NSW STATE EMERGENCY SERVICE

Moree Plains Shire

Local Flood Emergency Sub Plan

FloodSafe

MOREE PLAINS SHIRE FLOOD EMERGENCY SUB PLAN

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

Volume 1 of the Moree Plains Shire Flood Emergency Sub Plan

Version 3.0

AUTHORISATION

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

Signature: _____

NSW SES Local Unit Commander

Print Name: Vivianne Faiaciae

Date: 1/9/2023

Endorsed

Signature: _____

Chair, Local Emergency Management Committee

Print Name: K. MATHESON JOHN DYER

Date: 30-1-24 12/12/2023

LEMO

VERSION HISTORY

Version Number	Description	Date
1.0	Moree Plains Local Flood Plan endorsed	February 2003
2.0	Moree Plains Shire Local Flood Plan	December 2012
3.0	Moree Plains Shire Local Flood Plan	October 2023

AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

Manager Emergency Planning
NSW State Emergency Service
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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

Available for general use and distribution on the NSW State Emergency Service website www.ses.nsw.gov.au

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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 Moree Plains 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 Moree Plains Shire Local Emergency Management Plan (EMPLAN) and is endorsed by the Moree Plains Shire 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 Moree Plains 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 Moree Plains Shire LGA. The Moree Plains 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 Moree Plains Shire level emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Moree Plains Shire LGA.

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 Moree Plains 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 at: https://www.ses.nsw.gov.au/about-us/flood-storm-and-tsunami-plans/ including:

a. Flood Plan Glossary.

b. NSW SES Dam Failure Notification Flowchart.

c. NSW SES Resupply Flowchart.

2 OVERVIEW OF NSW FLOOD HAZARD AND RISK

2.1 THE FLOOD THREAT

2.1.1 NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Moree Plains Shire LGA.

2.1.2 Declared dams in or upstream of the Moree Plains Shire Local Government Area.

Dam Name	Owner	High Risk Dam
Copeton Dam	Water NSW	No
Pindari Dam	Water NSW	No
Glenlyon Dam (QLD)	Sun Water	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).

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

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

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

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 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 post a flood.

Actions:

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

b. All supporting emergency services and functional areas 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: 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. Moree Plains 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 Moree Plains 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 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. The Transport Services Functional Area is to coordinate the provision of information about the assessment and restoration of transport network infrastructure.

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

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

d. The 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. The 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 **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.

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

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

b. The NSW SES 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. The 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 the 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. The 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.

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

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

Actions:

a. The 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. The 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.

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 the 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 the 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 an '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 Moree Plains 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 Moree Plains 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 SEOCON 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 Moree Plains 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 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 are outlined in the NSW State Flood Plan.
Caravan Park Proprietor(s)	• Prepare a flood emergency plan for the Caravan Park. • Ensure that owners and occupiers of movable dwellings are aware that the caravan park is flood liable by providing a written notice to occupiers taking up residence and displaying this notice and emergency management arrangement within the park. • Ensure that owners and occupiers of movable dwellings are aware that if they are expecting to be absent for extended periods, they should: – Provide the manager of the caravan park with a contact address and telephone number in case of an emergency. – Leave any movable dwelling in a condition allowing it to be relocated in an emergency (i.e.: should ensure that the wheels, axles and draw bar of the caravans are not removed and are maintained in proper working order). • Ensure that occupiers are informed of Flood Information. At this time, occupiers should be advised to: – Ensure that they have spare batteries for their radios. – Listen to a local radio station for updated flood information. – 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
	caravan park(s) by owners or by vehicles and drivers arranged by the park managers. • Secure any movable dwellings that are not able to be relocated to prevent floatation. • 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	• When notified of possible flooding or isolation, childcare centres and preschools should. – 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	The roles and responsibilities for Energy and Utilities Services are outlined in the Energy and Utility Services Supporting Plan (EUSPLAN). Roles and responsibilities in addition to the Supporting Plan are: • Assist NSW SES with identification of infrastructure at risk of flood damage where resources are available. • Facilitate local utility service distribution providers (electricity, gas, water, wastewater) to: – Provide advice to 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)	• Monitor flood operations. • If requested, coordinate support for the NSW SES Incident Controller.
Local Emergency Management Officer (LEMO)	• If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.
Marine Rescue NSW	The roles and responsibilities for Marine Rescue NSW are outlined in the NSW State Flood Plan.
Moree Plains Shire Council	**Preparedness** • 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. **Response**

AGENCY	RESPONSIBILITIES
	• Subject to the availability of council resources, assist NSW SES with flood operations including: – 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. • 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. **Recovery**

AGENCY	RESPONSIBILITIES
	• 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.
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**.**

AGENCY	RESPONSIBILITIES
SEOCON/SEOC	The roles and responsibilities for the SEOCON/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	• Transport for NSW coordinates information on road conditions for emergency services access. • Transport for NSW coordinates the management of the road network across all modes of transport. • Transport for NSW in conjunction will assist 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

Community Members	**Preparedness** • Understand the potential risk and impact of flooding. • Prepare homes and property to reduce the impact of flooding. • Understand warnings and other triggers for action and the safest actions to take in a flood. • Households, institutions, and businesses develop plans to manage flood risks, sharing and practicing this with family, friends, employees, and neighbours. • Have an emergency kit. • Be involved in local emergency planning processes. **Recovery** • Assist with community clean-up if required and able to do so. • Participate in After Action Reviews if required.
Cross-border assistance arrangement	• A local cross-border mutual assistance arrangement exists in which the NSW SES Moree Plains Units and the Thallon and Goondiwindi SES (QLD) Units will deploy resources to support each other. • By local arrangement with NSW SES Commanders in neighbouring council areas, flood operations will be conducted under the control of the Moree Plains Shire NSW SES Incident Controller. • Along the Horton and Gwydir (downstream of Gravesend) Rivers and Mosquito Creek (part Gwydir Shire) from County Boundary Road to Pallamallawa.
Local Aboriginal Land Council for Moree, Mungindi and Toomelah.	• Act as the point of contact between the NSW SES and the Boggabilla, Moree, Mungindi and Toomelah communities. • Inform the NSW SES Incident Controller about flood conditions and response needs. • Disseminate flood information, including flood and evacuation warnings, to the Boggabilla, Moree, Mungindi and Toomelah communities.
Farmer flood warning networks	• Provide flood information to the NSW SES Incident Controller. • Distribute flood warnings and flood information provided by the NSW SES Incident Controller.
NSW SES Flood Contact Network	• Provide flood information to the NSW SES Incident Controller.

(Boggabilla, Garah, Mungindi, Pallamallawa, Biniguy, Terry Hie, Moree and Ashley, Gwydir Shire NSW SES Local/Unit Commander):	• Distribute flood warnings and flood information provided by the NSW SES Incident Controller.
Private Companies	**Reynolds Fogarty Bus Service and Wick's Bus Service:** Assist with the provision of: • Bus transport and drivers for evacuation, • Resupply or commuting purposes.
Service and sporting clubs	**Rotary Club, Lions Club** Assist with; – Delivery of evacuation warnings. – Lifting and/or moving household furniture and commercial stock. – Sandbagging. – Relocation of caravans. – Operation of the Moree Town Flood Advice System to disseminate. – warnings and advice to business and residents within Moree, – Yarraman and Ashley.

NSW STATE EMERGENCY SERVICE

HAZARD AND RISK IN MOREE PLAINS SHIRE

Volume 2 of the Moree Plains Shire Local Flood Plan

Last Update: September 2003

FloodSafe

ANNEX A - THE FLOOD THREAT

INTRODUCTION

1. Flooding in the Moree Plains Shire Council area originates from two major river catchments. The Border River Basin, which includes the Weir, Dumaresq, Macintyre and Severn rivers and the Gwydir River Basin which includes the Horton, Gwydir and Mehi rivers.

BORDER RIVERS BASIN

2. The NSW Border Rivers Catchment is located on the New South Wales / Queensland border, with an area of about 24,000km². This is approximately half the total area of the Border Rivers Catchment which is in both Queensland and New South Wales. It is one of the headwaters catchments of the Murray-Darling Basin. The NSW section is some 400km from east to west and some 100km from north to south. It is bounded by the Queensland border to the north and west, the Gwydir River Catchment in the south and the watershed of the Great Dividing Range in the east. The NSW Border Rivers Catchment has a temperate to sub-tropical climate, with considerable gradation from east (cooler and wetter) to west (hotter and drier). Average rainfall ranges from about 900mm in the east to about 500mm in the west. This rainfall mainly falls over the summer months, October to March

3. Downstream of the Macintyre/Dumaresq junction at Toomelah the drainage pattern becomes one of effluent channels and anabranches, which divert water from the main river. During major floods the carrying capacities of the numerous watercourses are not sufficient to confine the flood volume within the banks. Floods can spread over a vast area and join those in the Gwydir Basin to the south. Some residents in rural areas can be completely isolated for long periods. The plains area is undergoing a revolutionary change in land use with large tracts of land formerly used for grazing and winter cropping now being used for broad-acre irrigation. This is leading to major alterations in the pattern of flooding and to changes in the relative severity of any given flood. In New South Wales, the main effluents are Whalan Creek and the Boomi River.

4. The Whalan Breaks out of the Macintyre at Toomelah through two separate channels and flows generally westward being joined from the south by numerous streams draining the area round North Star. The most significant of these are Croppa Creek and Mobbindry Creek both of which can make worthwhile contributions to flood flows in the Whalan. The Whalan joins the Boomi River at the Moree – Mungindi road and rail bridges. Whalan Creek does not carry any significant flow in normal times and in places the channel becomes an almost indistinguishable depression. However, during floods the creek takes on significance in the plains possibly even greater than that of the main river. During the 1976 flood it carried some 35% of the total flood volume measured above Boggabilla. Of more significance though is the fact that it traverses a more direct route than the Macintyre. This means that flooding in the areas around Mungindi is often caused first by Whalan Creek and then sustained by the Macintyre.

5. The Boomi River carries regulated flow at all times but does not appear to exert any independent influence on flooding. It acts simply as a parallel channel to the main stream.

6. In the Boggabilla area after the break outs into Whalan Creek occur, flooding develops as a further break out develops between “Budleigh” and “Merewah”. This water moves south and east across the old Bruxner Highway. Low level flooding occurs over the south bank at Boggabilla and extends between the Newell Highway and the river towards Goondiwindi. Water flows into Mayne's Lagoon and Morella Watercourse to the south of Boggabilla and then encroaches into the town area between the railway line and the river from the south-east.

7. The Weir River is the only major tributary of the Macintyre River downstream of the Dumaresq junction and joins it 23km upstream of Mungindi. The Weir can have a significant influence on the pattern of flooding above Mungindi. Just below “Koramba” is a creek joining the Macintyre and Weir Rivers. It is known locally as Little Weir Creek. Depending on the relative timings of the two peaks it can lessen the downstream level of flooding in the Macintyre by passing floodwater across to the Weir River. Alternatively, floodwater from the Weir River can flow in the opposite direction and make the upstream flooding on the Macintyre worse.

8. The detailed history of flooding in the Macintyre began in 1889 when continuous gauge readings began at Mungindi only a few months before the “great flood” of 1890 occurred. This flood remains the highest on record at Mungindi and unofficial sources indicate it has never been exceeded in the basin generally, although some localised areas have suffered higher floods on rare occasions.

9. Following 1890 no event caused serious general discomfort until the 1950’s. Croppa Creek recorded an immense flood in 1910, as did the upper Macintyre in 1921. However, it would appear that these were isolated local events. During the latter months of 1950 there were several large floods at Mungindi and upstream but in general they did not reach the levels of the 1956 floods. The Macintyre River at Inverell recorded its second greatest height in living memory in 1955, however, elsewhere in the catchment this flood was much lower. January and February 1956 produced a series of major floods—the level reached in the Macintyre Brook at Inglewood the highest recorded. Floods in the early months of 1971 were of only moderate proportions in the upper catchment but reached near record levels at Mungindi. Similarly, one of the largest floods ever recorded at Mungindi happened in January 1974 and is worthy of special mention as the upper catchment recorded only minor peaks, the Mungindi level resulting from a storm over the Thallon area. In all this no flood approached the 1890 record until 1976. This event ranks as almost equal to that of 1890 in many parts of the basin. It is possible that the initial flooding at Mungindi during this event was caused by water from Gil Gil Creek, which crossed both Whalan Creek and Boomi River in a westerly direction before joining the Barwon.

10. The severity of flooding at any location in the catchment depends very much on the timing, location and nature of the flood producing rains. The following examples illustrate this point.

a. **February/April 1890.** Above average rainfalls were recorded for January, February and March throughout the basin. There was only one peak during this flood, and river levels at Mungindi stayed high for about 70 days.

b. **June/August 1921.** Well above average rainfalls from May to July meant that most streams contributed to the series of four major flood peaks recorded at Boggabilla. These merged to three peaks at Mungindi where river levels stayed high for about 75 days.

c. **July/December 1950.** Substantial rainfalls between 22 and 26 June saturated the basin. This was followed by significant falls in most parts of the basin during the periods 20 – 23 July and 3 – 5 October 1950. Between June and August three major flood peaks occurred at Boggabilla. This was then followed by a series of closely spaced peaks during the September to December period. At Mungindi river levels remained high for about 65 days and 80 days during the two periods.

d. **February/March 1955.** Intense storms limited to the Macintyre River catchment upstream of Inverell produced a new flood of record at Inverell with an AEP of about 1:100. The flood wave attenuated rapidly and only produced minor flooding near Boggabilla. It produced a moderate flood at Mungindi with an AEP of only about 1:5.

e. **January/February 1956.** Four major flood peaks were recorded at Boggabilla. The first (in January) originated mainly from Macintyre Brook in Queensland. The other peaks originated mainly in NSW. By the time the peaks reached Mungindi they had merged into three peaks. These floods produced the third highest peak at Boggabilla but only the sixth highest at Mungindi.

f. **December/February 1971.** A series of scattered flood peaks resulted from widespread storm activity from early December to the end of January. By the time they reached Mungindi they had merged into a single major flood peak during which river levels remained high for about 77 days.

g. **January 1974.** The main cause of this flood was a tropical low-pressure system, which moved across the basin and triggered heavy rainfalls in the western part. The flood originated from the area between Boggabilla and Mungindi with major contributions from the Weir River and Gil Gil Creek. The peak at Mungindi occurred two days ahead of a small peak at Boggabilla, indicating that the flood from the upper basin had no significant effect at Mungindi.

h. **February 1976.** Storms were followed by persistent rainfall through February with many districts receiving many times the average monthly rainfall. The highest volume of run-off came from the Macintyre - Severn Rivers but other contributions were evenly distributed and floods of near record to record level were recorded almost simultaneously throughout the basin. A single flood peak resulted

which travelled from the top of the basin to Mungindi in only seven days and the river level stayed high at Mungindi for about 55 days. This was generally regarded as the largest flood in living memory of the basin.

i. **May/June 1983.** Three distinct storm periods over the upper catchment produced three peaks at Boggabilla in early May, June and at the end of June. At Mungindi this series of flood peaks resulted in high river levels for a period of about 66 days.

j. **April 1985.** An extended period of storms during April produced a complex series of peaks throughout the catchment. However, most floodwater originated on the Dumaresq and Macintyre Brook catchments.

11. **Flood Travel Times.** Indicative flood travel times for the Macintyre/Barwon River are:

From	To	Time
Inverell	Wallangra	15 – 22 hours
Wallangra	Yetman	06 – 18 hours
Yetman	Boggabilla	22 – 28 hours
Boggabilla	Koramba	02 – 05 days
Boggabilla	Mungindi	07 days (average)
Boggabilla	Mogil Mogil	14 days (average)

Table 1 - Flood travel times (Macintyre/Barwon River)

GWYDIR RIVER BASIN

12. The Gwydir Valley (Basin No 418) has a total area of 25,900 km^2. The valley is one of the northernmost contributors to the Murray-Darling drainage system. Ground elevations in the valley vary from over 1,200m above sea level near the headwaters in the Great Dividing Range and in the Nandewar Range to less than 150m in the extreme west where the Gwydir River joins the Barwon. Land slopes of more than 15 degrees are found in isolated areas on the west of the great divide and in the Horton River and Halls Creek catchments. The majority of the valley above Gravesend though exhibits land slopes of three to eight degrees. West of Gravesend, the valley flattens quickly and slopes of less than one degree persist to the western edge of the catchment.

13. The valley is well defined in its eastern half by the Great Dividing Range to the east, the Nandewar Range to the south and Masterman's Range to the north. However, the western half of the valley is ill defined with the lack of definition being highlighted by the exchange of floodwaters that take place between the Gwydir system and the Barwon/Macintyre to the north and Namoi systems to the south.

14. The Gwydir River rises in the elevated plateau, which forms the Great Dividing Range west of Armidale and flows in a generally north-westerly direction past

Bundarra towards the township of Bingara. In its passage downstream to this point, several significant tributaries including Copes, Moredun, Georges and Laura Creeks join it.

15. River flows from this upper portion of the catchment are now regulated by Copeton Dam, which is situated just below the junction of the Gwydir River and Copes Creek.

16. Some 25km downstream of Bingara the Gwydir River is joined on the left bank by its main tributary, the Horton River, which rises in the Nandewar Range north west of Barraba. Below Bingara the river enters the plains and flows generally westward to eventually enter the Barwon River about 20km upstream of Collarenebri.

17. The Gwydir Valley could more logically be described as an inland river delta in its lower reaches since from the point of emergence onto the plains the main channels diverge, rather than converge, and display all the characteristics of delta watercourses. The first major effluent of the Gwydir River is the Mehi River, leaving the main river at a point about 30km (by river) upstream of Moree at the Tareelaroi Weir. North of Moree the Carole-Medgum-Gil Gil Creek system (with water from the Gwydir at Boolooroo Weir, some six kilometres east of Yarraman) forms a further major distributary, which enters the Barwon north of Collarenebri. About 32km downstream from Moree, Moomin Creek, a major anabranch, leaves the south bank of the Mehi above Combadello Weir and rejoins it just above the confluence with the Barwon River. Of the smaller distributary watercourses leaving the Mehi River, the most important are Mallowa and Ballin Boora Creeks.

18. A feature of streams in the lower reaches of the basin, below Biniguy, is the natural levee bank which has formed adjacent and parallel to the stream channels; overtopping of these levees results in widespread inundation of the lower ground behind them.

19. Downstream of Gravesend the Gwydir River begins to break its banks and considerable floodplain flow occurs. At Biniguy, 8km upstream of Pallamallawa, floodwaters leave the main channel via a high-level off-take known as the Biniguy Break. This first cuts the Gwydir Highway immediately east of “Trewallah” and then flows parallel to the river through an area known as the Washpool.

20. The first major effluent of the Gwydir River is the Mehi, which leaves it upstream of Moree at Tareelaroi Weir. This weir was built to control regulated flows into the Mehi but, during major floods, the gates are lifted clear of the water and the weir has no effect on flood patterns. Floodwaters continue down the Gwydir and then some leave via the Broadwater Channel moving south-east through Moree towards the Mehi. This usually occurs before the Mehi peak reaches Moree and is followed by some overbank flows to the north of the Gwydir River and then south into the area between the two rivers.

21. When the floodwater from the Biniguy Break and the Washpool enters the Mehi River approximately 15km upstream of Moree, a rapid rise usually occurs. This can be joined by floodwaters from Mia Mia Creek and the White Swamp from the south. In any event, the rapid rise in the Mehi usually results in water flowing into the

Broadwater Channel, which then reverses its direction and flows back towards the Gwydir.

22. The first flooding in Moree comes from the Mehi near Stanley Village. This is followed by a break out across Frome Street and through the Bowling Club area and back into the river. The next break out comes from the Broadwater Channel between Drummond Street and the Broadwater Bridge. Water then flows west along the line of Drummond and Iris Streets. The next break out is again from the Mehi and results in water flowing west along the line of Gwydir Street. As flood levels increase the area between the two rivers upstream of Moree is inundated, as is the whole of the northern side of the town. Some overbank flows also occur on the south side, particularly in the area of the Services Club, and the Showground.

23. The Boolooroo Weir (6km upstream of Yarraman Bridge) regulates flows in the Gwydir River and Carole Creek. The Combadello Weir (21km downstream of Moree) regulates flows in the Mehi and Moomin Creek. Like the Tareelaroi Weir, their gates are lifted above the water during major flooding.

24. The valley to the south of Moree is characterised by a number of creeks that rise in the Nandewar Ranges, the southern limit of the catchment, and flow in a north westerly and westerly direction to link up with the major watercourses of the flat western plains.

25. The most northerly of these creeks is Halls Creek, which generally exhibits limited overbank flooding until it joins the Mehi west of Moree. This is typical of most of the other creeks in the region such as Tookey, Boggy, Little Bumble and Millie Creeks which only flood narrow strips of country east of the Newell Highway and for up to 10km west of the highway. Beyond this the country flattens quickly and the watercourse channels decrease in capacity leading to extensive shallow flooding and joining of the waters from the various creeks. The exception to the above pattern is Tycannah (Weah Waa) Creek. Its floodplain begins to widen 30km east of the Newell Highway and then widens continually until the waters join the Mehi River and Moomin Creek, the principal southern anabranch of the Mehi River. In large floods part of the Tycannah (Weah Wea) Creek floodwaters spill north into the Mehi 15km east of Moree while a smaller amount spills south into Gurley Creek. The Tycannah (Weah Waa) floodplain at the Newell Highway is 10km wide.

26. The dominant features of the floodplain south and south west of Moree are the Mehi River and Moomin and Thalaba Creeks. Since the establishment of the Raft in the Gwydir channel the Mehi has carried the bulk of low flow discharge. It has numerous effluent and distributary streams throughout its length, the dominant one being Moomin Creek, which parallels the Mehi for some 85km. Thalaba Creek skirts the southern limits of the catchment and in fact drains into the Barwon River. During large flood events there is evidence of floodwaters from the Namoi Valley crossing into the Gwydir watershed near the headwaters of Thalaba Creek and Ten Mile Creek and continuing westwards within the Gwydir Valley. This water is essentially lost from the Namoi system although there may be a further exchange of water from the Gwydir to the Namoi just east of the Barwon River. The southern catchment boundary is therefore ill defined.

27. Except for isolated high points and some substantial low ridges around Merrywinebone and Poison Gate the entire area between the Mehi and the southern "boundary" of the valley is subject to flooding. Ninety per cent of the area bounded by the Barwon to the west, the Mehi to the north, the Newell Highway to the east and the catchment "boundary" to the south is inundated during major events. The total floodplain area in this region is over 4,000 km^2.

28. As is typical of most parts of the lower Gwydir Valley, opinions differ on the most severe flood events. Indeed the contention that “every flood behaves differently” is borne out well in the western plains. 1974 appears to be the greatest flood of recent times along Thalaba Creek and the upper reaches of Moomin Creek while 1976 was reported more severe along the Mehi. The flood of 1950 is remembered as being particularly large in the lower reaches of the Moomin.

29. The rivers and creeks break their banks on average once every two or three years but extensive inundation is only experienced every 10 to 20 years. Floods more extreme than a 20 year flood cause little additional extent of flooding, rather there is an increase in depth and of course duration. Floods such as 1971 and 1976 did not recede into channels for approximately 25 days. The duration of over banking at Collymongle is typical of much of the lower valley west of Combadello. At this location a 10 year flood overtops the channel banks for around 15 days while a 100 year flood is over the banks for in excess of 30 days.

30. The area to the north west of Moree is essentially an ‘inland sea’ in times of large floods. The area is characterised by poorly defined river and creek channels and extremely flat overland grades (less than one per cent) which lead to widespread, long duration flooding.

31. The main Gwydir River channel has been blocked just west of Moree since the turn of the century by the Raft, a complex of timber and silt, which gives rise to frequent over banking. The Raft has now been extensively cleared and the river has cut new channels since 1984. Therefore, its influence has been reduced. However, it will still result in some over bank flooding because of debris build-up during large floods. As floodwaters rise the distributary streams of the region such as Carole Creek and the Gingham Watercourse carry increasing volumes of water until their channel capacities are exceeded and cross country flow sets in.

32. Local rainfall is also a particular problem in the area as drainage is slow and flooded streams can keep local water on the fields and pastures for several weeks.

33. The area bounded by the Barwon River, the Newell Highway, the northern ‘boundary’ of the catchment and the Mehi River is over 5,000 km^2 of which 95% is inundated in major floods. Opinion on the largest floods on record varies greatly throughout the area and the scarcity of long-term stream gauges prevents a resolution of the differences. There is a consensus however, that 1955 was the greatest event on record along the Gwydir, and 1976 along the Gil Gil Creek. Between the two 1950 and 1971 have variously been stated by residents as being the most severe.

34. Over bank flooding is protracted throughout the area with periods in excess of 30 days being experienced particularly along the western boundary of the catchment near the Barwon River. As would be expected maximum flood rises are small with

the variations between 1 year and 100 year levels being 2.4 metres and 1.2 metres at Collymongle and Weemelah respectively.

35. Rainfall in the Gwydir Valley generally decreases with decreasing elevation with a maximum in the east and south-east where annual median rainfalls exceed 1200mm. On the western edge of the Basin the annual median rainfall is about 450mm. On average, the catchment receives over 50% of its annual rainfall in the five months from November to March with a short secondary wet spell occurring during June-July.

36. A draft Floodplain Management Study prepared for the Moree Plains Council in 1994 suggests that a 1:1,000 AEP flood could result in a river height at the Mehi Bridge of 11.65 metres.

37. Peak flood levels for some historical and recent floods are shown in the following tables:

	1890	**1955**	**1956**	**1971**	**1976**	**1983**	**1984**	**1988**	**1998**	**2000**
Roseneath (Dumaresq)			8.84	4.04	10.44	4.79	4.95	5.33	5.22	
Ashford (Severn)			8.03	4.79	9.56		4.46	3.34	5.76	
Inverell (Macintyre)		6.02	3.71	3.61	5.31	4.84	3.2	1.43		
Yetman (Macintyre)		11.23	11.10	9.81	11.70	10.32	8.23	4.24		
Boggabilla (Macintyre)	12.53	11.63	12.43	11.63	12.80	11.85	11.60	10.88	12.13	11.60
Mungindi (Barwon)	8.23		7.64	7.62	7.99	7.59	7.8	7.83	7.89	6.51

Table 2 - Peak flood levels for gauges in the Border Rivers Basin

	1955	**1964**	**1971**	**1974**	**1976**	**1984**	**1996**	**1998**	**2000**	**2001**
Bundarra	12.90	10.74	7.92	8.53	9.16	8.70	8.75	9.85		
Bingara	11.53	8.64	7.16	4.72	4.57	5.00	2.00	1.42	1.00	0.91
Gravesend	17.50	13.87	16.03	15.54	16.02	14.13		12.87		11.31
Pallamallawa	10.67	10.22	10.45	10.40	10.49	10.34	9.11	10.24	10.19	10.18
Moree	10.85	7.70	10.41	10.03	10.85	6.95	3.80	7.51	6.06	9.65

Table 3 - Peak flood levels for gauges in the Gwydir River Valley

38. Changing land use is leading to major alterations in the pattern of flooding and to changes in the relative severity of any given flood.

STORAGE DAMS AND WEIRS

Introduction

39. The Dumaresq, Macintyre and Barwon (to Mungindi), Gwydir, Mehi rivers and Moomin and Carole creeks are regulated streams. The Boomi River and the Gwydir River downstream of the Gwydir Wetlands and the Gingham Watercourse are controlled streams with reduced flows. There are two storage dams and several weirs along these river systems.

Copeton Dam

40. Copeton Dam is a massive earth and rock-fill structure located on the Gwydir River approximately 25 km south of Inverell in the north of New South Wales with a capacity of 1,364,000 ML. It is the fifth largest storage in NSW and it is situated upstream of several townships including Bingara and Moree.

41. The dam was completed in 1976 and was built primarily to provide water for irrigation in the Gwydir Valley. The dam wall is made from all local materials and consists of a massive earth and rock filled embankment with a central core of impervious clay. The wall is 113m high and the base is 427m wide. The storage capacity of the dam is 1,364,000 ML, which is nearly three times the volume of Sydney Harbour.

42. The embankment at the left abutment continues along a ridge from the main fill, giving a total crest length of 1,484m. The crest width is 10.7m.

43. The Dam was designed in 1967 and its three-stage construction started in March 1968. Stage 1 was completed in 1972 providing 111,000 ML of storage. Stage 2 was completed in September 1973 providing an increased storage capacity of 863,000 ML. Stage 3 was completed in 1976 and involved the installation of nine radial gates in the spillway to increase storage capacity to 1,364,000 ML.

44. Copeton Dam does not have a flood mitigation effect to beyond the Horton River confluence.

Pindari Dam

45. Pindari Dam is situated on the Severn River in Northern New South Wales, about 22 km upstream of Ashford and about 58 km north of Inverell. Pindari Dam was constructed to supply water to the New South Wales – Queensland Border Rivers area, including the towns of Yetman, Ashford, Goondiwindi and Boggabilla.

46. Construction of Pindari Dam began in 1967 following the promulgation of the Pindari Dam Act of 1966. Construction ended in 1969. This Pindari Dam was a concrete faced rock fill dam. The maximum height of this dam was 40m with a storage capacity of 37,500 ML.

47. A review of hydrology in the 1980s showed the spillway to be unable to pass the Probable Maximum Flood. The need to increase the spillway capacity, coupled the substantial growth in the cotton industry and an overall increase in farming

downstream of Pindari Dam, resulted in a decision to increase the spillway capacity and the storage capacity of the dam. Construction on the "new" dam began in 1992 and ended in 1995 leaving the dam 85 metres in height with a storage capacity of 312,000 ML. An additional outlet works was constructed enabling water to drawn off at various levels. The combined water release capability of Pindari Dam is 5,000 ML/day.

48. A 5.5 MW hydropower station was added to the outlet works in 2001.

Weirs

49. Three noteworthy weirs are located in the vicinity of Moree. They are the:

a. Tareelaroi Weir, which regulates flow into the Mehi River;

b. Boolooroo Weir (6km upstream of Yarraman Bridge), which regulates flows in the Gwydir River and Carole Creek; and

c. Combadello Weir (21km downstream of Moree), which regulates flows in the Mehi River and Moomin Creek.

50. The weir gates are lifted clear of the water during major floods and the weirs have no effect on flood patterns.

WEATHER SYSTEMS AND FLOODING

51. **Introduction.** There are two meteorological systems that give rise to flood producing rains and these are divided into summer and winter events.

52. **Summer Storms.** These have historically produced the most severe flooding in the Gwydir Valley. Most floods occur in January/February resulting from formations of depressions to the north of the catchments in a trough extending from south eastern Australia to the north of the continent. These depressions cause a very moist north to east air stream to occur west of the Great Dividing Range. Under these conditions falls of nearly 125 mm in 24 hours have been recorded in the driest parts of the catchments. Two most notable examples of this mechanism are February 1955 and February 1976.

53. **Winter Storms.** These are quite different from the summer storms and have tended to lead to less serious flood events. As for summer storms, a moisture laden low pressure system from tropical regions moves into the valley from the north west but the triggering mechanism for the rainfall is a cold air mass that moves in from the south or south-west at a high altitude. As the cold air passes over the warm, moist tropical air instability and rainfall result. The most notable examples of this type of weather pattern occurred in August 1949 and July 1950.

FLOOD HISTORY

Introduction

54. Damaging floods are not uncommon in the Moree Plains Shire. There are early reports dating back to 1879 and 1888 when the whole of the surrounding country was flooded at Moree. Moree Plains Shire is affected by flooding from river systems of two river basins. The Border Rivers Basin in northern parts of the shire and the Gwydir River Basin in the south.

Boggabilla

55. Nine floods exceeding 12 metres have been recorded. The flood of record occurred on 13 February 1976 when the Macintyre River reached a peak height of 12.83m. The major floods that have occurred at Boggabilla are depicted in the following chart. It should be noted that there was also flood in 1890, which was estimated to have reached 12.53m.

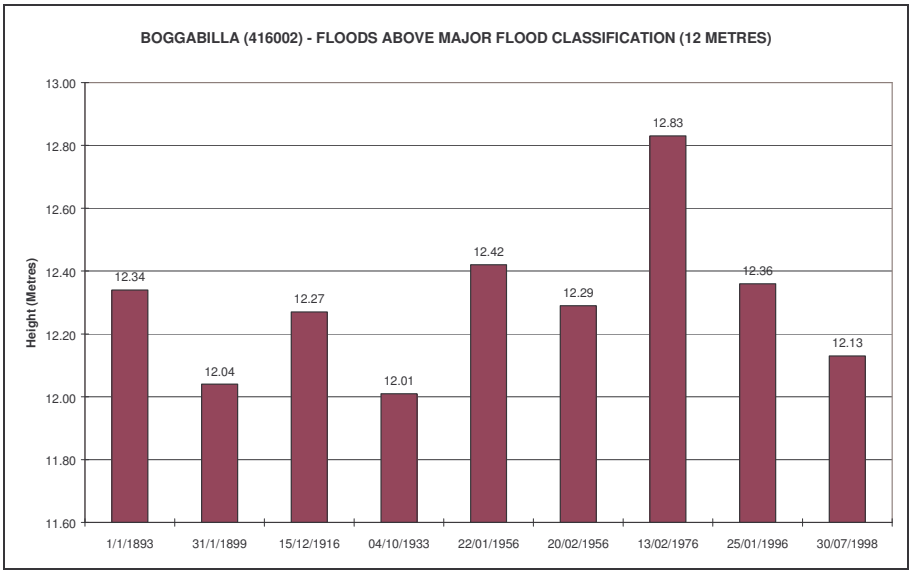

Figure 1 - Floods exceeding the major flood classification at Boggabilla

Moree

56. Floods have been observed at Moree since 1 January 1886 when a gauge was installed on Mehi Bridge (Moree gauge, AWRC No 422001). The February 1956 flood, which reached a peak height of 14 m on the Moree gauge, is the largest flood to have occurred at Moree since records have been kept for this gauge. The major floods that have occurred at Moree are depicted in the following chart:

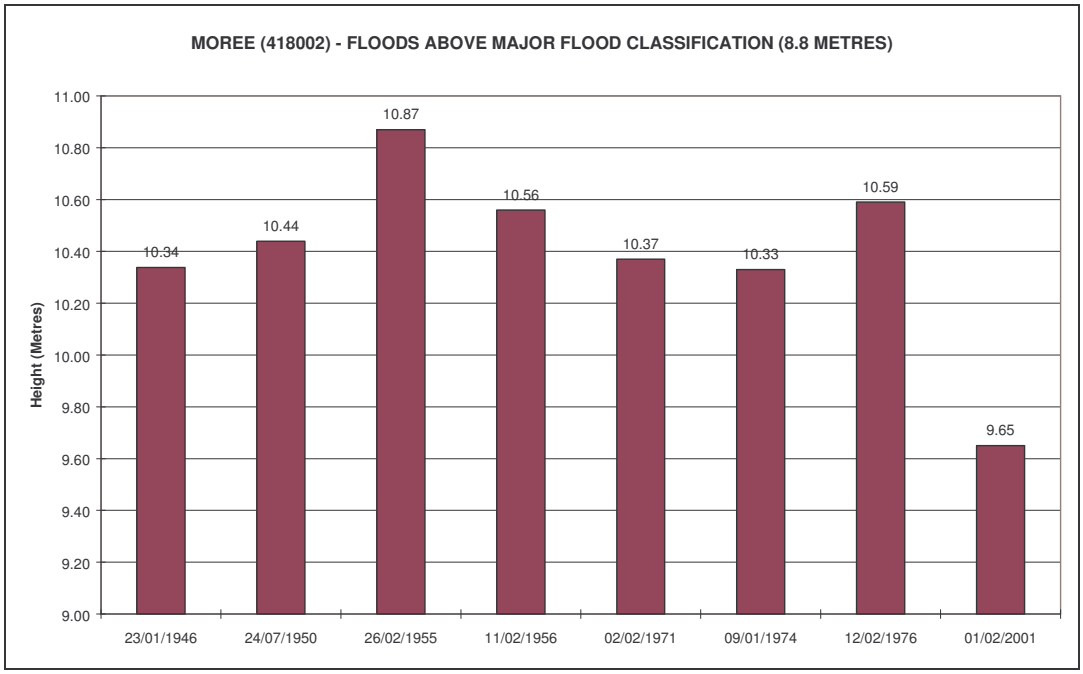

Figure 2 - Floods exceeding the major flood classification at Moree

Mungindi

57. The detailed history of flooding in the Macintyre began in 1889 when continuous gauge readings began at Mungindi only a few months before the "great flood" of 1890 occurred. This flood remains the highest on record at Mungindi and unofficial sources indicate it has never been exceeded in the basin generally, although some localised areas have suffered higher floods on rare occasions.

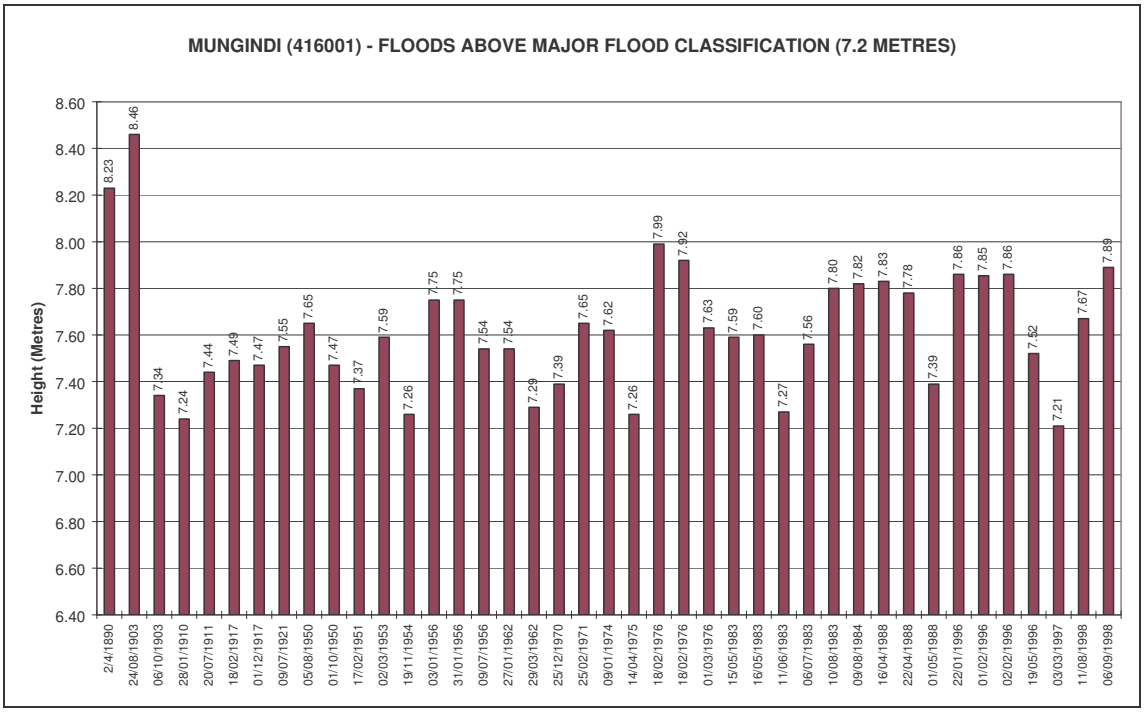

Figure 3 - Floods exceeding the major flood classification at Mungindi

Synopsis of the February 1955 Flood

58. The Gwydir Valley experienced several periods of moderate to heavy rainfall in the five weeks from mid-January to late February. The more intense falls, which saturated the catchment, occurred as two distinct events; the first from 13-18 February and the second from 22-27 February, with the latter falls causing major flooding throughout the valley.

59. The peak flood level of 10.87metres, which was reached by the Mehi River at Moree in 1955 is the highest flood level recorded at Moree. This flood was also the highest recorded at the upstream gauging stations on the Gwydir River at Gravesend, Pinegrove, Bundarra and Yarrowyck.

60. In this event, there was a high contribution of run-off from the whole of the catchment above Gravesend. This, coupled with a large volume of water from the Horton River, resulted in approximately 800 houses and most of the business section of Moree being affected by floodwaters. A summary of the peak heights recorded in the Gwydir Valley is provided in the following table (Note "*" signifies estimated height):

Stream	Station	Station No	Date of Peak	Time of Peak	Peak Height (metres)
Gwydir	Yarrowyck	418014	25/2/55	03:00	6.25
Gwydir	Bundarra	418008	25/2/55	06:00	12.90
Gwydir	Pinegrove	418012	25/2/55	20:00	14.04
Gwydir	Gravesend	418013	26/2/55	04:00	17.34
Gwydir	Pallamallawa	418001	26/2/55	12:00	9.80*
Gwydir	Yarraman	418004	26/2/55		6.69*
Mehi	Moree	418002	26/2/55	18:00	10.87

Figure 4 - Summary of the peak heights in Gwydir River Valley 1955

61. Storm activity was confined to the south-eastern corner of the Border Rivers Basin, primarily over the Macintyre River catchment above Inverell. The remainder of the basin experienced sporadic and relatively minor falls. Consequently the flood wave attenuated rapidly with only moderate flooding at Boggabilla and Mungindi.

Synopsis of the January – March 1971 Flood

62. Along with other western rivers in New South Wales, the Gwydir River Valley was subjected to major flooding during the months of January, February and March of 1971. Flooding was caused by a rain depression centred over the north west of the State late in January 1971. Very heavy storms fell over the entire valley. Rainfall varied between 101.6 and 304.8mm in four to five days, but at some locations registrations were much higher.

63. During this event, high flows from the Horton River combined with major flows in the Gwydir River. Flooding in the valley commenced 28 January 1971 and continued for about two weeks with three distinct peaks (2, 7 and 14 February 1971). The 1971 flood was the largest flood recorded at Moree in terms of volume and duration.

64. The main towns and villages affected by flooding included Moree, Pallamallawa and Biniguy. Moree was isolated for two weeks and about 450 residents were evacuated from their homes.

65. From the onset of the emergency, Army and RAAF fixed and rotary wing aircraft operated from the Moree Airport and carried out rescues, food drops and medical missions.

66. Requests for assistance, food and fodder drops, rescues by aircraft and provision of essential supplies were coordinated by the SES which was operational from 29 January until 19 March 1971.

67. Although flooding was severe in the upper and central sections of the Valley, the most serious flood problem was encountered along the lower reaches of the Gwydir River system, or more commonly termed the watercourse country. In this area, where the level of the land is almost flat, water from the Gwydir-Mehi Rivers and watercourse streams such as the Whalan, Croppa, Big Leather, Boomi and Thalaba Creeks spread over thousands of square km. At one stage water from the Gwydir-Mehi system had linked up with the Namoi, and made the area Narrabri-Moree-Boggabilla a virtual ocean of floodwater. Well over 50,000 sheep and cattle became trapped on the only high remaining ridges in the valley.

68. In the lower Gwydir the distance between homesteads and the slow movement of water resulted in extended periods of isolation for rural residents. As residents had no access to towns, aerial food drops had to be arranged. RAAF and Army helicopters initially performed this task until private aircraft took over. Food was dropped to properties in aerial containers or "torpedoes".

69. The RAAF commenced fodder drops to starving stock in the Gwydir and lower Macintyre basins on the 17th February 1971. When operations ceased on the 19th March, a total of 52,265 bales or about 1,750 tons of hay had been distributed. Most of the stock fed was saved.

70. Maximum river readings recorded along the Gwydir and Mehi Rivers were:

Location	Height	Time	Date
Copeton Dam	08.33m	08:45	30 Jan 71
Keera	08.48m	11:30	30 Jan 71
Caroda	09.14m	01:05	01 Feb 71
Kelvin Grove	15.75m	07:45	01 Feb 71
Gravesend	16.03m	12:00	01 Feb 71
Pallamallawa	09.42m	12:00	02 Feb 71
Yarraman	06.32m	05:20	02 Feb 71
Moree	10.38m	06:45	02 Feb 71

Table 4 - Maximum river readings for Gwydir and Mehi rivers January – February 1971

Synopsis of the January 1974 Flood

71. The flooding in the north west and far west sections of the State resulted from an inland low pressure system, which moved from northern Australia in early January, and centred in the south west sector of Queensland. Heavy rainfall commenced on 4 January and continued until 9 January 1974. During this period, between 203-381mm of rain fell over wide areas of the river catchments of the North and Far West Divisions. Some rainfall stations reported falls of 254-356mm in a 24-hour period.

72. By the middle of January, thousands of square km of land in the west were submerged. At one stage of the emergency an area stretching from the Queensland border to Bourke was a virtual ocean of floodwater. Towns affected by flooding included Gunnedah, Breeza, Carroll, Tamworth, Narrabri, Wee Waa, Moree, Pallamallawa, Walgett, Mungindi, Collarenebri, Rowena, Pilliga, Burren Junction. Lightning Ridge, Goodooga, Weilmoringle, Wanaaring, Louth, Tilpa, Wilcannia, Menindee, Coonamble, and Gilgandra. The Worst affected centres were Narrabri and Wee Waa on the Namoi River.

73. Flooding in the Moree area originated solely from run-off contributions below Copeton Dam with the Horton River being the major contributor (63% of total flood flow recorded at Gravesend).

74. Flooding from the Mehi River at Moree resulted in 17 residents being evacuated and over bank flows of the Gwydir River at Yarraman Bridge resulted in a partial evacuation of Yarraman Village.

75. Flooding in the northern part of the shire originated from the ungauged catchment between Boggabilla and Mungindi with major contributions from the Weir River and Gil Gil Creek.

Synopsis of the January 1976 Flood

76. During the latter half of January 1976, following extensive rain caused by tropical cyclone "David", areas of the north and north west of New South Wales were subjected to a major flood situation. In early February, when the worst had appeared to pass, a complex depression developed in Central Australia. As this low moved into the northern part of the State and southern Queensland, further heavy falls caused the already serious situation to escalate into a major flood which, in some centres, was the most severe this century.

77. Rainfall, during this period, resulted in major flooding along the Barwon, Birrie, Bogan, Bokhara, Bulloo, Clarence, Darling, Gwydir, Hunter, Lachlan, Macintyre, Namoi, Narran, Paroo, Richmond, Tweed and Warrego river systems.

78. During February, a series of depressions along the south Queensland coast maintained heavy rainfalls over the catchments of the northern rivers resulting in further moderate flooding along the Clarence River and major flooding of the Wilson/Richmond River at and downstream of Lismore.

79. At Moree, floodwaters from the Mehi and Gwydir Rivers cut all major and secondary roads into the town and many homesteads in the area were isolated. The main business section and significant areas of residential properties were affected by flooding from the Mehi in particular and by the time the peak was reached on 12 February there were about 300 evacuations.

80. Further to the north, record flooding along the Macintyre River caused the evacuation of the township of Yetman, and major inundation of Boggabilla and Goondiwindi. The highest volume of run-off came from the Macintyre-Severn Rivers. However, the flood behaviour in the Border Rivers area was uncharacteristic in that floodwater flowed from the Whalan Creek system whereas usually the reverse occurs. This resulted in an increase in the flood volume passing Mungindi. Due to the intensity of rainfall on an already saturated catchment a considerable volume of floodwater had exited the mainstream area upstream of Boggabilla and flowed into Whalan Creek. This volume was further boosted by local intense rainfall over the Whalan/Croppa Creek catchments. Rural inundation around Boomi commenced on 12 February 1976 isolating Boomi and the outlying rural area. Floodwater entered the village of Boomi on 15 February 1976. Access to Boomi was restored on 21 February 1976. Over the nine days of isolation there were 34 rural residents evacuated.

81. At Mungindi, the river peaked on 19 February 1976. Levees which, had previously withstood the 1974 floods, were breached in a number of places and water up to one metre in depth lay throughout the town. However, there was no general evacuation and the people carried on their normal business as best they could until water levels fell.

EXTREME FLOODS

82. The worst floods ever recorded in the Moree Plains Shire Council area since European settlement should not be regarded as being the most severe which can occur. Worse floods then have been seen by the present residents, including the catastrophic floods of 1955 and 1976, are possible.

83. There is a remote possibility, in an extreme flood on the Gwydir River that Copeton Dam could fail. Currently the dam can safely pass flows of up to 65% of the likely flow in a PMF flood event.

ANNEX B - EFFECTS OF FLOODING ON THE COMMUNITY

General

1. The Shire of Moree Plains is located on the New South Wales and Queensland border. Moree is 647km north-west of Sydney and 444km south-west of Brisbane. It is one of the largest Local Government areas in New South Wales with a total area of 17,931 km^2. The population of the Moree Shire is officially 15,737 (9,273 in the town of Moree) according to the 2001 census but this is seasonally adjusted upwards during peak agricultural casual employment periods (November to May).

2. Other substantial settlements include the villages of Pallamallawa, Ashley, Garah, Mungindi, Boggabilla and Boomi.

3. The indigenous population is 2,807 people or 17.9% of the Shire. The majority of the Aboriginal people live in Moree (1,927), with other substantial populations in Mungindi (157) and Boggabilla (281). The Aboriginal villages are at Mehi Crescent and Stanley Village in Moree, and at Toomelah (400) located 10km outside of Boggabilla.

4. Flooding can affect urban, village and rural properties in the Moree Plains Shire and close numerous roads. Farmlands are especially prone to inundation, with stock and pumps needing to be relocated in advance of flooding and fence and irrigation pipes periodically being damaged. The expansion of the cotton industry, broad acre farming, hobby farming and rural residential development is increasing the number of people exposed to the flood risk in the rural parts of the council area.

Boggabilla

5. Boggabilla (population 667 – 2001 Census) is a small rural community just a few kilometres below the Queensland Border. It lies on the junction of the Newell and Bruxner Highways, 10km from Goondiwindi (Qld) and 113km north of Moree. It is 769km north west of Sydney. The village has a population of 667.

6. The village has a large aboriginal community of about 281 people.

7. The combination of high flows in the Dumaresq, Macintyre and Severn rivers results in extensive, widespread flood problems in Boggabilla and the outlying rural area. The flood problems are significantly less when there are high flows only in the Macintyre River.

8. Although not often flooded, water entered the village in 1956 and in 1976 (approximately 1:80 years ARI) and completely inundated the entire village. The average depth of inundation was 0.5m. In large floods similar to the 1976 flood event, Boggabilla is completely isolated for several days with the only access being by boat, helicopters or, in emergencies, light aircraft. Even the local airstrip is inundated and light aircraft are forced to land on the Newell Highway south of Boggabilla. At the

record flood level (12.84m on the Boggabilla Gauge) there will be up to 0.46m of water covering the entire village.

9. The majority of the houses in Boggabilla have been built or elevated above the 1976 flood level (12.83m at Boggabilla). However, there are still five or sixes low-set houses in Brown, Merriwa and Macintyre streets. The Elanbe Caravan Park is flood liable and has to be evacuated when the river is expected to reach or exceed 12m on the Boggabilla gauge. The park can accommodate 25-30 caravans and three units. The Shell Truck Stop is located above the height of severe floods and can accommodate 30-40 heavy trucks.

10. Approximately 70 rural properties in the outlying area become isolated during major floods and will require assistance. The bulk of these properties are in the vicinity of Tulloona, a locality south west of Boggabilla. Rural residents in this area are cut off by a combination of flooding on the Croppa and Whalen Creek systems and black soil roads that become impassable after heavy rain.

11. The aboriginal community of Toomelah (approximately 480 people) is located to the east of Boggabilla. Toomelah is completely isolated in major floods and will require resupply from Boggabilla. Although flooding in this community is a rare event it was flooded in 1976 (approx 1:80 ARI). All new residences have floor levels above the height of the 1976 flood. However, evacuations may be required during major flooding. These evacuations would be into Goondiwindi.

Boomi

12. The small community of Boomi (approximately 80-90 people) lies around 95km north west of Moree, close to the Queensland Border.

13. Although on high ground, overland flows from the Boomi River can cause floodwater to enter the village from the north across Baronga Street. In a 5% AEP flood, these floodwaters encroach across Baronga Street and start to inundate the low-lying parts of the north-west corner of the village. Floodwaters continue to spread in two fingers towards the south-west and south-east with the Main street as the axis. The south-western finger of floodwater flows across Baronga Street, then down Boomi and Barwon streets. The south-eastern finger flows across Baronga Street then in a south-easterly direction across Duff Street, down Benson Street and continues on towards the south-eastern corner of the village. In a 1% event, these fingers are fully developed and about two thirds of the village is inundated.

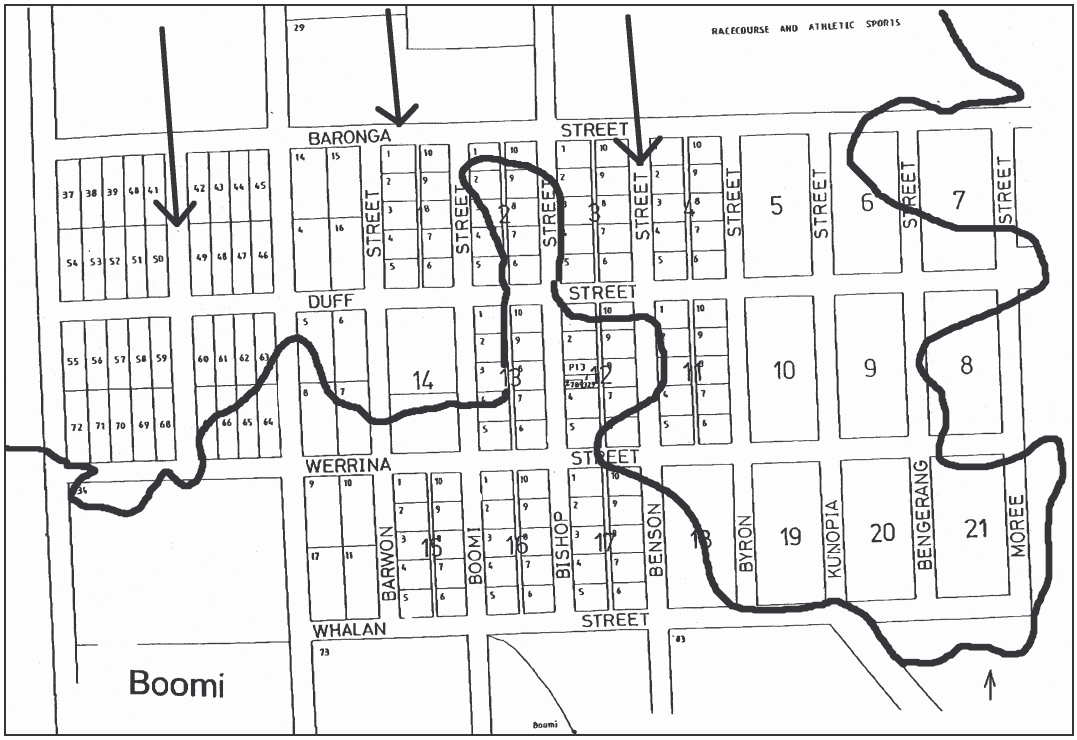

Figure 5 - Approximate flood line for a 1% AEP flood event at Boomi

14. When a large flood is predicted arrangements are made with the Moree Plains Shire Council for the construction of an improvised earthen levee on the northern side of the village across from Baronga Street.

15. In less severe floods there is usually a road open to either Moree or Goondiwindi. However, in major flooding the village can be isolated for several days. In 1976, the majority of the village was inundated and isolated for about 10 days. A good all-weather airstrip (bitumen at both ends and gravel runway) suitable for light aircraft is always accessible.

Garah

16. Garah is a village with a population of approximately 98 people located on the Carnarvon Highway, 51km north west of Moree.

17. High flows in Gil Gil Creek, Carole Creek and Black Gully combine to cause major flooding at Garah. When the Gil Gil Creek is in flood and is held up by high flows in Black Gully, it can cause the Wallon Creek to back up and break out of its banks about nine kilometres south east of Garah. Floodwaters from this break out then flow over the Carnarvon Highway (Moree – Mungindi road) closing the road. In a severe flood this break out can develop and flow in a northerly direction and inundate Garah from the south. Floodwater can also break out of Carole Creek (a distributary of the Gwydir) in the vicinity of "Brigalow Water" about 15km south west of Garah. This widespread overland flow links up with floodwaters from the Gil Gil Creek system and cause major flooding in and around the village of Garah.

18. Even when there are low flows in Carole Creek—and without the influence of Black Gully—high flows in Gil Gil Creek can still break out and flow through the

railway culverts south of Garah to result in minor to moderate level flooding. A high Gil Gil plus a high Carole Creek without the influence of Black Gully can result in moderate level flooding.

19. The "old town" section of Garah, the original site of the village located about a kilometre north-east of the main part of Garah, is the first area to be inundated. There are six houses in this area and the residents of this area are evacuated into the main part of the village. In 1974 the residents of four houses in the "old town" section were evacuated. The main street was completely flooded and water entered many homes. In 1976 all streets were inundated to a depth of up to one metre and water entered all but four or five residences. The village was isolated for five days and airdrops of foodstuffs were made from Moree. A flood of about 1:10 AEP will surround the village but a much rarer event is needed to cause significant inundation of houses.

20. About 50 rural properties in the immediate vicinity of Garah, including three large irrigation properties, are isolated for up to a week during major floods.

21. The main source of information regarding the flows in the Gil Gil Creek system is obtained from "Wellbon". The average flow time of the peak from "Wellbon" to Garah is about 12 hours. The residents of Garah can expect to receive about 24 – 36 hours warning of a major flood impacting on their village.

Figure 6 - Photograph of Garah in 1976 Flood (Looking South-West)

Moree

22. Moree (population 9,273 – 2001 Census) is a regional centre, with direct daily air links to Narrabri and Sydney. The Newell Highway is a major route between Melbourne and Brisbane, and the Gwydir Highway links Moree to the east and west.

23. Flooding in the town commences at about 8.95m from a break out from the Mehi River followed by later break-outs from the Broadwater Channel and then the Mehi River. The major flood prone area of the town is the northern precinct. Approximately one third of the business premises are above the 1:100 flood level as is most of the southern side of the town. During a 1:40 AEP flood event some 340 houses and 70 commercial premises could be inundated above floor level with hundreds of other raised residences having water with depths up to several metres below floor levels. This equates to the 1976 flood (with a peak of 10.59m) when 75% of buildings north of the Mehi were surrounded by floodwaters and 300 evacuations were carried out. During the 1971 flood, Moree was isolated for about two weeks and 450 residents were evacuated. During the 1955 flood (the highest on record—with a peak of 10.89 metres) some 800 residences and most of the business section of the town was affected. The subdivision of Bendegleet has been developed since the 1976 flood (AEP 1:80 approx) and it is expected that some evacuations will be necessary from this area. The Moree urban area includes sub-divisions of Yarraman, Bendegleet and Gwydirfield.

Mungindi

24. Mungindi (population approximately 700 people, 645 on NSW side – 2001 Census) is located 120km north-west of Moree on the Carnarvon Highway. The town straddles the Barwon River and the NSW/QLD border and is protected by a levee system on both sides of the border.

25. The levee system was breached in 1976 and 24 of the 190 occupied buildings on the NSW side were inundated. All land access into the town was cut for two weeks although high clearance 4WD vehicles could get from the town to the airstrip, which is on higher ground. The town is now protected by a levee to 8.08m (on the NSW side) which is almost one metre above the 1890 (Flood of Record) flood level. In the event of levee breach or overtopping, the community of Mungindi would need to be evacuated to Moree or further afield if Moree is flooded. This operation would be controlled by the North West SES Division Headquarters.

Pallamallawa

26. Pallamallawa (population 307 – 2001 Census) is protected from minor and major flooding by a levee to about 10.67m. The 1976 flood just entered the lower (western) part of the town. Five houses had water above floor level. A repeat of the 1955 (1:80 – 1:100 AEP) could overtop the levee and inundate about 22 houses. Major floods will isolate the town (3 – 4 days in 1976).

Weemalah

27. Weemalah (approximately 40-50 people) is protected by a levee but can be isolated by flooding either from the Gwydir River or Border Rivers system. It has no airstrip.

Highways and Main Roads

28. Many of the local roads within the Moree Plains Shire are black soil roads and are subject to closure at short notice due to rain—well before the onset of flooding.

29. There are major transport disruptions during major floods and all of the highways are subject to closure at many various locations depending upon the severity of the flooding. The Newell Highway has undergone major road works in order to keep the traffic flowing in the majority of floods but several low-spots remain and floodwaters can force its closure at these locations north and south of Moree. Probably the most significant closure is about 15km south of Moree at the Tycannah Creek. When the Tycannah Creek is in full flood it can close the highway for three days or longer. The Gwydir Highway is closed at several spots between Moree and Collarenebri and between Moree and Warialda – the most notable spots being at the Washpool, "Macquarie" and the Biniguy Break. There have been a number of motorists have been swept to their deaths at the Biniguy Break. In floods at the top end of the major flood level, the approaches to Gravesend Bridge can be washed out. The following highways and main roads are subject to flooding at the following locations within the Moree Plains Local Government Area:

Road	Designation	Location of Closure
Bruxner Highway	Highway 44	Between: • Boggabilla and Yetman. • Between Yetman and Tenterfield.

Gwydir Highway	Highway 38	Between:
		• Moree and Collarenebri.
		• Moree and Pallamallawa at:
		  • The Washpool,
		  • Biniguy Break.
		• Pallamallawa and Biniguy.

Newell Highway	National Highway 39	Between:
		• Narrabri and Moree at:
		  • Tycannah Creek.
		• Moree and Boggabilla.
		  • Near the Booloroo Bridge.

CarnarvonHighway	Highway 55	Between:
		• Moree and Garah.
		• Garah and Mungindi at:
		  • Wall Murray Bridge,
		  • Vyra Causeway,
		  • "Milton Ville",
		  • 9 Mile Causeway,
		  • 4 Mile,
		  • Twin Bridges, and
		  • Gravelly Creek.

Mungindi – Boomi road	Main Road 507	Between Boomi and Mungindi.
Garah – Boomi road	Main Road 232	This is an all-weather road but it is cut by floodwaters in three places at the : • second cement bridge 3-4km from Garah; • 10km mark from Garah;

Road	Designation	Location of Closure
		• Bora Waterhole about 33km from Garah.

Figure 7 - Road closures in the Moree Plains Shire

Airfields.

30. Moree has an excellent regional airport, which is located on flood-free land on the south side of Moree. The airport is well serviced by Mobil, Shell and Air BP ground services and capable of handling DASH-8, Hercules (C130) and Caribou (CC08) aircraft. There are several airfields and airstrips located throughout the shire. A quick summary of the airfields near the main centres follows:

a. **Boggabilla.** Good all-weather airstrip suitable for light aircraft up to the size of and including the RAAF Caribou (CC08).

b. **Boomi.** A good all-weather airstrip that is suitable for light aircraft services Boomi.

c. **Mungindi.** Good all-weather airstrip suitable for light aircraft up to the size of and including the RAAF Caribou (CC08). During periods of major flooding, the airstrip is cut off from town and is only accessible by high clearance 4WD vehicles.

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NSW STATE EMERGENCY SERVICE

SES RESPONSE ARRANGEMENTS FOR MOREE PLAINS SHIRE

Volume 3 of the Moree Plains Shire Local Flood Plan

Last Update: September 2003

FloodSafe

ANNEX C - GAUGES MONITORED BY THE MOREE PLAINS SES

GAUGES READ BY BOGGABILLA SES

Gauge Name	Type	AWRC No	Stream	Flood Classification		
				Min	Mod	Maj
Boggabilla* ‡	Manual	416002	Macintyre River	5	11.5	12
Goondiwindi*	Telemeter	416916	Macintyre River	3.5	6.1	8.5
Terrewah	Telemeter	416047	Macintyre River			
Riverview		416907	Macintyre River			
Boronga		10037	Macintyre River			
Boomi Weir	Telemeter	416043	Macintyre River			
Boonanga Bridge	Manual	416046	Macintyre River			
Kanowna	Telemeter	416048	Macintyre River			
Yarrowee	Manual	416051	Macintyre River			

GAUGES READ BY BOOMI SES

Gauge Name	Type	AWRC No	Stream	Flood Classification		
				Min	Mod	Maj
Willimill						
Kanowna (Boomi)	Manual	416029	Boomi River			
Kelvington	Manual	416913	Barwon River			
Marlow	Manual	10226	Croppa Creek			

GAUGES READ BY MOREE SES

Gauge Name	Type	AWRC No	Stream	Flood Classification		
				Min	Mod	Maj
Boolooroo Weir Offtake		10033	Carole Creek			
Miltonville		10237	Carole Creek			
Mooki Bridge		10245	Carole Creek			
Garah Bridge		10149	Gil Gil Creek			
Gil Gil		10155	Gil Gil Creek			
Miltonville (Gil Gil Creek)		10238	Gil Gil Creek			
Welbon		10415	Gil Gil Creek			
Murray Cummummulah		10254	Gurley Creek			
Ningle		10269	Gurley Creek			
Bingara*	Telemeter	418010	Gwydir River	5.5	7.6	9.1
Biniguy	Manual	418904	Gwydir River			
Boolooroo Weir D/S (Carole Creek)	Manual	418036	Gwydir River			
Boolorro Weir	Telemeter	418051	Gwydir River			
Brageen Crossing	Telemeter	418053	Gwydir River			
Copeton Dam D/S	Telemeter	418026	Gwydir River			
Gravesend* ‡	Telemeter	418013	Gwydir River	6.1	9.4	12
Kelvin Grove	Manual	418019	Gwydir River			
Millewa	Telemeter	418066	Gwydir River			

				Flood Classification		
Pallamallawa* ‡	Telemeter	418001	Gwydir River	6.0	9.5	10.4
Rider	Telemeter	418015	Gwydir River			
Yarraman Bridge* ‡	Telemeter	418004	Gwydir River	4.0	6.5	7.0
Bronte	Telemeter	418058	Mehi River			
Carroll (Mehi River)		10082	Mehi River			
Chinnok		10088	Mehi River			
Combadello Bridge		10098	Mehi River			
Combadello D/S	Telemeter	418037	Mehi River			
Combadello Weir WL	Telemeter	418047	Mehi River			
Gundare Regulator	Telemeter	418041	Mehi River			
Moree* ‡	Telemeter	418002	Mehi River	5.5	7.6	8.8
Orchins		10283	Mehi River			
Telleraga Weir		10368	Mehi River			
Alma Bridge	Telemeter	418061	Moomin Creek			
Claredon Bridge (Heathfield)	Telemeter	418067	Moomin Creek			
Millie Bridge (Krui Bridge)		10235	Moomin Creek			
Bundy Bridge		10059	Tycannah Creek			
Terry Hie Hie	Manual	418028	Tycannah Creek			
Tycannah		10392	Tycannah Creek			

GAUGES READ BY MUNGINDI SES

Gauge Name	Type	AWRC No	Stream	Flood Classification		
				Min	Mod	Maj
Mungindi* ‡	Telemeter		Barwon River	6.1	6.7	7.2
Goodar Station		10163	Weir River			
Windiamill		10425	Weir River			
Talwood	Telemeter	416202	Weir River			
Merriot		10232	Weir River			
Mugan		10250	Weir River			

Notes:

1. The Bureau of Meteorology provides flood warnings for the gauges marked with an asterisk (*). The SES maintains Flood Intelligence Cards for these gauges.

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

3. The SES also holds Flood Intelligence Cards for the gauges marked with a double cross (‡).

ANNEX D - DISSEMINATION OF SES FLOOD BULLETINS

The North West 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
2VM/NowFM	Moree	1530/98.3	AM/FM
ABC Local Radio		99.1	FM
2NOW/MaxFM	Narrabri	91.3	FM
2NZ	Inverell	1188	AM
2TM	Tamworth	1287	AM
2MO	Gunnedah	1080	AM
2WEB	Bourke	585	AM
2NOW/MaxFM	Narrabri	91.3	FM

Other Agencies:

- Namoi SES Division Headquarters.
- Macquarie SES Division Headquarters.
- Far West SES Division Headquarters.
- Walgett Shire SES Local Controller.
- NSW Police, Western Region Headquarters.
- NSW Police, Barwon Local Area Command.
- NSW Police, New England Local Area Command.
- Queensland SES (Goondiwindi, Waggamba and Balonne SES units).
- MacDonalds – Moree.
- KFC – Moree.
- Moree Service Stations.
- Bellata Roadhouse.
- Narrabri Roadhouse.
- Shell Truck Stop – Boggabilla.
- Moree Information Centre.

ANNEX E - TEMPLATE EVACUATION WARNING MESSAGE FOR [ENTER NAME OF AREA]

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 companion 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 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 FOR THE MOREE PLAINS SHIRE COUNCIL AREA

SITUATION

1. During most floods, it can be expected that residents in either raised or leveed houses 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.

2. Whilst there are numerous houses in Moree, and elsewhere in the shire, that have floor levels above the 1% AEP flood level (elevated and/or on mounds) they cannot be considered safe refuges because of the likely failure of water, sewerage, power and telephone systems. Due to the public safety risk, residents in flooded areas (including those in elevated houses) will be encouraged to evacuate when severe floods are predicted in order to avoid the necessity for later operations to rescue them.

3. The failure of essential lifelines such as power, water and sewerage systems may necessitate evacuations because of the risk to public health.

4. Historically, many residents in Moree have tended to stay put in their elevated houses and sit-out the flood. In the larger floods this has meant that they have been isolated in their homes for 2 – 3 days.

5. The effects of flooding on the community are documented in Annex B. The details of the dam failure emergency procedures are included in Annex G.

MISSION

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

EXECUTION

Control

7. During floods, the NSW SES will control evacuations. The Moree Plains LEOCON will coordinate support in accordance with the provisions of this plan.

8. Small-scale evacuations will be controlled by the Moree Plains SES Local Controller through the respective SES Unit Controllers. Should the evacuation operations escalate beyond the capabilities of local resources control may be handed over to the North West SES Division Controller.

Conduct

9. Evacuations will be controlled by the Moree Plains SES Local Controller and conducted by Police, SES, RFS, 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

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

a. Boomi,

b. Boggabilla,

c. Garah,

d. Moree, and

e. Mungindi.

11. **Moree Operational Sub-Sectors**. To assist with effective evacuation warnings and operations, Moree is divided into four sub-sectors as follows:

a. **Sector 1** – Stonnington and Chinamans Lane and the Zannes sub-division at the northern end of Kamilaroi Drive.

b. **Sector 2** – Orana, Balo, Queen, Kamilaroi, lower Edward, Brandt, Drummond, lower Hoover streets and Condor Crescent.

c. **Sector 3** – Calgorm, Iris, Bridge, Gwydir, Brigalow, McArthur, David, Mitchell, Boundary and Rous streets plus the Bendygleet rural sub-division.

d. **Sector 4** – Gwydir (upper end), Coolabah, Hassel streets and Merinda Avenue and Boonery Road as well as the Greenbah West sub-division.

The Decision to Evacuate

12. The responsibility for issuing any general evacuation order during flooding rests with the Moree Plains 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 LEOCON, the Mayor and the North West SES Division Controller.

13. As far as possible, evacuation will be carried out before inundation occurs.

Self-motivated Evacuation

14. 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.

Evacuation Triggers

15. **Boggabilla**:

a. The Elanbe Caravan Park is flood liable and has to be evacuated when the river is expected to reach or exceed 12m on the Boggabilla gauge. The park can accommodate 25-30 caravans and three units.

b. Five or six low-set houses in Brown, Merriwa and Macintyre streets and the Caltex All-Nighter Café will require evacuation if the river is expected to reach or exceed 12.3m.

c. The aboriginal community of Toomelah is completely isolated in major floods. All new residences have floor levels above the height of the 1976 flood (12.83m). However, evacuations may be required during major flooding.

16. **Boomi**. Although isolated during periods of major floods, the residents of Boomi are usually safe to remain in town unless there is a repeat of a 1976 flood.

17. **Garah**:

a. The "Old Town" section of Garah, located about a kilometre north of the village, is the first area to be effected. There are six houses in this area that may have to be evacuated in severe floods such as the 1976 event.

b. A large number of the houses in Garah are elevated but the village septic system is inundated and may cause health risks. Careful consideration should be given to evacuating vulnerable elements of the community because of possible public health risks but evacuations from Garah are not easy to arrange because of a loss of evacuation routes before there is evidence to suggest that the village will be inundated.

18. **Moree**:

a. **Sector 1** – When there are high flows in both the Gwydir and Mehi rivers and the levels are predicted to reach 7.1m at Yarraman Bridge gauge and exceed 7.8m on the Moree gauge.

b. **Sector 2** – After Broadwater Creek flow reverses and the levels are predicted to reach 7.3m at the Yarraman Bridge gauge and exceed 7.5m at the Moree gauge.

c. **Sector 3 then Sector 4** – When the river level at the Moree gauge is predicted to exceed 9m.

d. **NB**: The Dr Geoffrey Hunter Bridge is closed by floodwater when the Moree gauge reaches 10m. Once the bridge is closed there is no road access to the flood-free south side of Moree.

19. Mungindi:

a. At about 8m on the Mungindi gauge, water enters the Mungindi District Hospital grounds and floods the septic system. The hospital is normally evacuated when there evidence of this height being reached and before the loss of the Mungindi – St George road at about 7.7m.

b. Mungindi Levee-Failure.

c. Loss of Lifelines and/or Infrastructure.

20. **Dam-Break.** Downstream flood inundation could occur as the result of a failure of either Pindari or Copeton Dam. Failure of either of these dams could be due to extreme flood or a "Sunny Day" failure and would result in the need to evacuate residents from low-lying areas downstream of the dams. However, it should be noted that in the case of dam failure brought about by an extreme flood there would already be unprecedented flooding downstream of the dam due to spillway discharge and flow in the river systems.

Phase 1 – Warning

21. **Evacuation warnings.** On the receipt of flood warnings predicting flood levels that will trigger evacuations; the Moree Plains 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 Moree Plains SES Local Controller will issue evacuation warnings to the 'at risk' residents, indicating what people should do before evacuating and when actually doing so. Evacuation warnings will be prepared by the Moree Plains SES Local Controller or SES Unit Controllers as appropriate in conjunction with the Local Emergency Operations Controller and passed to the North West SES Division Headquarters for dissemination to media outlets.

22. **Doorknocking.** In built-up areas, evacuation warnings broadcast over radio and television stations will be followed up by doorknocking teams targeting individual premises to ensure that all occupants are aware of the contents of the evacuation warning messages. They will also advise the Moree Plains SES Local Controller of any persons requiring support such as medical evacuation or transport. Doorknock teams will be provided as follows:

a. **Moree.** Police, NSWFB, RFS, SES personnel and Service Clubs members not already committed to other aspects of flood operations plus Mehi Crescent and Stanley Community Leaders as appropriate working at the direction of the Moree SES Unit Controller.

b. **Boomi.** SES Flood Wardens and RFS personnel working at the direction of the Boomi SES Unit Controller.

c. **Mungindi.** Mungindi RFS and Mungindi Lions Club personnel working at the direction of the Mungindi SES Unit Controller.

d. **Weemelah.** Volunteers working at the direction of the Mungindi SES Unit Controller.

e. **Boggabilla.** Boggabilla RFS personnel working at the direction of the Boggabilla SES Unit Controller.

f. **Toomelah.** Toomelah Community Leaders working at the direction of the Boggabilla SES Unit Controller.

g. **Pallamallawa.** Pallamallawa RFS personnel working at the direction of the Pallamallawa Police Sector Commander.

h. **Binniguy.** Volunteers working at the direction of the Moree SES Unit Controller.

i. **Garah.** Volunteers working at the direction of the Garah SES Unit Controller.

j. **Terry Hie Hie.** Volunteers working at the direction of the Moree SES Unit Controller.

23. **Reporting.** 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.

24. **Content of Evacuation Warnings.** A template guide to the content of evacuation warning messages is at Annex E. These are disseminated via:

a. The radio and TV stations listed in Annex D.

b. Door-knocks by emergency service personnel.

c. Public address systems from emergency service vehicles.

d. Telephone.

e. Two-way radio.

f. Direct access to 2VM/NowFM and ABC Local Radio.

g. SES Flood Bulletins.

Phase 2 – Withdrawal

25. **Introduction.** Withdrawal involves the actual removal of the community/individuals from dangerous or potentially dangerous areas to safer areas.

26. **Movement.** Evacuees are to be encouraged to move using their own transport where possible. The Moree Plains SES Local Controller will arrange transport for those people without their own vehicles.

27. **Evacuation Routes.** In the event of widespread major flooding road movement is severely restricted. There is an extensive network of airfields suitable for use by light aircraft across the shire and evacuees from many of the outlying centres can be moved by air into Moree and on from there if necessary. In worst case scenarios evacuees can be moved by road using high clearance vehicles.

28. **Mungindi.** Mungindi is protected by ring levees on both sides of the river. The levee on the Queensland side does not however protect the Mungindi Hospital. The first evacuations from Mungindi usually involve patients from the hospital who are transported to St George in Queensland before the failure of its septic system. The hospital has its own septic system that is inundated at about 8m. The hospital has 20 beds and the patients are usually evacuated to St George before the Mungindi – St George road is closed by floodwaters (about 7.7m on the Mungindi gauge). In the event of a levee failure or evidence of an overtopping event the residents of Mungindi will be moved by high clearance 4WD vehicles to the Mungindi airport and then evacuated by air to Moree.

29. **Caravan Parks.** The Elanbe Caravan Park in Boggabilla and the Mehi River Resort and Caravan Park in Oak Street Moree are both flood liable.

a. **Boggabilla**. Caravans from the Elanbe Caravan Park will be moved to high ground along the Newell Highway adjacent to the grain silo to the south of Boggabilla.

b. **Moree**. Caravans and cabins from the Mehi Caravan Park will be relocated to the PCYC paddock in Boston Street or the Gwydir Air paddock at the airport. Council plant will assist with the movement of the cabins.

30. **Vehicle Parking.** In major floods flood-affected residents will be advised to move their vehicles to higher ground as follows:

a. **Boggabilla.** The Shell Truck Stop at Boggabilla is located on high ground and can accommodate 30 – 40 heavy vehicles during periods of major flooding.

b. **Garah**. Vehicles can be parked on the high ground and along the railway embankment in the vicinity of the Garah Hotel.

c. **Moree**. A secure vehicle compound will be established in the old railway yard in Warialda Street.

31. **Special Needs Groups.**

a. **Boggabilla**. Elderly and/or infirm residents are evacuated to the Goondiwindi Hospital before inundation begins. The Boggabilla SES Unit Controller maintains a list of vulnerable residents in and around Boggabilla.

32. **Animals.** 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. 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. NSW Agriculture will make separate arrangements for the evacuation and care of companion animals.

33. **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 Local Emergency Management Operations Controller who will arrange for Police to ensure their evacuation.

34. **Security.** The NSW Police will provide security for evacuated areas.

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

a. **Garah**. At the railway crossing on the northern side of the village.

b. **Moree**. Boughton Oval.

Phase 3 – Shelter

36. **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 Moree Plains SES Local Controller but managed as soon as possible by the Department of Community Services. Any or all of the following sites may be used as evacuation centres or assembly areas:

a. **Boggabilla.**

- Boggabilla Campus of the New England Institute of TAFE.
- St Marys Hall, Goondiwindi.

b. **Boomi.**

- Boomi Community Hall.

c. **Garah**.

- Garah Primary School.

d. **Moree**.

- The Police Community Youth Centre in Boston Street, MOREE.

- Moree Secondary College, Carol Avenue Site, Boston Street, MOREE.

e. **Mungindi**.

- Mungindi Hall.

37. **Action on arrival.** On arrival, evacuees will be registered, medically checked (if necessary) and provided with their immediate welfare needs.

38. **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 HQ of the Barwon Local Area Command by the quickest means available.

Phase 4 – Return

39. Once it is considered safe to do so, the Moree Plains 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.

40. The return will be controlled by the Moree Plains SES Local Controller and may be conducted, at his/her request, by DoCS.

ADMINISTRATION AND LOGISTICS

41. **Transport and storage.** Transport and storage of furniture from flood threatened properties will be arranged as time and resources permit.

42. **Support provided at evacuation centres.** 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.

43. **Animal shelter compounds**. Animal shelter compounds will be set up for the domestic pets and companion animals of evacuees. These facilities will be operated by [Nominate agency] at [List location of facilities].

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

General

1. The Mehi River Resort and Caravan Park in Oak Street Moree and the Elanbe Caravan Park in Boggabilla are flood liable.

Advising Procedures

2. Caravan Park proprietors will ensure that the owners and occupiers of caravans are:

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

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

- providing the manager with a key; in a sealed envelope; to the van;
- providing a contact address and telephone number;
- informing the manager if a vehicle will be required to relocate the van during flood time; and
- leaving 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, and
- prepare for evacuation and van relocation.

3. The Moree Plains 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; and
- 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 PCYC paddock in Boston Street or the Gwydir Air paddock Moree, or
- high ground along the Newell Highway adjacent to the grain silo to the south of Boggabilla.

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 six hours.

b. Advise the Moree Plains 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 Moree Plains SES Local Controller when the evacuation of the caravan park has been completed.

e. Provide the Moree Plains SES Local Controller with a register of people that have been evacuated.

Return of Occupants and Vans

7. The Moree Plains 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 REQUIREMENTS AND OPERATIONS

Situation

1. During periods of flooding; towns, villages and rural properties in the Moree Plains 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 Moree and the surrounding areas are the Newell, Gwydir and Carnarvon highways. All 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 Moree Plains 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.

Mission

4. 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

5. **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.

6. **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 Moree will be coordinated by North West SES Division using aircraft operating out of Sydney or Brisbane. From there, the Moree Plains SES Local Controller will coordinate the delivery of these supplies to outlying areas via the most practicable method.

7. **Normal Supply Arrangements**.

   a. **Moree**. Storekeepers in Moree normally source their supplies from Sydney or Brisbane. These stores are usually delivered by road transport using the Newell Highway.

   b. **Mungindi**. With the exception of dairy products, everything comes from Queensland via St George. Normal commercial arrangements

exist whereby daily supplies are sourced from Brisbane, Toowoomba and/or Goondiwindi and transported by road via the Moonie, Barwon and Carnarvon highways. A big flood on the Moonie River can close the Carnarvon highway at Thallon (QLD). The town has its own bakery and dairy products and newspapers are sourced from Moree. Australia Post normally services Mungindi from Moree.

c. **Boggabilla**. Normal supplies are sourced from Brisbane, Toowoomba and/or Goondiwindi.

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

a. **Newell Highway.** The Newell Highway links Moree to Melbourne, Sydney, Dubbo and Narrabri to the south and Boggabilla and Goondiwindi to the north.

b. **Carnarvon Highway.** The Carnarvon Highway links Moree to Ashley, Garah, Weemelah, Mungindi and St George (Queensland).

c. **Gwydir Highway**. The Gwydir Highway links Moree to Collarenebri and Walgett to the west and Biniguy, Pallamallawa to Inverell to the east.

d. **Barwon Highway**. The Barwon Highway is in Queensland and runs east to west from Goondiwindi and links up to the Carnarvon Highway at Nindigully about 60km north of Mungindi.

e. **Moonie Highway**. The Moonie Highway is in Queensland and runs from east to west from Moonie to St George.

The majority of these highways are susceptible to closure during periods of major flooding. However, the magnitude and location of the flooding will dictate whether some all of the highways will be closed. It is possible for the northern parts of the shire to be affected by major floods whilst the southern parts are not or vice versa. In severe floods such as those experienced in 1955 and 1976 it is not unusual for all of the highways to be closed. The depth and velocity of the flooding is such that it is often possible for high clearance trucks and 4WD vehicles to get through for emergency purposes. For example, in the past it has been possible for trucks and 4WD vehicles to make the journey into Mungindi via the Moonie and Carnarvon highways.

9. **Pre-Stocking**. If flood predictions indicate that areas are likely to become isolated, the Moree Plains SES Local Controller will advise businesses (normally through the Moree Plains Shire Council) and, where possible, rural residents that they should stock up.

10. **Dependency.** Almost all of the towns and villages in the Moree Plains Shire will require resupply during periods of major flooding. Many rural residents living along the watercourses can be isolated for a week or more during most floods and tend to be self-sufficient. Some of the larger cotton, cattle and broad-acre farms are

well resourced and many have their own airstrips and some even operate helicopters. However, in large-scale major flood events it is estimated that several hundred rural residents will require resupply. This will most likely be by air, predominantly helicopters.

11. **Resupply Procedures**. As far as possible, the normal means of resupply will continue. Depending upon the level of flooding on the Moonie and Weir rivers Boggabilla and Mungindi will continue to be resupplied by road from Queensland. 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 designated distribution points within the Moree Plains Shire Council area 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 air using both fixed wing and rotary wing aircraft.

12. **Resupply Arrangements for Toomelah**. The aboriginal community at Toomelah is serviced by the Toomelah Cooperative General Store, which obtains its supplies from the Goondiwindi Cooperative. During periods of isolation, the residents of Toomelah will place their order with the Toomelah Cooperative General Store, which will make arrangements with the Goondiwindi Cooperative for the supplies to be delivered to the Boggabilla Police Station. The Boggabilla SES pick the stores up and, in the company of an Aboriginal Liaison Officer, deliver them to the Toomelah Cooperative General Store. Payment will be by EFTPOS.

13. **Vetting Committee**. When isolation occurs the SES may establish a vetting committee to ensure that only essential goods are ordered. The committee will consist of representatives from the SES, Moree Plains Shire Council, Police, DoCS, retailers 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. **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.

17. **Hospital Linen and Medical Stores.** The SES will arrange for the delivery and resupply of linen and other medical stores (including oxygen bottles).

18. **Pharmaceutical Supplies.** Pharmaceutical and medical supplies are sourced from Orange. The procedure for the resupply of prescription medicine to isolated communities is outlined in the following flow chart:

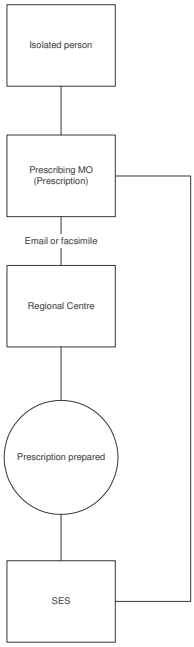


Figure 8 - Resupply of Pharmaceutical Supplies and Prescription Medicine

19. **Resupply of Isolated Properties**. There are at least 200 rural properties that require resupply during periods of flooding. The 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 their servicing SES Unit Controller to ensure that the items they seek are essential to their well being or livelihood. The Moree Plains SES 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:

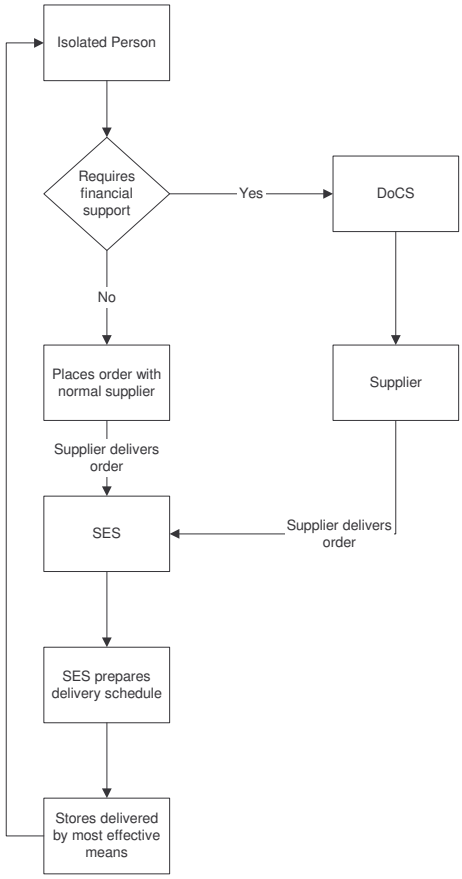


Figure 9 - Outline of the resupply arrangements for isolated properties

20. **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.

21. **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.

22. **Air Resupply.** When isolation by road is predicted, the Moree Plains Local Controller will liaise with the North West SES Division Controller who will make arrangements with the SES State Headquarters for air resupply. If air resupply is authorised the concept is that a loading point will be established at Dubbo, Sydney or Brisbane. Suppliers will be responsible to pack and deliver the approved stores to a nominated loading point from where it will be delivered to Moree by fixed wing aircraft operating on scheduled flights. From Moree the stores will be delivered to the retail outlets in Moree or transhipped to either light aircraft or helicopters for delivery to the outlying villages and communities in accordance with pre-determined delivery schedules.

ANNEX I - DETAILS OF EMERGENCY ACTIONS FOR COPETON DAM

Introduction

1. Although Copeton Dam is currently in good condition, it is recognised that an unsafe or emergency condition could occur at any time due to extreme natural events. Failure from a cause not related to extreme natural events is always a possibility although the risk is extremely low. The two most likely causes of dam failure would be due to:

a. extreme flood levels overtopping the embankment; or

b. a "sunny day failure" (i.e. not induced by an inflow flood) resulting from a rapidly deteriorating structural deficiency such as may be induced by an extreme earthquake, internal erosion, landslide or sabotage.

2. Copeton Dam is estimated to be able to withstand a flood volume up to 65-80% of that in the PMF (Probable Maximum Flood) at the dam site. However, it should be noted that this would result from an extreme event with a probability of about 1:25,000 AEP. The flow in such a flood would be vastly greater than has ever been recorded there and would be extremely rare.

3. If a failure were to occur the effects would be very severe and result in a flood of extreme proportions in the Gwydir River. The flood would be of great severity to Bingara, Pallamallawa, Biniguy, Moree and the rural areas in between. Under such circumstances, the Moree Plains local government area would experience its worst flooding in recorded history with the highest known flood being exceeded by metres.

Emergency Action

4. The prime means of detecting the development of a potential emergency condition is through the daily visual inspection of the dam by the Officer-in-Charge, Assistant Officer-in-Charge, and inspection and monitoring activities of the Asset Services Branch, State Water.

5. The Dam Safety Emergency Plan (DSEP) details two emergency actions—Action 1 and Action 2.

Action 1

6. Action 1 is known as the Emergency Action and is used to advise appropriate emergency services and authorities of a potential dam failure due to:

a. uncontrolled seepage through the embankment, abutments or foundations;

b. cracking or instability of the embankment caused by earthquakes or other factors;

c. the flooding and storage level reaching 575.4m AHD with an expectation that it will exceed RL 577.532m AHD; or

d. rapid and massive progression of spillway outlet channel erosion towards gate structure.

7. When Action 1 is activated, the SES is to make the necessary arrangements to evacuate at risk residents without delay. The extreme flood event that would cause a flood-induced failure would mean that many downstream residents should already have been evacuated before Action 1 is reached.

Action 2

8. Action 2 is activated when a significant incident occurs but immediate dam failure is unlikely and does not pose immediate danger. Action 2 may be activated because of significant incidents such as:

a. slips, cracking, increase in turbidity or volume of seepage flow or earthquake;

b. storage level reaches RL 575.40m AHD;

c. major electrical or mechanical equipment failure or damage;

d. erosion of spillway outlet channel; and/or

e. sabotage or terrorist action (e.g. bomb threat).

9. The main aim of Action 2 is for the dam staff to closely monitor the condition of the dam and implement preventative measures to return it to a safe condition as soon as possible.

Flood Operation

10. Under normal conditions, the operation of the storage is controlled from the dam. During flooding events, the dam will be continuously manned and dam staff will receive instructions for operating the spillway gates from the Manager, Management Systems Unit. The Duty Officer, Copeton Dam will keep the SES informed of the discharge through the spillway and ensure that the following alerts are be sent:

Water Level (metres AHD)	Alert or Action
Storage exceeds RL 572.655m.	Flood passing through the spillway
Storage reaches RL 575.4m.	Flood has reached the spillway design level—implement Emergency **ACTION 2**.

Water Level (metres AHD)	Alert or Action
Storage reaches RL 575.4m and is expected to exceed RL 577.532m.	Flood will exceed the spillway design level—implement Emergency **ACTION 1**.
RL 577.532m.	Storage at Embankment Design Crest Level (critical safety level)—Imminent Failure Flood Level.

Figure 10 - Copeton Dam Alerts

Inundation Area

11. **Introduction.** For the case where dam failure is brought about by an extreme flood, there would already be unprecedented flooding downstream of the dam due to spillway discharge and flow in the Gwydir River. Downstream flood inundation could occur as the result of a failure due to extreme flood or a “Sunny Day” failure.

12. **Failure Due to Extreme Flood.** It is extremely unlikely that a flood would occur that would overtop the Copeton Dam Main Embankment and lead to dam failure by erosion of the dam’s crest and downstream face. An overtopping failure may occur if an extreme flood event overtops the dam embankment because the spillway cannot cope with the flood flow involved. However, before this form of failure occurs, considerable areas of the downstream valley will already be inundated by river flood flow and emergency authorities would be either on standby or in action due to the flood. It is possible, though unlikely, that during an extreme flood, erosion of the spillway outlet channel could migrate back to the spillway concrete gate structure and undermine it leading to its failure. If this were to occur, storage release would be limited to the depth of erosion at the gate structure.

13. **"Sunny Day" Failure.** In the unlikely event of the dam failing under normal inflow conditions, downstream flood inundation would result from water held in the storage. It is extremely unlikely that any earthquake-induced settlement of the dam would exceed the height of the flood mitigation storage plus freeboard. However it is likely that some of the dam's ancillary structures may be severely damaged by an extreme earthquake. A non-flood failure may occur due to an incident when the reservoir is at normal operating levels. In this scenario, all downstream inundation is due to the dam failure event. "Piping" erosion through the embankment or its foundations and earthquake are possible causes of a non-flood failure. The non-flood failure is considered to have the most potential for loss of life as it is likely to occur when there are no flood warnings and hence emergency services are not on standby and the public is unprepared.

14. **Inundation Mapping.** Dam break flood inundation mapping is available for Copeton Dam and information on flood depths, velocities and travel times at various locations is recorded in the Dam Safety Emergency Plan for Copeton Dam held at North West SES Division and State Headquarters. It should be noted that the travel time listed therein relates to only one component of the lead-up time before downstream flooding commences, and therefore of the possible warning time. The other components are listed below:

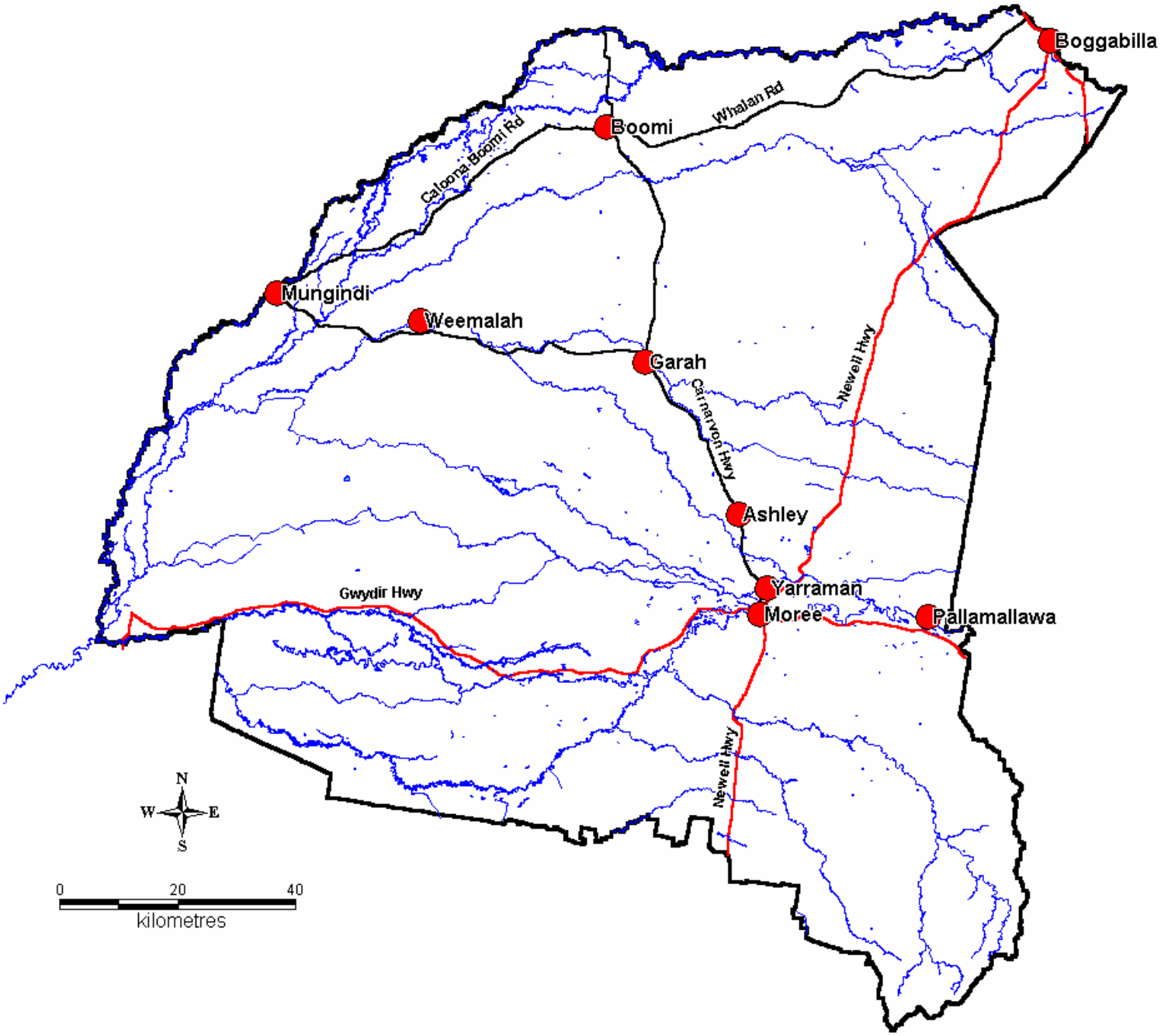
a. Rainfall duration, flood travel times upstream of the storage, and time to fill the storage (for flooding cases).

b. The lag time between the occurrence of an extreme earthquake and initiation of a consequential dam failure.

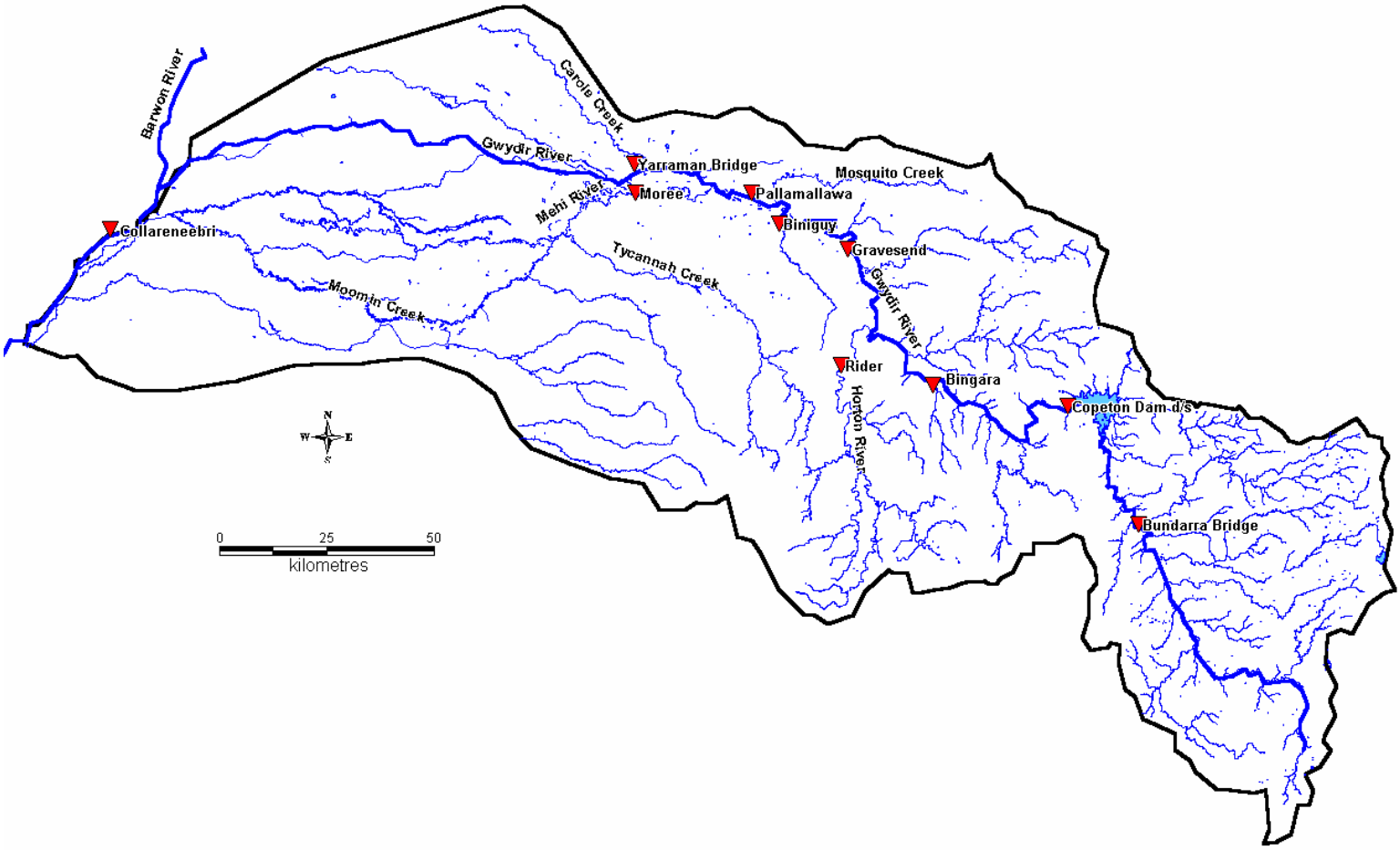
c. For other events not related to natural flooding, the lag between first observing a problem, and its development into a dam failure event.

15. **Effects of Dam Failure Flooding.** Severe flooding would also be likely to damage electricity supply facilities in the area resulting in loss of power, put telephone facilities out of action and to cut off evacuation routes. It should be noted that dam break resulting from extreme rainfall would be preceded by flooding many times more destructive than from a flood equivalent to the flood of record in the Gwydir Valley. Consequently, it can be assumed that vast areas downstream of Copeton Dam would already have been evacuated.

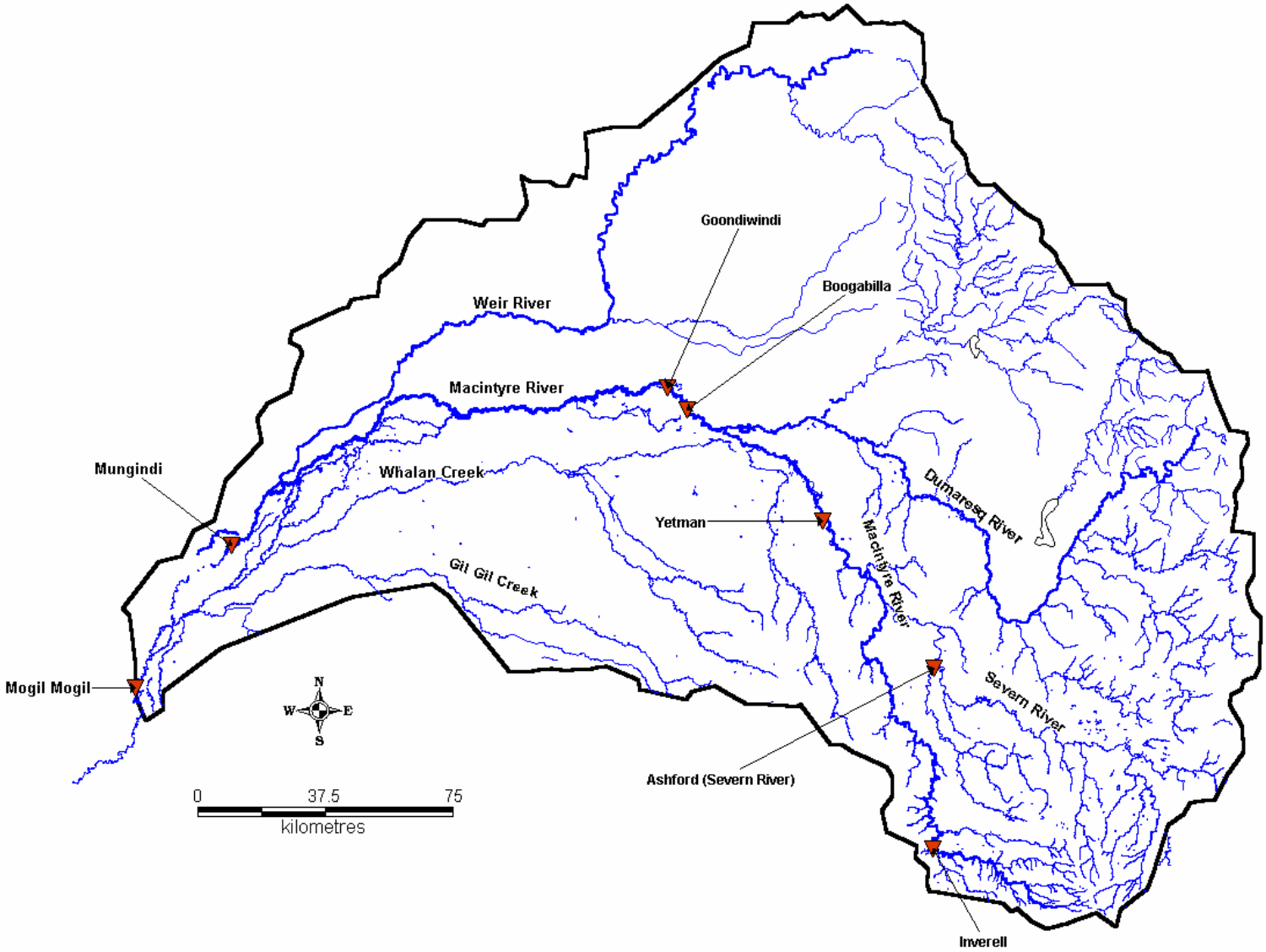
MAP 1 - MOREE SHIRE COUNCIL AREA



MAP 2 - GWYDIR RIVER CATCHMENT AND RIVER GAUGES



MAP 3 - BARWON RIVER CATCHMENT AND RIVER GAUGES



MAP 4 - SES OPERATIONAL SECTORS MOREE PLAINS COUNCIL AREA