NSW STATE EMERGENCY SERVICE

Lithgow City

Local Flood Emergency Sub Plan

FloodSafe

LITHGOW CITY FLOOD EMERGENCY SUB PLAN

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

Volume 1 of the Lithgow City Flood Emergency Sub Plan

Endorsed by the Lithgow Local Emergency Management Committee

20 November 2024
Version 3.0

AUTHORISATION

The Lithgow City Flood Emergency Sub Plan is a sub plan of the Lithgow City 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: Joshua Clark.

Date: 20/11/2024.

Endorsed

Signature: _____

Chair, Local Emergency Management Committee

Print Name: JONATHON EDGECOMBE

Date: 20/11/24.

VERSION HISTORY

Version Number	Description	Date
1.0	City of Lithgow Local Flood Plan	May 2001
2.0	Lithgow City Local Flood Plan	September 2014

AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

Manager Emergency Planning
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Amendments in the list below have been entered in this plan.

Amendment Number	Description	Updated by	Date

DISTRIBUTION LIST

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

CONTENTS

1 OUTLINE AND SCOPE

1.1 PURPOSE

1.1.1 The purpose of this plan is to set out the multi-agency arrangements for the emergency management of flooding in the Lithgow City 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 Lithgow City Local Emergency Management Plan (EMPLAN) and is endorsed by the Local Emergency Management Committee (LEMC).

1.3 ACTIVATION

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

1.3.2 The Lithgow City 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 Lithgow City LGA. The Lithgow City 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 Western Zone and for emergency management purposes, is part of the Central West Emergency Management Region.

1.4.3 The plan sets out the Lithgow City level emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Lithgow City 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 Lithgow City are detailed within this plan, Appendix B and Appendix C.

1.7.3 Any agency with agreed responsibilities in this plan which 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 and/or the NSW SES Western Zone office (for regional level responsibilities outside of response operations).

1.8 PLAN MAINTENANCE AND REVIEW

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

a. Ensuring that all supporting emergency services and Functional Areas, organisations and officers mentioned in it are aware of their roles and responsibilities.

b. 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 The NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Lithgow City LGA.

2.1.2 Declared dams in or upstream of the Lithgow City Local Government Area.

Dam Name	Owner	High Risk Dam
Lithgow Dam No.1 (Farmers Creek)	Lithgow City Council	No
Lithgow Dam No. 2 (Farmers Creek)	Lithgow City Council	No
Lyell Dam	Energy Australia NSW	No
Pipers Flat Dam	Centennial Coal	Not a declared dam
Rydal Dam	Water NSW	No
Sawyers Swamp Creek Ash Dam	Generator Property Management Pty LTD	No
Thompsons Creek Dam	Energy Australia NSW	No
Wallerawang Dam	Greenspot Wallerawang Pty Ltd as Trustee of the Greenspot Wallerawang Unit Trust	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. The 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. The 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. The 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. The 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.

b. The NSW SES will provide advice, support, technical resources and training for NSW SES representatives to contribute effectively on local Floodplain Risk 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 (CMGs) 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 the NSW SES.

4.3 FLOOD INTELLIGENCE SYSTEMS

4.3.1 **Strategy**: The 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. The 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. The 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 the NSW SES on alert levels and messaging. Alert level definitions are listed in the Dam Emergency Plans.

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

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

- Utilising flood intelligence data.
- Developing warning and flood information products.
- Continuously reviewing warning and flood information products.
- Consulting with affected communities, key stakeholders, Dam Safety NSW and the NSW and ACT Flood Warning Consultative Committee and maintains Operational Readiness.
- Participating in the development of public information and warning systems.

h. Gauge owners adequately maintain flood warning gauges and systems, including those identified in the 'Service Level Specification' maintained by the Bureau of Meteorology (Bureau) and those identified in the 'Provision and Requirements for Flood Warning in New South Wales's maintained by the NSW SES.

4.5 BRIEFING, TRAINING AND EXERCISING

4.5.1 **Strategy**: Ensure the 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. The NSW SES will consult stakeholders throughout the development of plans.

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

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

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

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

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

c. The NSW SES State 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. The NSW SES will operate Incident Control Centre(s) as required.

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

- Control resources from the NSW SES and coordinate resources of supporting emergency services and Functional Areas.
- Manage incident 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 the NSW SES and supporting agencies or Functional Areas in accordance with the local EMPLAN.

Actions:

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

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

c. Where possible Emergency Operation Centres are to be co-located with the 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. The NSW SES may request resources and logistics support directly from a supporting emergency service or Functional Area.

c. Wherever possible, supporting organisations are to provide their own logistic support in consultation with the 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 the 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. The 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 the NSW SES. This may occur post impact and continue into the recovery phase.

e. The NSW SES may request the Engineering Services Functional Area 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 the after-flood report.

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

Action: The 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 the NSW SES and communities (where appropriate).

c. The NSW SES Incident Controllers will issue the following the NSW SES Flood Warnings aligning to the Australian Warning System:

- Advice
- Watch and Act
- Emergency Warning

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

e. The NSW SES provides alerts and deliver flood information to affected communities using a combination of public information.

f. The 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 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 the NSW Police Force where required to provide information regarding evacuees and emergency information. Contact details will be broadcast once the centre is established.

i. The Disaster Welfare Assistance Line will be established by the Disaster Welfare Services Functional Area 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: The 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. Lithgow City 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. The NSW Police Force may close and re-open roads but will normally only do so (if the Lithgow City Council or Transport for NSW have not already acted and if public safety requires such action.

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

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

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

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

5.7 PROTECTION OF ESSENTIAL SERVICES

5.7.1 Local and Region EMPLANs 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 Lithgow City Council will keep the NSW SES informed of the status of utilities and infrastructure.

5.8 EVACUATION

5.8.1 Evacuation is the NSW SES' 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. The NSW SES will consider the following in evacuation decisions:

- Duration of evacuation.
- Characteristics of the community.
- Numbers requiring evacuation.
- Availability of evacuation routes and transport.
- 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. The 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 the NSW SES policies and procedures, and consistent with the NSW Evacuation Management Guidelines.

e. Potential Evacuation Centres are located in the Local EMPLAN.

f. The 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. The 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 the NSW SES and Welfare Services Functional Area.

f. School administration offices (government and private) will coordinate the evacuation of schools in consultation with the NSW SES and the Welfare Services Functional Area, 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 the NSW Police Force.

5.9 EVACUEE MANAGEMENT AND WELFARE

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

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

Actions:

a. The 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. The 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 the NSW SES in the temporary closure of schools and will coordinate with the NSW SES, the Transport and Welfare Services Functional Areas in the management of school evacuees.

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

e. The 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 State Emergency Operations Controller (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 the NSW SES and SEOCON in consultation with members of the State Emergency Management Committee (SEMC).

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 and assessment of animals the humane destruction and disposal of affected animals and the supply of emergency fodder and water (with aerial support where necessary).

5.10 FLOOD RESCUE

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

Actions:

a. The 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. The NSW SES may request other supporting emergency services to undertake flood rescues on behalf of the NSW SES. Agencies must be authorised/accredited to undertake flood rescue operations in accordance with State Rescue Board requirements, as prescribed by the NSW SES. Supporting emergency services must supply information regarding rescues

performed to the NSW SES. Notification arrangements with the 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. The 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, the NSW SES will establish loading points where retailers can instruct suppliers to deliver goods.

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

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

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

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

5.13 END OF RESPONSE OPERATIONS

5.13.1 **Strategy**: Conclude response operations.

Actions:

a. Response operations will conclude when:

- 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. The 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, the Welfare Services Functional Area and Lithgow City Council representatives.

b. The 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. The 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 the NSW SES as lead agency to transition to the 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. The 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: The NSW SES works with relevant stakeholders and Lithgow City Council 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**: The NSW SES will support recovery operations and established Recovery Committees.

6.2.2 **Actions**:

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

b. The 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. The NSW SES will provide information to the NSW Reconstruction Authority to support applications to Treasury for Natural Disaster Relief and Recovery Arrangements.

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

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

f. The NSW SES may coordinate immediate relief in collaboration with SEOCON and State Emergency Recovery Controller (SERCON).

7 ABBREVIATIONS

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

8 GLOSSARY

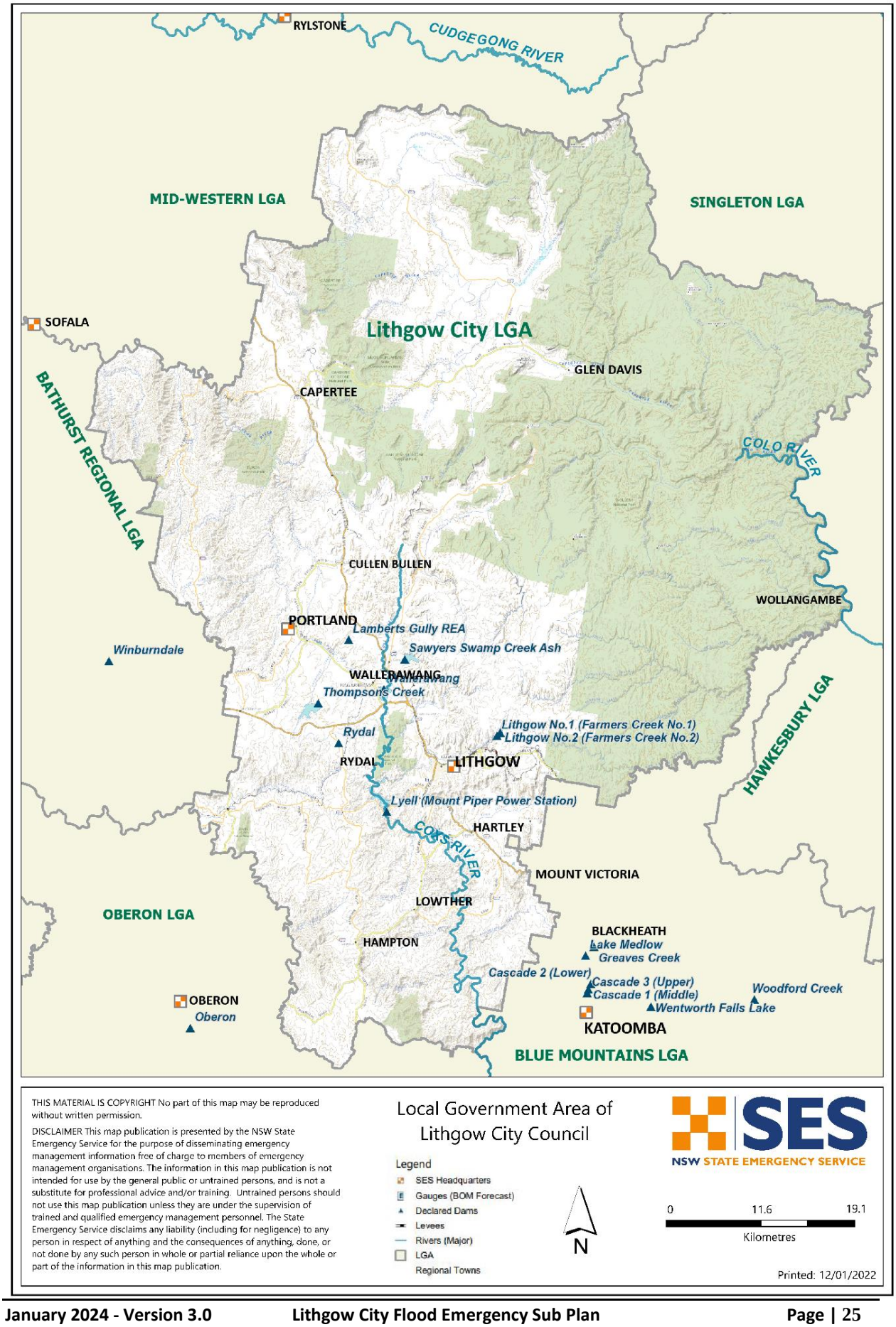
Common emergency service terminology can be found within the Australian Disaster Resilience Glossary.

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 Lithgow City Council Area



10 Appendix B – Roles and Responsibilities

AGENCY	RESPONSIBILITIES
NSW State Emergency Service	The NSW SES is the designated Combat Agency for floods, storms and tsunami and controls response operations. The 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 the Agriculture and Animal Services are outlined in the Agriculture and Animal Services Supporting Plan and NSW State Flood Plan.
Australian Government Bureau of Meteorology	The roles and responsibilities for the Australian Government Bureau of Meteorology (Bureau) are outlined in the NSW State Flood Plan.
Caravan Park Proprietor(s)	• 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 caravan park(s) by owners or by vehicles and drivers arranged by the park managers.

AGENCY	RESPONSIBILITIES
	• Secure any movable dwellings that are not able to be relocated to prevent floatation. • Inform the NSW SES of the progress of evacuation and/or movable dwellings relocation operations and of any need for assistance in the conduct of these tasks.
Childcare Centre's and Preschools	• When notified of possible flooding or isolation, childcare centres and preschools should: – Liaise with the NSW SES and arrange for the early release of children whose travel arrangements are likely to be disrupted by flooding and/or road closures. – Assist with coordinating the evacuation of preschools and 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 the 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 the NSW SES with identification of infrastructure at risk of flood damage where resources are available. • Facilitate local utility service distribution providers (electricity, gas, water, wastewater) to: – Provide advice to the NSW SES of any need to disconnect power/gas/water/wastewater supplies or of any timetable for reconnection. – Advise the NSW SES of any hazards from utility services during flooding and coastal erosion/inundation. – Advise the public with regard to electrical hazards during flooding and coastal erosion/inundation, and to the availability or otherwise of the electricity supply. – Clear or make safe any hazard caused by power lines or electricity distribution equipment. – Reconnect customers' electrical/ gas/ water/wastewater installations, when certified safe to do so and as conditions allow. – Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

AGENCY	RESPONSIBILITIES
Engineering Services Functional Area	The roles and responsibilities for the Engineering Services Functional Area are outlined in the Engineering Services Supporting Plan and NSW State Flood Plan.
Environmental Services Functional Area	The roles and responsibilities for the Environmental Services Functional Area 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 the Health Services Functional Area are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
Lithgow City 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 the NSW SES. • Maintain Dam Emergency Plans for Lithgow Dam No.1 (Farmers Creek) and Lithgow Dam No.2 (Farmers Creek) and provide copies to NSW SES. • Provide information on the consequences of dam failure to NSW SES for incorporation into planning and flood intelligence. • Maintain council-owned flood warning networks and flood mitigation works. • Participate in the NSW SES-led flood emergency planning meetings, to assist in the preparation of Flood Emergency Sub Plans. • Maintain a plant and equipment resource list for the council area. • Contribute to community engagement activities. **Response** • Subject to the availability of council resources, assist the NSW SES with flood operations including: – Traffic management on council managed roads.

AGENCY	RESPONSIBILITIES
	– Provision of assistance to the NSW SES (plant, equipment and personnel where able and requested). – Property protection tasks including sandbagging. – Assist with the removal of caravans from caravan parks. – Warning and/or evacuation of residents and other people in flood liable areas. – Provision of back-up radio communications. – Resupply of isolated properties. – Technical advice on the impacts of flooding. – Close and reopen council roads (and other roads nominated by agreement with Transport for NSW) and advise the NSW SES, the NSW Police Force and people who contact the council for road information. – Assist the NSW SES to provide filled sandbags and filling facilities to residents and business in areas which flooding is expected. • Assist with making facilities available for domestic pets and companion animals of evacuees during evacuations. • Operate flood mitigation works including critical structures such as detention basins and levees and advise the NSW SES regarding their operation. • Manage and protect council-owned infrastructure facilities during floods. • Provide advice to the NSW SES and the Health Services Functional Area during floods about key council managed infrastructure such as sewerage treatment and water supply. • Advise the Environmental Protection Authority of any sewerage overflow caused by flooding. • Work with the NSW SES and NSW Department of Planning and Environment to collect flood related data during and after flood events. **Recovery** • Provide for the management of health hazards associated with flooding including removing debris and waste. • Ensure premises are fit and safe for reoccupation and assess any need for demolition. • Provide services, assistance and advice to the State Government in accordance with the State Recovery Plan.
Local Emergency Operations Controller (LEOCON)	• Monitor flood operations. • If requested, coordinate support for the NSW SES Incident Controller.

AGENCY	RESPONSIBILITIES
Local Emergency Management Officer (LEMO)	• If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.
Manly Hydraulics Laboratory (MHL)	The roles and responsibilities for Manly Hydraulic Laboratory are outlined in the NSW State Flood Plan.
Marine Rescue NSW	The roles and responsibilities for Marine Rescue NSW are outlined in the NSW State Flood 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 the NSW Food Authority are outlined in the Food Safety Emergency Sub Plan.
NSW National Parks and Wildlife Services	The roles and responsibilities for the NSW National Parks and Wildlife Services are outlined in the NSW State Flood Plan.
NSW Police Force	The roles and responsibilities for the NSW Police Force are outlined in the NSW State Flood Plan.
NSW Reconstruction Authority	The roles and responsibilities for the NSW Reconstruction Authority are outlined in the NSW State Flood Plan.
NSW Rural Fire Service	The roles and responsibilities for the 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 the Public Information Services Functional Area are outlined in the Public Information Services Supporting Plan and the NSW State Flood Plan**.**
State Emergency Operations Controller (SEOCON)	The roles and responsibilities for the SEOCON/SEOC are outlined in the NSW State Flood Plan**.**

AGENCY	RESPONSIBILITIES
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 the Telecommunications Services Functional Area 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 the NSW SES with the communication of flood warnings and information provision to the public through Live Traffic and Social Media according to the VMS protocols and procedures. • Assist the NSW SES with identification of road infrastructure at risk of flooding.
Transport Services Functional Area	The roles and responsibilities for the Transport Services Functional Area are outlined in the Transport Services Functional Area Supporting Plan and NSW State Flood Plan.
VRA Rescue NSW	The roles and responsibilities for the 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 the Welfare Services Functional Area 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.
Private Companies or other Organisations	**Lithgow Bus Lines, Lithgow** Assist with the provision of; • Bus transport and drivers for evacuations, resupply or commuting purposes.
Service and Sporting Clubs	**Lithgow Lions Club** - Contact Heather Fitzgerald 0407 935 671 • Assist when required within their capabilities.
Aboriginal Organisations or Groups	**Minegaan/Wiradjuri Corporation –** Aunty Helen 0484189122 • Act as the point of contact between the NSW SES and the Mingaan/Wiradjuri community. • Inform the NSW SES Lithgow Unit Commander about flood conditions and response needs. • Disseminate flood information, including flood and evacuation warnings, to the Mingaan/Wiradjuri community.
Communication	• The NSW SES Lithgow Unit Facebook page • 2LT Lithgow • ABC Central West 549AM Emergency Radio Station • Lithgow 2790 Facebook Page
Name of Farmer or Flood Warning Networks	**NSW Farmers Association** – Contact John Lowe 0427 111 133 • Provide flood information to the NSW SES Unit Commander. • Distribute flood warnings and flood information provided by the NSW SES Incident Controller.

NSW STATE EMERGENCY SERVICE

HAZARD AND RISK IN LITHGOW CITY

Volume 2 of the Lithgow City Local Flood Plan

Last Update: May 2011

FloodSafe

ANNEX A - THE FLOOD THREAT

LANDFORMS AND RIVER SYSTEMS

1. Most of the territory of the Lithgow Council area is steep, mountainous and forested. There are some areas of undulating country but very little floodplain development. The drainage pattern is complex and includes the following rivers:

    a) The **Cox's River** and its tributaries (Farmers, Pipers Flat, Marrangaroo, Thompsons and Ganbenang Creeks and River Lett) which drain the south-eastern portion of the Council area. Important tributaries of Farmers Creek include Ida Falls, Vale of Clwydd and State Mine Creeks. The Cox's River, part of the Nepean-Hawkesbury river system (Basin No 212), flows into Lake Burragorang.

    b) The **Capertee-Wolgan River** System, including the tributaries Coco, Carne, Umbeliella, Red Rock, Rocky, Tambo and Woolongambe Creeks which drain the northern and eastern portions of the Council area towards the Colo River (part of the Nepean-Hawkesbury river system) to the east.

    c) The **Turon River** and its principal tributaries, Palmers Oakey, Round Swamp and Coolamingal Creeks. These streams drain the Airly, Turon and Sunny Corner State Forests and the Great Dividing Range and Ben Bullen Range in the north-west of the Council area. They are part of the Macquarie River system (Basin No 421).

    d) The **Fish River and Solitary Creek**, which drain the south-west of the Council area west from the Great Dividing Range. The watercourses are also part of the Macquarie River system.

2. A defining characteristic of flooding within the Lithgow Council area is the speed with which floods rise and fall. Because the whole area is elevated and the streams and short and steep within the Council boundaries, flash and near-flash flooding are the norm and flood velocities are usually high. There is little warning apart from that provided by the rain which causes the floods.

A1. STORAGE DAMS

Lyell Dam (also known as Lake Lyell)

Lyell Dam is located on the Cox's River about 10kms southwest of Lithgow. The dam is owned by Delta Electricity and is a cooling water storage that supplies cooling water to Mount Piper and Wallerawang Power Stations. The spillway consists of a dual concrete ogee crest with flip bucket controller by six 3.2m high Hydroplus fusegates. The storage capacity at Full Supply Level is 33,500 ML. Downstream from the dam there are Sixteen (16) residences along the Cox's River and four (4) camping reserves at McKanes Falls, Glenroy, Murdering Creek, and Blue Mountains National Park between the Megalong Valley and Warragamba Reservoir. There is a Flood Warning System that is tested and monitored by Delta Electricity. Inspection, maintenance and operation of the dam is conducted by Delta Electricity.

Pipers Flat Dam

Pipers Flat Dam is located on the Pipers Flat Creek and is owned and operated by Centennial Coal Company Ltd. The dam is used for water storage for mining operations at Centennial Coal Colliery. The dam is of earth-fill construction with a primary concrete sill and chute spillway. The storage capacity at Full Supply Level is 816 ML. Downstream from the dam is the Pipers Flat Creek Valley which comprises of broad flood plain, and Lake Wallace (Wallerawang Dam). There is no Flood Warning System in place and inspection, maintenance and operation of the dam is conducted by Centennial Coal Company Ltd.

Rydal Dam

Rydal Dam is located about 2kms north of Rydal. The dam is operated by the Department of Public Works and Services (DPWS) on behalf of the Department of Land and Water Conservation (DLWS) as part of the Fish River Water Supply (FRWS) Scheme. The dam is an off-stream storage, which is fed by the FRWS Stage 2 pipeline main from Oberon and supplies water to Wallerawang and Mount Piper power stations. The spillway consists of an open controlled channel. The storage capacity at Full Supply Level is 370 ML. Downstream from the dam is the Solitary Creek and the village of Rydal. There is no Flood Warning System in place and inspection, maintenance and operation of the dam is conducted by the Department of Public Works and Services.

Sawyers Swamp Creek Ash Dam

Sawyers Swamp Creek Dam is located on Sawyers Swamp Creek about 12kms north-west of Lithgow. The dam is owned by Delta Electricity and stores bottom and fly ash from Wallerawang Power Station. The spillway consists of a curved broad concrete crest with 0.6m high fusible clay embankment on top.

The storage capacity at Full Supply Level is 8,500 ML. Downstream from the dam there are thirty-six (36) residences along the Sawyers Swamp Creek, the Cox's River and Lake Wallace are both downstream from the dam. There are no warning systems in place and inspection, maintenance and operation of the dam is conducted by Delta Electricity.

Thompsons Creek Dam

Thompsons Creek Dam is located on Thompsons Creek about 5kms west of Wallerawang. The dam is owned by Delta Electricity and is an off-river storage that supplies cooling water to Mount Piper and Wallerawang Power Stations. The dam is filled by pumping water through a pipeline from Lyell Dam. The spillway consists of a concrete sill. The storage capacity at Full Supply Level is 28,000 ML. There are no warning systems in place and inspection, maintenance and operation of the dam is conducted by Delta Electricity.

WEATHER SYSTEMS AND FLOODING

3. Most parts of the Lithgow City Council area have an average annual rainfall of between 700 and 800mm. This rainfall is distributed in a fairly uniform manner across the seasons, but there are tendencies towards higher flood frequencies in the February-April and June-August periods than at other times of year. Almost all of the severe flood events recorded have been in these periods.

4. These main types of weather regime can produce flooding within the area:

   a) In summer, deep depressions moving south from tropical regions can bring very high daily precipitation totals leading to flooding. Such intrusions are not annual events, however, and flooding from this mechanism is not common.

   b) More often, high-intensity, short-duration convective thunderstorms occur in summer and bring flooding to limited areas. Such storms are concentrated in the November-March period and may cause town and village drainage systems to surcharge and small creeks to flood. They rarely cause pronounced rises in major streams, however.

   c) Winter floods tend to be the result of sequences of troughs associated with southern depressions and crossing the council area from west to east. These systems rarely produce very high daily rainfalls but they can bring substantial falls over longer periods.

5. Most flooding within the council area has followed periods of extended wet weather. A local rule of thumb in the valley of Farmers Creek is that rainfall of 100 mm in three days or less creates a significantly increased probability of

flooding if further rain occurs. Heavy daily falls not occurring on already wet catchments can cause flooding but frequently do not.

6. Detailed records of flooding within the council area are few except for the urban centre of Lithgow. It is known, however, that flooding is irregular on all streams, with long virtually flood -free periods separated by shorter periods of frequent and sometimes severe flooding. The 1986 flood at Lyell Dam is estimated to have been a once-in-100 years (1%) event; that is, a flood of the severity of this event would be expected to have only a 1% chance of occurring at the dam in any single year.

FLOODING ON FARMERS CREEK

7. Historically, the most damaging floods to occur in the council area have been on those on Farmers Creek within the urban centre of **Lithgow**. This creek has a catchment of only 50 square kilometres at Lithgow and a valley floor less than 300 metres in width. The valley is subject to heavy, short-duration storms which are often extremely localised. Damage may occur in areas distant from Farmers Creek itself, including the **Vale of Clwydd, Doctors Gap** and the valley of **State Mine Creek** as a result of these thunderstorms.

8. Built-up land along a 5.5 kilometre stretch of this creek is subject to inundation in events no more severe than those which occur, on average, about once five years. Flood severity has been worsened by human activity, large areas of the creek's floodplain having been filled to create ovals and reserves, and these act to constrict flood flows and raise flow velocities. Velocities of more than 3 metres per second have been recorded in the steeper, narrower sections and even in lower parts of the valley flows can be at rates of over 2 metres per second. Heavy rain associated with flooding periodically creates landslides in the hills around the town.

CHARACTERISTICS OF FLOODING

1. Historically, the most damaging floods to occur in the council area have been those on Farmers Creek within the urban centre of Lithgow. This creek has a catchment of only 50 square kilometres at Lithgow and a valley floor less than 300 metres in width. The valley is subject to severe, short-duration thunderstorms which are often extremely localised. Damage resulting from these storms may occur in areas distant from Farmers Creek itself, including the Vale of Clwydd, Doctors Gap and the valley of State Mine Creek.

   Built-up land along a 5.5 kilometre stretch of this creek is subject to inundation in events no more severe than those which occur, on average, about once in five years. Flood severity has been worsened by human activity; large areas of the

creek's floodplain have been filled in to create ovals and reserves, and these act to constrict flood flows and raise flow velocities. Velocities of more than 3 metres per second have been recorded in the steeper, narrower sections and even in the lower parts of the valley flows can be at rates of over 2 metres per second. Heavy rain associated with flooding periodically creates landslides in the hills around the town.

FLOOD HISTORY

9. On Farmers Creek the record of major floods causing inundation of residential property is incomplete but the following events are known to have occurred:

Month, Year	Average Recurrence Interval (years)	Annual Exceedence Probability (%)	Impacts
Feb-28	Not known		Very severe, widespread damage; water broke through colliery roof.
Jun-63	Not known		Roads cut.
Jun-64	Not known		Roads cut; water broke through colliery roof.
Mar-78	14	7	Caused landslides, extensive damage to cars, houses and roads.
Feb-81	Not known, but possibly similar to Feb 1990 event.		
Oct-83	Not known		Hail and torrential rain – local drainage problems caused widespread damage to cars, houses, businesses, and roads. Farmers Creek rose 2 metres in 30 minutes.
Aug 1986*	5-Oct	Oct-20	Heavy rain, snow and ice. Houses/businesses inundated from Farmers Creek and local drainage problems. Widespread damage.
Feb-90	1-Feb	50-90	Heavy rain – 36mm falling in 35 mins. About 50 houses/businesses suffered flood damage from Farmers Creek and local drainage problems.
April, 1990	Not Known		Heavy rain and hail. Houses/businesses inundated from Farmers Creek and local drainage problems. Road closures. Landslips.
Aug-90	Not Known		Heavy rain and hail – 112mm falling in 24 hour period. Houses/businesses inundated from Farmers Creek and local drainage problems. Road closures. Landslips. Glen Davis, Wolgan Valley, Kanimbla Valley isolated.
Jan-06	Not Known		Heavy rain – 63mm < 1 hour. Less than 10 houses/ businesses threatened or inundated from Farmers Creek and local drainage problems.

Jan-08	Not known	Heavy rain – 50mm < 1 hour. Less than 10 houses/ businesses threatened or inundated from Farmers Creek and local drainage problems. Heavy rain and hail. Less than 10 houses/businesses threatened or inundated from Farmers Creek and local drainage problems.
	Not known	Very severe, widespread damage; water broke through colliery roof.

10. * At this time there was also major flooring on most of the other streams of the council area, including the Fish, Turon and Cox's Rivers.

11. Note: A flood of a particular Annual Exceedance Probability has that % chance of occurring in any one year. The Annual Recurrence Interval is the average length of time which is estimated to elapse between floods of a given magnitude or greater. A 14% flood is expected to occur, on average, about seven times in a 100-year period. In a particular 100-year period it may occur more or less often that this.

FLOOD MITIGATION SYSTEMS

In the 1930's Farmers Creek was realigned and lined with concrete for about 2.5km from Montague Street to the Geordie Street low level crossing. This section is 1.4m deep and varies in width from 4.8m to 6.1m. Immediately upstream is a further 150m of formed channel, 2.3m deep and 11.8m wide

While various studies have been completed and recommendations made, no flood mitigation systems exist in the urban areas of Lithgow.

EXTREME FLOODING

12. The worst floods over in the Lithgow Council area since European settlement should not be considered to be the most serious which will ever occur. Floods as severe as the 1978 event in Lithgow or the 1986 event on the Cox's River will be equalled in the future and on occasions exceeded in their severity. When genuinely severe floods occur, they often reach much greater heights than was true of previous recorded floods. Moreover, they are generally both faster to rise and more dangerous in terms of depth and velocity than previously know events. An extreme flood in Farmers Creek could produce flood heights more than two metres higher than were seen in Lithgow in 1978 along with much greater inundation.

13. On the Cox's River it has been determined that an extreme flood far greater in magnitude than the record flood of 1986 in the valley could cause the Lyell Dam to fail. The dam is a 47-metre high concrete-faced rock fill embankment located seven kilometres west of Lithgow and commanding a catchment area of 380 square kilometres. In the unlikely event that failure occurred, a large volume of water would be released and would travel down the valley as a flood wave inundating large areas close to the river. The dam's owner, Pacific Power, has begun a program of works to ensure that a massive flood will not cause the dam to fail. This program is scheduled for complete in 1995.

14. Rydal Dam, a small storage on Solitary Creek (a tributary of the Fish River), is also at a very slight risk of failure. In this case failure could occur as a result of a failure. In this case failure could occur as a result of a failure of the earth embankment (perhaps after a major earthquake) or during a very severe flood.

ANNEX B - EFFECTS ON THE COMMUNITY

COMMUNITY PROFILE

Census Description	LGA	Lithgow	Portland	Wallerawang
Total Persons	19756	11298	1882	1906
Total Dwellings	7439	4553	670	690
Total persons aged 65 years and over	3038	1988	316	196
Total persons aged below 15 years	3860	2181	361	449
Total persons with a need for assistance (profound / severe disability)	1078	690	108	114
Total persons of indigenous origin	606	363	68	50
Total persons using Internet	3669	2064	287	362
Single parent families	885	620	63	79
Persons living alone	2163	1473	193	168
Total persons who do not speak English well	51	29	3	3
Total persons who lived at a different address 5 years ago	5615	3348	470	533
Households without vehicles	918	750	70	58
Total persons residing in caravans, cabins or houseboats	36	12	0	3
Mean household size	2	2	2	3

Table B-1: Census of Housing and Population data (2006)

SPECIFIC RISK AREAS - FLOOD

Large parts of the Lithgow Council area are affected by flooding, within the urban centre of Lithgow, many dwellings and businesses are liable to inundation. Outside the town, some localities are periodically isolated as a result of rises on rivers and creeks and resupply of food is required. These areas include Glen Davis, on the Capertee River, Turon Gates, a popular holiday and camping area on Turon River and the Kanimbla Valley area in the valley of the Cox's River. In farming areas, moving and feeding stock is necessary during periods of flooding.

LITHGOW

1. By far the most serious flood problems are within Lithgow, where scores of properties can be inundated when floods occur on Farmers Creek. The number of properties which have been assessed as being as being liable to over-floor

inundation in floods of different annual exceedance probabilities and average recurrence intervals is as follows:

ANNUAL EXCEEDENCE PROBABILITY	AVERAGE RECURRENCE INTERVAL (YEARS)	NUMBER OF PROPERTIES	
		RESIDENTIAL	INDUSTRIAL/ COMMERCIAL
100%	1	48	1
50%	2	87	1
20%	5	121	4
5%	20	170	9
1%	100	233	12

2. The 200-year and 500-year ARI floods are only slightly more serious in their inundation consequences than the 100-year event. In the 100-year event, some 700 people would need to evacuate from their homes.

3. The areas which are prone to inundation within the valley of Farmers Creek are identified below. Most are on the northern side of the creek.

4. Oakley Park: this is the uppermost urbanised section of Farmers Creek, and channel capacity is lower here than in downstream areas. More than 40 properties could experience over-floor flooding in the area upstream of the junction of Farmers and Vale of Clwydd creeks in a 1% flood event. The number affected in lesser events in much lower, only about 10 dwellings being inundated beyond floor level in a 20% (once-in-five-years) event.

Inundation

5. Properties likely to experience flooding of yards or buildings in a 1% flood are located in Bells Rd, Island Pde, Bragg, Brisbane, Mills, Hay and Brooks street and Victoria Ave. Part of the site of the Zig Zag Public School would also be inundated.

6. Vale of Clwydd Creek: three properties (one residential and two commercial) in the area upstream of Chifley Rd can be flooded in a 1% event. Chifley Road (the Bells Line of Road) can be closed between Hartley Valley Road and Clwydd Street.

7. Morts Estate: more than 80 properties, including several premises, could experience over-floor inundation in this area in a 1% event. About 30 of these would be flooded in a 20 % flood.

8. Properties likely to experience inundation of yards or buildings in a 1% event are located in Willes, Laidley, Atkinson, Guy, Macaulay and Montague streets and Sandford Ave on the north side of Farmers Creek and Inch, Burton, Union,

Tank and Gay streets on the south side. More than half of the properties are to the north of the creek.

9. Hermitage Flat: this is the area of Lithgow which has suffered most severely from flooding in the past. About 40% of the town's flood-liable properties are located here, more than 100 properties being likely to experience flooding beyond floor level in a 1% event. Two thirds of these are flooded in a 50% (once-in-two-years) flood.

10. The affected properties are located in Sandford Ave and Coalbrook, Stephenson, Wear, Geordie and Davey streets to the north of Farmers Creek. The Tank Street, Sandford Avenue and Alvert Street bridges are liable to closure.

11. Bowenfels: two dwellings to the south of Farmers Creek in Cooerwul Rd (the old Great Western Highway) could experience over-floor inundation.

12. South Bowenfels: the channel here is relatively large and incised, but a low-lying, flat portion of Lockyer St and Tweed Rd could be inundated in a 1% event. About 10 properties would be affected but none are expected to experience over-floor flooding in such a flood. The Cooerwall Road Bridge could be affected.

13. The flood prone community within Lithgow has the following characteristics:

    a) Most are long-term residents of Lithgow who own their own houses. Some 45 per cent have lived in their present house for more than 20 years.

    b) A significant proportion are elderly and live alone or with one other person. About half receive their income from pensions, special benefits and retirement incomes. There are few young families.

    c) Many are flood-experienced (about 40 per cent had their land inundation in the flood of February 1990) but because of their age will probably need assistance to raise belongings and/or evacuate during the onset of a flood.

Isolation

14. There is a potential for isolation of community and/or rural properties within the Lithgow area.

Dams

15. Dwellings below Lyell Dam - Seventeen dwellings within the Lithgow Council area (and a further three in the Oberon Council area and one in the Blue Mountains Council area) would be inundated in the event of a failure of Lyell Dam. An additional six dwellings are located above the expected flood height

but their occupants may need to move stock from low-lying parts of their properties.

16. It is expected that there would be difficulties associated with evacuation because of concurrent flooding on minor creeks, which would cause inundation of low-level bridges and low portions of roads.

17. About a third of the dwellings at risk are not permanently occupied. Most of these are used as weekend or occasional residences. One is utilised occasionally by a school for outdoor education and camping purposes. Of those which are permanently occupied, most contain only a couple or a single individual for the majority of the time.

18. Dwellings below Rydal Dam - three dwellings in the village of Rydal would be at risk of over-floor inundation in the event of a failure of Rydal Dam in a very severe flood. One of these would be flooded if the dam's wall collapsed for reasons other than flooding (for example because of an earthquake).

OTHER COMMUNITIEWS WITHIN LITHGOW LGA

Outside the Lithgow urban area, some localities are periodically isolated as a result of rises in rivers and creeks and re-supply of food is required. These areas include **Glen Davis**, on the Capertee River; **Turon Gates**, a popular holiday and camping area on the Turon River, **Newnes** on the Wolgan River and the **Kanimbla Valley** area in the valley of the Coxs River.

A number of rural communities can be affected by localised flooding. These include:

Community	**Population**	**Community**	**Population**
Hampton		Lowther	
Clarence	210 (2006 Census)	Hartley	
Hartley Vale	498 (2006 Census)	Little Hartley	
Kanimbla Valley	398	Tarana	
Wallerawang	542 (2006 Census)	Rydal	
Marrangaroo	292 (2006 Census)	Lidsdale	

Portland	1878 (2006 Census)	Cullen Bullen	199 (2006 Census)
Ben Bullen		Capertee	71 (2006 Census)
Dark Corner		Newnes	
Glen Davis		Glen Alice	353
Bogee	108	Emirates Resort	96 Guests & 200 Staff

Farm Inundation

In rural areas during periods of flooding, low-lying areas along creeks may become inundated, necessitating the movement of pumps, equipment and livestock to higher ground and the necessity for feeding of stock. This can be anticipated from time to time on all of the creeks in the council area.

During very severe events, small numbers of properties and some farm dwellings could be flooded necessitating evacuations.

ROAD CLOSURES

19. The following table B-2 lists roads liable to flooding in the Lithgow City area:

TOWN or LOCALITY	ROAD NAME	LOCATION(S) OF CLOSURE	ALTERNATIVE ROUTE/S	REMARKS
Capertee	Glen Davis Road	Bridge over Capertee River. Up to 12 hours		Caused by localised flooding after heavy rain
Cullen Bullen	Palmers Oakey Road	Various locations. Up to 12 hours		Caused by flash flooding after heavy rain
Hartley	Castlereagh	Lidsdale and		Caused by localised flooding

	Highway (Mudgee Road)	Cullen Bullen. Up to 12 hours		after heavy rain
Kanimbla Valley	Portland Road	Cullen Bullen. Up to 12 hours		Caused by localised flooding after heavy rain
Wallerawang **Meadow Flat**	Coxs River Road	Various locations Up to 12 hours.		Caused by localised flooding after heavy rain
	Cullenbenbong Road	Various creek crossings. Up to 12 hours		Caused by localised flooding after heavy rain
	Pipers Flat Road (Portland Road)	Thompsons Creek crossing (between Portland and Willowvale Lane). Up to 12 hours		Caused by localised flooding after heavy rain
	Sunny Corner Road	Near intersection with Great Western Highway [2 – 3 hours].	To Portland via Range Road. To Sunny Corner via Sunny Corner Road Kirkconnell.	Caused by localised flooding after heavy rain at small diameter pipe under roadway.

20. Table B-2 – Road Closures in Lithgow LGA

NSW STATE EMERGENCY SERVICE

SES RESPONSE ARRANGEMENTS FOR LITHGOW CITY

Volume 3 of the Lithgow City Local Flood Plan

Last Update: May 2011

FloodSafe

ANNEX C - GAUGES MONITORED BY THE LITHGOW & PORTLAND SES UNIT HEADQUARTERS

Gauge Name	Type	AWRC No.	Stream	Flood level classification			Special Reading Arrangements	Owner
				Minor	Moderate	Major		
Glen Davis ‡	Manual	212018	Capertee					DLWC
Turon Gates ‡	Manual	10389	Turon					SES
Lyell Dam	Manual	10222	Cox's					Pacific Power
Rydal Dam	Manual	10337	Solitary					FRWS
Geordie Street	Manual	10154	Farmers Creek					Council
Albert Street	Manual	10002	Farmers Creek					Council
Sandford Street	Manual	10340	Farmers Creek					Council
Tank Street	Manual	10364	Farmers Creek					Council
Atkinson Street	Manual	10009	Farmers Creek					Council

Table C-1: Gauges monitored by the Lithgow and Portland SES Unit Headquarters

Notes: The Bureau of Meteorology provides flood warnings for the gauges marked with an asterisk (*). SES Local Flood Advices are provided for the gauges marked with a single cross (†). The SES holds a Flood Intelligence Card for the gauges marked with a double cross (‡).

ANNEX D - DISSEMINATION OPTIONS FOR SES FLOOD INFORMATION AND WARNING PRODUCTS

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

Television Stations:

Station	Location
Capital TV	Orange
Prime TV	Orange
Win TV	Orange
ABC TV	Orange

Radio Stations:

Station	Location	Frequency	Modulation
2CR	Orange	1395	AM
2LT	Lithgow	107.9	FM
2BS	Bathurst	1503	AM
2GZ	Orange	105.1	FM

Newspapers:

Name	Location
Lithgow Mercury	Lithgow

ANNEX E - TEMPLATE EVACUATION WARNING, EVACUATION ORDER AND ALL CLEAR

Flood Evacuation Warning

[name] SES Region Headquarters

[Enter address]

Telephone: (02) [########]

Fax: (02) [########]

Issued *[day] [date]* at *[time in civilian format (am,pm)]*

Email: [#########]

Radio stations are asked to immediately broadcast this message and repeat it.

Use of the Standard Emergency Warning Signal (SEWS) with this message is authorized.

Flood Evacuation Warning for [Enter location/s]

Authorised By: [(name and operational position title)]

As a result of the flood level predicted by the Bureau of Meteorology for [***location***] at [***date/time***] the State Emergency Service recommends that residents within the nominated areas should prepare to evacuate within the next [***number***] hours.

Residents should monitor the situation and be prepared to evacuate when instructed to do so. A Flood Evacuation Order will be issued by the SES if evacuation is required.

You can choose to go to friends or relatives. Alternatively, evacuation centres will be established at [***location/s***] where you can obtain temporary accommodation and other help.

To prepare for possible evacuation you should:

- Raise belongings by placing them on tables, beds and benches. Put electrical items on top. You may be able to place light weight items in the roof space.
- Collect together medicines, personal and financial documents, mementos and photos
- If possible, check to see if your neighbours need help
- Make arrangements for care of pets or other animals, or take your pets with you when you evacuate
- Take three days' supply of clothing and medicines
- Find out where to turn off the electricity and gas
- Continue to listen to a local radio station for updates

Don't walk ride or drive through floodwaters – this is the main cause of death and injury during floods

For emergency assistance telephone the SES on 132 500

Web site: www.ses.nsw.gov.au

End SES Flood Evacuation Warning

[Enter next update and currency details]

Flood Evacuation Order

[name] SES Region Headquarters

[Enter address]

Telephone: (02) [########]

Fax: (02) [#########]

Email: [##########]

Issued *[day] [date]* at *[time in civilian format (am,pm)]*

Radio stations are asked to immediately broadcast this message and repeat it.

Use of the Standard Emergency Warning Signal (SEWS) with this message is authorized.

Flood Evacuation Order for [Enter locations]

Authorised By: [*(name & operational position title)*]

As a result of the flood level predicted by the Bureau of Meteorology for [***location***] at [***date/time***] the State Emergency Service is directing residents within the nominated areas to evacuate within the next [***number***] hours.

Do not delay your evacuation. Roads will be congested or closed. You could become trapped and need rescue. Remaining in flooded areas is dangerous and may place your life at risk.

You can choose to go to friends or relatives. Alternatively, evacuation centres will be established at [***location/s***] where you can obtain temporary accommodation and other help.

Delete as required {If you don't have a car, buses may operate where possible on normal routes. Special transport can also be provided on request if necessary, telephone [***telephone number***]}

As you evacuate you should:

- Take your important documents, mementos and photos
- Take your spare clothing and medicines
- If possible, check to see if your neighbours need help
- Turn off the electricity and gas
- Don't walk ride or drive through floodwater
- Continue to listen to a local radio station for updates

For emergency assistance telephone the SES on 132500

SES web site: www.ses.nsw.gov.au

End SES Flood Evacuation Order

This Flood Evacuation Order remains current until the All Clear has been issued

ALL CLEAR

[name] SES Region Headquarters

[Enter address]

Telephone: (02) [########]

Fax: (02) [#########]

Email: [##########]

Issued *[day] [date]* at *[time in civilian format (am,pm)]*

Radio stations are asked to immediately broadcast this message and repeat it.

All Clear for [Enter locations]

Authorised By: [*(name & operational position title)*]

[Describe the condition that justify the All Clear including any special precautions/conditions and safety advices that people must take]

The SES has issued the ALL CLEAR for [enter locations] at [time / date]. This means that it is now safe to return to [enter locations].

People with access to transport can return to their properties now.

[People who/If you] require transport assistance you should contact [insert contact details] for further information on arrangement for return.

For emergency assistance telephone the SES on 132500

SES web site: www.ses.nsw.gov.au

End SES All Clear

ANNEX F - DETAILS OF THE DAM FAILURE WARNING SYSTEM FOR LYELL DAM

The Special Lyell Dam Warning and Alarm System has been developed to warn people below the dam of potential or actual dam failure flooding. It consists of an automatic alarm system and a set of arrangements.

INUNDATION MAPPING.

1. Dam break flood inundation mapping has been prepared for Lyell Dam and is contained in the Lyell Dam Safety Emergency Plan.

MONITORING

2. The dam owner/operator is responsible for monitoring and managing any potential emergency at the dam site.

NOTIFICATION PROCEDURES

3. The primary contact for dam failure warning notification by the dam owner to the SES is the NSW SES 24hr Operations Communications Centre. The SES Operations Communications Centre will subsequently notify the Central West SES Region Headquarters Duty Officer who will contact the Lithgow SES Local Controller. An alternate NSW Police contact is available if this notification procedure was to fail.

4. A flow chart illustrating the notification arrangements for potential dam failure is shown in Annex H.

WARNING

5. Dam failure alerts are issued to SES and are used to trigger appropriate response actions. Alert levels from the DSEP for flood failure have been reproduced against SES responses. Responses escalate as the alert level migrates from white to red. The conditions that define each of the alert levels (as identified in the DSEP) are listed in Table F-1. The meaning of each alert level is as follows:

    - White: Preliminary alert to assist the SES in its preparation. This is not a public alert. It indicates a potential issue/condition has been observed at the dam and is being investigated.
    - Amber: Alert level necessitating the warning of the population at risk to prepare for evacuation.

- Red: Alert level requiring the immediate evacuation of the downstream population at risk.

6. Actions indicated as occurring at particular Alert Levels may be brought forward if the development of a flood warrants.

Alert	Defining Conditions	Min Time to Reach Alert Levels (approx)
White Alert	784.5 meters AHD. At this level, alarms will be triggered in the two control units only. The depth of water in the spillway at this level would be 2.5 metres, the resulting flood being of approximately 5% (AEP) severity. The SES Local Controller will also be phoned or paged.	
Amber Alert	784.5 metres AHD. At this level the alarms will be triggered in the two control units as well as in the residences below the dam. The depth of water in spillway at this point would be five metres and the flood would be of greater than 1% (AEP) severity. This event would be equal in severity to the record flood which occurred at the dam in 1986. The SES Local Controller will also be phoned or paged.	
Red Alert	792 meters AHD. At this level the alarms will be triggered as for the Amber alert. Water would be at the crest of the dam. This is taken as the flood level at which dam failure would begin to occur.	

Table F-1: Lyell Dam Flood Failure Alert levels

7. The SES and Pacific Power will disseminate dam failure warnings.

8. Pacific Power Staff will keep the SES informed of the details that include discharge through the spillway. The dam alerts will be activated in sequence as the storage level rises during the course of a major flood event and will be sent to the SES as they occur.

9. The following table outlines the notification, warning and evacuation arrangements for a potential failure of Lyell.

Alerts	Defining Conditions	Notification Arrangements and Actions for Lyell Dam					
		Pacific Power	SES OCC	SES Region Controller	SES Local Controller	LEOCON / Other agencies	People at risk
WHITE ALERT	784.5 meters AHD. At this level, alarms will be triggered in the two control units only. The depth of water in the spillway at this level would be 2.5 metres, the resulting flood being of approximately 5% (AEP) severity.	Advise SES Communications Centre of White Alert Level being reached and provide regular updates on the situation at the dam	Receive notification from dam operator Advise SES Region Controller Advise SEOC	Receive notification from SES SHQ Advise SES Local Controller, SES Units SES Local Headquarters Advise the District Emergency Management Officer (DEMO). Consider need for OOAA for warning and evacuation operations.	Confirm SES RHQ has been notified. Activate Local Flood Plan. Refer to Local Flood Plan for agencies to notify that the White Alert Level has been reached. (See Annex I, Dam Failure Alert Notification Arrangements Flowchart).	When requested by SES Local Controller, coordinate support	No action required. Some evacuations may be necessary due to mainstream riverine flooding.
AMBER ALERT	784.5 metres AHD. At this level the alarms will be triggered in the two control units as well as in the residences below the dam.	Advise SES Operations Communications Centre of Amber Alert Level being reached and provide regular updates on the situation at the	Receive notification from dam operator Advise SES Region Controller	Notify SES Local Controller, SES units SES LHQ. Provides SES Flood Bulletins and evacuation warnings to the media	Confirm SES RHQ has been notified. Coordinate the delivery of warnings to at-risk residents. Coordinate the	When requested by SES Local Controller, coordinate support	Prepare homes for inundation, pack valuables, mementos and pets and prepare to evacuate. Notify SES

	The depth of water in spillway at this point would be five metres and the flood would be of greater than 1% (AEP) severity. This event would be equal in severity to the record flood which occurred at the dam in 1986.	dam Closely monitor the condition of Lyell Dam and implement preventative measures to return it to a safe condition as soon as possible.	Advise SEOC	organisations listed in Annex D. Coordinate provision of out of area assistance for warning and evacuation operations.	notification of other agencies as listed in Local Flood Plan		doorknockers if transport to evacuation centres will be required. Some evacuations may be necessary due to mainstream riverine flooding.
RED ALERT	792 meters AHD. At this level the alarms will be triggered as for the Amber alert. Water would be at the crest of the dam. This is taken as the flood level at which dam failure would begin to occur	Advise SES Communications Centre of Red Alert Level being reached and provide regular updates on the situation at the dam	Receive notification from dam operator Advise SES Region Controller Advise SEOC	Notify SES Local Controller, SES units, SES LHQ. Advise the DEMO. Confirm that residents immediately downstream of the dam have been notified of Red Alert Level being reached. Activate the Standard	Confirm SES RHQ has been notified. Evacuate at-risk residents. Coordinate the notification of other agencies as per the Local Flood Plan Ensure that evacuation centres are ready to receive evacuees.	When requested by SES Local Controller, coordinate support	Evacuate to nearest evacuation centre or assembly area.

				Emergency Warning Signal (SEWS) and ensure that evacuation warnings are broadcast over the radio stations listed in Annex D. Coordinate provision of out of area assistance for evacuation operations	Conduct warning and evacuation of downstream residents by doorknock and public address systems from emergency service vehicles. Coordinate transport of evacuees without their own vehicles.		
DAM FAILURE ALERT CANCELLATION	Dam owner assesses threat and advises whether the risk to the dam structure has passed.	Advise SES OCC of the outcome of the risk assessment	Receive notification from dam operator Advise SES Region Controller Advise SEOC	Following risk assessment of the dam, decide in consultation with Local and State Controller whether to issue an All Clear. Issue 'All Clear' message to SES Local Controller, SES units, SES Local HQ and SES State HQ Advise the	Deliver 'All Clear' message to other agencies as necessary. Coordinate issue of 'All Clear' message at evacuation centres or by phone/doorknock.	When requested by SES Local Controller, coordinate support	Stay home, return home or await further advice.

				DEMO that 'All Clear' has been issued. Issue 'All Clear' message over radio stations listed in Annex D.			

Table F-2: Notification, warning and evacuation arrangements for a potential failure of Lyell

ANNEX G - DETAILS OF THE DAM FAILURE WARNING SYSTEM FOR RYDAL DAM

The Special Rydal Dam Warning and Alarm System have been devised to warm three at-risk households below Rydal Dam of potential or actual dam failure flooding. The system consists of a series of arrangements for monitoring the dam and passing warning messages to the households downstream.

Residents of the three houses at risk have been issued with a written summary of the circumstances under which dam failure could occur and of the arrangements governing the passage of warnings. In addition, they have been advised as to what to take with them when they evacuate and where they should go.

INUNDATION MAPPING.

1. Dam break flood inundation mapping has been prepared for Rydal Dam and is contained in the Rydal Dam Safety Emergency Plan.

MONITORING

2. The dam owner/operator is responsible for monitoring and managing any potential emergency at the dam site.
3. Rydal Dam is monitored as follows:
4. Visually, at the dam itself, by Water Distribution Officers employed by the Fish River Water Supply and by a contractor carrying out remedial works at the dam. If abnormalities are noted in the condition of the dam wall, the Operations Manager of Fish River Water Supply (Wallerawang) is advised.
5. By telemeter surveillance of water levels. An automatic alarm dialler connected to a gauge at the dam dials the Fish River Water Supply office at Wallerawang during office hours and five employee's houses after hours.

NOTIFICATION PROCEDURES

6. The primary contact for dam failure warning notification by the dam owner to the SES is the NSW SES 24hr Operations Communications Centre. The SES Operations Communications Centre will subsequently notify the Central West SES Region Headquarters Duty Officer who will contact the Lithgow SES Local Controller. An alternate NSW Police contact is available if this notification procedure was to fail.
7. A flow chart illustrating the notification arrangements for potential dam failure is shown in Annex G.

WARNING

8. Dam failure alerts are issued to SES and are used to trigger appropriate response actions. Alert levels from the DSEP for flood failure have been reproduced against SES responses. Responses escalate as the alert level migrates from white to red. The conditions that define each of the alert levels (as identified in the DSEP) are listed in Table G-1. The meaning of each alert level is as follows:

    - White: Preliminary alert to assist the SES in its preparation. This is not a public alert. It indicates a potential issue/condition has been observed at the dam and is being investigated.
    - Amber: Alert level necessitating the warning of the population at risk to prepare for evacuation.
    - Red: Alert level requiring the immediate evacuation of the downstream population at risk.

9. Actions indicated as occurring at particular Alert Levels may be brought forward if the development of a flood warrants.

Alert	Defining Conditions	Min Time to Reach Alert Levels (approx)
White Alert	9.8 metres. This level represents 300 mm depth of water in the spillway. This level is 300 mm above the Top Water Level at which Fish River Water Supply attempts to maintain the storage.	
Amber Alert	10.1 metres. This level represents 600 mm depth of water in the spillway.	
Red Alert	10.5 metres. At this level, which represents 1 metres depth of water in the spillway, failure of the dam would be expected to begin and a flood wave would reach Rydal about 15 minutes later.	

Table G-1: Rydal Dam Flood Failure Alert levels

10. The SES/Fish River Water Supply will disseminate dam failure warnings.

11. Fish River Water Supply Staff will keep the SES informed of details including discharge through the spillway. The dam alerts will be activated in sequence as the storage level rises during the course of a major flood event and will be sent to the SES as they occur.

12. The following table outlines the notification, warning and evacuation arrangements for a potential failure of Rydal.

Alerts	Defining Conditions	Notification Arrangements and Actions for Rydal Dam					
		Fish River Water Supply	SES OCC	SES Region Controller	SES Local Controller	LEOCON / Other agencies	People at risk
WHITE ALERT	9.8 meters. This level represents 300 mm depth of water in the spillway. This level is 300 mm above the Top Water Level at which Fish River Water Supply attempts to maintain the storage.	Advise SES Communications Centre of White Alert Level being reached and provide regular updates on the situation at the dam	Receive notification from dam operator Advise SES Region Controller Advise SEOC	Receive notification from SES SHQ Advise SES Local Controller, SES Units SES Local Headquarters Advise the District Emergency Management Officer (DEMO). Consider need for OOAA for warning and evacuation operations.	Confirm SES RHQ has been notified. Activate Local Flood Plan. Refer to Local Flood Plan for agencies to notify that the White Alert Level has been reached. (See Annex I, Dam Failure Alert Notification Arrangements Flowchart).	When requested by SES Local Controller, coordinate support	No action required. Some evacuations may be necessary due to mainstream riverine flooding.
AMBER ALERT	10.1 metres. This level represents 600 mm depth of water in the spillway.	Advise SES Operations Communications Centre of Amber Alert Level being reached and provide regular updates on the situation at the	Receive notification from dam operator Advise SES Region Controller	Notify SES Local Controller, SES units SES LHQ. Provides SES Flood Bulletins and evacuation warnings to the media	Confirm SES RHQ has been notified. Coordinate the delivery of warnings to at-risk residents. Coordinate the	When requested by SES Local Controller, coordinate support	Prepare homes for inundation, pack valuables, mementos and pets and prepare to evacuate. Notify SES

		dam Closely monitor the condition of Rydal Dam and implement preventative measures to return it to a safe condition as soon as possible.	Advise SEOC	organisations listed in Annex D. Coordinate provision of out of area assistance for warning and evacuation operations.	notification of other agencies as listed in Local Flood Plan		doorknockers if transport to evacuation centres will be required. Some evacuations may be necessary due to mainstream riverine flooding.
RED ALERT	10.5 metres. At this level, which represents 1 metre depth of water in the spillway, failure of the dam would be expected to begin and a flood wave would reach Rydal about 15 minutes later.	Advise SES Communications Centre of Red Alert Level being reached and provide regular updates on the situation at the dam	Receive notification from dam operator Advise SES Region Controller Advise SEOC	Notify SES Local Controller, SES units, SES LHQ. Advise the DEMO. Confirm that residents immediately downstream of the dam have been notified of Red Alert Level being reached. Activate the Standard Emergency Warning Signal	Confirm SES RHQ has been notified. Evacuate at-risk residents. Coordinate the notification of other agencies as per the Local Flood Plan Ensure that evacuation centres are ready to receive evacuees. Conduct warning and evacuation of	When requested by SES Local Controller, coordinate support	Evacuate to nearest evacuation centre or assembly area.

				(SEWS) and ensure that evacuation warnings are broadcast over the radio stations listed in Annex D. Coordinate provision of out of area assistance for evacuation operations	downstream residents by doorknock and public address systems from emergency service vehicles. Coordinate transport of evacuees without their own vehicles.		
DAM FAILURE ALERT CANCELLATION	Dam owner assesses threat and advises whether the risk to the dam structure has passed.	Advise SES OCC of the outcome of the risk assessment	Receive notification from dam operator Advise SES Region Controller Advise SEOC	Following risk assessment of the dam, decide in consultation with Local and State Controller whether to issue an All Clear. Issue 'All Clear' message to SES Local Controller, SES units, SES Local HQ and SES State HQ Advise the	Deliver 'All Clear' message to other agencies as necessary. Coordinate issue of 'All Clear' message at evacuation centres or by phone/doorknock.	When requested by SES Local Controller, coordinate support	Stay home, return home or await further advice.

				DEMO that 'All Clear' has been issued. Issue 'All Clear' message over radio stations listed in Annex D.			

Table G-2: Notification, Warning and Evacuation arrangements for a potential failure of Rydal.

ANNEX H - RESUPPLY FLOWCHART

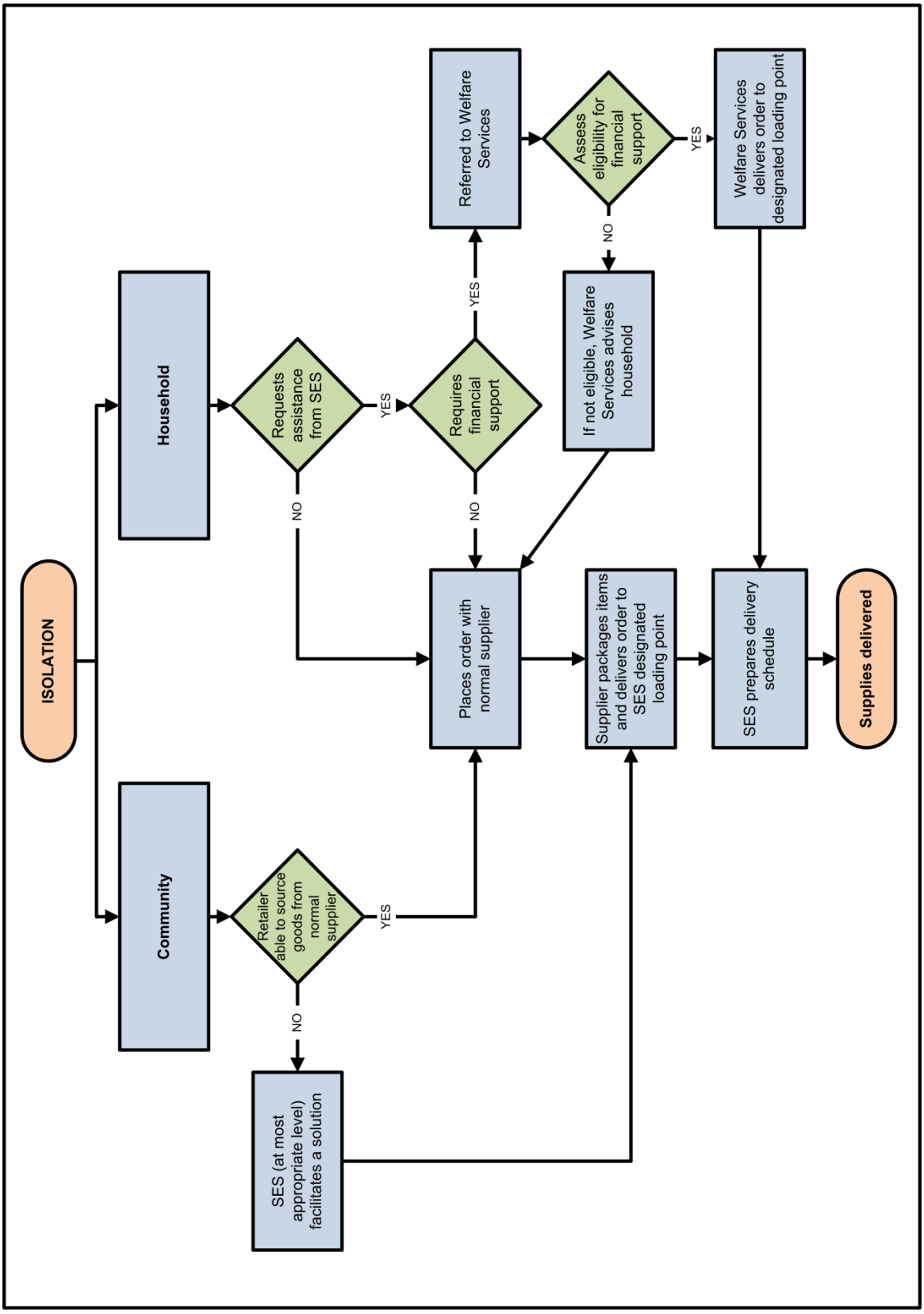
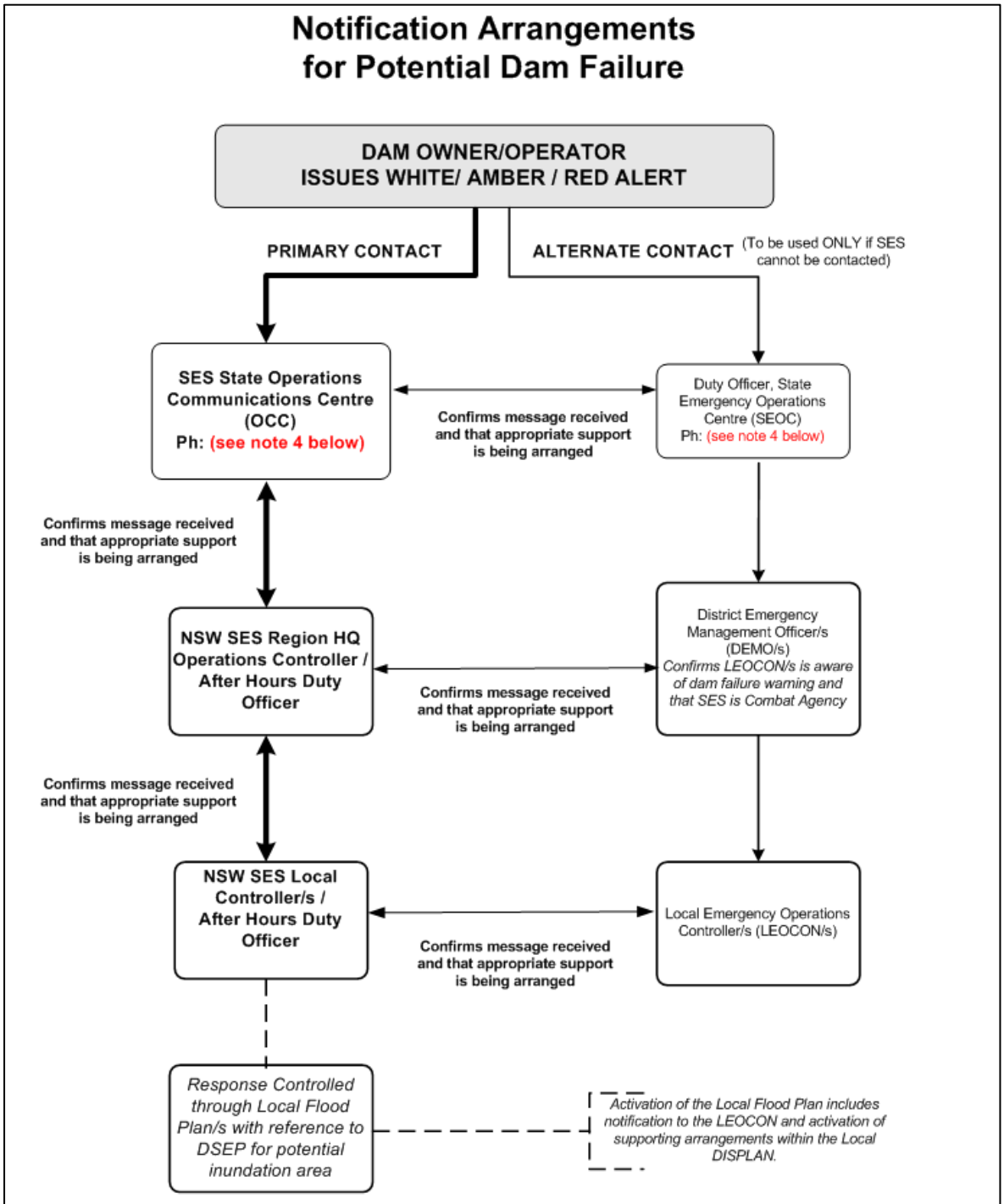


Figure I-1: Resupply Flowchart. Please note that the flowchart outlines the resupply process but does not encompass all potential situations and/or outcomes.

ANNEX I - DAM FAILURE ALERT NOTIFICATION ARRANGEMENTS FLOWCHART



NOTES:

1. Dam owners should only contact the SEOC if the SES State Operations Communications Centre (OCC) cannot be contacted.

2. The first priority for notification is to contact the next SES HQ or the next level of EOC down the flowchart. The second notification should always be across the flow chart to confirm the message is received. If the first priority notification fails or is not picked up for any reason, the second priority notification should be made before any further attempts to contact the first priority (this is why an alternate or backup system of contacts is in place).

3. The triple zero (000) number for emergency services should not be used unless contact cannot be made with SES or the SEOC, as it is likely the triple zero (000) operators will have difficulty dealing with the very unusual case of potential or actual dam failure.

4. Dam owners must contact the SES State Headquarters during the preparation of the DSEP to obtain the appropriate emergency contact numbers.

ANNEX J - AVIATION MANAGEMENT

PURPOSE

During floods aviation assets can be used to perform numerous tasks including re-supply, evacuation, personnel movement and reconnaissance.

COORDINATION OF AVIATION ASSETS

The Lithgow SES Local Controller may task aircraft for flood operations within the council area if other transport means are not available or not suitable. During floods affecting more than one council area, aircraft will normally be tasked centrally by the Central West SES Region Controller.

LANDING ZONES

The sites listed below should be used for the landing of aircraft in emergency situations only. A risk assessment should be carried out before use.

Landing Zone	**Aircraft Suitability**	**Features**
Ben Bullen	Helicopter	Located 14kms NE of Ben Bullen near Crown Creek
Capertee	Helicopter	Located at oval SW of Royal Hotel at Capertee
Glen Alice	Helicopter	Private airstrip located on 'Umbiella' at Glen Alice
Hartley	Helicopter	Private landing strip located south of the Great Western Highway at Little Hartley
Lithgow	Helicopter	Located behind SES Unit Headquarters at Silcock Street in Lithgow

ANNEX K - MAPS

MAP 1 - MACQUARIE RIVER BASIN

MAP 2 - HAWKESBURY RIVER BASIN

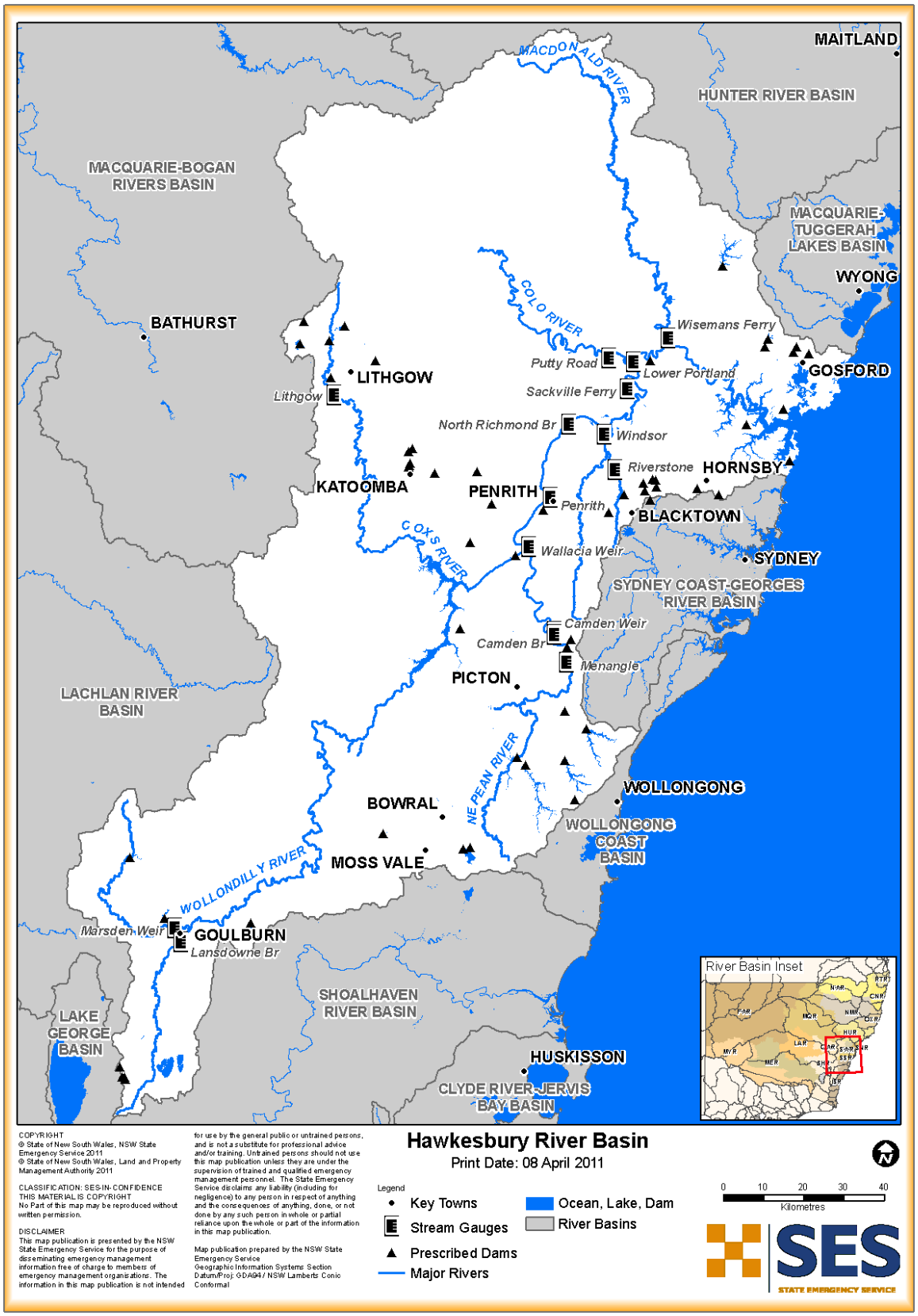
MAP 3 - LITHGOW CITY LOCAL GOVERNMENT AREA

MAP 4 - LITHGOW TOWN MAP

MAP 5 - PORTLAND VILLAGE MAP

MAP 6 - WALLERAWANG VILLAGE MAP

Map publication prepared by the NSW State Emergency Service
Geographic Information Systems Section
Datum/Proj: GDA94 / NSW Lamberts Conic Conformal


MAITLAND
MACDONALD RIVER
HUNTER RIVER BASIN
MACQUARIE-BOGAN RIVERS BASIN
MACQUARIE-TUGGERAH LAKES BASIN
WYONG
COLO RIVER
BATHURST
Wisemans Ferry
Putty Road
Lower Portland
GOSFORD
LITHGOW
Lithgow
Sackville Ferry
North Richmond Br
Windsor
Riverstone
HORNSBY
KATOOMBA
PENRITH
Penrith
BLACKTOWN
COX'S RIVER
Wallacia Weir
SYDNEY
SYDNEY COAST-GEORGES RIVER BASIN
Camden Weir
Camden Br
Menangle
PICTON
LACHLAN RIVER BASIN
NE PEAN RIVER
WOLLONGONG
BOWRAL
WOLLONGONG COAST BASIN
MOSS VALE
WOLLONDILLY RIVER
Marsden Weir
GOULBURN
Lansdowne Br
SHOALHAVEN RIVER BASIN
LAKE GEORGE BASIN
HUSKISSON
CLYDE RIVER-JERVIS BAY BASIN
River Basin Inset
Hawkesbury River Basin
Print Date: 08 April 2011
Legend
Key Towns
Stream Gauges
Prescribed Dams
Major Rivers
Ocean, Lake, Dam
River Basins
0 10 20 30 40
Kilometres
SES
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BYLONG VALLEY WY
MID-WESTERN REGIONAL COUNCIL
SINGLETON SHIRE COUNCIL
CAPERTEE RIVER
UMBEILLA CREEK
CASTLEREAGH HWY
TURON RIVER
GLEN DAVIS RD
COCO CREEK
GLEN DAVIS
CAPERTEE
CAPERTEE RIVER
WOLGAN RIVER
COLO RIVER
PALMERS OAKY CREEK
COOLAMIGAL CREEK
BEN BULLEN
COXS RIVER
CARNE CREEK
PORTLAND
BLACKMANS FLAT
BATHURST REGIONAL COUNCIL
PIPERS FLAT CREEK
WALLERAWANG
MARRANGAROO
GREAT WESTERN HWY
FARMERS CREEK
CHIFLEY RD
HAWKESBURY CITY COUNCIL
RYDAL
LITHGOW
RIVER LETT
BELLS LINE OF ROAD
HARTLEY
HAZELGROVE RD
SODWALLS
OBERON COUNCIL
JENOLAN CAVES RD
LOWTHER
GREAT WESTERN HWY
BLUE MOUNTAINS CITY COUNCIL
HAMPTON
OBERON
DUCK MALO RD
KATOOMBA
State Inset
QLD
NWR
NNR
CNR
FAR
MDR
CWR
HUR
LAR
CAN
SNR
MYR
MER
SHR
ISR
VIC
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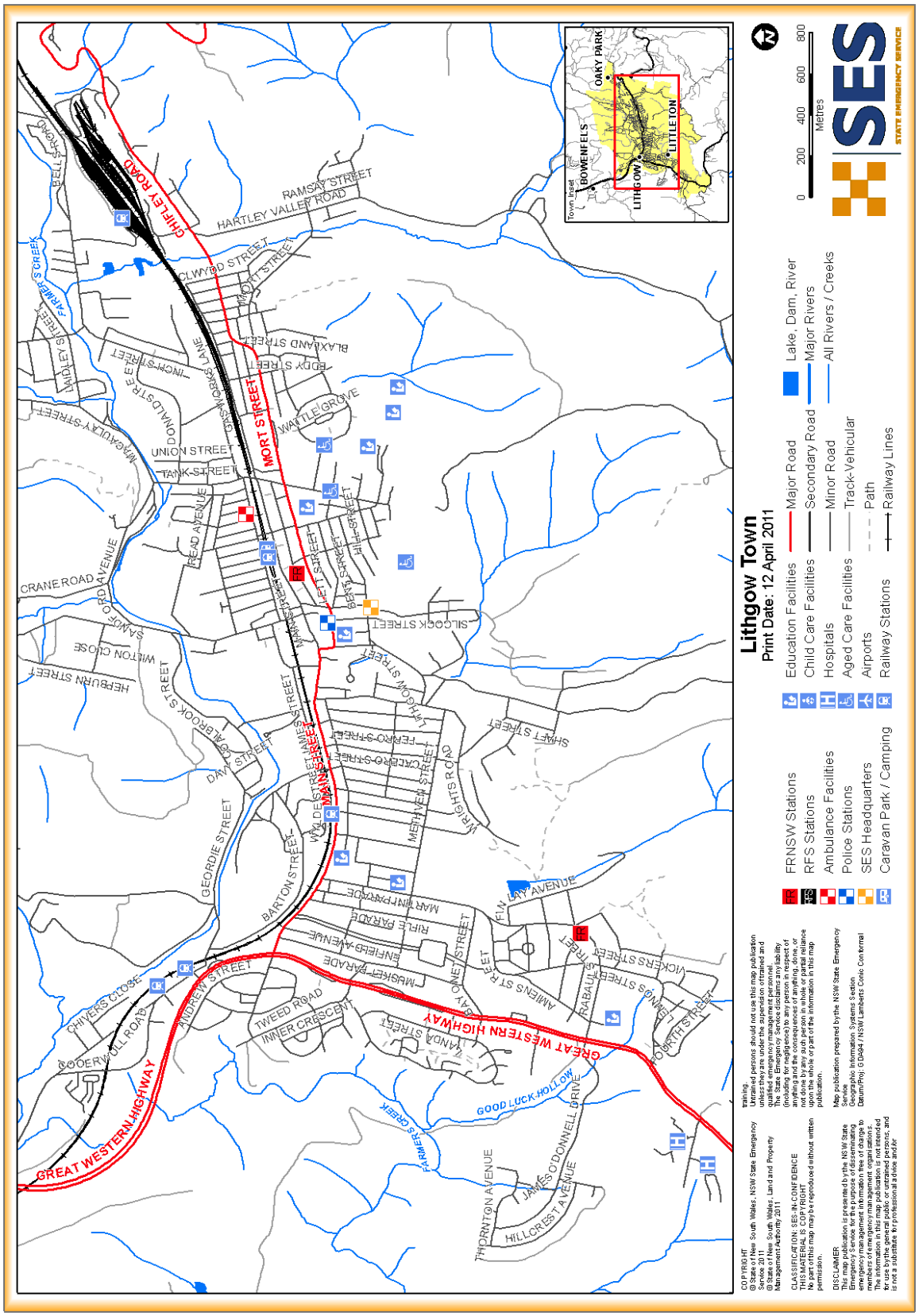
Datum/Proj: GDA94 / NSW Lamberts Conic Conformal
Lithgow City LGA
Print Date: 11 April 2011
Legend
Key Towns
Prescribed Dams
Key Roads
Key Rivers / Creeks
Ocean, Lake, Dam
Local Government Areas
0 5 10 15
Kilometres
SES
STATE EMERGENCY SERVICE


Lithgow Town
Print Date: 12 April 2011
Education Facilities
Child Care Facilities
Hospitals
Aged Care Facilities
Airports
Railway Stations
Major Road
Secondary Road
Minor Road
Track-Vehicular
Path
Railway Lines
Lake, Dam, River
Major Rivers
All Rivers / Creeks
FRNSW Stations
RFS Stations
Ambulance Facilities
Police Stations
SES Headquarters
Caravan Park / Camping
0 200 400 600 800
Metres
SES
STATE EMERGENCY SERVICE
OAKY PARK
BOWENFELS
LITHGOW
LITTLETON
Town Inset
MORT STREET
MAIN STREET
GREAT WESTERN HIGHWAY
CHIFLEY ROAD
HARTLEY VALLEY ROAD
RAMSAY STREET
FARMERS CREEK
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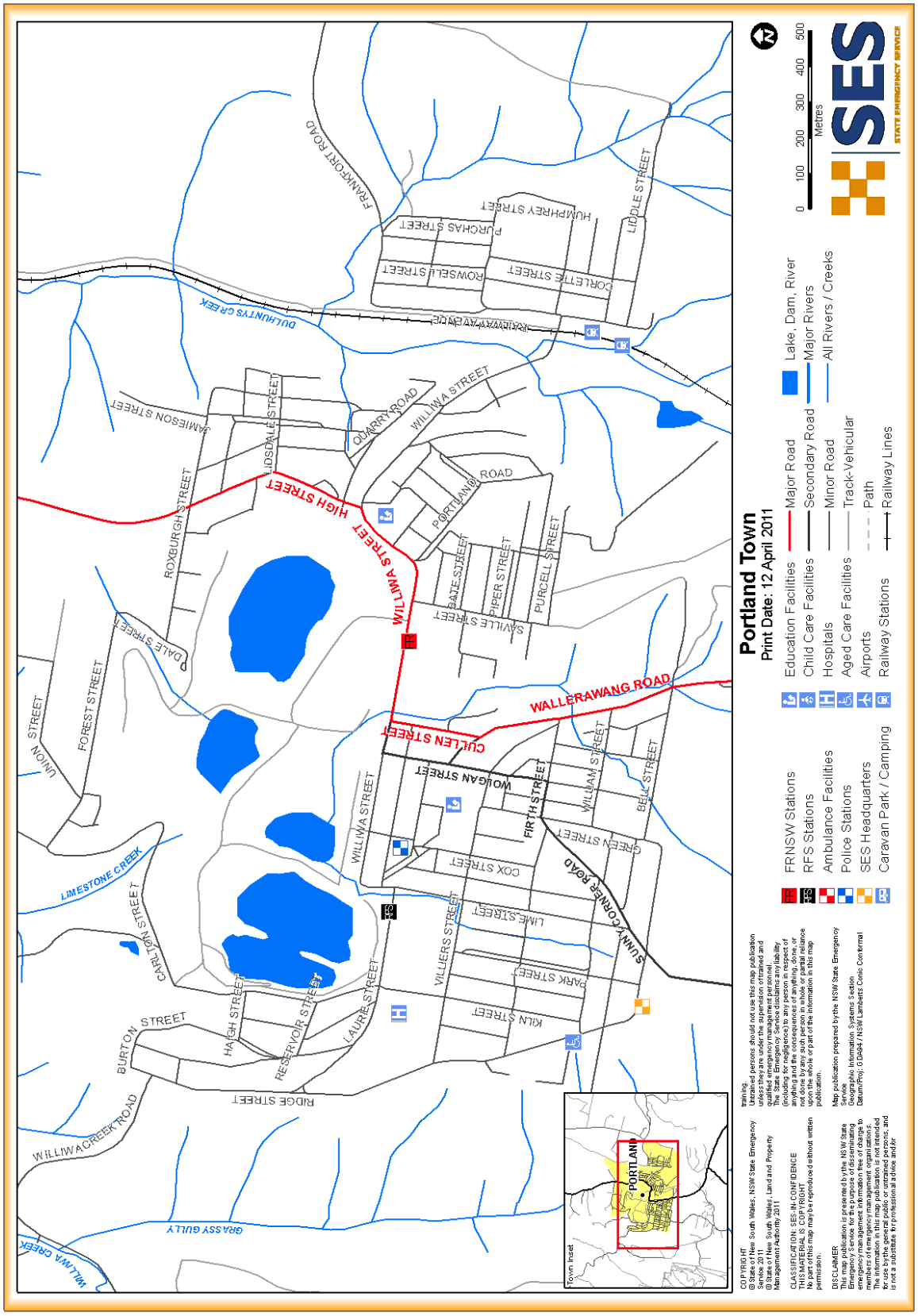
Portland Town
Print Date: 12 April 2011
HIGH STREET
WILLIWA STREET
WALLERAWANG ROAD
CULLEN STREET
WOLGAN STREET
QUARRY ROAD
PORTLAND ROAD
FORTH STREET
SUNNY CORNER ROAD
WILLIWA CREEK ROAD
LIMESTONE CREEK
GRASSY GULLY
WILLA CREEK
DULHUNTYS GR EEK
FRANKFORT ROAD
RAILWAY AVENUE
LIDDLE STREET
HUMPHREY STREET
PURCHAS STREET
ROWSELL STREET
CORLETTE STREET
SAMIESON STREET
LIDSDALE STREET
ROXBURGH STREET
DALE STREET
FOREST STREET
UNION STREET
BATE STREET
SAVILLE STREET
PIPER STREET
PURCELL STREET
WILLIAM STREET
BELL STREET
GREEN STREET
COX STREET
LIME STREET
PARK STREET
KILN STREET
VILLIERS STREET
LAURIE STREET
RESERVOIR STREET
HAIGH STREET
CARLTON STREET
BURTON STREET
RIDGE STREET
Town Inset
PORTLAND
FRNSW Stations
RFS Stations
Ambulance Facilities
Police Stations
SES Headquarters
Caravan Park / Camping
Education Facilities
Child Care Facilities
Hospitals
Aged Care Facilities
Airports
Railway Stations
Major Road
Secondary Road
Minor Road
Track-Vehicular
Path
Railway Lines
Lake, Dam, River
Major Rivers
All Rivers / Creeks
0 100 200 300 400 500
Metres
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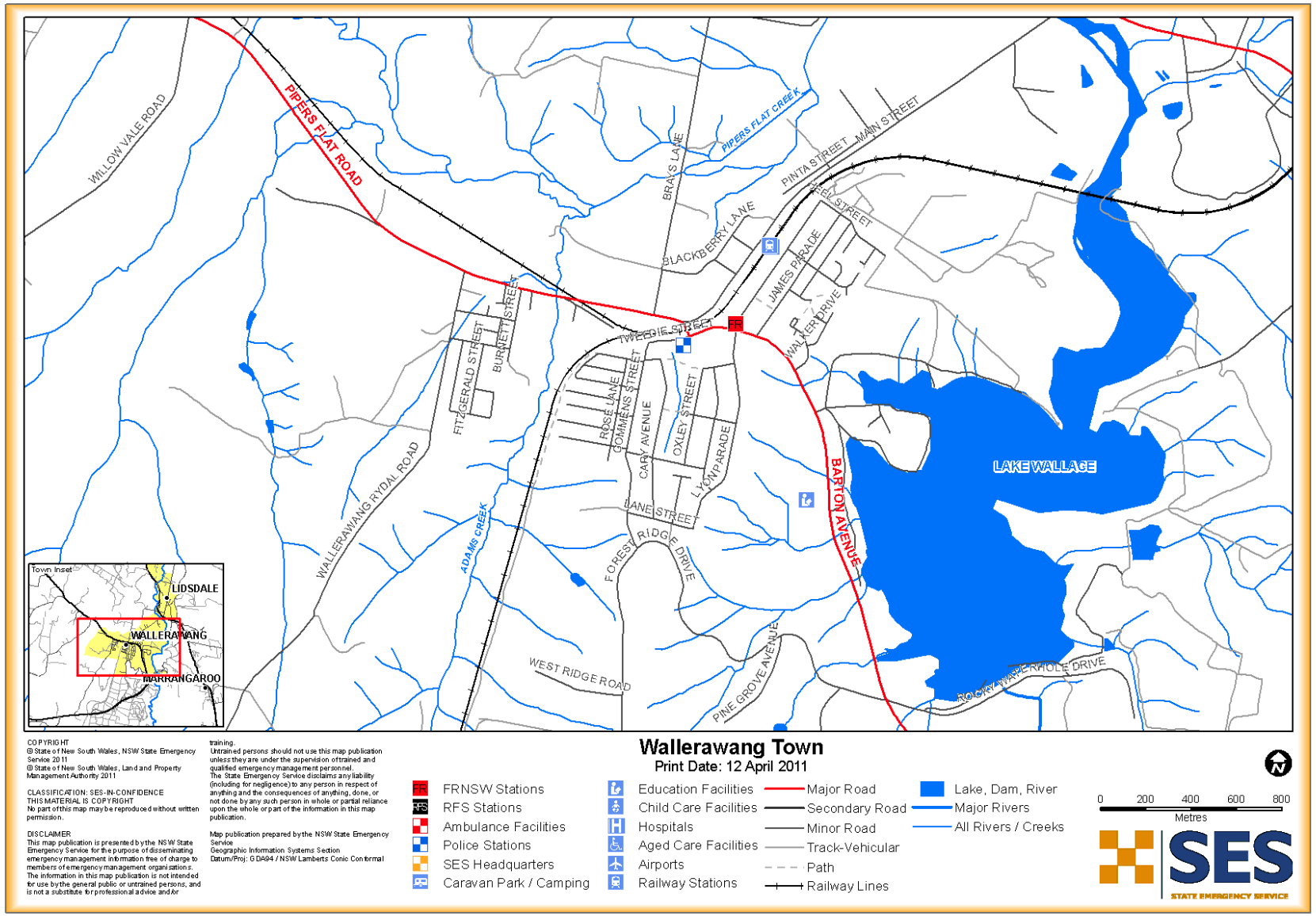

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