.
7.46	Water starts to enter houses in Wee Waa Road, Barwan Street and Balonne Street.
7.51	Water enters the Narrabri Motel Caravan Park and surrounds the Narrabri Tourist Information Centre.
7.60	Flood runners widen out and widespread general flooding occurs. About 22 houses in the Cooma precinct experience over-floor inundation. Access to garbage tip lost. Water encroaches on the CBD.
7.65	Hogan Park, Collins Park and the swimming area are completely inundated.
7.76	Southern end of Gibbons Street closed. No vehicular access to Hinds Street, Park Crescent, river end of Violet Street, Elliott Street, Grace Street, Wade Street, Smyth Avenue, Cedar Crescent, Purcell Drive, Mackenzie Street, Taylor Street, Hillam Avenue and Guest Street. Emergency access is via high clearance 4WD-vehicle or flood rescue boat.
7.80	Horsearm Creek begins to backup causing water to enter about four homes in Segol and George Street.
7.98	Newell Highway closes at Cooma Road between Fraser and Clarke Streets.
8.00	Normal road access to the Narrabri Airport is lost. Maitland Street is closed near the viaduct. No vehicular access to O'Connors Lane, Jenkins Street, Dale Street, Regent Street, Haley Avenue, Shannon Estate, Arnold Street and Old Gunnedah Road. Water enters the corner of Maitland and Dewhurst Street and threatens low-lying shops. Access across Narrabri is by rail.
8.19	Peak height 24 July 1998. Floodwaters cut Narrabri into about 12 isolated pockets and resulted in a total of 62 people being evacuated from 30 houses.
8.26	Peak height 2 February 1984. During this event, the flood problems in Narrabri were exacerbated by high flows in the Bohena Creek backing up into the Namoi River channel prior to the arrival of the main flood peak.

Height (Metres)	Consequences
	5% AEP (once-in-20-years) flood level. Most of the floodways would be operating (O/Briens, Eathers and Lagoon Creeks), key roads would be cut and the lower-most areas of town (including the main industrial area) begin to suffer inundation. It is estimated that nearly one third of all residential areas would experience flooding in yards. More than 80% of these properties would be in the Village and Cooma precincts where nearly 80 houses would experience over-floor inundation. <i>NB:</i> <i>a. Most escape routes by road in Narrabri are lost at this level.</i> <i>b. The Horsearm Creek rail crossing may be closed to trains in the vicinity of the bridge by more than 0.3 metres of water.</i>
8.50	Estimated that most of Narrabri, including the CBD, would be inundated.
8.92	Peak height 3 February 1971.
9.40	Estimated peak height 27 February 1955.
9.60	2% AEP (once-in-50-years) flood level. Estimated that about 80% of all properties in Narrabri would experience inundation of yards. About 520 houses and 230 business houses could experience over-floor inundation. About 1,350 houses have water in their yards but the floor would be located above the flood level.
10.20	1% AEP (once-in-100-years) flood level. Estimated that 1,000 houses and 280 business houses would experience over-floor inundation. All precincts of Narrabri, except Narrabri West, may experience extensive flooding.
12.20	Estimated possible maximum flood (PMF).

Figure 2 - Consequences of flooding at Narrabri

6. **Road Transport.** Road traffic throughout Narrabri begins to be restricted from about 7.3 metres (Narrabri Creek gauge) onwards. As the flood develops, flood runners widen and several flood islands begin to develop and road access between them becomes more restrictive. At about 8 metres The Newell Highway is closed when floodwaters inundate the section between Fraser and Belar Streets and the normal road access to the airport is also lost. By the time the flood reaches 8.3 metres most escape routes in Narrabri are lost.

Pilliga

7. Pilliga (population 139 – 2001 Census) is located about 90 km west of Narrabri at the junction of MR 127 from Wee Waa, MR 329 to Burren Junction, MR 383 to Coonamble, MR 329 to Gwabegar and SR 18 to Walgett. The major Namoi floodplain passes to the north of Pilliga with the town itself being flooded by local creeks and the back-up of floodwaters behind the embankment of MR 329 to the north.

8. Etoo Creek, about 3 km east of town, appears to be the major cause of the flood problem. This creek, with the added contributions from Plain and Oakey Creeks, inundates much of the eastern portion of Pilliga up to a depth of about 1.5 metres. In the flood of 1971, about 20 homes were affected but only two or three required evacuation.

9. Pilliga is isolated by main-river flooding to the north and local run-off to the south. Namoi waters to the north of the village and local creeks to the south cut all access to the town for lengthy periods during major floods (in 1971 all roads were cut for two months), with actual town flooding coming from the southern creeks. This inundation is limited to only a portion of the residential areas so evacuations can be catered for locally.

Wee Waa

10. Wee Waa (population 1,816 – 2001 Census. Note: The population can almost double during cotton chipping season) used to experience very serious flooding but now the town is now protected by a 9 km long ring levee. The levee has a design level one metre above the 1971 flood, which is equal to 8.5 metres on the Wee Waa (Glencoe) gauge. However, Wee Waa still suffers from serious transport isolation. The Wee Waa to Narrabri road (MR127) can be inundated for fairly extended periods at Myall Vale, Glencoe Channel and other localities. Wee Waa airstrip has been closed as the runway does not meet standards for fixed wing aircraft. Accordingly, there is a heavy reliance on the use of rotary wing aircraft to service Wee Waa and the outlying rural areas during periods of major flooding.

11. In an extreme event, actual or potential levee overtopping or failure may result in the entire population requiring evacuation. It should be noted that itinerant workers could double the population during the cotton-chipping season.

12. **Effects of Flooding.** The SES maintains a flood intelligence card depicting likely effects of flooding at the Wee Waa (Glencoe) gauge. An abridged version of the card briefly describing some of the effects is in the following table:

Height (Metres)	Consequences
5.30	Floodwater crosses the road near 'Vera's Leap'
5.90	Floodways run at Trindals Lane closing local roads at that location.
6.00	The Glencoe Channel floodrunner starts to flow across the Wee Waa – Narrabri road.
6.20	Tulladuna Lane cut at Watercourse Hollow. Floodwater starts to cut the Wee Waa – Culgoa road.
6.40	Floodwater starts to cross all of the access roads into Wee Waa.
6.50	The Wee Waa – Narrabri road cut at "Glencoe" by floodrunner.
6.70	Wee Waa isolated by road. All roads within a 20 km radius are cut by floodwaters and are impassible. No road access to the Wee Waa airport.(airport no longer licenced)
6.90	Railway levee gates must be in place.
7.75	Possible levee IFF level.
8.26	1955 peak height.
8.50	Levee crest height.

Figure 3 - Consequences of flooding at Wee Waa

Rural Areas

13. In rural areas widespread, though generally shallow, flooding occurs on the western plains downstream of Narrabri. As many as 250 rural properties have the potential to become isolated at short notice.

Road Closures

14. The majority of the council roads in the Narrabri Shire area are 'black soil' roads that are impassable to normal vehicles after 10mm of rain and to emergency four-wheel drive or multi-tyred vehicles when the roads become saturated.

15. The following highways and main roads in the Narrabri Shire Council area may be affected by riverine flooding:

Name	From-To	Designation	Location of Closure
Newell Highway	Narrabri—Coonabarabran	NH 39	Narrabri
Newell Highway	Narrabri—Moree	NH 39	Tycannah Creek (24 km south of Moree)
Kamilaroi Highway	Narrabri—Boggabri—Gunnedah	SH 37	
Kamilaroi Highway	Narrabri—Wee Waa	SH 37	
Kamilaroi Highway	Wee Waa—Burren Junction	SH 37	
	Wee Waa—Pilliga	MR127	Unsealed

Figure 4 - Road closures in the Narrabri Shire

Airports

16. Normal road access to the Narrabri airport is lost when the Narrabri Creek gauge reaches 8.00 metres. However, access to the airport can be maintained by high clearance emergency vehicles up to readings of 9.4 metres. Local run-off can affect the southern end of the airstrip but this is usually only for short periods of time. There is an additional all-weather airstrip on high ground at the northern end of the airfield. This airstrip is safe for C130 Hercules and CC08 Caribou aircraft and is an ideal helicopter Landing Zone. The airport is capable of handling C130 Hercules, DASH-8 and CC08 Caribou aircraft.

17. The Wee Waa airfield is located outside the levee and is not accessible during periods of major floods. This airport has been closed and is not suitable for fixed wing aircraft.

SES RESPONSE ARRANGEMENTS FOR NARRABRI SHIRE

Volume 3 of the Narrabri Shire Local Flood Plan

Last Update: April 2003

ANNEX C - GAUGES MONITORED BY THE NARRABRI SES UNITS

Station	AWRC No	Stream	Flood Classification			Type	SES Unit
			Min	Mod	Maj		
Narrabri Creek	419003	Narrabri Creek	4.9	6.4	6.7	Telemeter	Narrabri
Karuah	419013	Narrabri Creek				Manual	Narrabri
Karuah (Namoi River)	419018	Namoi River				Manual	Narrabri
Turrawan (Wallah)	419023	Namoi River				Telemeter	Narrabri
Womerah	419040	Namoi River				Manual	Narrabri
Gunidgera Weir D/S	419059	Namoi River				Telemeter	Pilliga
Cuttabri	419906	Namoi River				Manual	Pilliga
Wee Waa*	419019	Namoi River					Wee Waa
Mollee Weir D/S	419039	Namoi River				Telemeter	Wee Waa
Waminda	419049	Pian Creek				Telemeter	Wee Waa
Gunidgera Weir – WL	419060	Namoi River				Telemeter	Wee Waa
Gunidgera Offtake	419061	Namoi River				Telemeter	Wee Waa
Mollee Weir WL	419062	Namoi River				Telemeter	Wee Waa
Merah North	419063	Gunningbar Creek				Telemeter	Wee Waa
Rossmore	419064	Pian Creek				Telemeter	Wee Waa
Old Burren	419065	Pian Creek				Manual	Wee Waa
Weeta Weir (Storage)	419067	Namoi River				Telemeter	Wee Waa
Weeta Weir D/S	419068	Namoi River				Telemeter	Wee Waa
Pian Cutting D/S	419079	Gunidgera Creek				Telemeter	Wee Waa
Duncan Junction	419082	Namoi River				Telemeter	Wee Waa
Brigalow Creek (Tharlane)	419083	Namoi River				Telemeter	Wee Waa
Wee Waa (Glencoe)	419900	Namoi River	5.3	6.4	6.7	Telemeter	Wee Waa
Bohena Creek	419905	Bohena Creek				Telemeter	Wee Waa

Note:

1. The Bureau of Meteorology provides flood warnings for the Narrabri Creek, Bugilbone, Goangra and Wee Waa (Glencoe) gauges and the SES maintains flood intelligence cards for these gauges.

ANNEX D - DISSEMINATION OF SES FLOOD BULLETINS

The Namoi SES Division Headquarters distributes SES Flood Bulletins and other flood related information (including Flood Warnings) to the following regional media outlets:

Television Stations:

Station	Location
Prime TV	Tamworth
NBN TV	Tamworth
ABC	Tamworth
NRTV	Tamworth

Radio Stations:

Station	Location	Frequency	Modulation
2TM	Tamworth	1287	AM
Tamworth FM	Tamworth (co-located with 2TM)	92.9	FM
2NU (ABC)	Tamworth	648	AM
2MO	Gunnedah	1080	AM
2GGG	Gunnedah (co-located with 2MO)	97.5	FM
2VM	Moree	1530	AM
2CR (ABC)	Orange	549	AM
2AD	Armidale	1134	AM
2DU	Dubbo	1251	AM
2WEB	Bourke	585	AM
MAX FM	Narrabri	91.3	FM
2NZ	Inverell	1188	AM

Newspapers:

Name	Location
The Northern Daily Leader	Tamworth
Namoi Valley Independent	Tamworth

Other Agencies:

- All SES units and Emergency Services in the Namoi area.
- Councils in the Namoi area.
- Members of Parliament in the Namoi area.
- Tourist Information Centres.
- NRMA.

ANNEX E - EVACUATION WARNING MESSAGE

Evacuation Warning for []

Date/Time of Issue: []

Authorised By: []

The Bureau of Meteorology has predicted a flood level of [] metres at [] (*place*) at [] (*time*). This means that the following area(s) may be inundated [].

It is recommended that you prepare to evacuate/for evacuation within the next [] hours. If you leave it later, the roads may be congested or closed.

To prepare for evacuation, you should:

- Raise belongings by placing them on tables, beds and benches. Put electrical items on top. Some items may be able to be placed in ceilings.
- Gather medicines, personal and financial documents and mementos together to take with you.
- Listen to radio stations [] for further information and to confirm this warning.
- If possible, check to see whether your neighbours need help.
- Make arrangements for care of pets or other animals.

If evacuation is necessary:

- Turn off the electricity, gas and water.
- Take three days' supply of clothes with you.
- If you have a car, drive to the evacuation centre at [] (*specify route if appropriate*).
- If you don't have a car, buses will operate where possible on normal routes. Special transport can also be provided on request if necessary, telephone [].
- So that you can be accounted for, it is important that you register at the evacuation centre.
- After registering, you may go to the house of a friend or relative. Alternatively, accommodation will be arranged for you.
- The Police will provide security for your property while you are away.

ANNEX F - EVACUATION ARRANGEMENTS

SITUATION

1. During most floods, it can be expected that residents of raised houses in Narrabri will stay in their houses, while those of low-set houses will evacuate of their own accord to stay with friends or relatives within the town. Some residents from outlying rural areas may have to be evacuated into Boggabri, Narrabri and/or Wee Waa. A small number of people may have to be evacuated from 'at risk' areas in Boggabri, Pilliga, Narrabri and the area outside of the levee at Wee Waa during major floods. If there was to be a repeat of the 1955 flood, about 10 percent of the population of Narrabri may be required to evacuate.
2. Up to 18 residences outside the levee in the immediate vicinity of Wee Waa may require evacuation into Wee Waa. Ideally this is done prior to inundation occurring but ailing that the residents will normally be evacuated by SES flood rescue boats.
3. The failure of essential lifelines such as power, water and sewerage systems may necessitate evacuations because of the risk to public health.

MISSION

4. The SES is to coordinate the evacuation of areas at risk of flooding in order to ensure the safety of residents.

EXECUTION

Control

5. During floods, the NSW SES will control evacuations. The Narrabri LEOCON will be requested to coordinate support.

The Decision to Evacuate

6. The responsibility for issuing any general evacuation order during flooding rests with the Narrabri SES Local Controller who exercises his/her authority in accordance with Section 22(1) of The State Emergency Service Act 1989. However, the decision to evacuate will usually be made after consultation with the Narrabri Shire LEOCON, Namoi SES Division Controller and the Narrabri Shire Mayor.
7. As far as possible, evacuations will be carried out before inundation occurs.

Conduct

8. Evacuations will be controlled by the Narrabri SES Local Controller with support coordinated by the Narrabri LEOCON and conducted by Police, SES, RFS, VRA, NSWFB and Ambulance Service personnel in four phases:

- a. Phase 1 - Warning.
- b. Phase 2 – Withdrawal.
- c. Phase 3 – Shelter.
- d. Phase 4 – Return.

Groupings and Tasks

9. **Operational Sectors.** For the purpose of managing flood response operations and evacuations during severe floods, the Narrabri Shire will be divided into four operational sectors based on SES unit boundaries as detailed in Part 3 of this plan. The sectors are:

- a. Narrabri,
- b. Boggabri,
- c. Pilliga, and
- d. Wee Waa.

10. **Tasks.**

a. Narrabri Sector:

- Narrabri SES:
 - Control evacuation operations in the Narrabri Sector.
 - Coordinate evacuation operations.
- NSW Police, Narrabri:
 - Assist with the delivery of evacuation warnings and the conduct of evacuation operations in the Narrabri area.
 - Assist with the conduct of evacuation operations.
 - Conduct road and traffic control operations in conjunction with council and/or RTA.
 - Ensure all evacuees are registered.
 - Secure evacuated areas.

- NSW Fire Brigades, Narrabri:
 - Provide manpower and vehicles to assist the SES in the conduct of evacuation operations in Narrabri area.
 - Assist with the conduct of evacuations.
 - RFS:
 - Provide manpower and vehicles to assist the SES in the conduct of evacuation operations in Narrabri area.
 - VRA
 - Provide manpower and vehicles to assist the SES in the conduct of evacuation operations in Narrabri area.
- b. **Boggabri Sector:**
- Boggabri SES:
 - Control evacuation operations in the Boggabri Sector.
 - Coordinate evacuation operations.
 - NSW Police, Boggabri Station:
 - Assist with the conduct of evacuation operations.
 - Conduct road and traffic control operations in conjunction with council and/or RTA.
 - Ensure all evacuees are registered.
 - Secure evacuated areas.
 - RFS, Boggabri:
 - Provide manpower and vehicles to assist the SES in the conduct of evacuation operations in the Boggabri area.
- c. **Pilliga Sector:**
- Pilliga SES:
 - Control evacuation operations in the Pilliga Sector.
 - Coordinate evacuation operations.
 - NSW Police, Pilliga Station:

- Assist with the conduct of evacuation operations in the Pilliga sector.
- Conduct road and traffic control operations in conjunction with council and/or RTA.
- Ensure all evacuees are registered.
- Secure evacuated areas.
- RFS, Pilliga Brigade:
 - Provide manpower and vehicles to assist the SES in the conduct of evacuation operations in the Pilliga area.

d. **Wee Waa Sector:**

- Wee Waa SES:
 - Control evacuation operations in the Wee Waa Sector.
 - Coordinate evacuation operations.
- NSW Police, Wee Waa Station:
 - Assist with the conduct of evacuation operations in the Wee Waa Sector.
 - Conduct road and traffic control operations in conjunction with council and/or RTA.
 - Ensure all evacuees are registered.
 - Secure evacuated areas.
- RFS, Wee Waa Brigade:
 - Provide manpower and vehicles to assist the SES in the conduct of evacuation operations in the Wee Waa area.
- NSWFB Wee Waa
 - Provide manpower and vehicles to assist the SES in the conduct of evacuation operations in the Wee Waa area.

Phase 1 – Warning

11. Evacuation Triggers:

- a. **Narrabri Sector.** The first evacuations in Narrabri commence at 5.9 metres on the Narrabri Creek gauge when water starts to enter the low-lying area of the Narrabri Shire Council Caravan Park (southern end) in

Tibbereena Street. The other key heights (Narrabri Creek gauge) at which homes and property are affected are listed below (see the Narrabri Creek Flood Intelligence Card for details):

- 6.55 metres – Water enters low-set home in Barwan Street.
 - 6.8 metres – Narrabri Shire Council Caravan Park inundated.
 - 7.46 metres – Water starts to enter three shops and 13 houses in Wee Waa Road and four houses in Barwan Street.
 - 7.51 metres – Water enters the Narrabri Motel Caravan Park (NB: The evacuation route via Ugoa Street is lost at 7.0 metres).
 - 7.60 metres – 22 houses in Fraser and Peel streets experience over-floor inundation and enters the CBD.
 - 8.00 metres – The Kaputar Motel experiences over-floor inundation in all rooms.
 - 8.26 metres – Most of the evacuation routes in Narrabri are closed. Estimated that a total of approximately 80 houses in the Village and Cooma precincts would be flooded above floor level.
 - 8.5 metres – Estimated that most of Narrabri, including the CBD would be inundated.
 - 9.6 metres – Estimated that about 520 residences and 230 businesses would be flooded above floor level.
 - 10.2 meters – Estimated that about 1,000 residences and 280 businesses would now be flooded above floor level.
- b. **Boggabri Sector.** Several houses in the low-lying area of Boggabri, including houses along the Narrabri road, are at risk of over-floor inundation from the Namoi River at heights between 10.3—10.7 metres on the Boggabri (Namoi R) gauge.
- c. **Pilliga Sector.** Several houses in Pilliga are at risk of being flooded by break-outs from the southern creeks. However, this inundation is limited to only a portion of the residential area so evacuations can usually be catered for locally.
- d. **Wee Waa Sector.** The most likely event to trigger the decision to undertake a large-scale evacuation in Wee Waa would be evidence of a possible failure or overtopping of the Wee Waa levee.

12. **Evacuation Warnings.** On the receipt of flood warnings predicting peak heights of 6.7 metres and above at the Narrabri Creek gauge; the Narrabri SES Local Controller will consult as necessary to determine the level of the threat and the need to

consider evacuations. As soon as possible after the decision to evacuate is made, the Narrabri SES Local Controller will issue evacuation warnings to the ‘at risk’ residents, indicating what people should do before evacuating and when actually doing so.

13. **Voluntary Evacuations.** Some people will make their own decision to evacuate earlier and move to alternative accommodation using their own transport. These evacuees will be advised, via the media, to inform the Police or SES of their evacuation and their temporary address. Where possible, people will be given the opportunity to evacuate voluntarily at an early stage of a potentially severe flood. Elderly people and mothers with young children will especially be encouraged to evacuate voluntarily under such circumstances.

14. **General Evacuation Order.** A General Evacuation Order will be issued if it appears likely that land on which dwellings, commercial premises or community facilities are situated will be flooded. Such an order could be issued for the whole floodplain or for particular areas within it. Points to consider in issuing a General Evacuation Order will include:

- a. The predicted flood levels and the rate of rise of the river.
- b. The local rainfall situation and the state of tributaries downstream of Narrabri.
- c. The condition of evacuation routes.

15. **Content and Dissemination of Evacuation Warnings.** Evacuation Warnings or Orders will include:

- a. Instructions to evacuate.
- b. Location of Assembly Areas for transport to Evacuation Centres.
- c. Authorised routes to evacuation centres.
- d. Arrangements for children in schools and pre-schools.
- e. Arrangements for elderly or infirm residents unable to self-evacuate.
- f. Likely duration of evacuation.
- g. Arrangements for animals and pets.
- h. A template guide to the content of evacuation warning messages is at Annex E. These are disseminated by public address systems from Police and other emergency service vehicles, door-knocking teams from the Police and other emergency services, telephone, two-way radio, direct access to community radio, and/or via Namoi SES Flood Bulletins.

Phase 2 – Withdrawal

16. **Introduction.** Withdrawal involves the actual removal of the community/individuals from dangerous or potentially dangerous areas to safer areas.
17. **Movement.** Evacuees are to be encouraged to move using their own transport where possible. The Narrabri SES Local Controller will arrange transport for those people without their own vehicles. This may include the provision of buses or trains. Evacuees will be taken or advised to go to the nearest accessible Assembly Point or Evacuation Centre. Evacuees who cannot reach an Evacuation Centre unaided will be picked up from their homes or from designated Assembly Points nearby.
18. **Traffic Control.** When large-scale evacuations are likely, evacuation routes are to be secured by the NSW Police and kept clear by the following means:
- a. Denying access to all traffic except for emergency vehicles (including buses and private vehicles being used for the purpose of evacuation).
 - b. Keeping one lane clear at all times for use by emergency vehicles.
 - c. Positioning a tow truck or similar vehicle at appropriate entry points, road blocks and exit points along the evacuation routes.
19. **Large-scale Evacuations—Narrabri.** Under extreme circumstances, Narrabri could have to be completely evacuated. A number of options are available:
- a. **Air.** If the airport is not isolated from the main town area (east of Narrabri Creek) by flooding.
 - b. **Rail.** Evacuees could be collected from boarding points at Narrabri and Narrabri Junction Railway Stations, the Grace Street crossing and the old Narrabri West railway station yards and evacuated through Gunnedah.
 - c. **Road.** Usually, the Newell Highway to the south stays open during floods except when there are very heavy rainfalls over the Pilliga State Forest. Bus turn-around points could be established at the Narrabri West railway yard and/or the Mobil Road House to the south west of the town. Evacuees could then be moved through Coonabarabran. Evacuation routes to the north and east may also be available depending on whether or not the Gwydir River and Nandewar Creeks are in flood. In this case, a bus turn-around point could be established at the Newell Highway railway overpass just north of the town.
20. **Large-scale Evacuations—Wee Waa.** In the event of actual levee failure or overtopping, all essential services would be cut and the town would almost certainly have to be completely evacuated. Wee Waa usually has up to three days warning of a peak flood height. As this also includes up to two days warning of when the town may be isolated by road, some preliminary evacuations may be possible. In the event that predicted flood heights indicate a threat of levee overtopping, the Narrabri SES Local Controller, Wee Waa SES Unit Controller and the Narrabri Local Emergency

Operations Controller will consider preliminary road evacuation of the aged, infirm and children. This could reduce the population by up to 40 percent.

- a. **Safe Havens.** Locations at which people could be above flood waters until evacuated are the Public School (Cowper Street), High School (Purcell Street), Sports Complex (Narrabri Road), two hotels, (Rose Street), Church Hall (Cowper Street), CWA Rooms (Rose Street), Namoi Cotton Co-Op and Cotton Grower Services (Boolcarrol Road).
- b. **Assembly Areas.** An assembly area and helicopter pick-up point will be established at the Wee Waa Sporting Complex. A second assembly area and pick-up point could be established at Cotton Grower Services with the two locations linked by a bus shuttle service. Other landing points could be at the Namoi Cotton Co-Op and on the town approaches to the Lagoon Bridge.
- c. **Withdrawal.** Evacuees will be flown to a transit area at "The Pines". If the Bohena Creek Crossing on the Narrabri to Yarrarie Lake Road is open, the evacuees could be moved out of "The Pines" by bus. If not, they will need to be moved by air from Nicholson's Airport, which is next to "The Pines" and flood free.

21. **Hospitals and Aged Care Centres.** There are three hospitals and four Aged Care Centres in the Narrabri Shire Council area. They are:

- a. Narrabri:
 - Narrabri Hospital – 38 beds.
 - Namoi Valley Aged Care – 34 aged care beds, 28 self-contained units; and
 - Jessie Hunt Nursing Home – 60 nursing home beds.
- b. Wee Waa:
 - Wee Waa Hospital – 33 beds; and
 - a eight unit Retirement Village.
- c. Boggabri:
 - Boggabri Hospital – 16 high and low care beds and four in patient's beds; and
 - a 12 unit Retirement Village.

22. **Vehicle Compound.** During major floods in Narrabri, the Narrabri SES Local Controller will establish a secure vehicle compound at the Narrabri Airport where residents may leave vehicles above flood levels.

23. **Animals.** Evacuees with their own transport will be encouraged to take their companion animals such as cats, dogs and horses with them as they evacuate. These animals will therefore be transported by car, truck or horse float along the evacuation routes designated in this plan. Companion animals so shifted will be collected from their owners at evacuation centres and taken to facilities to be arranged by NSW Agriculture. Due to safety restrictions, it may not be possible to allow companion animals to accompany their owners when being transported via aircraft or flood rescue boats. In these cases provision will be made for animals to be picked up as the people are evacuated. Arrangements will also be made to pick up animals that are left behind. Assistance animals (guide dogs, hearing assistance animals, etc) will remain in the care of their owners throughout the evacuation. This includes transport and access into evacuation centres etc.

24. **Doorknocking.** Field teams conducting doorknocks will record and report back the following information back to the Operations Centre:

- a. Addresses and locations of houses doorknocked and/or evacuated.
- b. The number of occupants.
- c. Details of support required (such as transport, medical evacuation, assistance to secure house and/or property and raise or move belongings).
- d. Details of residents who refuse to comply with the evacuation order.

25. **Refusal to Evacuate.** Field teams should not waste time dealing with people who are reluctant or refuse to comply with any evacuation order. These cases should be referred to the LEOCON who will arrange for Police to ensure their evacuation.

26. **Security.** The NSW Police will provide security for evacuated premises. Details of evacuated premises are to be passed to the Narrabri Police Station.

27. **Helicopter Landing Points.** Suitable landing points are located at:

- a. Narrabri:
 - Narrabri Base Hospital.
 - Narrabri Airport (Landing Zone).
- b. Boggabri:
 - Boggabri Hospital.
 - Boggabri Sporting Oval.
 - Boggabri Showground.

- c. Pilliga:
 - At the intersection of Dangar and Vivienne streets, in front of the CWA building.
- d. Wee Waa:
 - Wee Waa Sports and Community Centre.
 - Namoi Cotton Services.
 - Namoi Cotton Co-op.

28. **Airport.** Normal road access to the Narrabri airport is lost when the Narrabri Creek gauge reaches 8.00 metres. However, access to the airport can be maintained by high clearance emergency vehicles up to 9.4 metres. The airport is capable of handling C130 Hercules, DASH-8 and CC08 Caribou aircraft. The Wee Waa airfield has been closed and is not suitable for fixed wing aircraft

Phase 3 – Shelter

29. **General.** The expected duration of evacuations will dictate the welfare staff requirement and need for facilities at evacuation centres.

30. **Evacuation Centres.** The usual purpose of evacuation centres is to meet the immediate needs of victims, not to provide them with accommodation. Evacuees will be advised to go to or be taken to the nearest accessible evacuation centre, which may initially be established at the direction of the Narrabri SES Local Controller but managed as soon as possible by DoCS. Any or all of the following sites may be used as evacuation centres:

- a. Boggabri:
 - CWA Rooms in Brent Street.
 - Uniting Church Hall in Norton Street.
- b. Pilliga:
 - CWA Rooms in Dangar Street.
 - Community Centre in Lagoon Street.
 - Pilliga School.
- c. Narrabri:
 - The Salvation Army Citadel.
 - Narrabri Public School.

- Narrabri High School.
- Southern end of the Narrabri Showgrounds in the vicinity of the horse stables.
- Secretary's Office at the Narrabri Showground.
- Anglican Church Hall Burigal St Narrabri West.

d. Wee Waa:

- Wee Waa Public School in Cowper Street.
- Wee Waa High School in Purcell Street.
- Sports Complex on Narrabri Road.
- Church Hall in Cowper Street.
- CWA Rooms in Rose Street.
- Namoi Cotton Co-Op and Cotton Grower Services on Boolcarrol Road.

31. **Action on Arrival.** On arrival, evacuees will be:

- a. registered;
- b. medically checked, if necessary; and
- c. provided with their immediate welfare needs.

32. **Registration.** The NSW Police will ensure that all evacuees are registered on arrival at the designated evacuation centres and details of the registrations are to be sent to the NSW Police Western Region Headquarters by the quickest means available.

Phase 4 – Return

33. Once it is considered safe to do so, the Narrabri SES Local Controller will authorise the return of evacuees to their normal or alternative place of residence. This decision will be made in consultation with appropriate officers in regard to matters such as the electrical safety of buildings.

34. The return will be controlled by the Narrabri SES Local Controller and may be conducted, at his/her request, by the LEOCON.

ADMINISTRATION AND LOGISTICS

Transport and Storage

35. Transport and storage of furniture from flood-threatened properties will be arranged as time and resources permit but may not be possible on a large scale in very severe floods. People will be encouraged to store belongings in elevated or multi-storey buildings in the vicinity where possible.

Support Provided at Evacuation Centres

36. The expected duration of the evacuation will dictate the need for and level of facilities and support at the evacuation centres. If evacuations are expected to be of a short duration, evacuees may be provided with short-term accommodation at the centres. However, if they are expected to last for longer than 24 hours, evacuees will be encouraged to go to alternative accommodation or stay with friends where possible. Alternatively, accommodation will be arranged for them in hotels, motels or by billeting.

ANNEX G - ARRANGEMENTS FOR THE EVACUATION OF CARAVAN PARKS AND THE RELOCATION OF CARAVANS

General

1. The Narrabri Council, Narrabri Motel & Caravan park and Highway caravan parks are flood liable and are flooded when the Narrabri Creek gauge reaches:
 - a. 5.9 metres – Narrabri Shire Council Caravan Park. Water starts to enter the low-lying southern end of the park. The park is inundated when the gauge reaches 6.8 metres.
 - b. 7.51 metres – Narrabri Motel Caravan Park. Water enters the park at this height. However, evacuations have to be completed before the gauge reads 7.0 metres. At this height the evacuation route (Ugoa Street) is closed by floodwaters near Forbes Street.
 - c. 8.6 metres – Hi-Way Tourist Village. Floodwaters threaten the village at about this height. The height that the complex is inundated is not known but it would probably occur shortly after reaching this height.

Advising Procedures

2. The proprietors of these caravan parks will ensure that the owners and occupiers of caravans are:
 - a. Made aware that the caravan park is flood liable by:
 - Handing a printed notice to occupiers taking up residence. The notice will indicate that the caravan park is liable to flooding and outline the evacuation and van relocation arrangements as detailed in this Annex.
 - Displaying this notice prominently in each van.
 - b. Made aware that if they are expecting to be absent from their vans for extended periods, they are encouraged to:
 - Provide the manager with a key; in a sealed envelope; to the van.
 - Provide a contact address and telephone number.
 - Inform the manager if a vehicle will be required to relocate the van during flood time.

- Leave any mobile van in a condition allowing it to be towed in an emergency (ie: tyres inflated, jacks wound up, personal effects secured and annexes and lines for water, sewer, electricity and gas readily detachable).
- c. Informed when a flood is rising. 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 van relocation.
3. The Narrabri SES Local Controller will ensure that the managers of caravan parks are advised of flood warnings and the details of any evacuation order.

Evacuation of Occupants and Relocation of Vans

4. When an evacuation order is given:
- a. Occupiers of non-movable vans should:
- Secure their vans by tying them down to prevent flotation.
 - Isolate power to their vans.
 - Collect personal papers, medicines, a change of clothing, toiletries and bedclothes.
 - Lift the other contents of their vans as high as possible within the van.
 - Move to a designated evacuation centre if they have their own transport, or move to the caravan office to await transport.
- b. Where possible, vans that can be moved will be relocated by their owners. Park managers will arrange for the relocation of mobile vans whose owners do not have a vehicle. Council and SES personnel will assist if required and may be able to provide additional vehicles. Vans are to be moved to the Narrabri Airport.
5. Occupants of vans that are being relocated should go to a designated evacuation centre if they have their own transport. Those without their own transport are to report to the caravan park office.
6. Caravan park managers will:
- a. Ensure that their caravan park is capable of being evacuated within 12 hours.
- b. Advise the Narrabri SES Local Controller of:

- The number of people requiring transport.
 - Details of any medical evacuations required.
 - Whether additional assistance is required to effect the evacuation.
- c. Check that no people remain in non-removable vans that are likely to be inundated.
- d. Inform the Narrabri SES Local Controller when the evacuation of the caravan park has been completed.
- e. Provide the Narrabri SES Local Controller with a register of people that have been evacuated.

Return of Occupants and Vans

7. The Narrabri SES Local Controller, using council resources as necessary, will advise when it is safe for the caravan parks to be re-occupied.
8. Vans will be towed back to the caravan parks by van owners or by vehicles and drivers arranged by the park managers. Again, Council and SES personnel will assist if available.

ANNEX H - RESUPPLY

Situation

1. During periods of flooding; towns, villages and rural properties in the Narrabri Shire Council area can be isolated for prolonged periods and will require resupply.
2. The three main highways that are used as the main supply routes for Narrabri and the surrounding areas are the Newell and Kamilaroi highways. Both of these highways are subject to inundation of varying levels and are often closed to all but emergency vehicles during periods of major flooding.
3. The majority of the other roads within the Narrabri Shire Council area are “black soil” roads that are impassable to normal vehicles after 10mm of rain and to emergency four-wheel drive or multi-tyred vehicles when the roads become saturated.
4. Flooding in the Narrabri Shire area normally results in extended periods of isolation for Wee Waa, Pilliga, Gwabegar, Cuttabri, Maules Creek and rural residents located on the floodplain with the potential for the need to resupply about 5,000 people. The Narrabri SES maintains a database of rural properties located in the Wee Waa area with the potential to be at risk of isolation during flooding.

Mission

5. The NSW SES is to coordinate resupply operations during periods of flooding in order to sustain people located in isolated towns and villages or isolated on rural properties.

Execution

6. **General.** Rural residents can become isolated on outlying properties even before the onset of flooding due to the “black soil” roads becoming impassable. People on these isolated properties may not have had an opportunity to stock up and may require resupply early in a flood event.
7. **Concept of Operations.** During periods of major flooding the normal mode of resupply will be maintained for as long as practicable. The main supply routes will be kept open to essential and emergency vehicles for as long as it is safe to do so. Once these routes are closed (either by the road owner, the Police or SES) the delivery of essential foodstuffs, fuel, urgent medical supplies and stores to Narrabri will be coordinated by Namoi SES Division using aircraft operating out of Dubbo, Narrabri and/or Moree. From there, the Narrabri SES Local Controller will coordinate the delivery of these supplies to outlying areas via the most practicable method.

8. **Normal Supply Arrangements.**

- a. Storekeepers in Narrabri and Wee Waa normally source their supplies from Sydney or Brisbane. These stores are usually delivered by road transport using the Newell Highway.

9. **Main Supply Routes.** Normally, goods are shipped by road via any of the following main supply routes:

- a. **Newell Highway (Highway 39).** The Newell Highway links Narrabri to Brisbane, Moree, Dubbo and Sydney.
- b. **Kamilaroi Highway (Route 37).** The Kamilaroi Highway links Narrabri to Boggabri and Gunnedah to the south-east and to Wee Waa and Walgett to the north-west.

10. **Pre-Stocking.** If flood predictions indicate that areas are likely to become isolated, the Narrabri SES Local Controller will advise businesses (normally through the Narrabri Shire Council) and, where possible, rural residents that they should stock up on high usage non-perishable items.

11. **Dependency.** Almost all of the towns and villages in the Narrabri Shire will require resupply during periods of flooding. In major floods, about 200 rural properties will require resupply by air, predominantly by helicopters.

12. **Resupply Procedures.** When isolation occurs, storekeepers and rural residents on isolated properties will be expected to place orders on suppliers where they have a line of credit and to instruct those suppliers to package their goods and deliver them to loading points designated by the SES. Similarly, essential services (eg. hospitals) will make arrangements to acquire their resupply needs from the normal sources and have the supplies delivered to the designated loading point. The SES will arrange for the stores to be conveyed to a distribution point that will be established at Narrabri Airport. From there the Narrabri SES will arrange for delivery via the most appropriate and practical means. Due to the extent of flooding and its impact on the road system, stores and equipment will usually be transported by SES flood rescue boats or by air using both fixed wing and rotary wing aircraft.

13. **Vetting Committee.** If the isolation of towns or villages is expected to occur, the SES may establish a vetting committee to ensure that only essential goods are ordered. If and when established, the committee will consist of representatives from the SES, Narrabri Shire Council, Police, DoCS, retailers (represented by the Narrabri Chamber of Commerce) and the aboriginal community. The committee will ensure that businesses requesting supplies are not using the flood as a means of restocking free of charge and also that load space in resupply vehicles and aircraft is optimally used (ie no wasted capacity).

14. **Essential Items.** As a guide, the priorities for the resupply of essential items are:

- a. **Priority 1 - Subsistence Items and Operational Supplies.** Foodstuffs (including animal food for companion animals), water, health and

welfare items and items for the maintenance of morale (eg. newspapers).

- b. Priority 2 - Pharmaceutical and medical supplies (including hospital linen).
- c. Priority 3 - Petrol, Oils and Lubricants (including AVTUR and AVGAS).
- d. Priority 4 - Repair parts for essential machinery.
- e. Priority 5 - General Stores.

15. **Operational Supplies.** The SES will also coordinate the resupply of operational supplies such as sandbags, sandbagging machines, plastic sheeting and chemicals for disease or pest control.

16. **Resupply of Isolated Properties.** There are at least 260 rural properties that require resupply during periods of flooding. The Narrabri Shire SES Local Controller maintains a list of these properties and their geographical coordinates. The SES will coordinate the resupply of isolated properties. Rural residents will liaise with the SES (Narrabri, Boggabri, Pilliga or Wee Waa units) to ensure that the items they seek are essential to their well being or livelihood. The Local Controller will coordinate the resupply of approved items and establish a delivery schedule. Property owners are responsible for sourcing the supplies and arranging finance. People who claim to be or are considered to be in necessitous circumstances and require financial assistance are to be referred to DoCS. A flow chart outlining the resupply system for isolated properties is shown below:

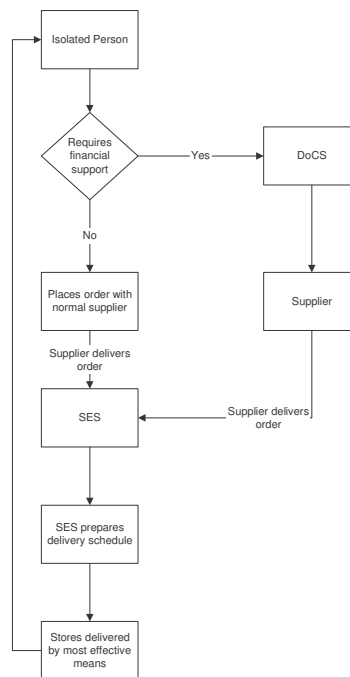


Figure 5 - Resupply arrangements flow chart

17. **People in Necessitous Circumstances.** Some people in the isolated communities or on isolated properties may find themselves in financial difficulty or dire circumstances. People in this situation should be directed to liaise with DoCS who will arrange for the necessary assistance.

18. **Hospital Linen and Medical Stores.** There are three hospitals in the Narrabri Shire Council area—Narrabri Hospital (38 beds), Wee Waa Hospital (33 beds) and Boggabri Hospital (16 high and low care beds and four in patient's beds). The SES will arrange for the delivery and resupply of linen and other medical stores (including oxygen bottles) These stores will initially be delivered to the Narrabri District Hospital. Medical staff at the Narrabri Base Hospital will liaise with the Narrabri SES Local Controller to arrange for delivery to the hospitals at Boggabri and Wee Waa. As a guide, it is estimated that there are ?? bags of linen (approximately ?? kg) to be moved twice per week. Pharmaceutical ,general stores and meals once per week During periods of flooding there may be a requirement to transport pesticide for combating the spread of mosquitos.

19. **Pharmaceutical Supplies and Prescription Medicine.** Pharmaceutical and medical supplies are sourced from local chemist while available then restocked via normal suppliers with delivery arranged by SES. The procedure for the resupply of prescription medicine to isolated communities is outlined in the following flow chart:

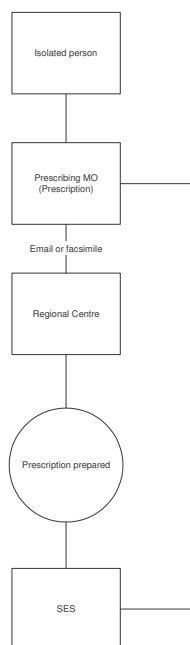


Figure 6 – Resupply of Pharmaceutical Supplies and Prescription Medicine

20. **Mail.** At the request of Australia Post, the SES will deliver mail to isolated communities. However, it may not be possible to do so in accordance with normal Australia Post timetables.

21. **Personnel Movement.** Where possible, the SES will assist isolated communities or properties with the movement of people to and from isolated areas.

This includes property owners who require access to their property, school children and/or university students who need to get to or return from boarding schools or universities and members of the isolated communities who have to attend medical appointments etc. Each request will be considered on its merit.

22. **Air Resupply.** When isolation by road is predicted, the Narrabri Shire SES Local Controller will liaise with the Namoi SES Division Controller who will make arrangements with the SES State Headquarters for air resupply. If air resupply is authorised the concept is that loading points will be established at Sydney, Brisbane, Taree, Port Macquarie and/or Coffs Harbour. Suppliers will be responsible to pack and deliver the approved stores to a nominated loading point from where it will be delivered to Narrabri by fixed wing aircraft operating on scheduled flights. From Narrabri the stores will be delivered to the retail outlets in Narrabri or transhipped to either high clearance vehicles, SES flood rescue boats, light aircraft or helicopters for delivery to the outlying communities in accordance with pre-determined delivery schedules.

ANNEX I - DETAILS OF THE EARLY WARNING SYSTEM FOR KEEPIT DAM

Introduction

1. As part of a regular review process State Water (NSW Department of Infrastructure, Planning and Natural Resources) has identified that Keepit Dam does not meet current design standards for flood handling capacity and earthquake. Consequently, State Water has embarked on a program of upgrading Keepit Dam to meet these standards.
2. Flood inundation mapping has not been prepared for Keepit Dam. However, the extent of dam-failure flooding would greatly exceed that of extreme natural flooding. The approximate travel times of a dam-failure flood wave from Keepit Dam to different locations have not been calculated. It is estimated that travel times for a dam-failure flood would be substantially less than travel times for the 1% AEP event. It should be noted that a dam-break resulting from extreme rainfall would be preceded by flooding many times more destructive than from a flood equivalent to the 1964 flood of record in the Namoi Valley. It is assumed that vast areas downstream of the dam would already have been evacuated.
3. A flood-induced failure of Keepit Dam can exacerbate flooding at Narrabri whilst a 'sunny day' failure can cause serious flooding upstream and downstream of Narrabri.
4. There is an Early Warning System for the dam that is monitored by Gunnedah SES and Namoi SES Division Headquarters. Division Headquarters will keep the Narrabri SES Local Controller apprised of the situation at the dam.

Keepit Dam Early Warning System (EWS)

5. An automatic storage level recorder, built into the main dam wall at Keepit Dam, determines the storage level at the dam. The river flow downstream of the dam is also measured as part of the EWS. This information is relayed via a radio repeater network to the State Water office, situated at Narrabri. A Personal Computer compares the storage level at Keepit Dam and the river flow downstream of the dam with pre-determined set points. When the storage level and/or the downstream river flow reach these set points the system converts to a pre-determined "state". Each of these states has defined actions associated to them. Alerts will be sent to the SES and affected residents who live immediately downstream of the dam. Residents who live outside the village of Carroll will be contacted by telephone and, at the same time, the sirens and lights of the town warning units (TWUs) will begin sounding and flashing in the village of Carroll. The residents of Carroll will not receive automated telephone calls.

Keepit Dam Alert Levels

6. The four alert levels for the Keepit Dam are listed below:
- a. **Green.** The system is operational and signals the 'ALL CLEAR'.
 - b. **White.** A recorded message is sent to the SES only.
 - This is a preliminary alert to assist the SES in its preparation.
 - The alert level is activated when the river-flow downstream of Keepit Dam reaches or exceeds approximately 100,000 Megalitres per day (1,157 m³/s).
 - An automated message is relayed to the SES. Communication between the dam staff and the SES begins and will continue throughout the period of high flows downstream of Keepit Dam.
 - c. **Amber.** The Amber Alert is triggered when a high storage level (equivalent to the original Design Flood Level) at Keepit Dam has been reached. The dam is not at risk at this stage, but may be at risk if the situation at the dam worsens. A notification is sent to the SES and residents located immediately downstream of the dam. Residents will be advised to prepare to evacuate.
 - d. **Red.** The Red Alert is triggered when the storage level at Keepit Dam has reached a critical level—nominated as 300 mm below the top of the upstream parapet wall on the main dam wall. Modelling done on Keepit Dam has shown the dam to not be at risk at this point but should the situation worsen the dam may be at risk. Once reached, an alert is sent to the SES and residents immediately downstream of the dam.

**NOTIFICATION, WARNING AND EVACUATION ARRANGEMENTS FOR A POTENTIAL FAILURE OF KEEPIT DAM
IN THE EVENT OF A SUNNY DAY FAILURE**

Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DIPNR	Gunnedah SES	Namoi SES Division HQ	People at Threat
Green	System operating normally, storage at or near to Full Supply Level	Nil	N/A	No action required apart from standard surveillance; no danger implied; normal water level	No action required.	No action required.	No action required.
Amber, possibly progressing to Red	Significant earthquake felt at Keepit Dam	None unless failure occurs; failure would cause serious flooding in the Namoi Valley	N/A	<p>Activate Earth Tremor Evaluation and Procedure, Figure 4 of Keepit Dam DSEP.</p> <p>Institute visual surveillance.</p> <p>Inform State Water Dam Engineers and SES Namoi Division by telephone and maintain contact.</p> <p>Light / siren alarm may be triggered by State Water staff and automated telephone calls made.</p>	Activate the Gunnedah Local Flood Plan.	Ensure that the evacuation centre is ready.	<p>Move to Evacuation point immediately.</p> <p>Follow directions of SES and/or NSW Police.</p> <p>Wait for the "ALL CLEAR" to be announced.</p>

Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DIPNR	Gunnedah SES	Namoi SES Division HQ	People at Threat
Amber, possibly progressing to Red	Increased seepage and cracking indicated by monitoring instruments	None unless failure occurs; failure would cause serious flooding in the Namoi Valley	N/A	<p>Initiate ACTION 2 of Keepit Dam DSEP.</p> <p>Institute visual surveillance.</p> <p>Inform State Water Dam Engineers and SES Namoi Division by telephone and maintain contact.</p> <p>Light / siren alarm may be triggered by State Water staff and automated telephone calls made.</p>	Activate the Gunnedah Local Flood Plan.	Ensure that the evacuation centre is ready.	<p>Follow directions of SES and/or NSW Police.</p> <p>Prepare to evacuate flood affected area.</p>

NOTIFICATION, WARNING AND EVACUATION ARRANGEMENTS FOR A POTENTIAL FAILURE OF KEEPIT DAM

Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DIPNR	Gunnedah SES	Namoi SES Division HQ	People at Threat
Green	System operating normally, storage at or near to Full Supply Level	Nil	N/A	No action required apart from standard surveillance; no danger implied; normal water level.	No action required.	No action required.	No action required.
White	Downstream gauging station indicates a flow of 100,000 ML/day being released from Keepit Dam	The Namoi River normally flows within the banks of the river. The low-level bridge at Carroll Gap is affected at about 25 000 ML/day. Other tributaries (Peel River) may affect the flow at Carroll and Gunnedah.	Not available	<p>Continue routine surveillance.</p> <p>Inform local State Water staff and SES Namoi Division by telephone and maintain contact.</p> <p>Automated telephone calls made to SES</p>	<p>Activate the Gunnedah Local Flood Plan.</p> <p>Monitor the behaviour of the storage and areas below the spillway.</p> <p>Advise Namoi SES Division Headquarters and other emergency services.</p>	Ensure that the evacuation centre is ready.	No action required unless directed to do so by SES

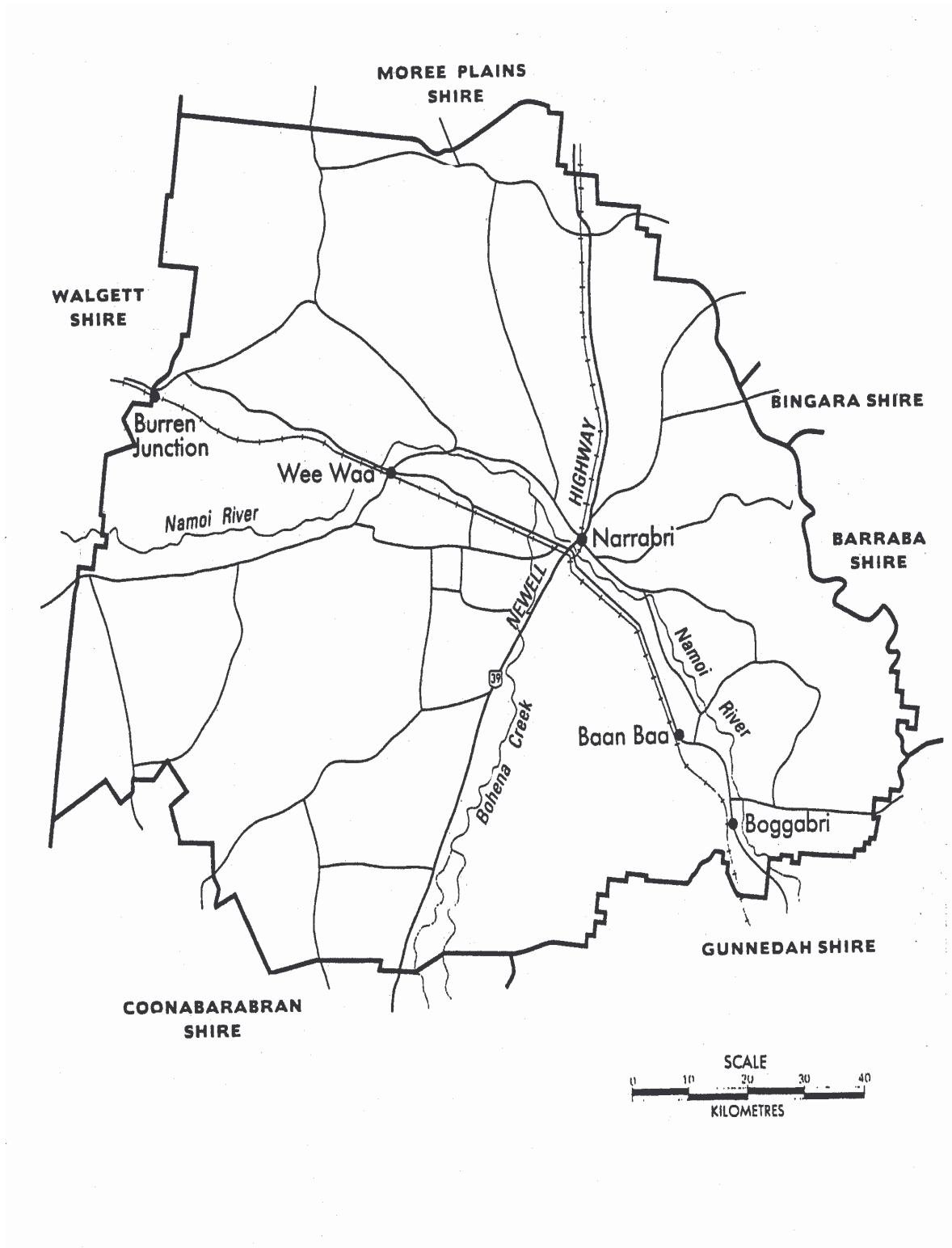
Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DIPNR	Gunnedah SES	Namoi SES Division HQ	People at Threat
Amber	Storage reaches the original Design Flood Level of RL 333.530; ie. 3.962 metres above Full Supply Level (Spillway discharge will be approximately 900,000 ML/day).	Significant flooding in the Namoi Valley. Carroll and Gunnedah have water flowing through them	5 hours from commencement of inflow to the storage. (Gates not raised.)	<p>Initiate ACTION 2 of Keepit Dam DSEP.</p> <p>Continue visual surveillance.</p> <p>Inform State Water Dam Engineers and SES Namoi Division by telephone and maintain contact.</p> <p>Trigger light/siren alarms and activate automated telephone calls.</p>	Warn downstream residents and prepare for possible evacuation of all residences at risk of dam failure flood.	Ensure that warnings are broadcast over radio stations 2MO, 2GGG, 2TM, Tamworth FM and 2NU (ABC).	Prepare to evacuate. (Collect valuables and dependents.)
Red	Dam storage level at RL334.45 (4.88 metres above Full Supply Level). This level is 0.3 metres below the top of the upstream parapet wall. (Spillway discharge will be approximately 940,000 ML/day).	Serious flooding in the Namoi Valley. Carroll and the affected areas of Gunnedah should already be evacuated.	8 hours from start of inflow to the storage. (Gates not raised.)	<p>Initiate ACTION 1 of Keepit Dam DSEP, documenting process.</p> <p>Inform State Water Dam Engineers and SES Namoi Division by telephone and maintain contact.</p> <p>Trigger light/siren alarms and activate automated telephone calls.</p>	Evacuate Carroll, low-lying portions of Gunnedah and the occupants of the homesteads immediately downstream of the dam.	Arrange for the evacuation of homesteads further than 15 km downstream of the dam, parts of Gunnedah and areas further down the Namoi Valley.	<p>Area affected is the low-lying areas of the Namoi River valley below Keepit Dam.</p> <p>Affected people should immediately move to assembly points identified by the SES</p>

Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DIPNR	Gunnedah SES	Namoi SES Division HQ	People at Threat
ALL CLEAR	No apparent threat to life or property		N/A	Confirm stream flows with SES and confirm the "ALL CLEAR"			Return to normal

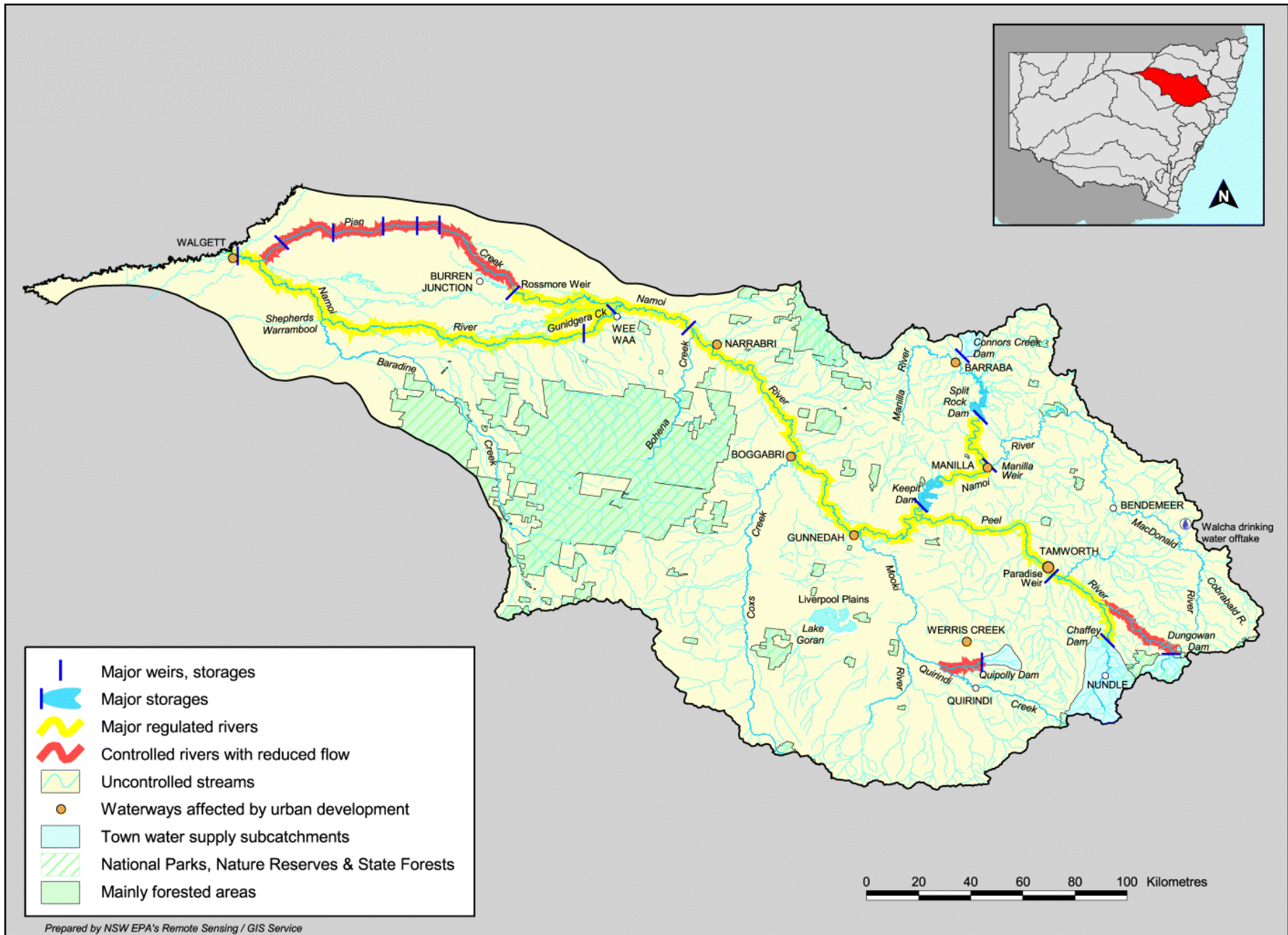
Notes:

1. All Reduced Levels (RL) are in metres AHD.
2. The storage level will normally only reach the white, amber and red levels in a flood.
3. Other circumstances may also trigger the white, amber and red levels.
4. These alert levels will need to be reviewed on completion of the Keepit Dam Upgrade Works.
5. Flows in the Namoi River have been removed since the releases from Keepit Dam will be dependent on the storage level and inflows to the storage.
6. The above information related to minimum times available has been calculated and may be subject to error depending on the rainfall that occurs in the Keepit Dam catchment.

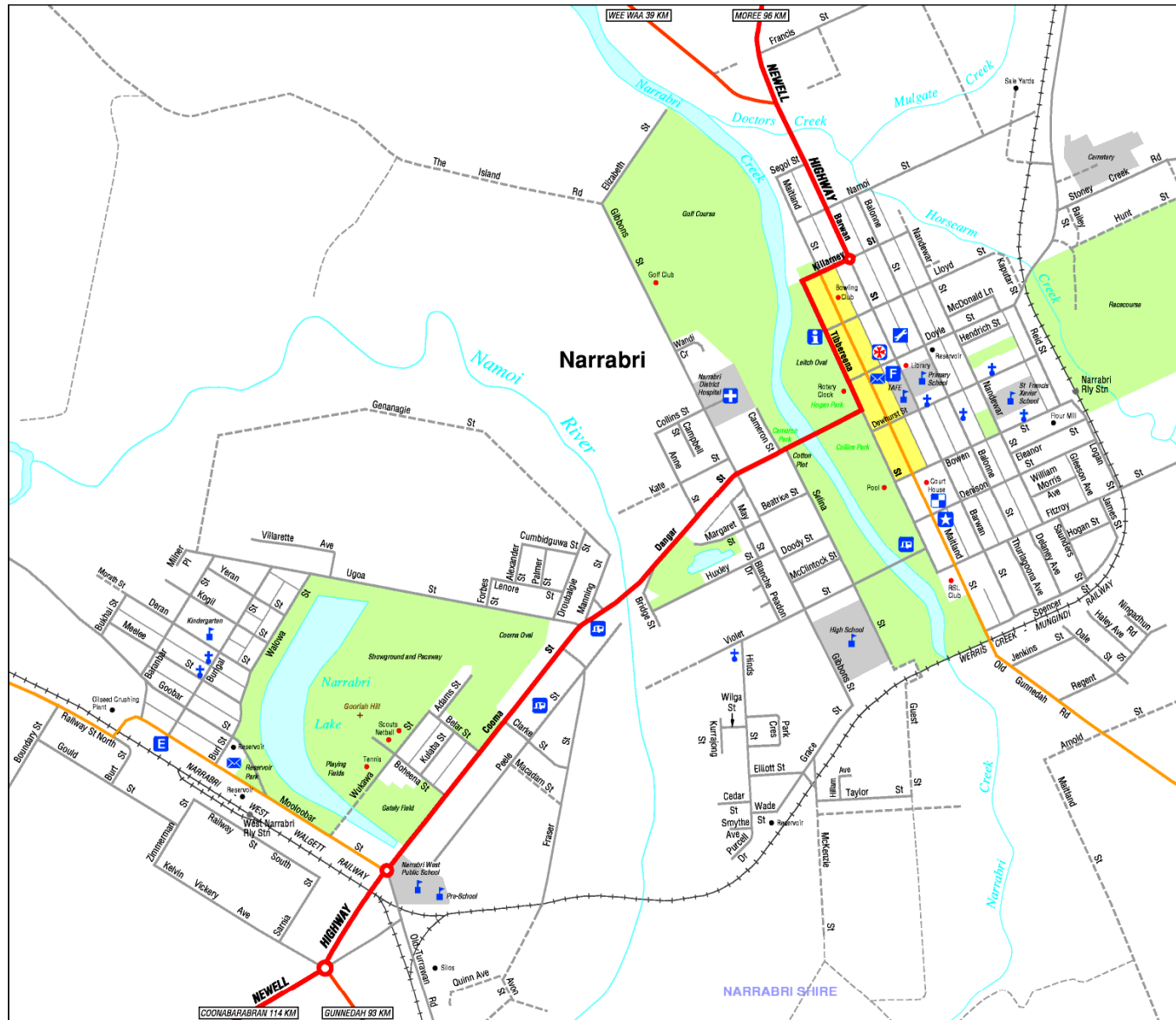
MAP 1 - NARRABRI SHIRE COUNCIL AREA



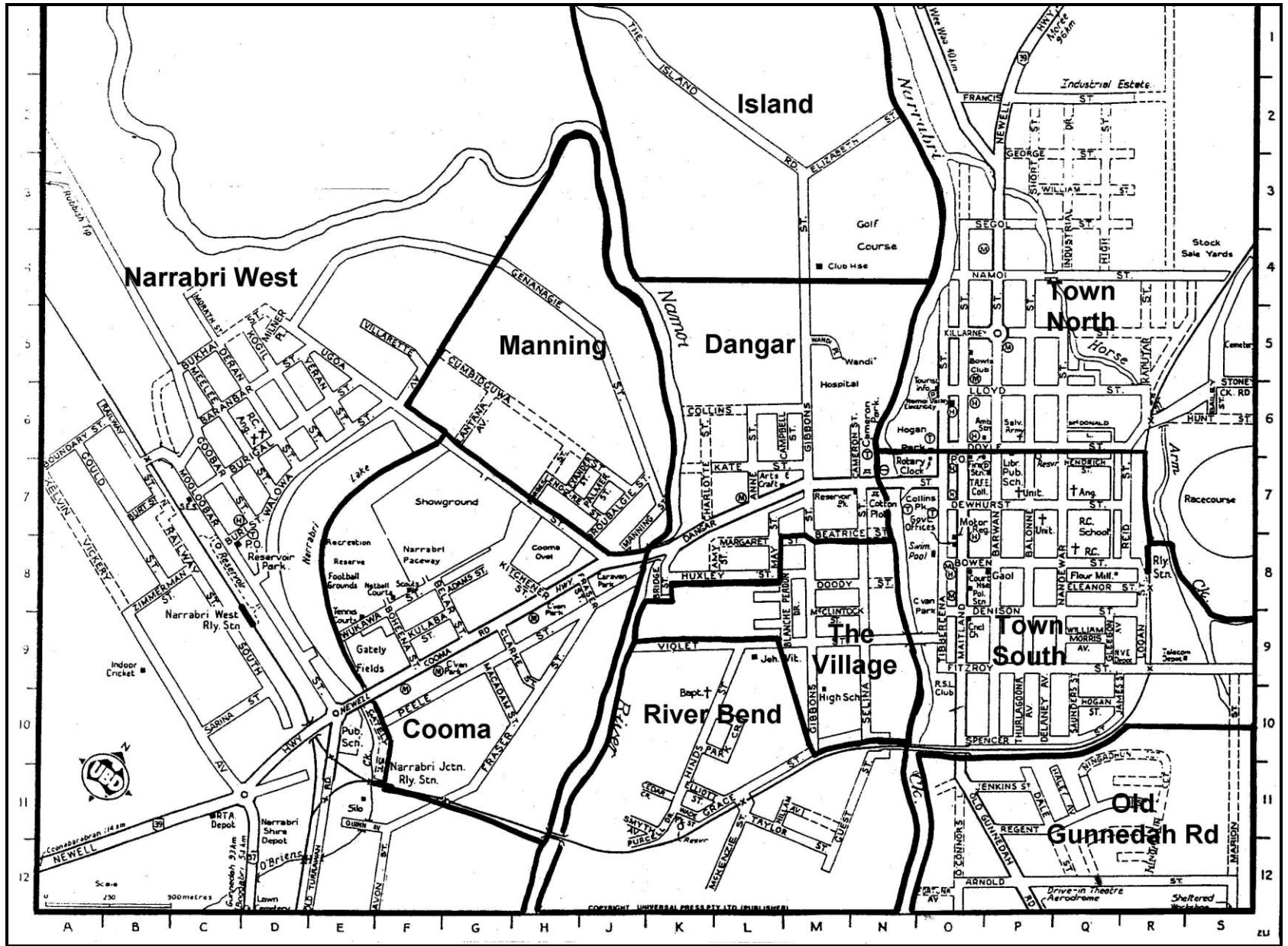
MAP 2 – NAMOI RIVER CATCHMENT



MAP 3 – NARRABRI

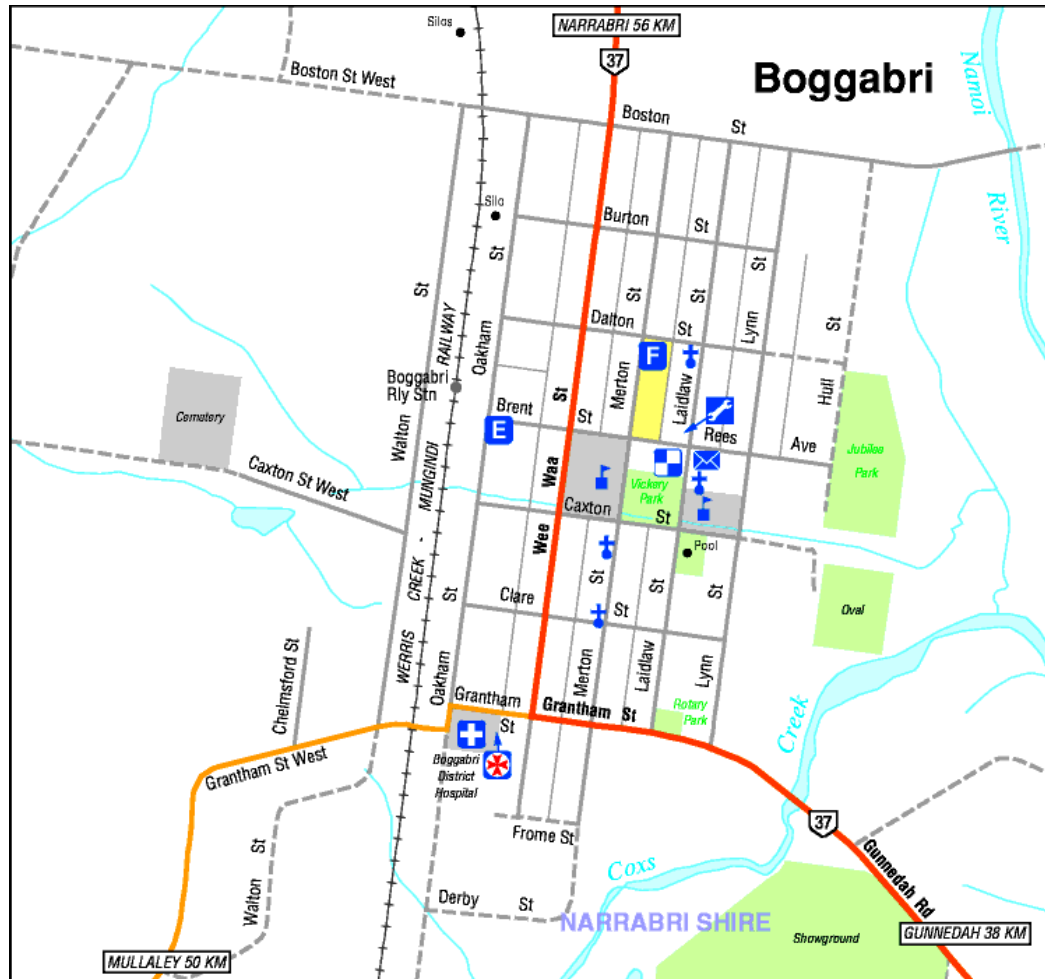


MAP 4 – NARRABRI FLOOD PRECINCTS & WARDEN BOUNDARIES



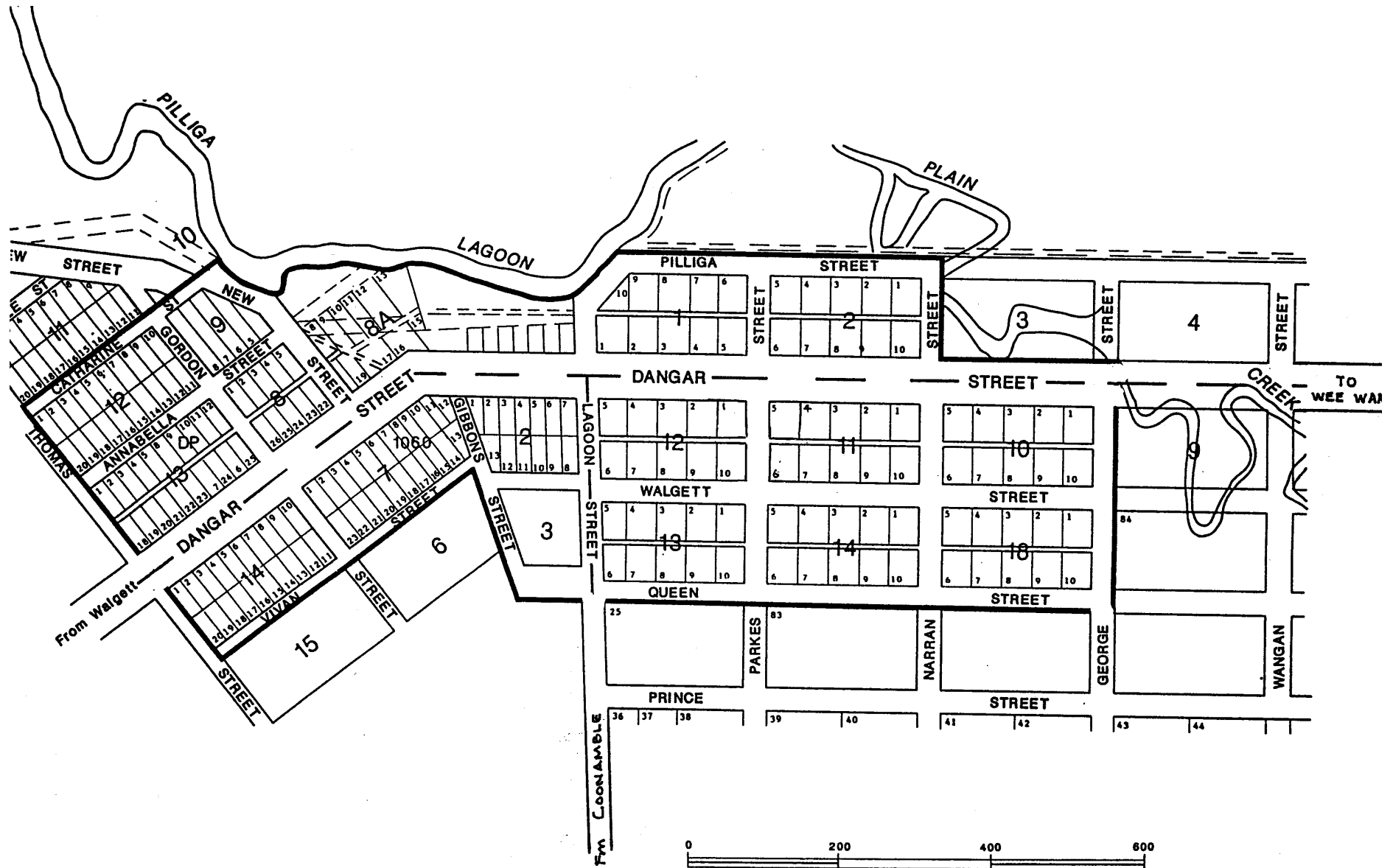
MAP 5 - FLOODING AT NARRABRI - 1998

MAP 6 – BOGGABRI



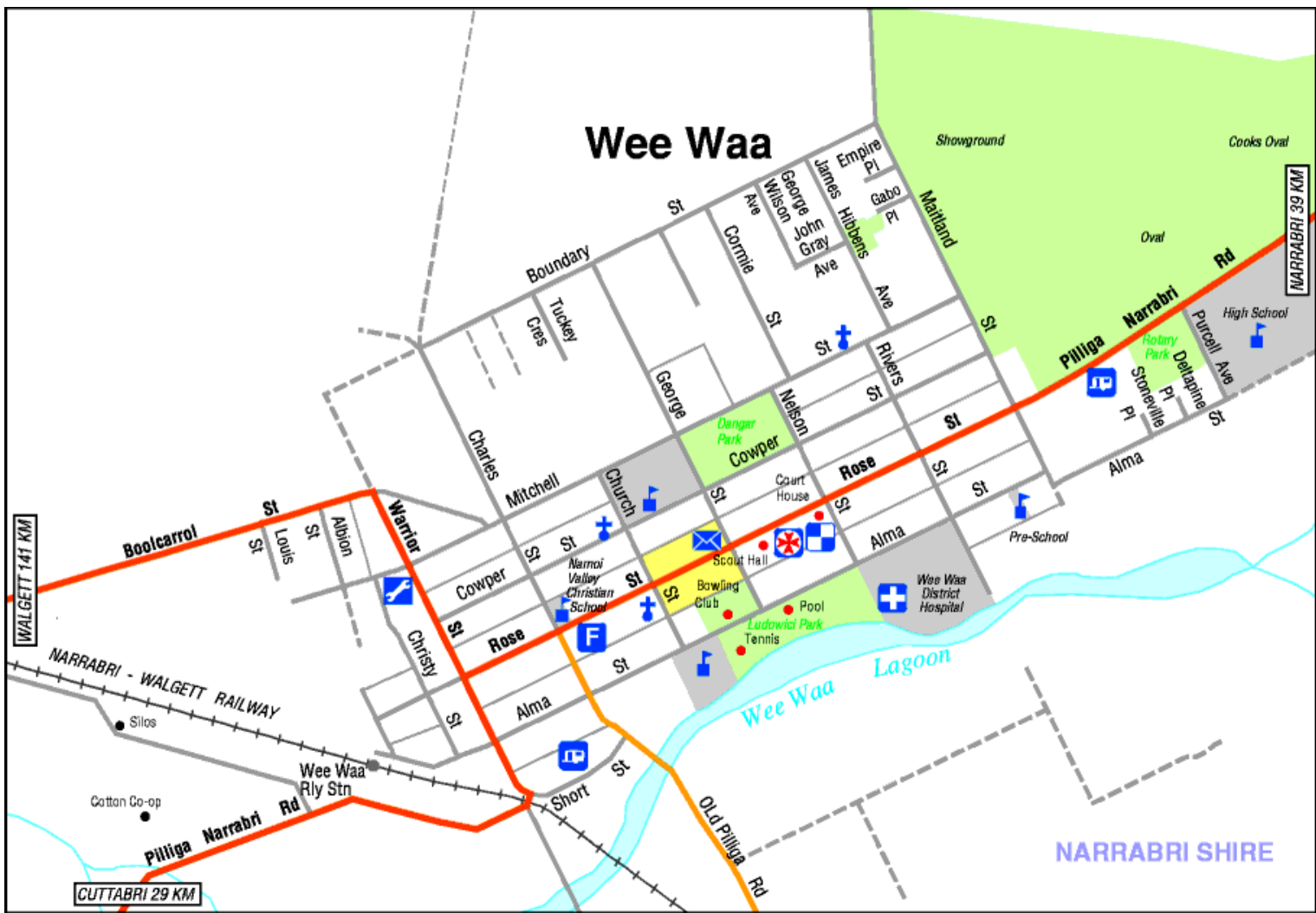
MAP 7 - FLOODING AT BOGGABRI - 1998

MAP 8 - PILLIGA



COMMON SCALE IN METRES

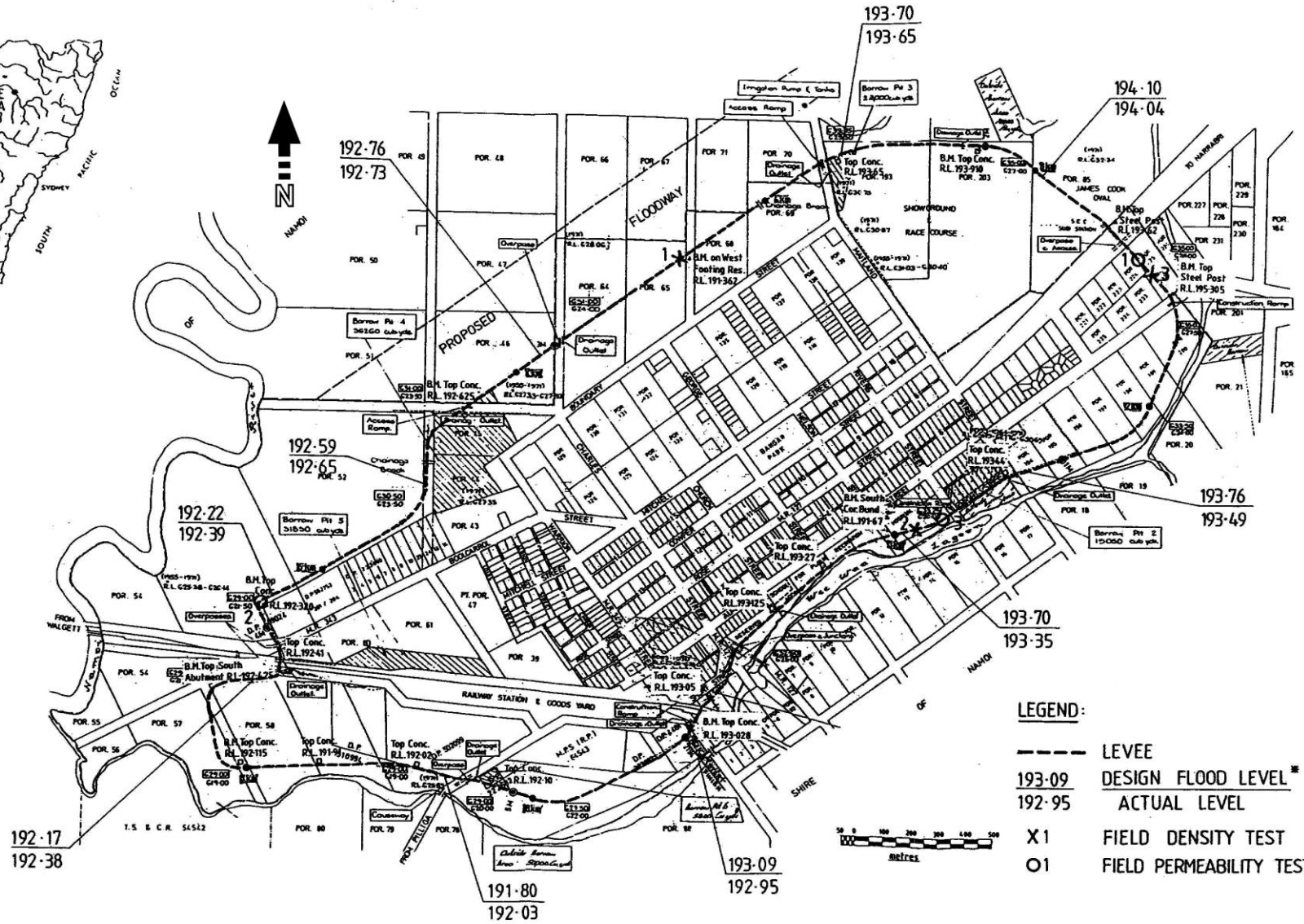
MAP 9 – WEE WAA



MAP 10 – WEE WAA LEVEE



Locality Map



LEGEND:

- LEVEE
- 193-09 DESIGN FLOOD LEVEL*
- 192-95 ACTUAL LEVEL
- X1 FIELD DENSITY TEST
- O1 FIELD PERMEABILITY TEST

* FLOOD OF RECORD (1971) + 1 metre

MAP 11 - FLOODING AT WEE WAA - 1998