NSW STATE EMERGENCY SERVICE

Kempsey Shire

Local Flood Plan

FloodSafe

July 2012

To be reviewed no later than July 2017

KEMPSEY SHIRE
LOCAL FLOOD PLAN

A Sub-Plan of the Kempsey Shire Local Disaster Plan (DISPLAN)

Chair, Local Emergency Management Committee

Kempsey Shire SES Local Controller

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AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

The Local Controller
Kempsey Shire LGA State Emergency Service
Po Box 331
KEMPSEY NSW 2440,

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

Amendment Number	Description	Date	Amendment entered by	Date
1	Full Review	May 2012	Stephen Hart	July 2012

LIST OF ABBREVIATIONS

The following abbreviations have been used in this plan:

AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AIIMS	Australasian Inter-service Incident Management System
ARI	Average Recurrence Interval (Years)
ALERT	Automated Local Evaluation in Real Time
AWRC	Australian Water Resources Council
Bureau	Australian Government Bureau of Meteorology
DCF	Dam Crest Flood
OEH	Office of Environment and Heritage (OEH)
DSC	Dams Safety Committee
DISPLAN	Disaster Plan
DSEP	Dam Safety Emergency Plan
DVR	Disaster Victim Registration
NOW	NSW Office of Water
GIS	Geographic Information System
GRN	Government Radio Network
IFF	Imminent Failure Flood
LEMO	Local Emergency Management Officer
LEOCON	Local Emergency Operations Controller
IAP	Incident Action Plan
PMF	Probable Maximum Flood
PMR	Private Mobile Radio
PMP	Probable Maximum Precipitation
RAMS	Roads and Maritime Services

SEOCON State Emergency Operations Controller

SERCON State Emergency Recovery Controller

SES NSW State Emergency Service

SEWS Standard Emergency Warning Signal

GLOSSARY

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

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

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

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

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

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

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

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

- **Flood Induced Dam Failure**: Dam failure caused by flood, either due to overtopping erosion or by subsequent structural failure.
- **Sunny Day Dam Failure**: Dam Failure as a result of factors other than flood i.e. other than flood flow into the reservoir. Causes of "Sunny Day" dam failure can include internal erosion, landslide, piping, earthquake or sabotage.

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

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

DisPlan (Disaster Plan). The object of a Displan is to ensure the coordinated response by all agencies having responsibilities and functions in emergencies.

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

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

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

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

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

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

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

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

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

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

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

Flood of record. Maximum observed historical flood.

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

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

Flood Rescue: the rescue or retrieval of persons trapped by floodwaters.

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

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

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

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

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

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

Geographic Information System (GIS). A computerised database for the capture, storage, analysis and display of locationally defined information. Commonly, a GIS portrays a portion of the earth's surface in the form of a map on which this information is overlaid.

Inundation. See definition for *Flood.*

Indirect Effect. Indirect effects are generally a consequence of infrastructure damage or interruption of services and can affect communities distant from the actual flood footprint i.e. floodplain. Indirect effects can also refer to indirect losses due to disruption of economic activity, both in areas which are inundated or isolated. Indirect effects are one of the three primary sources of risk in the context of flooding (the other two are inundation and isolation).

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

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

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

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

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

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

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

Prescribed Dam. "Prescribed" dams are those listed in Schedule 1 of the Dams Safety Act 1978. The NSW Dam Safety Committee will prescribe those dams with the potential for a failure which could have a significant adverse effect on community interests.

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

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

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

Stream gauging station. A place on a river or stream at which the stage height is routinely measured, either daily or continuously, and where the discharge is measured from

time to time so as to develop a relationship between stage and discharge or rating curve.

PART 1 - INTRODUCTION

1.1 PURPOSE

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

1.1.2 The plan also covers arrangements for the management of coastal erosion in the council area.

1.2 AUTHORITY

1.2.1 This plan is issued under the authority of the State Emergency and Rescue Management Act 1989 and the State Emergency Service Act 1989. It has been accepted by the Mid North Coast SES Region SES Region Controller and the Kempsey Shire Local Emergency Management Committee.

1.3 AREA COVERED BY THE PLAN

1.3.1 The area covered by the plan is the Kempsey Shire area which includes:

a. Upper Macleay – Georges Creek, Bellbrook, Turners Flat

b. Central Macleay – Kempsey & Frederickton

c. Lower Macleay – Austral Eden, Seven Oaks, Smithtown, Gladstone, Kinchela, Jerseyville, South West Rocks, Hat Head, Crescent Head & Maria River areas.

1.3.2 The council area and its principal rivers and creeks are shown in Map [1].

1.3.3 The council area is in the Mid North Coast SES Region and for emergency management purposes is part of the North Coast Emergency Management District.

1.4 DESCRIPTION OF FLOODING AND ITS EFFECTS

1.4.1 The nature of flooding in the Kempsey Shire area is described in **Annex A.**

1.4.2 The effects of flooding on the community are detailed in **Annex B.**

1.4.3 Community Emergency Flood classification is described in **Annex J.**

1.5 RESPONSIBILITIES

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

the flooding. Specific responsibilities of agencies and organisations as they relate to tsunami are detailed in the State Tsunami Emergency Sub Plan.

1.5.2 **Kempsey Shire SES Local Controller.** The Kempsey Shire SES Local Controller is responsible for dealing with floods as detailed in the State Flood Plan, and will:

Preparedness

a. Maintain a Local Headquarters at Kempsey in accordance with the SES Controllers' Handbook and the SES Operations Manual.

b. Ensure that SES members are trained to undertaken operations in accordance with current policy as laid down in the SES Controllers' Handbook and the SES Operations Manual.

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

d. Participate in floodplain and coastal risk management initiatives organised by the Kempsey Shire.

e. Coordinate a public education program.

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

g. Identify strategic local communications.

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

Response

i. The Kempsey Shire SES Local Controller will appoint an appropriate Local Incident Controller to undertaken response roles.

j. Control flood and storm response operations. This includes:

- Directing the activities of the SES units operating within the council area.
- Coordinating the activities of supporting agencies and organisations and ensuring that liaison is established with them.
- Contribute to preparation of Region IAP

k. Provide an information service in relation to:

- Flood heights and flood behaviour.
- Coastal erosion / inundation.
- Road conditions and closures.
- Advice on methods of limiting property damage.
- Confirmation of evacuation warnings and evacuation orders.

l. Direct the conduct of flood rescue operations.

m. Direct the evacuation of people and/or communities.

n. Provide immediate welfare support for evacuated people.

o. Coordinate the provision of emergency food and medical supplies to isolated people and/or communities.

p. Coordinate operations to protect property, for example by:

- Arranging resources for sandbagging operations.
- Lifting or moving household furniture.
- Lifting or moving commercial stock and equipment.

q. Assist the Kempsey Shire to organise temporary repairs or improvements to levees.

r. Arrange for support (for example, accommodation and meals) for emergency service organisation members and volunteers assisting them.

s. If SES resources are available, assist with emergency fodder supply operations conducted by Agriculture and Animal Services.

t. If SES resources are available, assist the NSW Police Force, RAMS and Council with road closure and traffic control operations. Exercise financial delegations relating to the use of emergency orders as laid down in the SES Controllers' Handbook.

u. Coordinate the collection of flood and coastal erosion/inundation information for development of intelligence.

v. Submit Situation Reports to the Mid North Coast SES Region SES Region Headquarters and agencies assisting within the council area. These will contain information on:

- Road conditions and closures.
- Current flood behaviour.
- Current operational activities.
- Likely future flood behaviour.
- Likely future operational activities.
- Probable resource needs.

w. Keep the Local Emergency Operations Controller advised of the flood situation and the operational response.

x. Issue the 'All Clear' when flood operations have been completed.

Recovery

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

z. Assist in the establishment and deliberations of the Recovery Coordinating Committee.

1.5.3 **Kempsey, Gladstone & South West Rocks Unit Controllers:**

a. Conduct flood and coastal erosion operations within the Kempsey Shire area as directed by the Kempsey Shire SES Incident Controller.

b. Submit Situation Reports to the Kempsey Shire SES Local Headquarters, the Mid North Coast SES Region SES Region Headquarters and agencies assisting within the local area.

c. Assist the Kempsey Shire SES Incident Controller with flood preparedness activities, including:

- Flood planning.
- Training of unit members.
- The development of flood and coastal erosion/inundation intelligence.
- The development of warning services.
- Floodplain and coastal risk management initiatives.
- Public education.
- Community network trees.

1.5.4 **Kempsey Shire, Kempsey, Gladstone & South West Rocks SES Unit Members:**

a. Carry out flood and coastal erosion response tasks. These may include:

- The management of the Kempsey Shire SES Local and Unit Headquarters Operations Centres.
- Assist in the collection of flood and coastal erosion/inundation information for the development of intelligence.
- Flood rescue.
- Evacuation.
- Providing immediate welfare for evacuated people.
- Delivery of warnings and information.
- Resupply.
- Levee monitoring.
- Sandbagging.
- Lifting and/or moving household furniture and commercial stock.
- Animal rescue.
- Assisting in repairing or improving levees.
- Assisting with road closure and traffic control operations.
- Assisting with emergency fodder supply operations.

b. Assist with preparedness activities.

c. Undertaken training in flood and storm response operations.

1.5.5 **Agricultural and Animal Services Functional Area**

a. When requested by SES;

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

b. Forests NSW

- Close and evacuate at risk camping grounds in Forests NSW managed areas.

1.5.6 **Australian Government Bureau of Meteorology (The Bureau):**

a. Provide Flood Watches for Macleay River Catchment.

b. Provide Flood Warnings, incorporating height-time predictions, for

- Georges Creek Gauge - 206024
- Bellbrook Gauge - 206019
- Kempsey Traffic Bridge Gauge - 206403

c. Provide severe weather warnings when large waves and/or storm surge conditions are forecast to result in coastal erosion/inundation.

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

1.5.7 **Caravan Park Proprietors, Central, Sundowner, Willowbrook and Southside**:

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

b. Ensure that owners and occupiers of caravans are aware that the caravan park is flood liable and what they must do to facilitate evacuation and van relocation when flooding occurs.

c. Ensure that occupiers are informed of flood warnings and flood watches.

d. Coordinate the evacuation of people and the relocation of moveable vans when floods are rising and their return when flood waters have subsided.

e. Inform the SES of the progress of evacuation and/or van relocation operations and of any need for assistance in the conduct of these tasks.

1.5.8 **Child Care Centres and Preschools**:

a. Childcare Centres listed in **Annex S** are to be contacted by the SES in the event of possible flooding or isolation.

b. When notified the child care centres should:

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

1.5.9 **Communication Services Functional Area**:

a. When requested by SES;

b. Coordinate the restoration of telephone facilities damaged by flooding;

c. Coordinate additional telecommunications support for the SES Headquarters as required; and

d. Assist the SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

1.5.10 **Department of Corrective Services:**

a. In consultation with the Kempsey SES Incident Controller, prepare a flood management plan for the Kempsey Correctional Centre.

b. Liaise with the Kempsey SES Incident Controller during periods of flooding to ascertain the impacts of flooding and/or road closures on the operation of the centre. This would include the Centre's plan for resupply and the establishment of a ferry service for employees.

1.5.11 **Office of Environment and Heritage, (OEH)**:

a. Provide specialist policy, engineering and scientific advice to councils and the SES on flood related matters including assistance with:

- The identification of flood problems.
- The preparation of Floodplain Risk Management Plans and associated studies.
- The implementation of floodplain risk management plans. This involves floodplain management projects which include flood mitigation works, flood warning, strategic land use planning and upgrade of evacuation routes.
- The exercising of Flood Sub Plans.

b. Provide specialist advice flood related matters as follows:

- Provide the SES with access to relevant studies regarding flooding, including Flood Studies and Floodplain Risk Management Studies.

- Coordinate the collection of post event flood data, in consultation with the SES.
- Provide advice to the SES in relation to the operation of the Macleay Catchment Flood Mitigation Scheme.
- Provide advice to the SES about conditions which may lead to coastal flooding or retarded river drainage near the coast.
- Collect and maintain flood data relating to flood heights, velocities and discharges in coastal areas of NSW (through a contract with MHL as discussed separately).
- Provide data to the Bureau of Meteorology and SES real-time or near real-time access to river height gauges and height data for the development of official flood warnings (through a contract with MHL as described in the Response section of this plan).

c. **National Parks and Wildlife Service**

- Close and evacuate at risk camping grounds in National Parks managed areas.

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

a. When requested by SES;

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

b. Essential Energy:

- Provide advice to the Kempsey Shire SES Local Controller of any need to disconnect power supplies or of any timetable for reconnection.

- Clear or make safe any hazard caused by power lines or electrical reticulation equipment.
- Assess the necessity for and implement the disconnection of customers' electrical installations where these may present a hazard.
- Advise the public with regard to electrical hazards during flooding and to the availability or otherwise of the electricity supply.
- Inspect, test and reconnect customers' electrical installations as conditions allow.
- Assist the SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

c. Water and Sewerage: Kempsey Shire Council

- Provide advice to the Kempsey Shire LGA SES Incident Controller of any need to disconnect water or sewerage supplies or of any timetable for reconnection.
- Advise the public with regard to any health hazards during flooding.
- Inspect, test and reconnect customers' as conditions allow.
- Assist the SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

1.5.13 **Engineering Services Functional Area**:

a. When requested by SES;

b. Provide engineering advice regarding the integrity of damaged structures;

c. Assist the SES with damage assessment;

d. Acquire and/or provide specialist technical engineering expertise;

e. Assist the SES and councils with the assessment and operation of flood protection levees when requested;

f. Assist with property protection, including the construction or repair of levees; and

g. Coordinate the restoration of critical public facilities.

1.5.14 **Environmental Services Functional Area**:

a. When requested by SES;

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

1.5.15 **Health Services Functional Area**:

a. When requested by SES;

- Activate Health plan if required;

- Ensure that appropriate business continuity plans are developed for essential health infrastructure and are activated during floods;
- Provide medical support to the SES;
- Establish health surveillance in affected areas;
- Assess potential public health risks that either acutely endanger the health of human populations or are thought to have longer term consequences;
- Provide environmental health advice;
- Provide public health warnings and advice to affected communities;
- Assist the SES with the warning and evacuation of hospitals.

b. The **Ambulance Service of NSW** will:

- Assist with the evacuation of at risk communities (in particular elderly and/or infirm people).
- Deploy ambulance resources to if access is expected to be lost.
- Assist the SES will flood rescue operations.

c. Provide a liaison officer to the Kempsey Shire SES Operations Centre if requested.

1.5.16 **Marine Rescue NSW**:

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

b. Assist the SES with the conduct of evacuations.

1.5.17 **Fire Rescue NSW, Kempsey & South West Rocks.**

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

b. Assist the SES with the conduct of evacuations.

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

d. Assist with clean-up operations, including the hosing out of flood affected properties.

e. Deploy fire resources to if access is expected to be lost.

f. Provide a liaison officer to the Kempsey Shire SES Operations Centre if requested.

1.5.18 **NSW Office of Water**

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

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

c. Provide flow rating charts for river height gauges; and

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

- Assessment and approval of flood control works (including flood mitigation works) in rural areas designated under the Acts.
- Use of floodplain management plans prepared by DECCW in rural areas designated under the Acts to assess flood control work approvals.
- Giving the SES access to relevant studies regarding flooding and studies supporting floodplain management plans prepared by DECCW including flood studies, floodplain risk management studies and flood behaviour investigations.

1.5.19 **NSW Police Force, Mid North Coast Local Area Command (LAC):**

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

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

c. Conduct road and traffic control operations in conjunction with council and/or RAMS.

d. Coordinate the registration of all evacuees.

e. Secure evacuated areas.

f. Provide a liaison officer to the Kempsey Shire SES Operations Centre if requested.

1.5.20 **NSW Rural Fire Service (RFS Lower North Coast):**

a. Provide personnel in rural areas and villages to:

- inform the Kempsey Shire SES Local Controller about flood conditions and response needs in their own communities, and
- disseminate flood information.

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

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

d. Assist the SES with the conduct of evacuations.

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

f. Assist with the removal of caravans.

g. Provide back-up radio communications.

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

i. Deploy fire resources as required if access is expected to be lost.

j. Provide a liaison officer to the Kempsey Shire SES Operations Centre if requested.

1.5.21 **Private Companies**:

a. Assist with the provision of:

- Bus transport and drivers for evacuation, resupply or commuting purposes.
- Trucks and drivers to relocate furniture.
- Warehousing facilities to store furniture.
- Sand for sandbagging.
- Space for evacuation centres.

1.5.22 **Public Information Services Functional Area:**

a. When requested by SES;

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

1.5.23 **School Administration Offices (including Catholic Education, Department of Education & Training and Private Schools):**

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

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

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

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

e. List of Schools are provided in **Annex T**

1.5.24 **Service and Sporting Clubs:**

a. Assist with:

- Delivery of evacuation warnings.
- Conduct of evacuations.
- Lifting and/or moving household furniture and commercial stock.
- Sandbagging.

- Monitoring of levees.
- Relocation of caravans.

1.5.25 **Surf Life Saving NSW:**

a. Assist the SES with the warning and/or evacuation of at risk communities;

b. Provide space in Surf Life Saving facilities for evacuation centres where required.

1.5.26 **Transport Services Functional Area:**

a. When requested by SES;

b. Assist with the coordination of transport for evacuation purposes.

c. **The Roads and Maritime Services** (RMS) will:

- Close and reopen RMS roads affected by flood waters and advise the SES of their status;
- Facilitate the safe reliable access of emergency resources on RMS managed roads;
- Assist the SES with identification of road infrastructure at risk of flooding;
- Manage traffic; and
- Assist the SES with the communication of warnings and information provision to the public through variable message signs.

d. Assist with the resupply of isolated communities and/or properties.

e. The Rail Corporation New South Wales (urban lines) and the Australian Rail Track Corporation (country lines) will close and reopen railway lines affected by flood waters and advise the SES.

1.5.27 **Welfare Services Functional Area:**

a. When requested by SES;

- Establish and manage evacuation and recovery centres; and
- Administer the Personal Hardship and Distress component of the NSW Disaster Relief Scheme established to provide financial assistance to people affected by emergencies.
- Provide a liaison officer to the Kempsey Shire SES Operations Centre if requested.

1.5.28 **Kempsey Shire Local Emergency Operations Controller (LEOCON):**

a. Monitor flood operations.

b. Coordinate support to the Kempsey Shire SES Local Controller if requested to do so.

1.5.29 **Kempsey Shire Local Emergency Management Officer (LEMO):**

a. Provide executive support to the Local Emergency Operations Controller in accordance with the Kempsey Shire Local Disaster Plan.

b. At the request of the Kempsey Shire SES Local Controller, advise appropriate agencies and officers of the activation of this plan.

1.5.30 **Kempsey Shire Council:**

Preparedness

a. Establish and maintain floodplain and coastal risk management committees and ensure that key agencies are represented on such committees.

b. Provide levee studies, flood studies, floodplain management studies and coastal management studies to the SES.

c. Maintain Dam Safety Emergency Plans for the Steuart McIntyre dam and provide copies to the SES.

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

e. Maintain a plant and equipment resource list for the council area.

f. Contribute to the development and implementation of a public education program.

Response

g. At the request of the Local SES Controller, deploy personnel and resources for flood and coastal erosion related activities.

h. Close and reopen council roads (and other roads nominated by agreement with the RMS) and advise the Kempsey Shire SES Local Controller and the Police.

i. Provide information on the status of roads through Council's http://www.kempsey.nsw.gov.au or call 1300 663 211.

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

k. Assist with the removal of caravans from caravan parks.

l. In the event of evacuations, assist with making facilities available for the domestic pets and companion animals of evacuees.

m. During periods of coastal erosion from ocean storms:

- Assist the SES with reconnaissance of coastal erosion risk areas.
- Liaise with the SES Local Controller to determine the need for response actions by the SES such as evacuations.
- Activate the Kempsey Shire Coastal Zone Management Plan – Emergency Action Plan.

n. Provide a liaison officer to the Kempsey Shire Operations Centre if requested.

Recovery

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

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

q. Arrange for storage of evacuees' furniture as required.

1.5.31 **Steuart McIntyre Dam (Kempsey Shire Council):**

a. Maintain and operate the Dam Failure Warning System for Steuart McIntyre Dam.

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

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

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

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

f. Close and evacuate any at risk camping grounds/recreational areas in Kempsey Shire Council managed areas.

g. Dam Failure **Annex F**

1.5.32 **Dunghutti & Thungutti Nation Aboriginal Communities:**

a. Act as the point of contact between the SES and the Dunghutti & Thungutti Nation community.

b. Inform the Kempsey Shire SES Local Controller about flood conditions and response needs.

c. Disseminate flood information, including flood and evacuation warnings, to the Dunghutti & Thungutti Nation community.

1.5.33 **Macleay Valley Flood Warning Network:**

a. Provide flood information to the Kempsey Shire SES incident Controller.

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

1.6 CROSS-BORDER ASSISTANCE ARRANGEMENTS

1.6.1 A local cross-border mutual assistance arrangement exists in which the Kempsey Shire SES and the Port Macquarie, Armidale & Nambucca SES units will deploy resources to support each other.

1.6.2 Operations involving the Lower Creek area of the Armidale Dumaresq Council may be conducted by the Kempsey SES when the area is cut off from Armidale by floodwaters or landslides.

1.6.3 Operations involving the northern portion of the Hastings Shire (Maria River and Point Plomer) may be conducted by the Kempsey SES when these areas are inaccessible from Port Macquarie. Similarly the Port Macquarie Hastings SES may operate in the Kundabung area and the Nambucca SES may operate in the Stuarts Point and Clybucca areas.

PART 2 - PREPAREDNESS

2.1 MAINTENANCE OF THIS PLAN

2.1.1 The Kempsey Shire SES Local Controller will maintain the currency of this plan by:

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

b. Conducting exercises to test arrangements.

c. Reviewing the contents of the plan:

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

2.1.2 In any event, the plan is to be reviewed no less frequently than every five years.

2.2 FLOODPLAIN AND COASTAL RISK MANAGEMENT

2.2.1 The Kempsey Shire SES Local Controller will ensure that:

a. SES participates in local floodplain and coastal risk management committee activities when those committees are formed, in accordance with the protocols outlined in the SES Controllers handbook.

b. The Mid North Coast SES Region SES Region Headquarters is informed of involvement in floodplain and coastal risk management activities.

2.3 DEVELOPMENT OF FLOOD INTELLIGENCE

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

2.3.2 The SES maintains a centralised flood intelligence system.

2.4 DEVELOPMENT OF WARNING SYSTEMS

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

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

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

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

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

2.4.2 Kempsey Shire Council and the Bureau have installed hardware and software to monitor water levels in the Macleay River catchments.

2.5 PUBLIC EDUCATION

2.5.1 The Kempsey Shire SES Local Controller, with the assistance of the Kempsey Shire, the Mid North Coast SES Region SES Region Headquarters and SES State Headquarters, is responsible for ensuring that the residents of the council area are aware of the flood threat in their vicinity and how to protect themselves from it.

2.5.2 Specific strategies to be employed include:

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

b. Dissemination of coastal erosion related brochures in coastal erosion liable areas.

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

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

e. Flood Safe guides:

- Georges Creek to Sherwood
- Central & West Kempsey
- East & South Kempsey
- Frederickton
- Smithtown, Gladstone & Surrounding area
- Kinchela, Jerseyville & Surrounding areas

2.6 TRAINING

2.6.1 Throughout this document there are references to functions that must be carried out by the members of the Kempsey, Gladstone & South West Rocks SES. The Kempsey Shire SES Local Controller is responsible for ensuring that the members are:

a. Familiar with the contents of this plan.

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

2.7 RESOURCES

2.7.1 The Kempsey Shire SES Local Controller is responsible for maintaining the condition and state of readiness of SES equipment and the Kempsey Shire SES Local Headquarters.

2.7.2 The Kempsey, Gladstone & South West Rocks SES Unit Controller has similar responsibilities in relation to the Kempsey, Gladstone & South West Rocks Unit Headquarters and equipment.

PART 3 - RESPONSE

CONTROL

3.1 CONTROL ARRANGEMENTS

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

3.1.2 The SES is the designated Combat Agency for damage control for storms. This includes damage control for coastal erosion and inundation from storm activity, specifically the protection of life and the coordination of the protection of readily moveable household goods and commercial stock and equipment. The SES is not responsible for planning or conduct of emergency beach protection works or other physical mitigation works.

3.1.3 The Local DISPLAN will operate to provide support as requested by the SES Local Operations Controller.

3.2 OPERATIONAL MANAGEMENT

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

a. functional management;

b. management by objectives; and

c. span of control.

3.2.2 The Local Government Area may be divided into sectors and divisions to manage the flood and/or coastal erosion event (divisions are usually a group of sectors).

3.2.3 Floods in Kempsey Shire will initially be managed on a sector basis.

3.2.4 For Flood Emergency Community Classification see **Annex J.**

3.2.5 Sectors are based on geographical boundaries and are as follows:

Sector Name	Community	Boundary	Sector Basis	Sector Controlled By:
Sector 1	Georges Creek – Bellbrook - Turners - Skillion Flat	Dumaresq Shire boundary in the West heading East to Turners Flat road turn off.	High Flood Island	Kempsey Unit
Sector 2	Kempsey CBD (Levee)	South from Kemps road heading North to Glen Rock Drain. East Side of Turners Flat Rd in the West heading East to the Bypass Road.	Low flood Island	Kempsey Unit
	Kempsey East, Kempsey West, Kempsey South		High flood Island	Kempsey Unit
Sector 3	Frederickton	South from Glen Rock Drain heading North to Other side of Great Northern Road. (In line with Golf Course). West from Spooners Ave heading East to Pacific Hwy.	High flood Island	Kempsey Unit
Sector 4	Bellimbopinni - Clybucca	South from Great North Road heading North to Cooks Lane. West from Collombatti railway line heading East to Pacific Hwy.	Low Flood Island	Kempsey Unit
Sector 5	Gladstone –Smithtown –Kinchela -Belmore River - Austral Eden and Seven Oaks.	SWR Rd to Belmore River Road including Belmore River Road Plummers Ln East of Pacific Hwy to Macleay River down to Kinchela along SWR Rd. From Kinchela to Ocean.	Low Flood Island	Gladstone Unit
Sector 6	Crescent Head	South from and Including Crescent Head road heading North to & Inclusive of Belmore/Seale Roads. West from Kempsey By Pass heading East to Ocean	High Flood Island	Kempsey Unit
Sector 7	Maria River	South from Port Macquarie Shire boundary heading North to Crescent Head Rd. West from Maria River heading East to the Ocean.	Low Flood Island	Kempsey Unit
Sector 8	South West Rocks - Stuarts Point - Grassy Head	South From Plummer Ln heading North to Stuarts Point Rd to Grassy Head. West from Pacific Hwy heading East to Ocean.	High Flood Island	South West Rocks Unit
	Rainbow Reach - Jerseyville		Low Flood Island	South West Rocks Unit
Sector 9	Hat Head	Town Ship surround North, South and West with the Hat Head national Park heading East to Ocean	High Flood Island	Gladstone Unit

3.3 START OF RESPONSE OPERATIONS

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

3.3.2 Response operation will begin:

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

b. On receipt of a dam failure alert.

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

3.3.3 Contact with the Bureau of Meteorology to discuss the development of flood warnings will normally be through the Mid North Coast SES Region SES Region Headquarters.

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

a. Kempsey Shire Local Emergency Operations Controller (for transmission to the NSW Police Force Local Area Command Headquarters).

b. Kempsey, Gladstone & South West Rocks SES Unit.

c. Kempsey, Gladstone & South West Rocks SES Local/Unit Controller(s).

d. Mid North Coast SES Region SES Region Headquarters.

e. Kempsey Shire Local Emergency Management Officer (for transmission to appropriate council officers and departments).

f. Kempsey Shire Mayor.

g. Other agencies listed in this plan will be advised by the LEMO on the request of the Kempsey Shire SES Local Controller and as appropriate to the location and nature of the threat.

3.4 RESPONSE STRATEGIES

3.4.1 The main response strategies for SES flood operations include:

a. Information Provision and Warning

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

b. Property protection

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

- Assistance with the relocation of readily moveable household goods and commercial stock and equipment from properties threatened by coastal erosion.
- Assistance with the protection of essential infrastructure;

c. Evacuation

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

d. Rescue

- The rescue or retrieval of persons trapped by floodwaters.

e. Resupply

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

3.4.2 The SES Incident Controller will select the appropriate response strategy to deal with the expected impact of the flood in each sector. The impact may vary so a number of different strategies may to be selected and implemented across the whole operational area. The available strategies for each sector are explained in detail in **Annex K.**

3.4.3 Supporting strategies include:

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

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

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

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

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

3.4.4 The execution of these strategies is detailed in the Functional Areas section below.

3.5 OPERATIONS CENTRES

3.5.1 The Kempsey Shire SES LGA Operations Centre is located at 179 River Street, Kempsey.

3.5.2 The Kempsey, Gladstone & South West Rocks SES Operations Centre are located:

a. Kempsey: 179 River Street. Kempsey

b. Gladstone: 16 Kinchela Street, Gladstone

c. South West Rocks: 379 Gordon Young Drive, South West Rocks

3.5.3 Supporting EOCs are located at:

a. The Kempsey Shire Emergency Operations Centre is located at the NSW Police Force Centre - 5-9 Elbow Street, Kempsey.

3.6 LIAISON

3.6.1 At the request of the Kempsey Shire SES Incident Controller, each agency with responsibilities identified in this plan will provide liaison (including a liaison officer where necessary) to the Kempsey Shire SES LGA Operations Centre.

3.6.2 Liaison officers are to:

a. have the authority to deploy the resources of their parent organisations at the request of the Kempsey Shire SES Local Operations Controller,

b. advise the Kempsey Shire SES Local Operations Controller on resource availability for their service, and

c. be able to provide communications to their own organisations.

3.7 ALL CLEAR

3.7.1 When the immediate danger to life and property has passed the SES Region Operations Controller or the SES Incident Controller will issue an 'all clear' message signifying that response operations have been completed. The message will be distributed through the same media outlets as earlier evacuation messages. The relevant Controller will also advise details of recovery coordination arrangements, arrangements made for clean-up operations prior to evacuees being allowed to return to their homes, and stand-down instructions for agencies not required for recovery operations.

3.7.2 A template guide to the content of an all clear message is contained in Annex E – Template Evacuation Warning, Evacuation Order and All Clear.

PLANNING

3.8 COLLATING SITUATIONAL INFORMATION

Strategy

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

Actions

3.8.2 The Kempsey Shire SES Local Headquarters collates information on the current situation in the Kempsey Shire LGA and incorporates in Situation Reports.

3.8.3 The Mid North Coast SES Region SES Region Headquarters collates Region-wide information for inclusion in Region SES Situation Reports.

3.8.4 Sources of situational information during times of flooding are:

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

b. **Active Reconnaissance**. The Kempsey Shire SES Local Operations Controller is responsible for coordinating the reconnaissance of impact areas, recording and communicating observations. Reconnaissance can be performed on the ground and using remote sensing (more commonly aerial). The SES monitors the following problem areas:

- The Eden Street and First lane (Cochrane Street) levees.
- The Corduroy near Crescent Head
- Crescent Head Rd at Rudders lagoon
- Rainbow Reach Road
- Maria River area

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

d. The Department of Services, Technology and Administration's, **Manly Hydraulics Laboratory** automated river watch system funded by the Department of Environment, Climate Change and Water. This system provides river height and rainfall readings for a number of gauges as indicated in Annex C. Recent data from this system is available on the Manly Hydraulic Laboratory website: http://www.mhl.nsw.gov.au. A history of area floods is also available upon request via the website.

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

f. **Steuart McIntyre Dam Storage Monitoring System.** This system provides information on Steuart McIntyre Dam.

g. **Mid North Coast SES Region SES Region Headquarters**. The Region Headquarters provides information on flooding and its consequences, including those in nearby council areas (this information is documented in Bulletins and Situation Reports).

h. **Kempsey Shire** Will provide information of the closure of the Lower Macleay Flood gates and local roads.

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

a. Kempsey Shire Council **1300 663 211** or website http://www.kempsey.nsw.gov.au

b. Roads and Maritime Service on **132 701** or website http://livetraffic.rta.nsw.gov.au

3.8.6 Situational information relating to consequences of flooding and/or coastal erosion should be used to verify and validate SES Flood Intelligence records.

3.9 PROVISION OF FLOOD INFORMATION AND WARNINGS

Strategy

3.9.1 The Kempsey Shire SES Local Headquarters provides advice to the Mid North Coast SES Region SES Region Headquarters on current and expected impacts of flooding in the Kempsey Shire LGA.

3.9.2 The Mid North Coast SES Region SES Region Headquarters issues SES Flood Bulletins, SES Livestock and Equipment Warnings, Evacuation Warnings and Evacuation Orders to media outlets and agencies on behalf of all SES units in the Region.

Actions

3.9.3 The Kempsey Shire SES Incident Controller will ensure that the Mid North Coast SES Region SES Region Incident Controller is regularly briefed on the progress of operations.

3.9.4 Kempsey Shire SES Local Headquarters operations staff will be briefed regularly so that they can provide information in response to inquiries received in person or by other means such as phone or fax.

3.9.5 The SES State Communication Centre will operate a “phone-in” information service for the community in relation to:

a. river heights,

b. flood behaviour,

c. advice on safety matters and means of protecting property.

3.9.6 **Bureau of Meteorology Severe Thunderstorm Warning**. These are issued direct to the media by the Bureau when severe thunderstorms are expected to produce dangerous or damaging conditions, including flash flooding. Severe thunderstorms are usually smaller in scale than events covered by Flood Watches and Severe Weather Warnings.

3.9.7 **Bureau of Meteorology Severe Weather Warnings for Flash Flooding**. These are issued direct to the media by the Bureau and provide a warning of the possibility for flash flooding as a result of intense rainfall. These warnings are issued when severe weather is expected to affect land based communities with

6 to 24 hours. Severe Weather Warnings may also include other conditions such as Damaging Surf, Dangerous Surf or tides, or Damaging Winds.

3.9.8 **Bureau of Meteorology Flood Watches**. Flood Watches are issued by the Bureau to advise people of the potential for flooding in a catchment area based on predicted or actual rainfall. Flood Watches will be included in SES Flood Bulletins issued by the Mid North Coast SES Region SES Region Headquarters.

3.9.9 **Bureau of Meteorology Flood Warnings.** The Mid North Coast SES Region SES Region Headquarters will send a copy of Bureau Flood Warnings to the Kempsey Shire SES Unit. On receipt the SES Local Operations Controller will provide the Mid North Coast SES Region SES Region Headquarters with information on the estimated impacts of flooding at the predicted heights for inclusion in SES Region Flood Bulletins.

3.9.10 **SES Livestock and Equipment Warnings**. Following heavy rain or when there are indications of significant creek or river rises (even to levels below Minor Flood heights), the Kempsey Shire SES Local Operations Controller will advise the Mid North Coast SES Region SES Region Headquarters which will issue SES Livestock and Equipment Warnings.

3.9.11 **SES Local Flood Advices**. The SES Local Operations Controller may issue Local Flood Advices for locations not covered by the BOM Flood Warnings. They may be provided verbally in response to phone inquiries but will normally be incorporated into SES Region Flood Bulletins. They will be distributed to agencies listed in Annex D.

3.9.12 **SES Flood Bulletins**. The Mid North Coast SES Region SES Region Headquarters will regularly issue SES Flood Bulletins which describe information on the estimated impacts of flooding at the predicted heights (using information from Bureau Flood Warnings and SES Local Flood Advices) to SES units, media outlets and agencies on behalf of all SES units in the Region. When operations relating to coastal erosion/inundation are being undertaken, SES Region Bulletins will contain information and advice about property damage mitigation measures and evacuation in affected areas.

3.9.13 **SES Evacuation Warnings and Evacuation Orders**. These are usually issued to the media by the SES Region Operations Controller on behalf of the SES Local Operations Controller. A template guide to the content of evacuation warning and evacuation order messages is at Annex F.

3.9.14 **Emergency Alert Warning System**: The Emergency alert can directly alert communities in imminent danger via a voice message on landline and a text message on mobile phones based on the subscribers billing address.

3.9.15 **Dam Failure Alerts**. Dam failure alerts are issued to SES by the dam owner, in accordance with arrangements in the Dam Safety Emergency Plan (DSEP), the system involves the Dam Owner notifying SES State Headquarters Communications Centre, who in turn distribute the warning to the SES Region Headquarters and SES Unit Headquarters.

3.9.16 A flow chart illustrating the notification arrangements for potential dam failure is shown in **Annex I**.

3.9.17 Dam failure alert levels are set in consultation with the SES and are used to trigger appropriate response actions. The conditions that define each of the alert levels are listed in the relevant DSEP. Responses escalate as the alert level migrates from white to amber to red. Table 3-1 briefly outlines example defining conditions and appropriate SES responses associated with each alert.

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

Table A-1: Dam Failure Alert levels

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

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

3.9.19 Special arrangements apply in the case of severe flooding that may have the potential to cause the failure of Steuart McIntyre Dam. Details of these arrangements are described in **Annex F**.

3.9.20 **Standard Emergency Warning Signal (SEWS).** This signal may be played over radio and television stations to alert communities to Evacuation Warnings,

Evacuation Orders, Special Warnings or Dam-Failure Warnings. Approval to use the signal is associated with who approves the warning/order message.

3.9.21 **The Public Information and Inquiry Centre** (operated by the Police Service) will answer calls from the public regarding registered evacuees.

3.9.22 **The Disaster Welfare Assistance line** is a central support and contact point for disaster affected people inquiring about welfare services advice and assistance.

3.9.23 **The RAMS Traffic Information Line** will provide advice to callers on the status of roads. The RAMS website also lists road closure information.

3.9.24 **Kempsey Shire Council** 1300 663 211 or website http://www.kempsey.nsw.gov.au will provide information on the status of roads.

OPERATIONS

3.10 AIRCRAFT MANAGEMENT

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

3.10.2 Air support operations will be conducted under the control of the SES Region Headquarters, which may allocate aircraft to units if applicable.

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

a. Kempsey

- Kempsey Airport

b. Gladstone/Smithtown

- Oval – Barnard Street and McLeay St

c. South West Rocks

- Cadet Oval next to unit

d. Each Sector has an identified landing area, refer to sector Annexes

3.10.4 **Airport.** Access to the Kempsey airport remains until approx. 7.20 metres at the Kempsey Traffic bridge. The airport is capable of handling:

a. Rotary aircraft

b. Small fixed wing

c. Security. Arrangement will be put in place when airport is used by Local firm

3.11 ASSISTANCE FOR ANIMALS

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

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

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

3.12 COMMUNICATION SYSTEMS

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

3.12.2 The primary means of communication to and between deployed SES resources is SES PMR Radio.

3.12.3 All liaison officers will provide their own communication links back to their parent agencies.

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

3.12.5 Back-up communications are provided as follows:

a. NSW Rural Fire Service

3.13 PRELIMINARY DEPLOYMENTS

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

3.13.2 When access between locations is expected to be cut, the Kempsey Shire SES Incident Controller will advise appropriate agencies so that resources (including sandbags, fire fighting appliances, ambulances, etc.) are deployed to ensure that operational capability is maintained.

a. **Kempsey and Frederickton**: Deploy from Kempsey SES flood rescue boat and crews to Frederickton and advise other agencies if height to exceed 5.6m (AHD) on the Kempsey Traffic Bridge Gauge.

b. **Gladstone/Smithtown:** Deploy extra SES flood Rescue boats/Vehicles and crews and other resources if height to be > 4.9 m (AHD) on the Kempsey Traffic Bridge Gauge to the Gladstone SES unit.

c. **Crescent Head/Hat Head:** Deploy from Kempsey a SES liaison officer to the RFS headquarters in Crescent head if height to be > 5m (AHD) on the Kempsey Traffic Bridge Gauge.

d. **Kempsey Levee overtopping**: In the event in Kempsey (6.6mAHD Kempsey Traffic Bridge Gauge) the SES Incident Controller will liaise with the LEOCON by 5.4mAHD and arrange for the assembly and briefing of doorknocking teams who will be deployed to warn the residents and businesses of Kempsey.

3.14 ROAD AND TRAFFIC CONTROL.

3.14.1 A number of roads/bridges within the council area are affected by flooding. Details are provided in **Annex B**.

3.14.2 The council closes and re-opens its own roads.

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

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

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

3.14.6 Police, RAMS or Council officers closing or re-opening roads or bridges affected by flooding are to advise the Kempsey Shire SES Local Headquarters, which will then provide a road information service to local emergency services, the public and the Mid North Coast SES Region SES Region Headquarters. All such information will also be passed to the Police, RAMS and the Council.

3.15 STRANDED TRAVELLERS

3.15.1 Flood waters can strand travellers at Kempsey, South Kempsey, West Kempsey, Clybucca, Hat Head, Crescent Head and South West Rocks. Travellers seeking assistance will be referred to Family & Community Services for the arrangement of temporary accommodation.

3.16 MANAGING PROPERTY PROTECTION OPERATIONS

Strategy

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

Actions

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

3.16.3 Property may be protected from floods by:

a. Lifting or moving of household furniture

b. Lifting or moving commercial stock and equipment

c. Sandbagging to minimise entry of water into buildings

3.16.4 The SES maintains stocks of sand and sandbags.

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

3.16.6 Property protection measures for the threat of coastal erosion involves the relocation of readily moveable household goods and commercial stock and equipment. The SES is not responsible for planning or conduct of emergency beach protection works or other physical mitigation works.

3.17 MANAGING FLOOD RESCUE OPERATIONS

Strategy

3.17.1 Rescue of people from floods.

Actions

3.17.2 The Kempsey Shire SES Local Operations Controller controls flood rescue in Kempsey Shire local government area.

3.17.3 Flood rescues, may be carried out by accredited units in accordance with appropriate standards.

3.17.4 Additional flood boats and crews can be requested through the Mid North Coast SES Region SES Region Headquarters.

3.17.5 In the Lower Macleay there will be some residual population which did not evacuate during the early stages of flooding and which require rescue.

3.18 MANAGING EVACUATION OPERATIONS

Strategy

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

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

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

c. Evacuation of people where essential energy and utility services have failed or where buildings have been made uninhabitable.

d. Evacuation of people when their homes or business are at threat of collapse from coastal erosion.

Actions

3.18.2 The evacuation operation will have the following stages:

a. Decision to evacuate

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

c. Evacuation Warning/Order Delivery

d. Withdrawal

e. Shelter

f. Return

3.18.3 During floods evacuations will be controlled by the SES. Small-scale evacuations will be controlled by the Kempsey Shire SES Local Incident Controller. Should the scale of evacuation operations be beyond the capabilities of local resources control may be escalated to the Mid North Coast SES Region SES Region Incident Controller.

Decision to evacuate

3.18.4 In most cases the decision to evacuate rests with the Kempsey Shire SES Local Operations Controller who exercises his/her authority in accordance with Section 22(1) of The State Emergency Service Act 1989. However, the decision to evacuate will usually be made after consultation with the Mid North Coast SES Region SES Region Incident Controller and the Local Emergency Operations Controller.

3.18.5 In events that require large scale evacuations, the decision to evacuate may be escalated to the Region or the State Incident Controller.

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

Mobilisation

3.18.7 The SES Local Operations Controller will mobilise the following to provide personnel for doorknock teams for designated Sectors/locations:

a. Kempsey Shire SES Unit members,

b. RFS Lower North Coast District members via the RFS Fire Control Officer,

c. Local Police Force officers.

3.18.8 The Mid North Coast SES Region SES Region Operations Controller will mobilise any additional personnel required to assist with doorknock teams using:

a. SES members from the Mid North Coast SES Region SES Region and surrounding SES Regions.

b. FRNSW personnel arranged via the FRNSW Liaison Officer located at Mid North Coast SES Region SES Region Headquarters.

c. RFS personnel arranged via the RFS Liaison Officer located at Mid North Coast SES Region SES Region Headquarters.

3.18.9 The SES Local Incident Controller will request the Kempsey Shire LEMO to provide Council personnel to assist with traffic coordination.

3.18.10 The Mid North Coast SES Region SES Region Incident Controller will mobilise the required number of buses for Sectors via the Transport Services Functional Area Coordination Centre.

Delivery of Evacuation Warnings and Evacuation Orders

3.18.11 The SES will advise the community of the requirements to evacuate. The SES will issue an **Evacuation Warning** when the intent of an SES Incident Controller is to warn the community of the need to prepare for a possible evacuation. The SES will issue an **Evacuation Order** when the intent of the SES Incident Controller is to instruct a community to immediately evacuate in response to an imminent threat. A template guide to the content of evacuation warning and evacuation order messages is provided at Annex E.

3.18.12 The SES Local Incident Controller will distribute Evacuation Warnings/Orders to:

a. Sector Command Centres (where established)

b. Kempsey Shire Local Emergency Operations Centre

c. Kempsey Shire Council

d. Mid North Coast Police Local Area Command

e. Lower North Coast Rural Fire Service Control Centre

f. Local SES Wardens

g. Radio Stations

h. Other local agencies and specified individuals

3.18.13 The Mid North Coast SES Region SES Region Incident Controller will distribute Evacuation Warnings/Orders to:

a. The SES State Operations Centre.

b. The Kempsey Shire SES Local Incident Controller.

c. Metropolitan media outlets via the Joint Media Information Centre.

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

e. Media outlets and agencies as identified in Annex D.

3.18.14 Evacuation Warnings and Orders may be delivered through:

a. Radio and television stations (see Annex D).

b. Doorknocking by emergency service personnel.

c. Public address systems (fixed or mobile).

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

e. Two-way Radio.

f. Direct access to Radio Station.

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

3.18.16 Doorknock teams will work at the direction of:

a. The relevant Sector Commander where a Sector Command Centre has not been established.

3.18.17 Field teams conducting doorknocks will record and report back the following information:

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

b. The number of occupants.

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

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

3.18.18 Refusal to evacuate. Field teams cannot afford to waste time dealing with people who are reluctant or refuse to comply with any Evacuation Order. These cases are to be referred to the NSW Police Liaison Officer who will arrange for Police to ensure their evacuation.

Withdrawal

3.18.19 In each Sector, evacuations will generally be carried out in stages starting from the lowest areas, low flood islands and low trapped perimeters; and progressively from higher areas.

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

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

3.18.22 Evacuees will:

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

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

3.18.23 **Health Services**. The Health Services Functional Area will coordinate the evacuation of hospitals, health centres, and aged care facilities (including nursing homes).

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

3.18.25 If there is sufficient time between the start of response operations and the evacuation of communities, the Mid North Coast SES Region Incident Controller will discuss the temporary closure of appropriate schools with the Regional

Director, North Coast Region, Department of Education and Training. This will enable pupils to stay at home or be returned home so they can be evacuated (if required) with their families.

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

3.18.27 **Caravan parks**. The caravan parks known to be flood liable are listed in Annex G, along with arrangements relating to the evacuation of residents and the removal of caravans.

3.18.28 **Assistance Animals, Pets and Companion Animals of Evacuees:** Assistance animals (guide dogs, hearing assistance animals, etc.) will remain in the care of their owners throughout the evacuation. This includes transport and access into evacuation centres etc. Due to safety restrictions, it may not be possible to allow companion animals to accompany their owners when being transported via aircraft or flood rescue boats. Agriculture and Animal Services will make separate arrangements for the evacuation and care of companion animals.

3.18.29 **Transport and storage:** Transport and storage of furniture from flood and/or coastal erosion threatened properties will be arranged as time and resources permit.

3.18.30 **Security:** The NSW Police Force will provide security for evacuated areas.

3.18.31 The SES Local Incident Controller is to provide the following reports to the SES Mid North Coast SES Region SES Region Headquarters:

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

b. Half-hourly progress reports (by Sectors) during evacuations;

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

Shelter

3.18.32 **Evacuation centres / assembly areas.** The usual purpose of evacuation centres is to meet the immediate needs of disaster affected people following evacuation from an emergency situation, not to provide them with accommodation. Evacuees will be advised to go to or be taken to the nearest accessible evacuation centre, which may initially be established at the direction of the SES Kempsey Shire Local Incident Controller, but managed as soon as possible by Welfare Services.

3.18.33 The following locations are suitable for use as flood evacuation centres:

a. Kempsey High School – Broughton St, Kempsey

b. Melville high School – Nicholson St, Kempsey

c. South West Rocks Anglican Hall – 15 McIntyre St,

d. Crescent Head Primary School – 44 Pacific St, Crescent

e. For further Evacuation location Community Service's will identify and advise

3.18.34 **Registration:** The NSW Police Force will ensure that all evacuees are registered on arrival at the designated evacuation centres.

3.18.35 **Animal shelter compounds:** Animal shelter compounds will be set up for the domestic pets and companion animals of evacuees if required. Facilities will be managed by Agriculture and Animal Services.

Return

3.18.36 Once it is considered safe to do so, the SES Local incident Controller will authorise the return of evacuees to their normal or alternative place of residence. This decision will be made in consultation with the following:

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

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

c. Transport Services Functional Areas Coordinator (status of State roads),

d. Kempsey Shire Council (public health, status of local roads).

e. SES Region Incident Controller.

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

3.19 INITIAL EVACUATIONS

3.19.1 A number of evacuations are required during the relatively frequent floods of Minor and Moderate classification.

a. **Upper Macleay Community** – The upper Macleay has about 500 people living there. Generally there is no need to evacuate people other than for Medical needs. In moderate to major flooding the area is cut off by road closures due to washouts and low levels bridges causing properties to become isolated, depending on the severity of road damage isolation can be from 5 days in smaller event up to 30 days in extreme events. Evacuation arrangements for this Sector are detailed at **Annex M.**

b. **Central Macleay Community** – The Kempsey CBD is protected by a Levee system. Levee overtopping can be expected to occur when the predicted peak water level at the Kempsey Traffic Bridge falls between a range of 6.7mAHD and 6.9mAHD, the evacuation is to rising ground in the South or to the West.

c. **Lower Macleay Sector/Community** – The Lower Macleay area has about 9000 people living there. The area covers these main communities such as; Smithtown/Gladstone, South West Rocks, Crescent Head, Hat Head, Jerseyville, Kinchela and Sturts Point/Grassy Head. The area also has extensive rural farming land which includes Austral Eden, Old Station, Verges Creek, Belmore River, Maria River, Seven Oaks, Summer Island, Clybucca and Rainbow Reach.

d. Large areas of the Lower Macleay liable to flooding, roads and bridges can close early, areas then can be isolated and farming operations disrupted even in relatively frequent and low-level events. The problems are many and the effects in the more severe events can be devastating. Community impacts are detailed in the sector tables - See **Annex K.**

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

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

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

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

3.19.6 All reasonable efforts will be made to deliver supplies, however where necessary the SES will prioritise the delivery of items.

Resupply of Isolated Towns and Villages

Strategy

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

Actions

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

3.19.9 If flood predictions indicate that areas are likely to become isolated, the SES Local Operations Controller should advise retailers that they should stock up.

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

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

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

Resupply of Isolated Properties

Strategy

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

Actions

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

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

- The SES will coordinate resupply and establish a schedule.
- Some isolated households will not have the ability to purchase essential grocery items due to financial hardship. If an isolated household seeks resupply from the SES and claims to be, or is considered to be, in dire circumstances, he/she is to be referred to Welfare Services for assessment of eligibility. Where financial eligibility criteria are met, Welfare Services will assist with the purchase of essential grocery items. Welfare Services will deliver the essential grocery items to the SES designated loading point for transport.
- Local suppliers will liaise with the SES regarding delivery of resupply items to the designated loading point.
- Local suppliers are responsible for packaging resupply items for delivery.

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

PART 4 - RECOVERY

4.1 RECOVERY COORDINATION AT THE LOCAL LEVEL

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

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

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

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

4.1.5 The SES Region Incident Controller, the District Emergency Management Officer (DEMO) and appropriate District Functional Area Coordinators will be invited to the initial local meeting and to subsequent meetings as required.

4.1.6 The recovery committee will:

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

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

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

d. provide the SERCON with an end of recovery report.

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

4.2 RECOVERY COORDINATION AT THE DISTRICT AND STATE LEVEL

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

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

4.3 ARRANGEMENTS FOR DEBRIEFS / AFTER ACTION REVIEWS

4.3.1 As soon as possible after flooding has abated, the Kempsey Shire SES Local Controller will advise participating organisations of details of response operation after action review arrangements.

4.3.2 The Kempsey Shire SES Local Controller will ensure that adequate arrangements are in place to record details of the after action review and each item requiring further action is delegated to an organisation or individual to implement.

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

ANNEX A - THE FLOOD AND COASTAL EROSION THREAT

LANDFORMS AND RIVER SYSTEMS

1. The Macleay River traverses the Kempsey Shire making its way from the New England Plateau in the Great Dividing Range to the ocean mouth at South West Rocks. Rising from the Guyra River, it merges with a range of tributaries including the Asprey, Chandler and Styx Rivers. Originally the river exited at Grassy Heads, however, following the 1893 floods a new entrance was forged at South West Rocks.

2. The Macleay River catchment covers 11,500 square kilometres with its tributaries extending for a distance of about 160 kilometres from the coast. The Macleay River valley consists of three distinct zones:

   a) **The New England Tablelands section**, where the principal tributaries (the Chandler, Muddy and Apsley rivers) rise. This section is entirely outside Kempsey Shire.

   b) **The Gorge section**, where the rivers leave the tablelands in a series of waterfalls and join to form the Macleay River in the well-defined gorge zone. Here the valleys are steep sided, stream gradients are steep and flood flow velocities are high. On this section there are several minor tributaries (the Parrabel, Hickeys, Georges and Nulla Nulla creeks and Dykes River) but no major ones. Below the Hickeys Creek confluence the topography becomes less severe as the river emerges from the gorges.

   c) **The lower valley section**, which begins at the upper limit of tidal influence about 16 kilometres upstream of Kempsey. Here there are extensive alluvial flats, occupying some 43,000 hectares, and well-defined natural levees along the river and its tributaries (the Belmore River and Christmas, Kinchela and Clybucca creeks). Some of the levees have been raised as part of the flood mitigation effort. The ground slopes away from the levees to low-lying swamplands (the Doughboy, Cooroobongatti and Belmore Swamps and Swan Pool) which act as storage areas for floods. These swampy areas are mostly less than a metre above sea level. The river reaches the sea via the main entrance and during floods may do so through Korogoro Creek, Big Hill Cut, Rowes Cut, Ryans Cut, Killicks Creek and South West Rocks Creek. Other breakouts through the sand dunes may also occur. Water can also flow into the Hastings Catchment via Connection Creek to the Maria River or even flow from Maria River back into the Macleay catchment.

A2. STORAGE DAMS

Steuart McIntyre Dam

1. The Steuart McIntyre Dam catchment is very small only 545km2. The dam is located in the very upper catchment area of Fattorini Creek. The catchment area is covered by medium density timber. The storage is located on private land, which has been acquired by Kempsey Shire Council.

2. Steuart McIntyre Dam is an off stream storage, there are no gauges that are directly relevant to the inflow into the Dam, however there are several stream gauges upstream of the dam in the Macleay River that may indicate potential floods entering Steuart McIntyre Dam.

3. The dam's capacity is 2500ml and construction is via earthed filled embankment. See Annex F

Malpas Dam

4. In an extreme flood on the Gara River, a tributary of the Muddy River in the New England Tablelands, it is possible that Malpas Dam could fail. This earth and rock fill dam north-east of Armidale impounds a small storage lake with a capacity of 13,000 mega litres.

5. While the effects of a failure of Malpas Dam would be very severe within Dumaresq Shire, the flood level would attenuate very quickly downstream. It is thought that the incremental impact of dam-failure flooding in the Kempsey Shire – that is, the impact above whatever flooding was already occurring there would be negligible.

A3. WEATHER SYSTEMS AND FLOODING

1. The heavy rain which produces floods in the Kempsey Shire may come from the following kinds of weather systems:

    a) **East Coast Low-Pressure Systems**. East coast low-pressure systems that travel along the coast, usually in a southerly direction and during the cooler months, direct moist on-shore winds over the Macleay River basin. Orographic uplift of these air masses brings heavy rain over the lower valley and the Gorge zone. The August 1949, June 1950 and May 1963 floods, the most severe in living memory, were of this origin. In 1949 the heaviest rainfall was over the lower valley, whereas in 1950 and 1963 it was over the Gorge section but with substantial falls also occurring over the lower valley. The 1949 system was unusual in that it originated over land in southern Queensland, moving south-eastwards very slowly over the Macleay River catchment. In 2009/11 a complex weather pattern off the northern eastern NSW coast which also included a low pressure

system moving from the southern Queensland and a slow moving high from the Tasman Sea.

b) **Rain Depressions**. Rain depressions originating as tropical cyclones in the Gulf of Carpentaria or Coral Sea move southwards. The flood of January 1974 was of this type, the 'tail' of ex-tropical cyclone Wanda causing heavy falls over south-eastern Queensland and north-eastern NSW. Two months later, flooding occurred from a rain depression, which had originated as Tropical Cyclone Zoe.

c) **Monsoonal Low-Pressure Systems**. Monsoonal low-pressure systems move across the Great Dividing Range from northern Australia, usually during the late summer and autumn months. These systems are indicated on weather maps as elongated low-pressure troughs stretching from the Northern Territory to the north coast of NSW. These may produce heavy rains over the Gorge zone. Flooding from this mechanism is rare in the Macleay River valley.

d) **Frontal Systems**. Sequences of fronts cross the valley from west to east, usually in the winter months. The individual fronts are not usually associated with very heavy falls but the cumulative effect of a series of them over a period of some weeks may produce flooding. The flood-producing mechanism is uncommon.

e) **Thunderstorms**. High-intensity, short-duration, convective thunderstorms occur frequently over the shire, especially during the summer months. The rain from such storms may cause town drainage systems or minor creeks to surcharge, creating local flooding of low-lying areas. No rise in the Macleay River is likely from such events.

2. Rains from the first three types of systems noted above could persist for some days, especially in the case of east-coast low-pressure systems which can cause heavy rain over periods of three to five days. Sometimes there may be two or more separate rain events a few days or weeks apart. In 1974, there were separate floods from these influences in January, March and April, and again in 2009 in February, March and May.

3. Most of the larger floods at Kempsey have resulted from events in which significant rain has fallen over the whole of the catchment. Lesser events may occur after rain only falling over parts of the catchment. The 1949, 1950, 1963, 2001 floods all followed general catchment-wide rainfall. The 2009 and 2011 floods whilst had rainfall over the entire catchment area, the heaviest falls were in the lower part of the catchment.

4. North-eastern NSW experiences a distinct wet period between January and April, and about half of the recorded floods on the Macleay River have

occurred between January and March. The incidence of flooding in the winter months is lower but winter floods have tended to be the most severe. The spring and early summer months are relatively dry and floods are infrequent during these times of year.

A4. CHARACTERISTICS OF FLOODING

Macleay River

1. Flooding upstream of Kempsey is confined to areas close to the river and its tributaries though in the more severe events quite large areas can be inundated in the Temagog, Mooneba, Sherwood, Turners Flat, Dondingalong and Euroka areas.

2. Much larger areas downstream of Kempsey in the Lower Macleay are liable to flooding.

3. Minor flooding can occur when the gates on Flood Control Structures on Belmore and Kinchela Creeks are opened the flood waters flow into the Belmore and Kinchela storage areas.

4. On some occasions, flooding in the area below Kinchela can be exacerbated by very high tides or by storm surge conditions. Below Jerseyville the extent of flooding may be more closely correlated with sea conditions than with upstream flood magnitude. In 1963, flood levels were higher in this area than in 1949 when the flooding was much more severe at Kempsey.

5. The lower valley includes Connection Creek, which may take water from Belmore Swamp to the Maria River or vice versa (see Maria River).

Maria River

6. The Maria River is the major tidal tributary and joins the Hastings River about 10 kilometres upstream from the ocean entrance. It drains the northern section of the Hastings catchment that extends along the coastal plain toward Kempsey and during periods of flood flow permits an exchange of water between the adjacent valleys via Connection Creek. The water level can be partially controlled through the operation of a weir at the Kempsey / Port Macquarie Hastings LGA boundary. It is joined by the Wilson River immediately downstream of Telegraph Point which extends west to Upper Rowland's Plains.

7. Flooding of the Maria Rivers is largely influenced by the flood levels within the Hastings River. The floodwater gradient is typically very flat, with floodwaters "backing-up" along the Maria River from the Hastings River confluence. The flat water surface gradient can also be attributed to the substantial storage afforded by the coastal floodplain of the Maria River which extends from the Pacific Highway to the coast.

8. During the Major Flood on the Macleay in March 2001 several property owners had approx. 60cm of water in their homes. This flooding originated in the Macleay River.

9. The flood in February 2009 originated in the Hastings and Wilson River Areas due to backing up of the Hastings River. The river began to flow back towards the Connection creek and the Lower Macleay catchment. This flood put approximately 1.22 meters of water in 8 houses on the Eastern side of Maria River.

Approximate Gauge Levels & Flow Times (From Georges Creek)

Georges Ck Height	Bellbrook	Turners Flat	Kempsey	Smithtown
4m	3.0m (+8hrs)	2.65m (+16hrs)	1.4m(+24hrs)	-
8m	7.0m (+9hrs)	5.5m (+17hrs)	4.6m(+25hrs)	-
9m	7.3m (+9hrs)	6.0m (+16hrs)	5.7m(+24hrs)	4.2m (+29hrs)
11m	10.65m (+7hrs)	9.87m (+13hrs)	6.60m(+20hrs)	4.3m (+22hrs)
13.8m	15.5m (+5hrs)	13.7m (+11hrs)	8.0m(+16hrs)	4.5m (+17hrs)
17m	17.5m (+4hrs)	18m (+10hrs)	8.7m(+14hrs)	4.75m (+15hrs)
20m	21m	20m	12.5m(+12hrs)	-

Table A-1: Approximate Gauge Levels & Flow times (From Georges creek) (Webb2004)

Design Flood & Peak Flows Estimates

	1% AEP		2% AEP		5% AEP		10% AEP	
	Level (mAHD)	Velocity (m/s)	Level (mAHD)	Velocity (m/s)	Level (mAHD)	Velocity (m/s)	Level (mAHD)	Velocity (m/s)
Aldavilla	15.3	3.0	14.4	3.0	12.9	2.9	11.7	2.7
Short Street	10.79	3.5	10.13	3.6	9.23	3.5	8.50	3.4
Kempsey Bridge	8.55	4.9	8.24	4.4	7.77	3.8	7.37	3.3
Pola Creek	8.40	-	8.09	-	7.62	-	7.22	-
Glenrock Drain	7.60	2.6	7.30	2.5	6.91	2.5	6.43	2.4
Frederickton	6.53	3.0	6.38	2.8	6.17	2.4	6.00	2.2
Smithtown	4.76	1.7	4.66	1.6	4.50	1.5	4.34	1.4
Jerseyville	3.59	1.3	3.12	1.2	2.45	1.2	2.15	1.2
New Entrance	2.30	3.3	2.20	2.7	2.05	2.1	2.05	1.6

Hydraulic Modelling Report. wpd: 4 August 2009

Table A-2: Design heights

A5. FLOOD HISTORY

1. Flood records are available from 1838, soon after the founding of Kempsey to 2011. Floods which are known to have exceeded 6.0 metres (AHD) at the Kempsey Road Bridge gauge are shown in *Table 4*, along with the heights reached in these events, where known, at Georges Creek and Bellbrook. Some of the earlier values are approximations, but those since 1945 are believed to be accurate.

2. The table highlights the irregularity of serious flooding on the lower Macleay River. Several Major floods may occur in a short period of time, as was the case in the periods 1863-75 and 1890-93, and 1949 and 1950 saw Kempsey's worst two floods ever within eight months of each other. Equally, there may be long periods in which few if any serious floods are experienced (for example, between 1921 and 1949 and between 1967 and 2001). The same irregularity applies for floods of lesser significance.

Peak Flood Heights - 1838-2011

Peak Flood Heights (metres) at Georges Creek, Bellbrook and Kempsey

Date	*Georges Creek*	*Bellbrook*	*Kempsey*	*Smithtown*	*AEP (%) Kempsey (approx)*	*ARI (years) Kempsey (approx)*
1838	-	-	*7.2*	-	-	-
1841	-	-	*7.2*	-	-	-
Aug 1848	-	-	*6.3*	-	-	-
Feb 1863	-	-	*6.6*	-	-	-
Feb 1864	-	-	*7.9*	-	-	-
July 1864	-	-	*6.8*	-	-	-
Aug 1864	-	-	*7.8*	-	-	-
July 1866	-	-	*6.8*	-	-	-
April 1867	-	-	*7.2*	-	-	-
March 1870	-	-	*6.8*	-	-	-
March 1875	-	-	*8.1*	-	*2.5%*	*40*
June 1879	-	-	*6.6*	-	-	-
March 1890	-	-	*6.6*	-	-	-
April 1892	-	*8.8*	*6.6*	-	-	-
March 1893	-	-	*7.2*	-	-	-
June 1893	-	*17.1*	*8.0*	-	*3%*	*30*
July 1921	-	*16.16*	*7.82*	-	-	-
Feb 1928	-	-	*6.06*	-	-	-
Feb 1929	-	*12.20*	*6.75*	-	*15%*	*7*
March 1946	-	*12.73*	*6.49*	-	*16%*	*6*
Aug 1949	*14.10*	*17.22*	*8.42*	-	*1%*	*90*
June 1950	-	*18.06*	*8.27*	-	*2%*	*60*
Aug 1952	-	*13.03*	*6.52*	-	*16%*	*6*

Feb 1954	-	*11.23*	*5.29*	-	*20%*	*5*
Nov 1959	-	*9.75*	*6.09*	-	*25%*	*4*
April 1962	-	*8.15*	*6.04*	-	*25%*	*4*
May 1963	*13.50*	*15.54*	*7.64*	*4.50*	*7%*	*15*
June 1967	-	*10.24*	*6.52*	-	*16%*	*6*
Jan 1968	-	*8.84*	*6.27*	-	*20%*	*5*
Jan 1974	*8.63*	*7.70*	*6.06*	-	*25%*	*4*
March 1974	*6.78*	*7.11*	*6.19*	-	*22%*	*4.5*
Feb 1976	*8.64*	*7.56*	*6.04*	-	*25%*	*4*
May 1977	*7.60*	*6.75*	*6.06*	-	*25%*	*4*
May 1980	*7.00*	*7.14*	*6.23*	-	*20%*	*5*
April 1989	*6.72*	*6.34*	*6.07*	-	*25%*	*4*
March 2001	*12.06*	*12.85*	*7.40**	*4.34*	*8%*	*12*
May 2009	*11.90*	*10.80*	*6.90**	*4.29*	*14%*	*8*
June 2011	*11.0**	*10.65**	*6.92**	*4.21*	*15%*	*7*

Table A-3: Peak River Heights 1838-2011

*** Manual gauge readings only - telemetric failed**

3. The last two columns in the table refer to the frequency of floods of differing severity. The AEP (Annual Exceedance Probability) value is the percentage chance that a flood of this height will be reached in a particular year. For example, a 2% AEP flood has a 2% chance of occurring in any given year.

4. The below table shows the conversion of Annual Exceedance Probability (AEP) to Average Recurrence Interval (ARI)

AEP	ARI	Kempsey traffic bridge (AHD)
0.2%	**1:500**	**-**
0.5%	**1:200**	**-**
1%	**1:100**	**8.55m**
2%	**1:50**	**8.24m**
5%	**1:20**	**7.77m**
10%	**1:10**	**7.37m**
20%	**1:5**	**-**
50%	**1:2**	**-**

5. The percentage value corresponds with the ARI (Average Recurrence Interval), which is the average length of time, which is estimated to elapse between floods of a given magnitude. A 2% AEP flood, for example, is expected to be experienced **on average** once in a 50-year period. In a **particular** 50-year

period it could occur on several occasions or not at all. An illustration of this unevenness of occurrence is that Kempsey's two worst floods, both of them higher than the 2% AEP event, happened within nine months of each other.

6. A brief history of the major flood events is provided in the following paragraphs.

August 1949 Flood Event – Flood of Record

7. The eastern states of NSW received above average rains during 1949. This rainfall tended to occur as brief but intense cyclonic storms, with relatively dry intervening periods. Flooding was experienced in some part of the eastern states in every month of 1949 but was most widespread in February, March and October. In New South Wales, flood rains occurred in the far north-west in March, on the central coast in June and on the Macleay in August. Late in August 1949 an extremely intense storm that covered a fairly small area moved slowly from west to east over the period 22—27 August 1949. Heavy rain fell over the Macleay catchment area during the 25, 26 and 27 August 1949.

8. Surface runoff commenced at about midnight of 25 August 1949 and headwater streams rose rapidly, reaching their peak during the afternoon and evening of 26 August. The Gara River reached its highest stage of 4.1 metres at 3 p.m. on 26 August 1949. The Macleay River began to rise early in the morning of 26 August 1949 and reached its peak of 17.2 metres at Bellbrook at 5 a.m. on 27 August 1949 following phenomenal rises of up to 3.05 metres per an hour.

9. At Kempsey, the Macleay commenced to rise during the morning of Friday, 26 August 1949 and rose to a level of 4.5 metres (AHD) by midnight. Early on Saturday 27 August 1949 floodwaters entered Central Kempsey from near the railway bridge and by 5 a.m. the level was 7.0 metres (AHD) on the gauge. At about this level floodwaters were around the Post Office corner. By noon that day the water flowing across Belgrave Street was 3 metres deep, flowing very fast (a velocity of 3m/sec) and substantial damage had occurred. Water also crossed River Street near Wide Street, washing a house from its foundations into the street. The level at that point was about 11 metres AHD (at least 10m above the normal level) and the velocity was 3.5 m/sec.

10. The river continued to rise and reached a maximum height on the Traffic Bridge gauge of 8.42m (AHD) at 3 p.m. on 27 August 1949.

11. In the lower Macleay areas much of Frederickton was inundated and the villages of Smithtown, Gladstone, Kinchela and Jerseyville were totally flooded. The rural areas of Belmore River, Austral Eden, Upper Kinchela, Seven Oaks, Bellimbopinni, Rainbow Reach, Summer Island and Clybucca were all severely affected by depths up to 3 metres. The entire area downstream of

Frederickton, from Collombatti in the west, to the coastal dunes 20 km away to the east and north to Stuarts Point was flooded. Floodwaters also crossed the Crescent Head Road and combined with water from the Hastings River, flooded rural areas of Maria River towards Port Macquarie. Water remained on much of these affected areas for months after the flood.

12. At least six people are known to have lost their lives in the August 1949 flood and very extensive damage to infrastructure and properties was caused. Contemporary reports indicate that in Kempsey alone, 35 houses were completely washed away and 300 left uninhabitable. About 2,000 people were made homeless in Kempsey. Many shops were severely damaged and stock and furniture ruined.

13. The flood of August 1949 was originally considered as the "1 in 100 year flood", however more recent analysis indicates that it had an average recurrence interval (ARI) of about 1 in 90 years. It is now predicted that a statistical 1 in 100 year probability flood would reach a level of 8.2 metres on the Kempsey Traffic Bridge Gauge.

June 1950 Flood Event

14. 1950 was a particularly wet one throughout NSW. There were major floods earlier that year in the central-west, north-west, central coast and Sydney area from low pressure fronts moving across the continent. The rainfall record for Kempsey indicates that the total rainfall in 1950 was 2,359 mm, almost twice the average of 1,220 mm and by far the wettest on record (surpassing the 1949 figure by some 700 mm).

15. There is a lack of stream data from this event, due to many gauges being washed away in the previous year and not replaced. Flood levels in some areas were comparable to or exceeded the 1949 event due to local conditions. Particularly in the Lower Macleay levels in 1950 were said to be 300—450mm higher than in 1949. At Bellbrook the recorded level was the highest on record at 18.06 metres (some 800 mm above the previous year). The peak at Kempsey of 8.27 metres (AHD) on the gauge occurred on the 25 June 1950.

16. There was less destruction in this flood due mainly to the fact that buildings and houses damaged in the 1949 event had not yet been replaced. However, the railway viaduct, which had not yet been reconstructed from the previous year, was again washed away. Several houses were destroyed in Kempsey and down river and downriver there was extensive damage to infrastructure and rural properties.

May 1963 Flood Event

17. This flood resulted from an intense series of low-pressure systems along the east coast from late April to early May, 1963. These weather systems travelled almost parallel to the coast as far south as Victoria.

18. Rainfall was concentrated in the zone from Lower Creek to Kempsey, with the highest falls in the upper Styx River and Georges Creek areas. The rainfall occurred over a five-day period and the general intensities are much less than the 1949 and 1950 storms. Hence there was more warning and less destruction.

19. The peak of the flood at 7.64 metres occurred at Kempsey on 7 May 1963. Kempsey was flooded with 3 to 4 metres of water through the central business district and several streets were evacuated. Smithtown was also evacuated. Damage was mostly to Central Kempsey and the rural lower river areas.

20. Levels downriver were about 300 mm below the 1949 levels. This flood is now estimated to be a 1 in 15 year ARI event.

21. There were no significant flood events (over 1 in 10 year ARI) in the Macleay River for a further period of 38 years, and as a result the population had become complacent. Mitigation and protection measures were largely untested.

March 2001 Flood Event

22. A very intense sub-tropical low-pressure system produced heavy rainfall over the north coast of NSW between 6—11 March 2001 and resulted in major flooding occurring in several valleys including the Macleay River Valley.

23. The highest recorded rainfall occurred in the lower half of the Macleay River Valley. This reduced the amount of lead time between heavy rain and the peak at Kempsey compared to the previous major flood of May 1963, where major flooding was also experienced in the upper catchment at places such as Armidale.

24. The heaviest rain fell between 9 p.m. on 8 March 2001 until midnight on 9 March 2001. The time difference between the heaviest rain and the flood peak at Kempsey was about 21 hours. A key warning for major flooding (6.7 metres (AHD) was issued at 12:30 p.m. on 9 March 2001, some 18 hours before the level was reached.

25. The warnings that followed, however, were based on faulty river level readings as the river bank, on which the river level recorder was affixed, gradually slumped causing the pressure sensor to sink, resulting in it recording artificially high river heights. The Bureau suspected there was a problem with the river gauge shortly after noon on 10 March 2001 as the apparent rate of river level

rise at Kempsey seemed to be too high compared with river gauges located upstream at Aldavilla and Turners Flat.

26. The SES attempted to manually read the gauge from a flood boat but could not safely navigate it between the bridge pier, on which the gauge plate is affixed, and the riverbank. Further attempts to manually verify the river level readings from the automatic gauge resulted in some confusion between physically reading the gauge plate and reading the value from a computer screen locally, which was the same level as the BoM had on its screen in Sydney. As a result, the high levels were "confirmed" locally so the BoM was forced to adjust its flood forecasts to reflect this. Fortunately, for people downstream, the high levels recorded on the Kempsey automatic gauge were false, otherwise flooding would have been similar to that experienced in the 1949 and 1950 floods. The Kempsey Shire Council quickly issued a press release the following day to explain what had happened.

27. The catchment was already very wet from heavy rain in February, when a level of 4.72 metres (AHD) at Kempsey had been recorded.

28. At about 7 a.m. on Saturday 10 March 2001, water began to flow over the Eden Street levee (level on the gauge at that time was 6.65 metres (AHD) and at about 8 a.m. the First Lane levee was just overtopped (gauge was reading 6.7 metres (AHD) at that time. Water then flowed into the Kempsey CBD basin from north and south, filling the basin over a period of 5—6 hours. Forth Street was closed to traffic by 11 a.m. and Belgrave Street by around 1 p.m. Saturday. The peak ponded level in the Kempsey CBD appears to be about 6.6 metres AHD.

29. Gladstone, Smithtown, South West Rocks, Hat Head, Crescent Head and many upstream and downstream rural areas were isolated. Many food drops or evacuation for medical reasons were organised. The sewerage treatment system at Smithtown / Gladstone was overloaded by floodwaters and disebarging occurred. Council staffs were unable to bring the system back on line until late Tuesday 13 March 2001. Both villages were voluntarily evacuated of some persons until the sewer was fully functional. Apart from short periods during power failures at Bellbrook and Stuarts Point, there were no problems with or disruptions to water supply in any area.

30. The Kempsey Traffic Bridge Gauge malfunctioned from about mid-day Saturday, causing much higher predictions by the BoM and Council than the actual levels. A manual read was finally able to be made at 10:55 p.m. confirming a level of 7.2 metres (AHD) at that time. It appears the flood peaked at 7.4 metres (AHD) between 9 and 10 p.m. on the evening of Saturday 10 March 2001. Actual levels were observed thereafter. Overtopping of all the

town levees and inundation of the Kempsey CBD did occur and the basin filled in about 6 hours. Belgrave Street and Forth Street were impassable for about 24 hours. Water slowly receded in the River and below the top of all the levee banks but was unable to drain from the town until the river receded at First Lane.

31. This flood now appears to be about a 1 in 12 year event, and the highest to occur since 1963. The 1963 flood reached a level of 7.64 metres (AHD) on the Kempsey Traffic Bridge Gauge, and was classed as a 1 in 15 (ARI) year event.

32. Approximately 94 businesses were flooded within the CBD. Damage to individual businesses ranged from several hundred dollars to almost half a million dollars.

MAY 2009 FLOOD EVENT

33. A severe weather event impacted the north-eastern areas of NSW during the week following 18th May 2009. As a result of the subsequent intense rainfall and heavy wind gusts, a major flood event impacted upon the Macleay River between 20th and 22nd May 2009.

34. On 18 May the Bureau identified a complex weather pattern off the north eastern NSW coast which included a low pressure system moving from the southern Queensland coast and a slow moving high from the Tasman Sea. The catchment was wet due to smaller flooding events in March 2009 and a wet season.

35. Following continued severe weather and high rainfall a flood watch was issued for the region on Thursday 21 May prompting Council to activate its flood procedures and close the Kinchela and Belmore Floodgate structures.

36. At 0730 on Friday 22 May the Bureau issued a warning for moderate flooding of the Macleay River. Rural communities within the lower Macleay were informed to prepare for moderate flooding as it was anticipated the flood gates would need to be opened at some stage. The flood warning was upgraded to prepare for a major flood event at 0130 on Saturday 23 May.

37. Monitoring of weather and flood predictions and local flood gauges was undertaken by the SES and Council throughout the day and evening. The BoM had warned of an expected maximum peak for the Kempsey Traffic Bridge to be 7.2 metres. Hourly monitoring of the gauge however calculated that to a point up to 6 metres the readings were 150mm below the automatic telemetry readings and 300mm below when the reading was above 6 metres on the manual gauge. Based on this information, and comparing data from previous events it was anticipated that the maximum peak would be 6.9metres on the manual gauge. Based on historical data it was anticipated that at 6.9 metres the Glenrock and Eden Street levees would begin to overtop.

38. At 2030 the river broke its banks at the Riverside Park Boat ramp causing Eden Street to backfill approximately 100 metres south to a depth of 300mm. Road levels at John and Verge Streets successfully contained the breach however the water breached through erosion gutters on either side of the road at the intersection of Eden and Sydney Streets. At the southern end the water flowed into a stormwater pit whilst the northern end it flowed down the gutter on Sydney Street, into a car park and overtopping the kerb onto the playing field in Verge Street.

39. Soon after the river again broke through the sandbagging of the Pacific Highway abutting the Glenrock levee causing it to slowly over top. Whilst some overtopping of the levee systems did occur, water levels subsequently dropped and the CBD was not inundated.

40. Major disruption was caused to the smaller surrounding communities outside Kempsey as the rural levee systems in the Lower Macleay overtopped. Significant flood damage to the rural farming land of Jerseyville, Gladstone and Smithtown. The damage sustained was to livestock and equipment with only a small amount of properties with over floor flooding. The coastal townships of Hat Head, South West Rocks and Crescent Head were isolated for a few days.

JUNE 2011 FLOOD EVENT (Similar to 2009)

41. A severe weather event impacted the north-eastern areas of NSW during the week beginning 12th June Following continued severe weather and high rainfall a flood watch was issued for the region on Thursday 21 May prompting Council to activate its flood procedures and close the Kinchela and Belmore Floodgate structures 2011. As a result of the subsequent intense rainfall and heavy wind gusts, a major flood event impacted the Macleay River catchment on the 15th of June.

42. On 12 June the Bureau identified a strong high pressure system west of Tasmania moving slowly east extending a ridge across the southern Tasman Sea and low pressure trough deepening off New South Wales central & North Coasts. This was accompanied by a gale warning stretching from Smoky Cape to Norah Head with wind speeds up to 40 knots & swell increasing to 4 metres.

43. Following continued severe weather and high rainfall a flood watch was issued for the region on Thursday 21 May prompting Council to activate its flood procedures and close the Kinchela and Belmore Floodgate structures.

44. At 11:10 on Tuesday 14 June the Bureau issued a warning for minor to moderate flooding of the Macleay River. Rural communities within the lower Macleay were informed to prepare for moderate flooding as it was anticipated the flood gates would need to be opened at some stage. The flood warning was upgraded to prepare for a major flood event at 22:35 on Tuesday 14 June.

45. This event was similar to the 2009 event with Major disruption to the Lower Macleay as the rural levee systems in the Lower Macleay overtopped. Significant flood damage to the rural farming land of Jerseyville, Gladstone and Smithtown. The damage sustained was to livestock and equipment with only a small amount of properties with over floor flooding. The coastal townships of Hat Head, South West Rocks and Crescent Head were isolated for a few days.

46. All warning gauges failed in this event and manual reading had to be undertaken by the SES members and phoned to the Bureau of Meteorology for warning predictions.

A6. FLOOD MITIGATION SYSTEMS

1. Extensive rural flood mitigation works have been completed since the 1950s on the floodplain of the lower Macleay River. These comprise levees, barrages, drains, floodgates, floodway's, training walls, ocean cuts and river bank stabilisation works. They are designed to reduce the frequency and real extent of flooding and to facilitate drainage after inundation.

KEMPSEY LEVEE:

2. The town of Kempsey is protected by a Levee. The Levee system is made up of

Levee Name	Surveyed Height	Design Height	Gauge Related To	Construction type	Low Spots	Location of any spots that require closure
Short St	-	10.90m	Kempsey Bridge	Earth Embankment	-	-
Cochrane Street (Glenrock Drain)	5.86m	5.90m	Kempsey Bridge	Earth Embankment	Pacific Highway	Sandbags
Eden Street	7.3-7.7m	7.50m	Kempsey Bridge	Earth Embankment	Eden St near Sydney St Intersection	Sandbags
RSL Levee	7.10-7.15m	7.26m	Kempsey Bridge	Concrete Wall	-	-

3. Levee overtopping can be expected to occur when the predicted peak water level at the Kempsey Traffic Bridge falls between a range of 6.7mAHD and 6.9mAHD.

4. The levee spillways are designed to work differently depending on if the water is fast or slow rising. Fast rising floods will typically cause the Eden Street levee

to overtop before the Cochrane Street levee. When the rate of water level rise is slower (less than approximately 0.1 m/hr.), the Cochrane Street levee may begin to overtop first.

5. The Kempsey has levee protection in the form of the Eden Street and First Lane (Cochrane Street) levees. When the Eden Street levee is overtopped, the basin to its immediate north could fill within 90 minutes to a depth of 3—4 metres.

Table A-4: Kempsey Levee

POLA CREEK LEVEE:

6. Old Pola Creek levee is at the northern end of Old Pola Creek. It was placed there to keep floodwaters from backing up into Old Pola Creek. The corresponding level at the Kempsey Traffic Bridge for overtopping of the levee is 3.5mAHD.

Frederickton Levee: (due for completion 2012)

7. As part of the Kempsey bypass project a levee will be constructed along the bank of the Macleay River at Lawson Street and the Pacific Highway, Frederickton.

8. The levee will be approximately 960metres 1.5 to 2 metres in height, 920 metres cubic metres of fill. The levee wall is primarily an earth embankment with a small section behind the Frederickton Butter Factory, being a sheet pile

wall. The Levee is built to a one in one hundred year flood level with 500mm free board.

9. Until the levee is finalised there is to 5 – 6 properties in a 5% (1:20) flood.

Smithtown Levee:

10. Smithtown has levee protection by natural river bank levee but only to about a 20% (1:5) flood event. The corresponding level at the Kempsey Traffic Bridge for overtopping of the levee is 5.7m (AHD). (4.0m Smithtown Gauge)

Hat Head Levee:

11. Hat Head has levee protection to about the level of the 1% AEP (1:100) flood. The levee is principally to prevent flooding due to storm surge

12. The Hat Head levees are designed for large flood events to direct water through the Korogoro Creek, this forms part of the flood mitigation and drainage system for the Belmore-Kinchela are of the lower Macleay, and this system deflects water through the sand dunes upstream of Hat head. The flood mitigation system comprises the following works:

    a) An excavated channel through the inner coast sand dunes to convey floodwaters from Kinchela Creek and the Swanpool to Korogoro creek.

    b) Floodgates across the Korogora Creek at Hat Head Road approximately 3 klms upstream of Hat Head.

    c) A control levee fitted with culverts is constructed across Korogoro creek between the coastal inner sand dunes approximately 2 klms upstream.

    d) An emergency overflow spillway was excavated through the coastal sand dunes some 300 metres upstream of the Control Levee.

    e) Flood levees are on both sides of korogoro Creek through Hat Head.

    f) It is constituted from compacted beach sands with internal plastic membrane to limit seepage and has been grassed.

Levee	Crest Height (AHD)	Design height (AHD)	AEP
Control Levee	3.9 m	3.5 m	-
Hat Head Levee	2.4 m	2.1 m	1 in 100
South – Western Levee	2.4 m	2.1 m	-

Table A-5: Hat Head Levee System

FLOOD GATES – Belmore and Kinchela:

13. When a flood warning is received predicting heights greater than 5.0m AHD (Kempsey Traffic Bridge Gauge) a preliminary notice will be issued by Kempsey Shire Council that the Flood Control Structures at Belmore and Kinchela may need to be opened.

14. The control gates are gradually opened in several stages as required or until full outflow is reached.

15. The floodway's were originally designed to assist in achieving uniformity of protection along the river for a designated bank full flood. By opening the floodway's at appropriate times flood protection was improved in most of the lower valley adjoining the main river. Flood protection from more frequent floods was also improved for the Belmore and Kinchela by installing the headwork's structures.

16. As soon as possible after the flood has receded off the low roads and the level has dropped below 5.0 metres (AHD) at Kempsey, the gates will be progressively closed.

A7. EXTREME FLOODING

1. Worse floods than have been seen in the Kempsey Shire must be regarded as inevitable. They will occur when particularly severe weather conditions of the sorts described above are experienced. An estimate of the Probable Maximum Flood (PMF) at Kempsey is that it would reach a height of 11.7 metres (AHD) at the Kempsey Traffic Bridge gauge. This flood, the worst possible on the Macleay River, would peak more than 3 metres higher than the level reached in 1949. Floods considerably smaller than this but bigger than the event of 1949 are more likely to occur and would have devastating consequences for the whole of the lower valley.

2. All of the lower Macleay communities such as Smithtown, Gladstone, Kinchela and Jerseyville would have flood waters over roof levels and would require evacuation early due to the early loss of evacuation routes.

A8. COASTAL EROSION

1. Kempsey shire has a low risk to coastal erosion. The following two locations have a risk of medium coastal erosion to the foreshore only and are shown on map;

    a) Hat Head Beach and

    b) Killick Beach

ANNEX B - EFFECTS ON THE COMMUNITY

B1. COMMUNITY PROFILE

1. In the 2006 Census the Kempsey Local Government Area was found to comprise a population of 27,387 with an Indigenous population of 9.3%, well above the national percentage at 2.3%. The median age is 42 with 17.6% aged 65 years or over compare with a national figure of 13.3%. 58% or 15,932 residents live outside the serviced or populated area.

Census	LGA	Kempsey	Smithtown /Gladstone	Crescent Head	Hat Head	SWR
Total Persons	27388	8138	959	1966	298	4612
Total Dwellings	10293	3127	387	421	130	2278
Persons aged 65 years and over	4824	1604	187	241	76	1212
Persons aged below 15 years	5693	1888	199	404	31	763
Medium Age			44	43	52	50
Total persons with a need for assistance (profound / severe disability)	1740	684	27	32	22	-
Persons of indigenous origin	2540	1392	39	37	16	165
Total persons using Internet	4828	1115	165	224	55	-
Single parent families	1585	669	50	91	12	211
Persons living alone	2750	1024	95	135	33	-
Persons who do not speak English well	20	7	0	3	0	51
Total persons who lived at a different address 5 years ago	8585	2499	203	318	89	-
Households without vehicles	998	572	24	27	12	-
Total persons residing in caravans, cabins or houseboats	318	106	0	21	0	-
Mean household size	2	2	2	2	2	2

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

B2. SPECIFIC RISK AREAS - FLOOD

UPPER MACLEAY VALLEY

Overview of Area

1. The Upper Macleay area has about 900 people living there. The area reaches from Georges Creek high in the catchment making its way down to Bellbrook, Toorooka, Willawarrin, Temagog and Turners Flat, Mooneba and Skillion Flat in the east.

2. In moderate to major flooding the area is cut off by road closures due to washouts and low levels bridges causing properties to become isolated, depending on the severity of road damage isolation can be from 5 days in smaller event up to 30 days in extreme events.

3. The main populated communities are Bellbrook, Mirrawinni Gardens Aboriginal community and Willawarrin with the other area being mainly rural farming.

George Creek/Bellbrook Community

4. This little village is 54 km west of Kempsey in the Upper Macleay Valley. The village of Bellbrook itself (population less than 200) is flood free but a small number of farmhouses in lower areas outside the village could be affected by severe floods. The community has a Hotel, shop and community hall.

5. The Bellbrook Bridge closes when the Bellbrook gauge reaches 2.80m.

Name	Total
Total Persons	544
Total Dwellings	271
Persons aged 65 years and over	48
Persons aged below 15 years	144
Medium Age	40

Classification of Floodplain

6. Bellbrook is a High Flood Island that is cut off and becomes isolated due to road closures.

Schools and childcare centres

7. The following schools are at risk of isolation.

   a) **Bellbrook Public School** – Main Street Bellbrook

Utilities and Infrastructure

8. The following utilities and infrastructure may be at risk:

   a) The communities utilise bore water or rain water tanks for drinking, in flooding events properties along the river may lose power to their pumps.

   b) Bellbrook community Septic systems will continue to be monitored under Council's On-site Sewage Management Strategy.

   c) Communications systems have in previous events failed such as land lines and mobile service; however the community uses satellites internet connections so information can be distributed through this means to agencies.

Willawarrin Community

Overview of Area

9. The Rural village 35kms west of Kempsey on the Armidale Road. Willawarrin in surrounded by grazing land and forests and is close to the Macleay River, although flood free the hotel and a few houses could be flooded during severe events.

Name	Total
Total Persons	**335**
Total Dwellings	153
Persons aged 65 years and over	53
Persons aged below 15 years	74
Medium Age	44

Classification of Floodplain

10. Willawarrin is a High Flood Island that is cut off and becomes isolated due to road closures.

Schools and childcare centres

11. The following childcare centres are at risk of isolation.

   a) **Upper Macleay Pre School** – 77 main Street Willawarrin

12. **The following Major Annual Events occur:**

   a) Akubra Willawarrin Camp Draft - two full days of camp drafting in May

Facilities for the aged and/or infirm

13. There are no facilities

Utilities and Infrastructure

14. Properties in this area rely on their own systems for water and waste.

CENTRAL MACLEAY VALLEY COMMUNITY

Overview of Area

15. This area is made of the following communities

    a) Kempsey CBD (Central Kempsey)

    b) Kempsey West, East and South

    c) Aldavilla

    d) Euroka

    e) Frederickton

    f) Bellimbopinni

16. Kempsey has been flooded on several occasions, with loss of life and severe property damage in the Central Business District and to nearby residences. The 1949 flood, the highest seen in the town, caused six deaths, destroyed 35 dwellings and forced 2,000 people to evacuate.

Cultural and Linguistic Diversity

17. The Macleay Valley today has one of the largest concentrations of Aboriginal people in NSW. The community is dispersed throughout the shire, and most of the local people consider themselves to be descendants of the Macleay Valley Dunghutti people or Gumbaynggir people, the group to the north. The former government reserves of Bellbrook, Burnt Bridge, Greenhill and Kinchela, all located in the shire of Kempsey are now indigenous land and form the nucleus of Indigenous residential communities.

18. To date there are some 246 Aboriginal sites recorded in an area of 190 square kilometres centred on Kempsey – Eungai. Site include scarred trees, burials, shell middens, stone arrangements, artefacts scatters, isolated finds, rock shelters with deposits and natural sites of culture significance. Thirty six sites are within this area.

Kempsey CBD: (Central Kempsey)

19. Boundary of Kempsey CBD is from the Macleay River on the east to the Railway line in the west.

20. The Central Business District (CBD) of Kempsey is sited on a natural overbank flow path of the Macleay River and is prone to severe flooding during floods in the order of the 10% AEP (1 in 10 year event). A significant portion of the

existing CBD area is currently zoned as floodway and consequently, the scope for further development is limited based on existing flood information.

21. The Kempsey CBD area is located within a large natural floodway that conveys significant flows during large floods. Flood protection for the CBD is currently provided by a series of interconnected levees that have progressively been constructed since 1958. The flood of March 2001 is the first event during which this levee system has been overtopped and came close in 2009.

22. Central Kempsey is the worst affected area, and up to 450 people would have to be evacuated from it in a short time if the Eden St and/or First Lane levees were likely to be overtopped.

23. All roads within Central Kempsey would be cut in a levee-overtopping flood.

Name	Total
Total Persons	1000
Total Dwellings	400
Persons aged 65 years and over	110
Persons aged below 15 years	-
Medium Age	45

Flood Mitigation Systems

24. The town of Kempsey is protected by a levee. Levee overtopping can be expected to occur when the predicted peak water level at the Kempsey traffic bridge falls between a range of 6.7mAHD and 6.9mAHD.

25. Fast rising floods will typically cause the Eden Street levee to overtop before the Cochrane Street levee. When the rate of water level rise is slower (less than approximately 0.1 m/hr.), the Cochrane Street levee may begin to overtop first.

26. Flooding first begins to enter the urban section of Kempsey at 5.5 metres (AHD), flooding the Eden St car park. With further rises yards of houses in Austral, Verge and Eden Streets begin to flood. These properties require evacuation if a height of 6.2 metres (AHD) is predicted.

Post drainage of CBD area

27. Following inundation, as flood levels in the CBD area fall below the crest levels of the various flood protection levees, drainage of the CBD area is provided by a series of flood gates located underneath the Cochrane Street levee. The floodgates consist of six (6) 1.8 m wide x (at least) 1.8 m high culverts that are designed to allow water to only flow out from inside the levee.

28. Following cessation of flow across the Cochrane Street levee in the 1% AEP flood event, it is estimated that it would take approximately 26 hours for the CBD area to drain to a level of 4.5 mAHD (most of the existing development within the CBD is generally located on land above 4.5 mAHD).

29. The flood levels inside the levees reach a level of 2.5 mAHD about three (3) days after Cochrane Street has ceased flowing. Below this level, flooding is generally confined to the low lying areas adjacent south of First Lane and in and around the Gladstone Street railway underpass.

Schools and childcare centres

30. The following childcare centre are located within the Levee

    a) Kempsey Preschool & Nursery School: Verge Street Kempsey

    b) Kempsey Community Child Care: 8 Austral Street

Evacuation

31. The following Areas need to be monitored for possible early evacuation are shown below (grid references relate to Kempsey map, 9435-1-N):

    a) Area behind Elrington's Car Park (GR 848611)

    b) Forth St, from Hopetoun Street to Clyde Street (GR 841616 -GR 849615)

    c) Lower end of Regent, Yaelwood and Hopetoun streets (GR 845618 – GR 841619)

    d) Verge Street, Eden Street and Austral Street (GR 846611 – GR848612)

    a) All roads within Central Kempsey would be cut in a levee-overtopping flood.

West Kempsey Community

Classification of Floodplain

32. This is mostly a high flood Island with rising road access. Some low lying area would be affected.

33. Some 26 properties would be flooded above their floor levels in a 1% AEP event and an additional 7 properties would experience over-ground inundation

Name	Total
Total Persons	4740
Total Dwellings	2054
Persons aged 65 years and over	1040
Persons aged below 15 years	1061
Medium Age	41

Isolation

34. West Kempsey would be Isolated with a Levee overtopping. Council Deport would be partly flooded (not store or workshop) the top gate still would be available for access.

Schools and childcare centres

35. The following schools are at risk of isolation:

    a) **Kempsey High**: Broughton Street West Kempsey

    b) **Kempsey West:** Public Marsh Street West Kempsey

    c) **St Joseph's Primary:** Kemp Street West Kempsey

    d) **St Pauls high School:** Sea Street West Kempsey

36. The following childcare centres are at risk of isolation:

    a) **Dalaigur pre-school**: Nancy Ellis St West Kempsey

    b) **Kempsey Kindy**: 32 Short Street West Kempsey

    c) **Kempsey Kindy**: 269 River St West Kempsey

    d) **ABC Child Care**: Kemps Street West Kempsey

    e) **The Cubbyhouse Child Care**: Centre41 Polwood St West Kempsey

    f) **The Kindergarten**: 51-53 north St West Kempsey

Facilities for the aged and/or infirm

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

    a) Taking care of the Lives in Our Hands: 71-97 Cochrane St West Kempsey

    b) Cedar place Aged Care facility: 58 Cochrane St West Kempsey

    c) Booroongen Djugan Aboriginal facility: 337 River Street West Kempsey

    d) **Vincent Court**: 88 Leith Street West Kempsey

Utilities and Infrastructure

38. The following utilities and infrastructure are at risk of flooding:

    a) The Sewerage treatment works is generally not affected in flooding events

Inundation/Evacuation

39. The following Areas need to be monitored for possible early evacuation are shown below:

    a) Low areas in Sea Street (GR 830632) and Tozer Street (GR 827631)

    b) Lower end of Tabrett and Polwood streets (GR 839631 – GR837632).

    c) Other streets affected: Dangar, Short, Wide, Marsh, Cochrane, Cameron and Becke streets; Cooks, Perrins and Hudsons lanes and Colin Tait Avenue

    d) Low laying area only

Utilities and Infrastructure

40. The following utilities and infrastructure are at risk of flooding:

    a) The two Kempsey sewerage treatment works are built above the 20 year (1:5) flood level. There may be some pump wells and effluent ponds flooded in smaller event.

    b) Water supply should not be affected, although this is subject to electricity supply.

East Kempsey Community

Classification of Floodplain

41. This is mostly a high flood Island with rising road access. Some low lying area would be affected. This is on the eastern side of the Macleay river over the traffic bridge from the CBD.

Name	Total
Total Persons	1117
Total Dwellings	518
Persons aged 65 years and over	194
Persons aged below 15 years	254
Medium Age	38

Schools and childcare centres

42. The following schools childcare centres are at risk of isolation:

    a) **Kempsey Adventist School**:108 Crescent Head Road

    b) **Kempsey East Public School**: Innes Street

    c) Kempsey Family Day Care: 20 Macleay St.

Utilities and Infrastructure

43. The following utilities and infrastructure are at risk of flooding:

    a) Nil Known

Classification of Floodplain

44. Low Flood ground rising to High land.

Inundation/Evacuation

45. The following Areas need to be monitored for possible early evacuation are shown below

    a) Rudder St, between Bissett and Sullivan streets (GR 854614 – GR856617).

    b) Lower end of Stanley Street (GR 856613).

    c) Other streets affected: Little Rudder, Ferry, William and Ernest Larkin streets.

South Kempsey Community

46. This is south of the CBD on the southern side of the Macleay river along the highway north to the river including the area of Euroka.

Name	Total
Total Persons	2467
Total Dwellings	1020
Persons aged 65 years and over	340
Persons aged below 15 years	640
Medium Age	36

Schools and childcare centres

47. The following childcare centres are at risk of isolation:

    a) **Kempsey South Public:** 21 Queen St South Kempsey

    b) **Macleay Vocational College:** 11-13 Reginald South Kempsey

    c) ***Melville High:** Nicholson Street South Kempsey

48. The following childcare centres are at risk of isolation:

a) **South Kempsey Preschool**: 32 Nicholson St South Kempsey.

Classification of Floodplain

49. This is mostly a high flood Island with rising road access Inundation.

Inundation/Evacuation

50. The following Areas need to be monitored for possible early evacuation are shown below:

    a) Bloomfield Street (GR 830605).

    b) Green Wattle Creek, Gill Creek and Rudder's Lagoon areas (GR 855604).

    c) Area near the Greyhound track (GR 849594).

    d) Other streets affected: Hill, Jersey, Druitt, Carri, Nicholson, Yarravel, Middleton, Macquarie and Goonbi streets Lower.

Frederickton Community

51. Small township which is just north of Kempsey.

52. Currently a Levee system is being built which is due for completion late 2012, The Levee is built to a one in one hundred year flood level with 500mm free board.

53. Until the levee is finalised there is to 5 – 6 properties in a 5% (1:20) flood.

Name	Total
Total Persons	1248
Total Dwellings	483
Persons aged 65 years and over	170
Persons aged below 15 years	226
Medium Age	35

Schools and childcare centres

54. The following schools and childcare centres are at risk of flooding and/or isolation.

    a) **Bellimbopinni Public:** Pacific Highway Bellimbopinni

    b) **Frederickton Public:** Great North Road Frederickton

Isolation

55. Frederickton will become isolated due to road closures. Some low-lying houses in the southern portion (in Lawson and Macleay streets) are affected by floods as low as the 40% AEP event Inundation.

56. Some 26 properties would be flooded above their floor levels in a 1% AEP event and an additional 7 properties would experience over-ground inundation.

Facilities for the aged and/or infirm

57. The following facilities are at risk of isolation:

    a) **Macleay Valley house:** 82-114 Macleay Street Frederickton

Classification of Floodplain

58. This is mostly a high flood Island with rising road access. Some low lying area would be affected. Although most of Frederickton is on relatively high ground some low-lying houses in the southern portion (in Lawson and Macleay streets) are affected by floods as low as the 40% AEP event Inundation.

Inundation

59. Some 26 properties would be flooded above their floor levels in a 1% AEP event and an additional 7 properties would experience over-ground inundation. Such floods can also cut the Pacific Highway near the northern end of the town for days, as occurred in March 2001, but a bypass route to Kempsey is available via Spooners Avenue but will be cut in 1:10 year flood events.

Flood Mitigation Systems

60. Frederickton Levee will extend form the rear of the Macleay River Hotel to the new Highway under construction. The Levee will be built to a 1:100 flood plus 0.5m.

LOWER MACLEAY - SMITHTOWN/GLADSTONE & CRESCENT HEAD & SURROUNDING AREAS

Overview of Area

61. The Lower Macleay area has about 9000 people living there. The area covers these main communities such as; Smithtown/Gladstone, South West Rocks, Crescent Head, Billimbopinni, Hat Head, Jerseyville, Kinchela and Sturts Point/Grassy Head. The area also has extensive rural farming land which includes Austral Eden, Old Station, Verges Creek, Belmore River, Maria River, Seven Oaks, Summer Island, Clybucca and Rainbow Reach.

62. Large areas of the Lower Macleay liable to flooding, roads and bridges can close early, areas then can be isolated and farming operations disrupted even in relatively frequent and low-level events. The problems are many and the effects in the more severe events can be devastating.

63. In the more severe floods there is a potential for massive stock losses on farms, great damage to infrastructure and private property and large-scale evacuations from the town of Smithtown, Gladstone, Kinchela, Jerseyville and the rural areas of the lower floodplain will be required.

64. All road access are cut at just above the 40% AEP flood level and access for evacuations can be a major problem. An internal evacuation was conducted during the 1963 and 2001 flood, but some evacuations could be required at a significantly lower level of flooding than was reached on these occasions. This is the worst problem area on the lower floodplain.

Gladstone and Smithtown Community

65. Are twin towns separated by the Macleay River. Both towns are completely inundated in a 1% AEP flood, with 261 Smithtown dwellings and 164 in Gladstone being flooded above their floor levels. A total of 412 properties would experience over-ground inundation in such a flood.

66. Smithtown has levee protection by natural and artificial levees but only to about the 20% (1:5) flood event. The corresponding level at the Kempsey Traffic Bridge for overtopping of the levee is 5.7m (AHD).

67. Although a large percentage of houses are elevated the whole town is flood prone.

68. Gladstone is located mainly on the natural river levee. Some parts are affected by backwater inundation in minor floods and major flooding inundates large portions of the town. The town can be isolated by a flood with an AEP as low as 20% and was isolated in March 2001 in a flood of only moderate proportions.

69. Most of the dwellings in these areas are elevated. Inundation of blocks on which dwellings are located within Smithtown & Gladstone begins in floods reaching about 6.0m at the Kempsey Traffic Bridge gauge. The land area of Smithtown and Gladstone must be regarded as being covered in floods reaching about 7.5m. At this level the entire community would require total evacuation:

    a) Gladstone:

Name	Total
Total Persons	364
Total Dwellings	164
Persons aged 65 years and over	81
Persons aged below 15 years	76
Medium Age	44

b) Smithtown

Name	Total
Total Persons	591
Total Dwellings	261
Persons aged 65 years and over	108
Persons aged below 15 years	118
Medium Age	41

Schools and childcare centres

70. The following schools are at risk of flooding and/or isolation.

    a) **Gladstone Public:** Kinchela Street Gladstone

    b) **Smithtown Public:** Cannane Street Smithtown

71. The following childcare centres are at risk of flooding and/or isolation.

    a) **Lower Macleay Preschool**: 51 Belmore St. Smithtown

Utilities and Infrastructure

72. The following utilities and infrastructure are at risk of flooding:

73. The Sewerage treatment works is generally not affected in small flooding events. However in 2001 the system was overloaded by floodwaters and surcharging occurred.

Flood Mitigation Systems

74. Smithtown has levee protection by natural and artificial levees but only to about the 20% (1:5) flood event Nil.

Kinchela/Belmore River Community

75. This is mostly a high flood Island with rising road access. Some low lying area would however be affected the village of Kinchela including Belmore River is located on a natural levee and most houses are raised, but over-levee flooding would inundate most properties. Evacuations are rendered difficult because road access is lost early in floods. Resupply is necessary during flood periods.

76. In a 1% AEP flood, 11 houses would experience over-floor flooding and an additional 12 properties would have over-ground inundation.

Name	Total
Total Persons	525
Total Dwellings	237
Persons aged 65 years and over	89
Persons aged below 15 years	99
Medium Age	45

Schools and childcare centres

There are no schools or childcare centres at risk of flooding and/or isolation:

Crescent Head Community

Classification of Floodplain

77. This is mostly a high flood Island with rising road access. There is no problems of inundation of property at Crescent Head (apart from a few low-lying properties along Killick Creek in Willow St and the adjacent Caravan Park which could be affected by storm surge conditions.

78. Access to Kempsey can be cut at the Connection Creek causeway on Crescent Head Road. This can occur due to flooding on the Hastings River and the Maria River backing up or major flooding on the Macleay and could last for at least a week in severe cases.

79. There is generally 4WD beach access to Port Macquarie as long as there is no storm surge or the Hastings River is not in Flood.

Name	Total
Total Persons	1966
Total Dwellings	1100
Persons aged 65 years and over	241
Persons aged below 15 years	404
Medium Age	43

Schools and childcare centres

80. The following schools and childcare centres are at risk of flooding and/or isolation:

    a) ***Crescent Head Public:** 44 Main Street Crescent Head.

    b) Crescent Head Community Pre-School: Killuke Cres Crescent Head.

Utilities and Infrastructure

81. The following utilities and infrastructure are at risk of flooding:

a) The Sewerage treatment works is generally not affected in flooding events.

Hat Head Community

Classification of Floodplain

82. This is a high flood Island with rising road access. Hat Head can be isolated for considerable periods by flooding over the road to Kinchela. There is no serious problem of inundation within the town, however, because Ryan's cut (a natural outlet through the sand dunes). Severe oceanic conditions could erode the sand dunes and allow seawater entry.

Name	Total
Total Persons	299
Total Dwellings	285
Persons aged 65 years and over	80
Persons aged below 15 years	30
Medium Age	52

Schools and childcare centres

83. There are no schools or child care centres that could become isolated.

Utilities and Infrastructure

84. The following utilities and infrastructure are at risk of flooding:

a) Hat head Sewage treatment system works on a Vacuum pump. When this becomes filled with water from excessive rains this can cause the system to stop working.

Flood Mitigation Systems

85. Hat Head has levee protection to about the level of the 1% AEP (1:100) flood. The levee is principally to prevent flooding due to storm surge.

86. The Hat Head levees are designed for large flood events to direct water through the Korogoro Creek, this forms part of the flood mitigation and drainage system for the Belmore-Kinchela are of the lower Macleay.

South West Rocks Community

87. The lower parts of South West Rocks could be liable to flooding from the Macleay River flowing into Back Creek, and coinciding with high tides or storm surge activity. The Macleay Valley Holiday Centre Caravan Park would be flooded under such circumstances. Local flooding of low areas east and west of Gregory St and adjacent to Saltwater Creek can also occur.

South West Rocks and nearby Arakoon can both be cut off from Kempsey.

Name	Total
Total Persons	4612
Total Dwellings	2892
Persons aged 65 years and over	1212
Persons aged below 15 years	763
Medium Age	50

Schools and childcare centres

88. The following schools and childcare centres are at risk of flooding and/or isolation.

    a) **South West Rocks Public:** Gregory Street South West Rocks.

    b) **South West Rocks Pre –School:** 1 Trial St South West Rocks.

    c) **Early learning Centre:**16 Wilfred partridge St. South West Rocks.

Facilities for the aged and/or infirm

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

    a) South West Rocks Nursing facility.

Utilities and Infrastructure

90. The following utilities and infrastructure are at risk of flooding:

    a) The Sewerage treatment works is generally not affected in flooding events.

Stuarts Point/Grassy Head Community

91. The village of Stuarts Point is essentially flood-free. A combination of floodwaters and high seas could cause Stuarts Point Holiday Park to be inundated.

92. The Grassy Head Holiday Park and the Seventh Day Adventist Convention Centre could be flood prone in severe events.

Name	Total
Total Persons	724
Total Dwellings	412
Persons aged 65 years and over	171
Persons aged below 15 years	126
Medium Age	47

Schools and childcare centres

93. The following schools and childcare centres are at risk of flooding and/or isolation:

    a) **Community Pre School:** 9-11 Fourth Ave Stuarts Point.

Jerseyville

94. This is mostly a high flood Island with rising road access. Some low lying area would however be affected. The village of Jerseyville is surrounded and isolated by major floods and access for evacuations can be a major problem. During 1949 floodwaters in the village were up to a metre deep and stayed near that level for a day or so. The 1963 flood was more severe, however, because of oceanic influences. Nearly all the dwellings are elevated, but 13 would have over-floor flooding in a 1% AEP event.

B3. BRIDGE CLOSURES

1. The following table lists Bridges liable to flooding in the Kempsey Shire area,

Bridge	Closure Location	Consequence of closure	Alternate Route	Indicative Gauge Height
Sherwood	Sherwood: 9435-4-N: GR 743636	Road Closed	Yes	3.6mAHD Turners Flat Gauge
Turners Flat	Sherwood: 9435-4-N: GR 724691	Road Closed	Yes	3.0m AHD Turners Flat Gauge
Toorooka	Willawarrin: 9436-3-N: GR 600791	Road Closed	Yes	3.5m AHD Toorooka Gauge
Temagog	Willawarrin: 9436-3-N: GR 600729	Road Closed	Yes	3.6m AHD Temagog Gauge
Bellbrook	Willawarrin: 9436-3-N: GR 526901	Road Closed	No	2.8m AHD Bellbrook gauge
Dungay Creek/Wittitrin Causeway	Sherwood: 9435-4-N: GR 679589	Road Closed	No	0.3 to 0.6 m AHD Dungay Creek Gauge
Nulla Creek Bridge	Armidale Rd	Road Closed	No	9.5 to 10.5 m AHD Bellbrook Gauge

B4. ROAD CLOSURES

1. The following table lists Roads liable to flooding in the Kempsey Shire area (Lower Macleay roads Evacuations route closes early)

Road	Closure location	Consequence of closure	Alternate Route	Indicative Gauge Height
Pacific Hwy – Kempsey to Frederickton	Glenrock Drain Kempsey: 9435 -1-N GR 56639 Second Lane Kempsey: 9435 -1-N GR 858639 Christmas Ck Kempsey: 9435 -1-N GR 859657 Easter Creek Kempsey: 9435 -1-N GR 862660	Access to Kempsey Closed	No	Approx. 5.60mAHD Kempsey Gauge
Pacific Hwy – Frederickton to Clybucca	Dangar Lane: 9435 -1-N GR 907685 Sutherland Lane: 9435 -1-N GR 14700 Seven Oaks Turnoff: 9435 -1-N GR 930702 Clybucca Flat : 9435 -1-N GR 951751	Frederickton Isolated	No	Approx. 5.70m AHD Kempsey Gauge
Crescent Head Rd	Rudders Lagoon: 9435-1-N GR	Crescent Head	Possible	Not gauged

	845589 The Corduroy: 9435-1-N GR 969495	Isolated	via Belmore River Rd	
Loftus Road	Kempsey: 9435-1-N GR 984581			

Kempsey - Armidale Road	**Closes in very severe floods at various locations in the Bellbrook & Willawarrin areas.**	**Isolates the Upper Macleay**	**No**	**Not gauged**
Belmore River to Crescent Creek Road	Seale Road: 9435-1-N GR 955579	Isolation to properties in Belmore river area	No	Approx. 5.70m AHD Kempsey Gauge
South West Rocks Road MR 198	Red Hill: 9435-1-N GR 876640 Austral Eden: 9435-1-N GR 916697 Gladstone Drain: 9435-1-N GR 970696 Kinchela: 9435-1-N GR 988715 Mannix Corner SWR: 9536-3-S GR 038777	Isolates Rd to Gladstone & SWR Evacuation route to East Kempsey	No	Approx. 5.70mAHD Kempsey gauge
Smithtown Road	Various locations - Inundation to road	Evacuation route for Smithtown & lower Macleay	No	Approx. 5.70mAHD Kempsey gauge
Plummer's Lane	Various locations - Inundation to road	Evacuation route for SWR, Jerseyville and Summer Island	No	Approx. 5.70mAHD Kempsey gauge
Hat Head Road	Various locations - Inundation to road	Isolation to Hat Head	No	Approx. 5.70mAHD Kempsey gauge
Kinchela Creek Road	Various locations - Inundation to road	Isolation to rural properties	No	Approx. 5.70mAHD Kempsey gauge

Belmore River Road	Various locations - Inundation to road	Alternative route to Crescent head now closed	No	Approx. 5.70mAHD Kempsey gauge
Old Station Road	Various locations - Inundation to road	Isolates properties around Old Station area	No	Approx. 5.70mAHD Kempsey gauge
Inner & Outer Roads Austral Eden	Kempsey 9435-1-N GR 916679	Yes	No	Approx. 5.70mAHD Kempsey gauge
Old Pola Creek Road	Kempsey 9435-1-N GR 861615	Evacuation route closes to East Kempsey	No	Approx. 5.70mAHD Kempsey gauge
East Frederickton Lane	Kempsey 9435-1-N GR 895655	-	No	Approx. 5.70mAHD Kempsey gauge
Two Hills Lane	North of Smithtown Rd at Seven Oaks Kempsey 9435-1-N GR 702930	Isolation to Summer Island area	No	Approx. 5.70mAHD Kempsey gauge
Summer Island Road	At McCabe's Drain 9436-2-S GR 979746	Isolates properties along river bank	No	Approx. 5.70mAHD Kempsey gauge

B5. SUMMARY OF ISOLATED COMMUNITIES AND PROPERTIES

1. The following table lists communities liable to isolation and approximate potential periods of isolation. Information presented here is based on historical, design events and does not reflect the duration of isolation expected in larger and extreme events.

Town / Area Upper Macleay Division	Sector	Approx. Pop.(Properties)	Flood Affect Classification	Possible time of Isolation			Main Supply Routes	NOTES
				Minor	Moderate	Major		
Georges Creek	1	50 (22)	High Flood Island	1-5days	6-9days	>9days	Armidale Rd	Resupply likely to be required after 5 days by air
Bellbrook & surrounding area	1	544 (271)	High Flood Island	1-10days	10-16Days	>20days	Armidale Rd	Resupply likely to be required after 5 days by air
Willawarrin	1	335 (153)	High Flood Island	5-7days	10-14days	>20days	Armidale Rd	Resupply likely to be required after 5 days by air

Central Macleay Division– (Kempsey Bridge Gauge)				10%	5%	2%	1%	Main Supply Routes	NOTES
	Sector	Approx. Pop	Classification	7.37m	7.77m	8.24m	8.55m		
Kempsey CBD	2	1000 (450)	Low Flood Island/Levee	2-5days	5-7days	>10days	>15days	Pacific Hwy	Resupply generally not required - Inundated
Kempsey West	2	4740 (2054)	High Flood Island	2-5days	5-7days	>10days	>15days	Pacific Hwy	Resupply likely to be required after 5 days by air
Kempsey East	2	1117 (518)	High Flood Island	2-5days	5-7days	>10days	>15days	Pacific Hwy	Resupply generally not required
Kempsey South	2	2467 (1020)	High Flood Island	2-	5-7days	>10days	>15days	Pacific Hwy	Resupply generally not required

				5days					
Frederickton	3	1248 (483)	High Flood Island days	2-5days	5-7days	>10days	>15days	Pacific Hwy	Resupply likely to be required after 5 days by air
Aldavilla	2	1055 (231)	High Flood Island days	2-5days	5-7days	>10days	>15days	Pacific Hwy	Resupply generally not required

Lower Macleay Division - (Smithtown Gauge)				**10%**	**5%**	**2%**	**1%**	**Main Supply Routes**	**NOTES**
	Sector	Pop.	Classification	4.34m	4.50m	4.66m	4.76m		
Bellimbopinni, Clybucca	4	100	Low Flood Island	5-7 days	7-10days	10-15days	>20days	Pacific Hwy, Plummer's lane	Resupply likely to be required after 5 days to Summer Island Area
Smithtown	5	591 (261)	Low Flood Island	5-7 days	7-10days	10-15days	>20days	South West Rocks Rd/	Resupply likely to be required after 5 days
Gladstone		364 (164)							
Kinchela	5	525 (237)	Low Flood Island	5-7 days	7-10days	10-15days	>20days	South West Rocks Rd	Resupply likely to be required after 5 day
Jersey Ville	8		Low Flood Island	5-7 days	7-10days	10-15days	>20days	South West Rocks Rd	Resupply likely to be required after 5 day
Austral Eden, Belmore River	5		Low Flood Island	5-7 days	7-10days	10-15days	>20days		Resupply generally not required
Hat Head	9	299 (285)	High Flood Island	5-7 days	7-10days	10-15days	>20days	Sth. West Rocks Rd Hat Head Rd	Resupply generally not required
Crescent Head	6	1966 (1100)	High Flood Island	5-7 days	7-10days	10-15days	>20days	Crescent Head Rd	Resupply Local store
South West Rocks	8	4612 (2892)	High Flood Island	5-7 days	7-10days	10-15days	>20days	South West Rocks Rd Plummer's Lane to Gregory Street	Resupply to supermarket
Maria River	7	100 (55)	Low Flood Island	5-7 days	7-10days	10-15days	>20days	Maria river Rd	Resupply generally not required

Table B-2: Potential Periods of Isolation for communities in the Kempsey Shire during a Moderate - Major flood. Unknown for large events

ANNEX C - GAUGES MONITORED BY THE KEMPSEY SHIRE LGA SES

Gauge Name	Type	AWRC No.	BOM No.	Stream	Flood level classification			Special Reading Arrangements	Owner
					Min	Mod	Maj		
D/S Dumaresq Dam	T	-	556022	Dumaresq Ck				BOM	NOW
Wollomombi	M	206002	057079	Wollomombi River				BOM-MHL	NOW
Georges Creek*†‡	T	206024	557001	Macleay River	6.0	8.0	10.0	BOM-MHL	NOW
Bellbrook*†‡	T	206019	059122	Macleay River	6.5	10.5	13.5	BOM-MHL	BOM
Kogal	T	206900	059036	Nulla Nulla Creek				BOM	BOM
Toorooka	T	-	559038	Macleay River				BOM-MHL	KSC
Moparrabah	T	206904	059128	Parrabel Creek				BOM-MHL	BOM
Turners Flat‡	T	206011	559002	Macleay River				NOW-MHL	NOW
Wittitrin	T	206903	059125	Dungay Creek				BOM-MHL	BOM
Aldavilla	T	206431	059135	Macleay River				BOM-MHL	OEH
Kempsey*†‡	T	206403	059127	Macleay River	4.5	5.7	6.65	BOM-MHL	OEH
Seven Oaks†	T	-	559034	Macleay River				KSC	KSC
Smithtown/Belmore River Entrance	T	206406	559003	Macleay River				MHL	OEH
Smithtown	T	-	559040	Belmore River				MHL	OEH
Kinchela Creek	T	206427	559031	Macleay River				MHL	OEH
Plummer's Lane	T	-	559035	Macleay River				KSC	KSC
Jerseyville	T	206409	553019	Macleay River				BOM	KSC
Killick Gates	T	-	559033	Killick CK				BOM-MHL	KSC
South West Rocks	T	-	559041	Macleay River				MHL	OEH
Maria River	T	-	560003	Maria River				BOM	OEH

NOW = NSW Office of Water BOM = Bureau of Metrology MHL = Manly Hydraulics KSC = Kempsey Shire Council OEH=Office of Environment & heritage

Table C-1: Gauges monitored by the Kempsey Shire LGA SES Local 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 Mid North Coast 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
Prime TV	Port Macquarie
Ten Northern	Taree
NBN 9 TV	Port Macquarie
ABC TV	Port Macquarie

Radio Stations:

Station	Location	Frequency	Modulation
TANK FM	Kempsey	103.1 MHz	AM
ABC North Coast	Coffs Harbour	92.3 MHz	FM
ABC North Coast	Coffs Harbour	684	AM
ABC Mid North Coast	Port Macquarie	95.5	FM
ABC Mid North Coast	Port Macquarie	756	AM
2MC	Port Macquarie	106.1 MHz	FM
STAR FM	Port Macquarie	105.1 MHz	FM
EASY LISTENING 531	Port Macquarie	531 KHz	AM

Newspapers:

Name	Location
MACLEAY ARGUS	KEMPSEY
MID COAST OBSERVER	KEMPSEY

Other Agencies:

- All Agencies as outlined in Part 1 of this plan.

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

Flood Evacuation Warning

Mid North Coast SES Region Headquarters

14 Arkwright Crescent
Taree NSW 2430

Telephone: (02) 6592 5800
Fax: (02) 6592 5809
Email: mnr.ops@ses.nsw.gov.au

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

Media 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]

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 where you can obtain temporary accommodation and other help at:

- [***location/s***].
- [***location/s***].

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

Prepared By:

Approved By:

Flood Evacuation Order

Mid North Coast SES Region Headquarters

14 Arkwright Crescent
Taree NSW 2430

Telephone: (02) 6592 5800
Fax: (02) 6592 5809
Email: mnr.ops@ses.nsw.gov.au

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

Media 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]

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 where you can obtain temporary accommodation and other help at:

- [***location/s***].
- [***location/s***].

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

Prepared By:

Approved By:

ALL CLEAR

Mid North Coast SES Region Headquarters

14 Arkwright Crescent
Taree NSW 2430

Telephone: (02) 6592 5800
Fax: (02) 6592 5809
Email: mnr.ops@ses.nsw.gov.au

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

Media are asked to immediately broadcast this message and repeat it.

All Clear for [Enter locations]

[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].

Returning evacuees should be aware of precautions to be taken in flood-affected areas:

- Avoid contact with flood water due to possible contamination.
- Native wildlife (including snakes and spiders) may have taken refuge in houses, sheds etc.
- Do not drink from garden hoses, taps or water supply sources that may have been exposed to floodwater.
- Practise basic personal hygiene at all times. Wash your hands regularly and before eating or handling food. Cuts and abrasions should be treated immediately.
- Local roads may remain closed due to inundation and driving conditions may be dangerous.
- 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

Prepared By:

Approved By:

ANNEX F - DETAILS OF THE DAM FAILURE WARNING SYSTEM FOR STEUART MCINTYRE DAM

This Annex describes the downstream consequences and specific notification and warning arrangements for the failure of Steuart McIntyre Dam and should be read in conjunction with the response arrangements detailed in this plan.

F1. INTRODUCTION

Steuart McIntyre Dam	
Location (-31.04448 152.7446)	2042 Armidale Rd, Yarravel NSW 2440
Owner	Kempsey Shire Council
Commissioned	2000
Catchment Area	0.545km2
Capacity (Future)	2500ML
Type	Zoned Earth fill Embankment
Construction	Earth fill Embankment
Monitoring Process	Daily visual check & piezometers data logger
Hazard Category	High C
Full Capacity AHD	RL53.5mAHD

1. The two most likely causes of dam failure are:

   a) Failure due to flood levels overtopping the embankment.

   b) Failure due to rapidly deteriorating structural deficiency such as may be induced by an extreme earthquake, internal erosion, piping, landslide or sabotage. (This is the so-called “Sunny Day” failure, i.e. not induced by an inflow flood).

2. Although the dam is currently in good condition, an unsafe or emergency condition could occur at any time due to extreme natural events. Failure from a cause not related to extreme natural events is always a possibility although the probability of occurrence is extremely low.

F2. CONSEQUENCES OF FAILURE

1. Dam failure could result in the following:

    a) Approximately 51 dwellings could be inundated by failure of Steuart McIntyre Dam.

2. The DSEP identifies properties at risk. In the event of an Alert being issued to SES for Steuart McIntyre Dam, some or all of these properties may require evacuation.

F3. SUNNY DAY FAILURE.

1. In the unlikely event of the dam failing under normal inflow conditions, downstream flood inundation would result from water held in the storage.

2. The non-flood failure is considered to have the most potential for loss of life as it is likely to occur when there are no flood warnings and hence emergency services are not on standby and the public is unprepared.

F4. MONITORING

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

2. Daily visual check & piezometers data logger

F5. NOTIFICATION PROCEDURES

1. 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 Mid North Coast SES Region Headquarters duty officer who will contact the Kempsey Shire LGA SES Local Controller. An alternate NSW Police contact is available if this notification procedure was to fail.

F6. WARNING

1. 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 in Table 4-6 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.

2. 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	53.8	1:00
Amber Alert	54.3	2:00
Red Alert	54.7	3:00

Table F-1: Steuart McIntyre Dam Flood Failure Alert levels

3. The Kempsey Shire Council will disseminate dam failure warnings.

4. Kempsey Shire Council Staff will keep the SES informed of the 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.

5. The following table outlines the notification, warning and evacuation arrangements for a potential failure of Steuart McIntyre.

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

Alerts	Defining Conditions	Notification Arrangements and Actions for Steuart McIntyre Dam					
		Kempsey Shire	SES OCC	SES Region Controller	SES Local Controller	LEOCON / Agencies	People at risk
White Alert	53.80m	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	54.30m	Advise SES Operations Communications Centre of Amber Alert Level being reached and provide regular updates on the situation at the dam Closely monitor the condition of	Receive notification from dam operator Advise SES Region Controller Advise SEOC	Notify SES Local Controller, SES units SES LHQ. Provides SES Flood Bulletins and evacuation warnings to the media organisations listed in Annex D. Coordinate provision of out of area assistance for	Confirm SES RHQ has been notified. Coordinate the delivery of warnings to at-risk residents. Coordinate the notification of other agencies as listed in Local Flood Plan	When requested by SES Local Controller, coordinate support	Prepare homes for inundation, pack valuables, mementos and pets and prepare to evacuate. Notify SES doorknockers if transport to evacuation

		Steuart McIntyre Dam and implement preventative measures to return it to a safe condition as soon as possible.		warning and evacuation operations.			centres will be required. Some evacuations may be necessary due to mainstream riverine flooding.
Red Alert	54.70m	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, Advise the DEMO. Advise LEOCON Confirm that residents immediately downstream of the dam have been notified of Red Alert Level being reached. Activate the Standard Emergency Warning Signal (SEWS) and ensure that evacuation warnings are broadcast over the radio stations listed in Annex D.	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 downstream residents by doorknock and public address systems from emergency service vehicles.	When requested by SES Local Controller, coordinate support	Evacuate to nearest evacuation centre or assembly area.

				Activate Emergency Alert Coordinate provision of out of area assistance for evacuation operations	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	Issue 'All Clear' message to SES Local Controller, SES units, SES Local HQ and SES State HQ Advice the DEMO that 'All Clear' has been issued. Issue	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.

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

G1. GENERAL

1. The following caravan parks are flood liable:

Name	Sector	Address	N0. of sites	Inundation Begins	Classification
Central Caravan Park	2	63 Belgrave Street Kempsey	40	6.70m Levee Overtopping	Inside Levee (Low Flood Island)
Sundowner caravan Park	2	161 Smith Street Kempsey	40	6.70m Levee Overtopping	Inside Levee (Low Flood Island)
Name	Sector	Address	No. Sites	Isolation begins	Classification
Willowbrook Caravan Park	2	325 Pacific highway South Kempsey	50	8.42m	High Flood Island Town Isolated
Tall Timbers Caravan Park	2	425 Pacific highway South Kempsey	80	8.42m	High Flood Island Town Isolated
Trial Bay	8	Access Rd Arakoon	40	5.70m	High Flood Island Town Isolated
Hat Head Holiday Park	9	Straight St Hat Head	80	5.70m	High Flood Island Town Isolated
Horseshoe Bay Caravan Park	8	1 Livingston St South West Rocks	30	5.70m	High Flood Island Town Isolated
Sth West Rocks Tourist Park	8	89 Gordon Young Drive South West Rocks	40	5.70m	High Flood Island Town Isolated
Crescent Head Caravan Park	6	Pacific St Crescent Head	70	Not Gauged	High Flood Island Town Isolated
Stuarts Pt. Holiday Park	8	Marine Parade Stuarts Pt.	100	Not Gauged	High Flood Island Town Isolated

G2. ADVISING PROCEDURES

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

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

- Handing a printed notice to occupiers taking up residence. The notice will indicate that the caravan park is liable to flooding and outline the evacuation and van relocation arrangements as detailed in this Annex.
- Displaying this notice prominently in each van.

b) Made aware that if they are expecting to be absent from their vans for extended periods, they must:

- Provide the manager with a key; in a sealed envelope; to the van.
- Provide a contact address and telephone number.
- Inform the manager if a vehicle will be required to relocate the van during flood time.
- Leave any mobile van in a condition allowing it to be towed in an emergency (i.e.: tyres inflated, jacks wound up, personal effects secured and annexes and lines for water, sewer, electricity and gas readily detachable).

2. Be informed when a flood is rising. At this time, occupiers will be advised to:

a) Ensure that they have spare batteries for their radios.

b) Listen to a local radio station for updated flood information.

c) Prepare for evacuation and van relocation.

3. The Kempsey Shire LGA SES Local Controller will ensure that the managers of caravan parks are advised of flood warnings and the details of any evacuation order.

G3. EVACUATION OF OCCUPANTS AND RELOCATION OF VANS

1. Caravan park proprietors will install flood depth indicators and road alignment markers within their caravan parks.

2. When an evacuation order is given occupiers of non-movable vans should:

a) Secure their vans by tying them down to prevent flotation.

b) Isolate power to their vans.

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

d) Lift the other contents of their vans as high as possible within the van.

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

3. Where possible, vans that can be moved will be relocated by their owners. Park managers will arrange for the relocation of mobile vans whose owners do

not have a vehicle. Council and SES personnel will assist if required and may be able to provide additional vehicles. Vans are to be moved to the following locations:

a) Kempsey Showground. Sea Street Kempsey.

4. Caravan park managers will:

   a) Ensure that their caravan park is capable of being evacuated within Three hours.

5. Advise the Kempsey Shire LGA SES Local Controller of:

   a) The number of people requiring transport.

   b) Details of any medical evacuations required.

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

6. Check that no people remain in non-removable vans that are likely to be inundated.

7. Inform the Kempsey Shire LGA SES Local Controller when the evacuation of the caravan park has been completed.

8. Provide the Kempsey Shire LGA SES Local Controller with a register of people that have been evacuated.

G4. RETURN OF OCCUPANTS AND VANS

1. The Kempsey Shire LGA SES Local Controller, using council resources as necessary, will advise when it is safe for the caravan parks to be re-occupied.

2. Vans will be towed back to the caravan park(s) by van owners or by vehicles and drivers arranged by the park managers. Again, Council and SES personnel will assist if available.

ANNEX H - RESUPPLY FLOWCHART

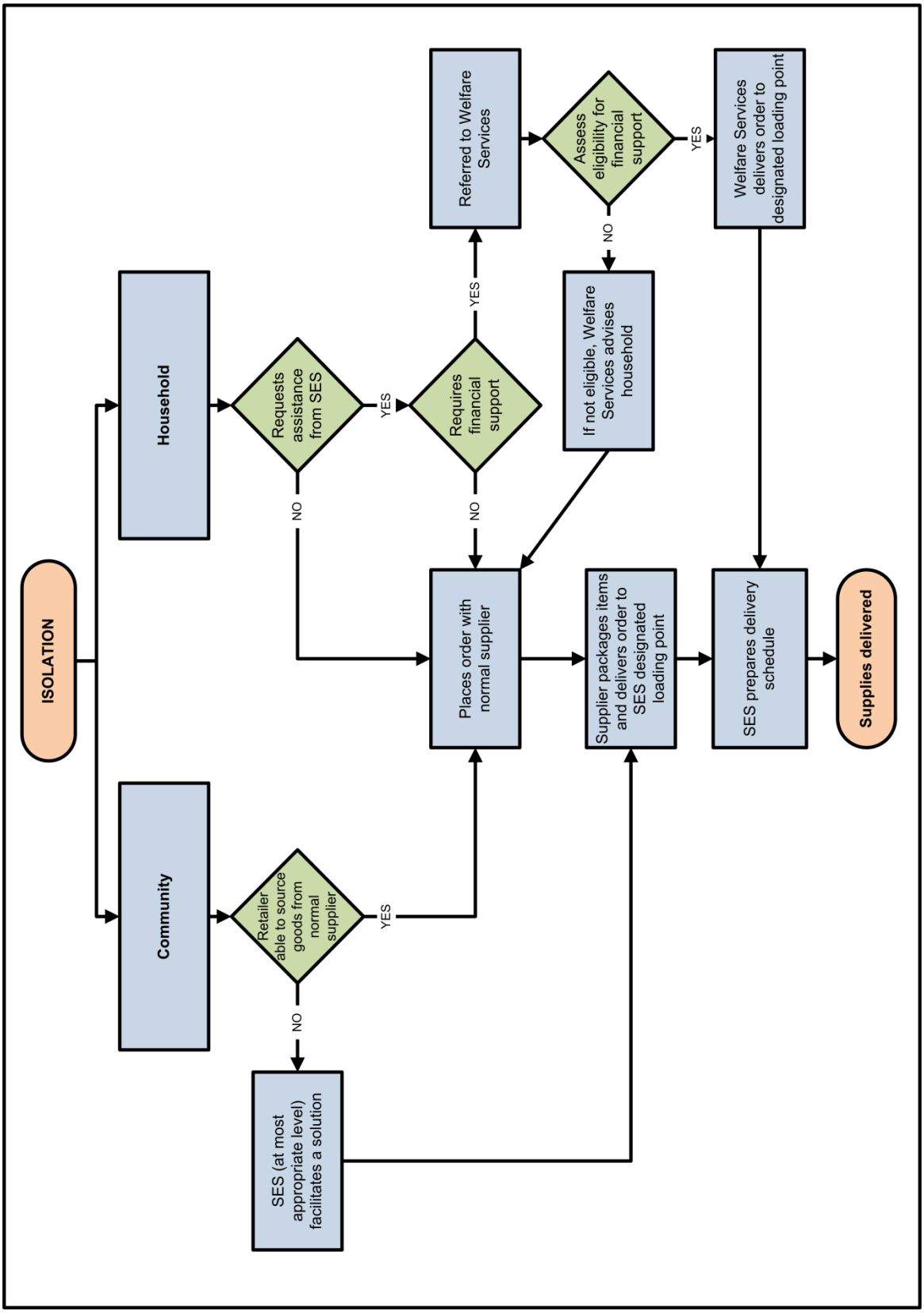
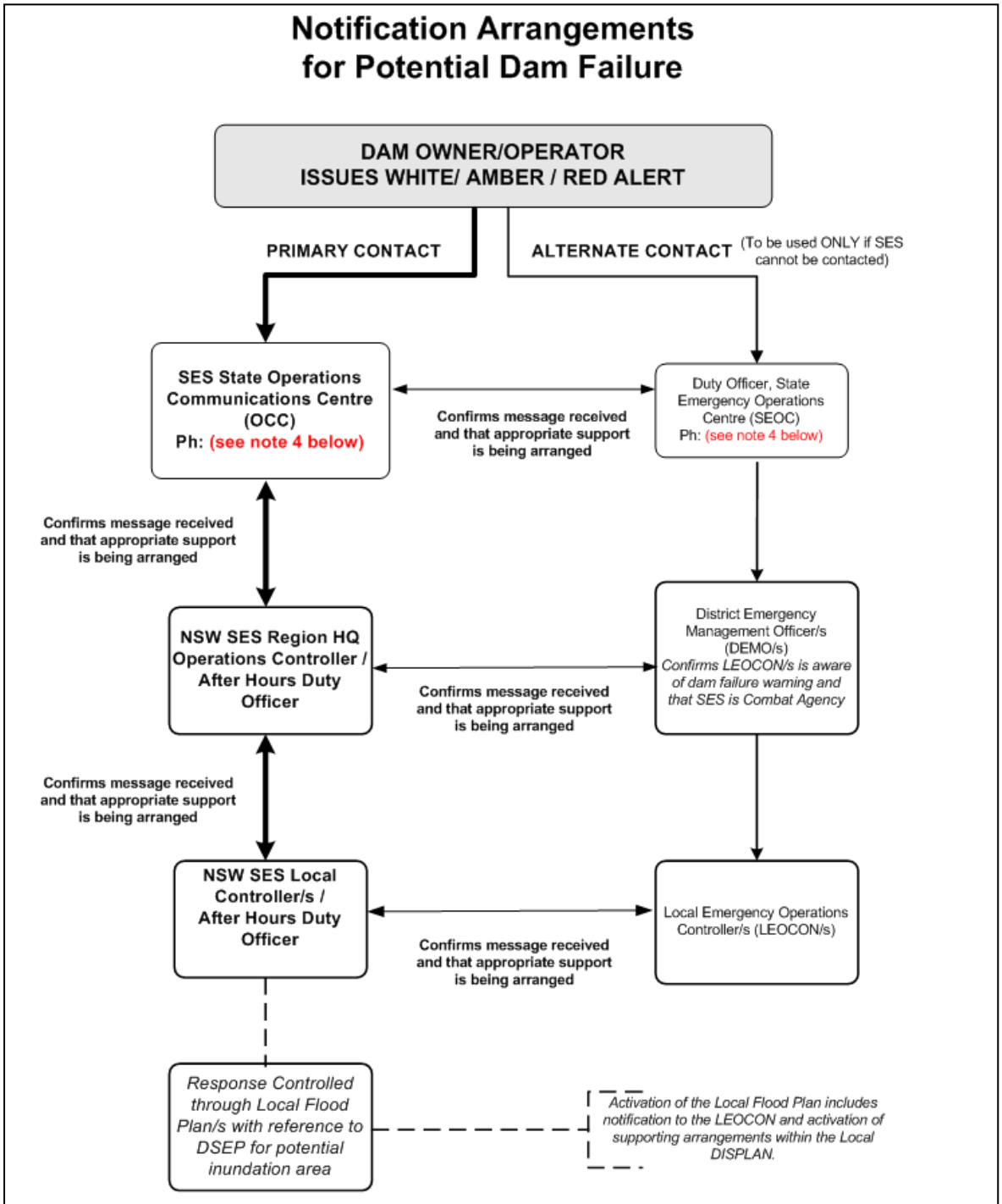


Figure H-1: Resupply Flowchart.

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:

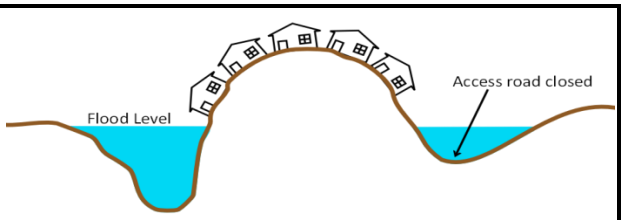
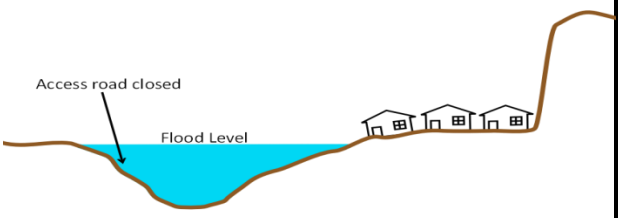
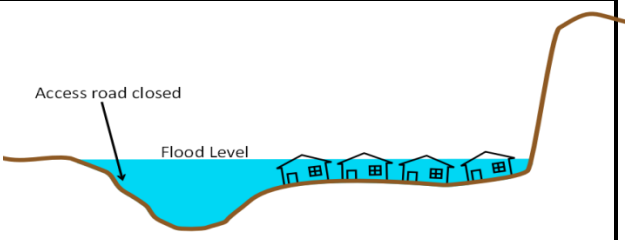
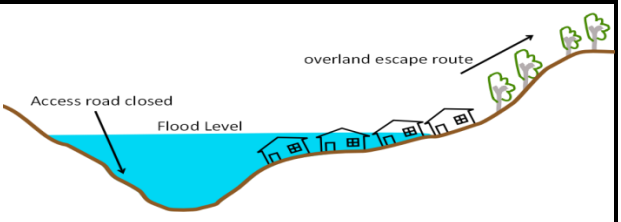
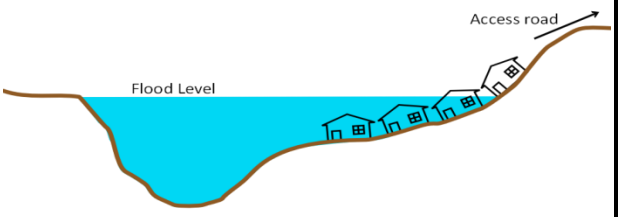
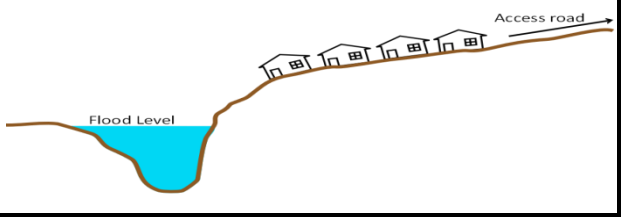
1. Dam owners should only contact the SEOC if the SES State Operations Communications Centre (OCC) cannot be contacted.

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 - FLOOD COMMUNITY CLASSIFICATION

HIGH FLOOD ISLAND (HFI) • Access road closed and no overland or alternative road access possible; • Island above predicted flood level. • Enough land is higher than the limit of flooding to cope with number of people in the area.	
LOW FLOOD ISLAND (LFI) • Access Road closed and no overland or alternative road access possible; • Island below predicted flood level.	
HIGH TRAPPED PERIMETER • Access road closed and no overland or alternative road access possible; • Inhabited (or potentially inhabited) area above predicted flood level. • Cannot retreat to higher ground due to topography or impassable structures.	
LOW TRAPPED PERIMETER • Access road closed and no overland or alternative road access possible; • Inhabited (or potentially inhabited) area is below predicted flood level; • Cannot retreat to higher ground due to topography or impassable structures;	
OVERLAND ESCAPE ROUTE • Access road closed but overland escape/rescue possible on foot or 4WD vehicle; • Inhabited (or potentially inhabited) area is below predicted flood level.	
RISING ROAD ACCESS • Access uninterrupted and via all-weather rising road (usual or alternate route); • Inhabited (or potentially inhabited) area is below predicted flood level.	
INDIRECTLY AFFECTED AREA • Access uninterrupted and via all-weather rising road (usual or alternate route); • Inhabited (or potentially inhabited) area is above predicted flood level; • One or more services failed (eg electricity).	

ANNEX K - SECTORS 1- 9

GEORGES CREEK/BELLBROOK AREA SECTOR 1

Community:	Upper Macleay
Flood Management Sector:	Bellbrook/Georges Creek
At Risk Population:	800
Flood Affect Classification:	High flood Island Rising Road
Hazard:	Isolation

Sector Description:

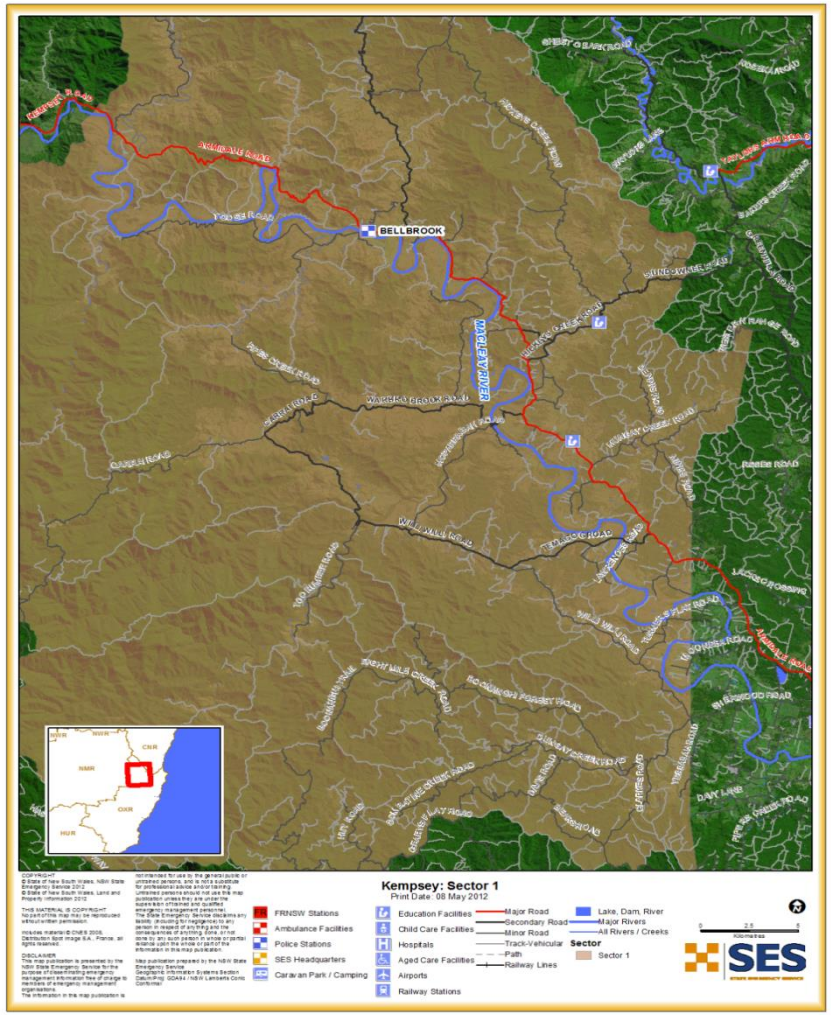
This Sector covers from Dumaresq Shire boundary in the West heading East to Turners Flat road turn off. Covering Bellbrook, Toorooka, Willawarrin, Temagog, Corangula, Turners Flat and to Skillion Flat. In moderate flooding the area is cut off by road closures due to washouts and low levels bridges causing properties to become isolated.

Georges Creek Gauge -206024			**Bellbrook Gauge** - 206019						**Command**	**Sector Control**
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	-	-	-	Kempsey SES LGA IC	Kempsey Unit
6.00m	8.00m	10.00m	6.50m	10.50m	13.50m					
Evacuation		**Warning Time**	**Evacuation**		**Warning Time**	**-**		**-**	**General Strategy**	
nil		-	nil		-	-		-	Resupply Only	

Evacuation Routes	**Evacuation Route Closure**	**Evacuation/Assembly Point**	**At Risk Properties**
• Armidale Road	• This can close in small events	• Bellbrook Community Hall	• Low laying Farmland

Key Risks / Consequences	• Georges Creek camping Ground and Blackbird Flat Camping Ground are to be considered • Residents in Bellbrook may experience isolation • Medical emergencies will require aviation support	**Property Protection**	**Specific property protection measures:** property protection not required due to their residential floor height & valley structure Low lying farmland properties will need to move livestock and equipment **Protection of essential infrastructure:** Nil required
Considerations	• Bellbrook Public School – Notify School • Upper Macleay Pre School – Notify School	**Protection of essential infrastructure:**	• Nil required

Information and Warnings	Method of Evacuation
• Flood Warning bulletin will be issued upon BOM warnings • Flood Advice to properties owners on pumps/livestock • Notifications are sent out via Commercial radio • Kempsey unit operates a phone tree network system	• Any Evacuation will be by Aviation or Flood Boat • Generally Evacuation for Medical treatment only is required



Pre-deployment of Resources

Sand

- Willawarrin Main Street

Flood Rescue Risks

- **Rescue:** No areas in general, Georges Creek Camping Ground & Blackbird Flat known possible campers – Medical evacuations or attempted crossings of flooded creeks are considered to be the only scenarios.
- Addressed by dedicated Flood Rescue personnel using air resources

Resupply

- Resupply operations are normally not required until isolation has continued for over 5 days. This will be carried out by aviation support to the local store in Bellbrook or direct to properties.
- Medical evacuations may force an earlier response.
- Bellbrook Public School
- Willawarrin Public School

Aircraft Management

Helicopter Landing Points.

- Georges Creek camping Ground - (Carrai map 9336-3-N: GR 225 975)
- Bellbrook – S30 49.097 E152 30.463
- Blackbird Flat Camping Ground – S30 49.882 E 152 33.334
- Homestead as per SES Homestead report

KEMPSEY SECTOR 2

Community:	Central Macleay
Flood Management Sector:	Kempsey Sector
At Risk Population:	8138
Flood Affect Classification:	Levee with Rising Road Access Area
Hazard:	Levee failure @ 6.68m

Sector Description:
This sector covers South from Kemps road heading North to Glen Rock Drain. East Side of Turners Flat Rd in the West heading East to the Bypass Road. Kempsey CBD (central), East Kempsey, South Kempsey and West Kempsey and the outer laying area of Aldavilla, Euroka and Pola Creek area.
Kempsey CBD is protected by a Levee system, all other area are evacuation by rising road.

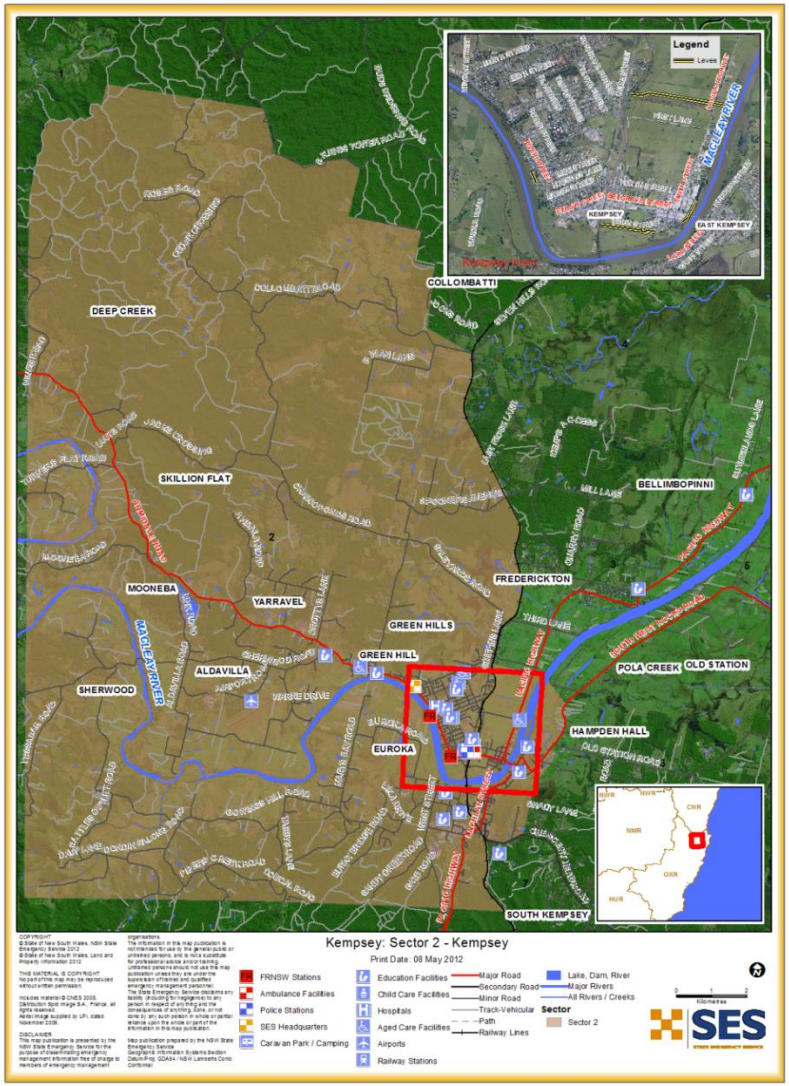
Georges Creek Gauge -206024			Bellbrook Gauge - 206019			Kempsey Gauge -			Command	Sector Control
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**		
6.00m	8.00m	10.00m	6.50m	10.50m	13.50m	4.50m	5.70m	6.65m	Kempsey SES LGA IC	Kempsey Unit

Trigger	Flow time	Trigger	Flow time	Evacuation Trigger	General Strategy
>11.90m	15-23Hrs	>10.65m	9-15hrs	=>6.40m CBD Levee =>7.50m Other parts of Kempsey	Evacuation

Evacuation Routes	Evacuation Route Closure	Evacuation/Assembly Point	At Risk Properties	
Kempsey CBD to West Kempsey: • Via any local street to West **Pola Creek to East Kempsey:** • South West Rocks Road	**Kempsey CBD:** • Belgrave St **Pola Creek to East Kempsey:** • 5.2m	• Kempsey High School – Broughton St, Kempsey 2440 • Melville high School – Nicholson St, Kempsey 2440	Central CBD • Businesses: 450 • Houses: 210	@ 8.70m West Kempsey : 112 South Kempsey: 74 East Kempsey : 52

Key Risks / Consequences	• Evacuation before levee is overtopped in CBD area • 2 x Caravan Parks within Levee • Warning to CBD business owners	**Property Protection**	**Specific property protection measures:** • Limited property protection within Levee • CBD Business owners need to be advised at 5.70mAHD **Protection of essential infrastructure:** • West Kempsey Sewerage treatment ponds • Kempsey District Hospital is outside the flood risk
Considerations	• Kempsey Pre-School • Nursery School Palm Court Aged Units		
Information and Warnings		**Method of Evacuation**	

• Flood Warning bulletin will be issued upon BOM warnings • Door Knock CBD with issue of moderate warning (5.70m) • CBD Evacuation Order at 6.40m if height yet to be determined by BOM	Evacuees are to use their own transport where possible, buses will be arranged



Pre-deployment of Resources

Sand/Sandbags:

- Clyde St Mall
- East Kempsey memorial
- South Kempsey Information Centre

Flood Rescue Risks

Area within the Levee System due to rising water
Polo Creek area in East Kempsey

Resupply

Generally not required within Kempsey Sector unless Extreme event.

The establishment of a resupply distribution depot for other communities needs to be put in place in east Kempsey

Aircraft Management

Helicopter Landing Points.

- Kempsey District Hospital Helipad, Tozer St, West Kempsey S31 4.028 E 152 49.278
- Kempsey Airport - Access is lost by road at approx. 7.20m
- West Kempsey High School- S 31 4.294 E 152 49.540
- Melville High South Kempsey – S31 5.397 E 152 49.585

FREDERICKTON AREA SECTOR 3

Community:	Central Macleay
Flood Management Sector:	Frederickton Sector
At Risk Population:	1000
Flood Affect Classification:	Levee - High Flood Island
Hazard:	Isolation

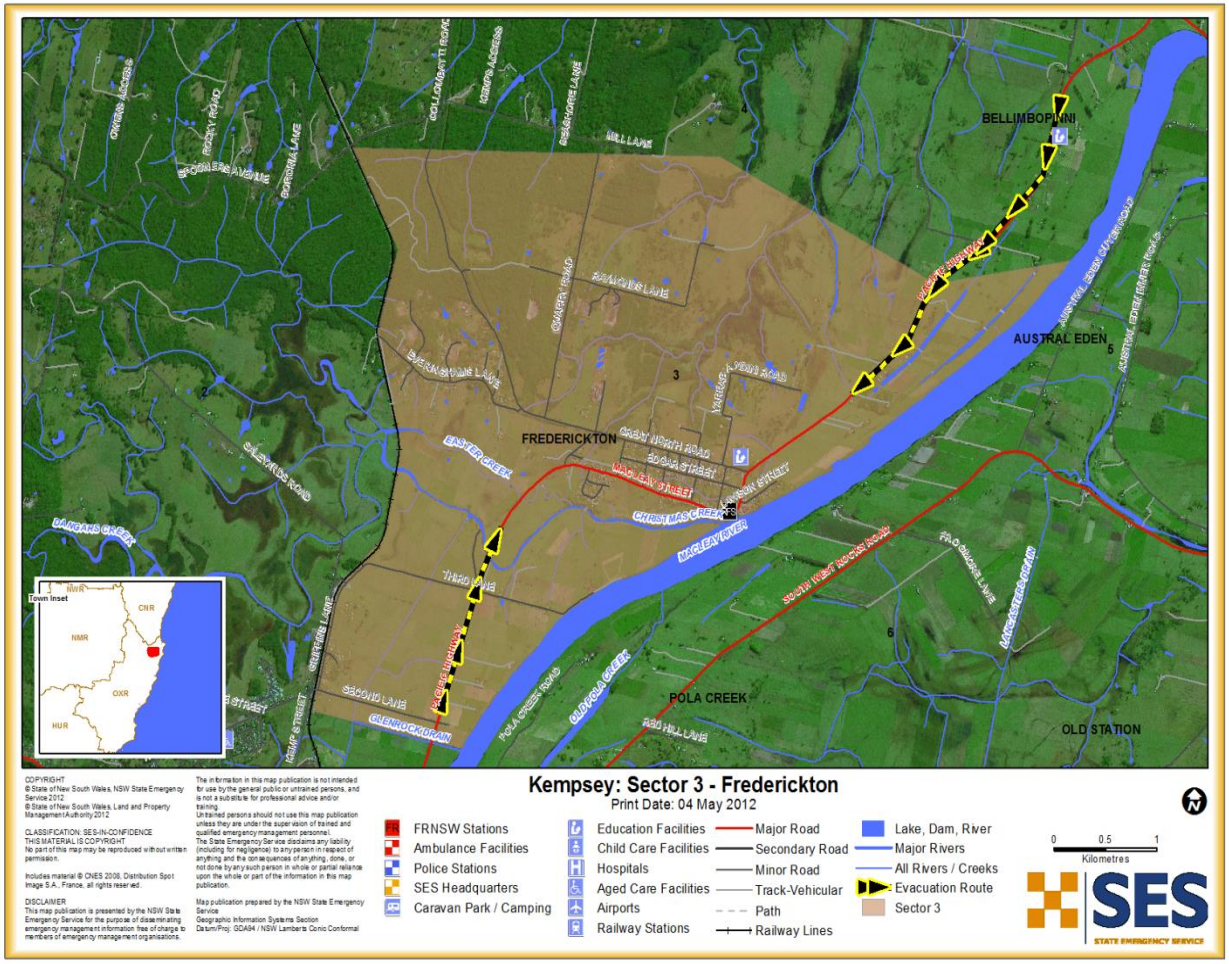
Sector Description:
This sector covers South from Glen Rock Drain heading North to Other side of Great Northern Road (in line with Golf Course). West from Spooners Ave heading East to Pacific Hwy. Lying on the Macleay River, Frederickton is situated just 8 km away. Most of the town is flood free with the exception of some low lying properties near the river; The new Levee will give the town protection to a 1% event.

Georges Creek Gauge -206024			**Bellbrook Gauge -** 206019			**Kempsey Gauge -**			**Command**	**Sector Control**
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	**Minor:**	**Moderat e:**	**Major:**		
6.00m	8.00m	10.00m	6.50m	10.50m	13.50m	4.50m	5.70m	6.65m	Kempsey SES LGA IC	Kempsey Unit
Trigger		**Flow Time**	**Trigger**		**Flow Time**	**Trigger**			**Trigger**	**Flow Time**
11.90m		15-23Hrs	10.65m		9-15hrs	5.70m			11.90m 15-23Hrs	10.65m

Evacuation Routes	**Evacuation Route Closure**	**Evacuation/Assembly Point**	**At Risk Properties**
Frederickton to Kempsey: • Pacific Highway to Kempsey • An alternative unsealed route, Spooner's avenue	• 5.20m (Kempsey Bridge Gauge) • 5.70m (Kempsey Bridge Gauge)	• Kempsey High School – Broughton St, • Frederickton Hall once Evac route closes	• Until levee completed: • @ 5.7m Houses in Lawson street, • @8.7m houses in both Macleay street Frederickton & houses in

Key Risks / Consequences	• Low lying properties in Lawson St affected by Backwater	**Property Protection**	**Specific property protection measures:** Sandbagging of lower lying houses followed by evacuation to higher ground at the evacuation centre **Assistance with property protection:** • Sandbagging, assistance to raise furniture

Information and Warnings	**Method of Evacuation**
• Flood Warning bulletin will be issued upon BOM warnings • Assistance with other ESO in delivering warning and advice	Evacuees are to use their own transport where possible, buses will be arranged;



Pre-deployment of Resources

Sand: Frederickton Community Hall

Flood Rescue

Will be responded from Gladstone if on Eastern side of Bypass

Will be responded from Kempsey if on Western Side of Bypass

Resupply

Resupply operations are normally not required until isolation has continued for over 5 days & these will be carried out by aviation support the local store.

Medical evacuations may force an earlier response.

Aircraft Management

Helicopter Landing Points.

- Frederickton Sports Field

BILLIMBOPINNI/CLYBUCCA AREA SECTOR 4

Community:	Lower Macleay	**Sector Description:** This sector cover South from Great North Road heading North to Cooks Lane. West from Collombatti railway line heading East to Pacific Hwy. The area is rural farming land and is in the flood plain that loses evacuation routes in moderate events before property inundation.
Flood Management Sector:	Clybucca Sector	
At Risk Population:	100	
Flood Affect Classification:	Low Flood Island	
Hazard:	Riverine Flooding - Inundation	

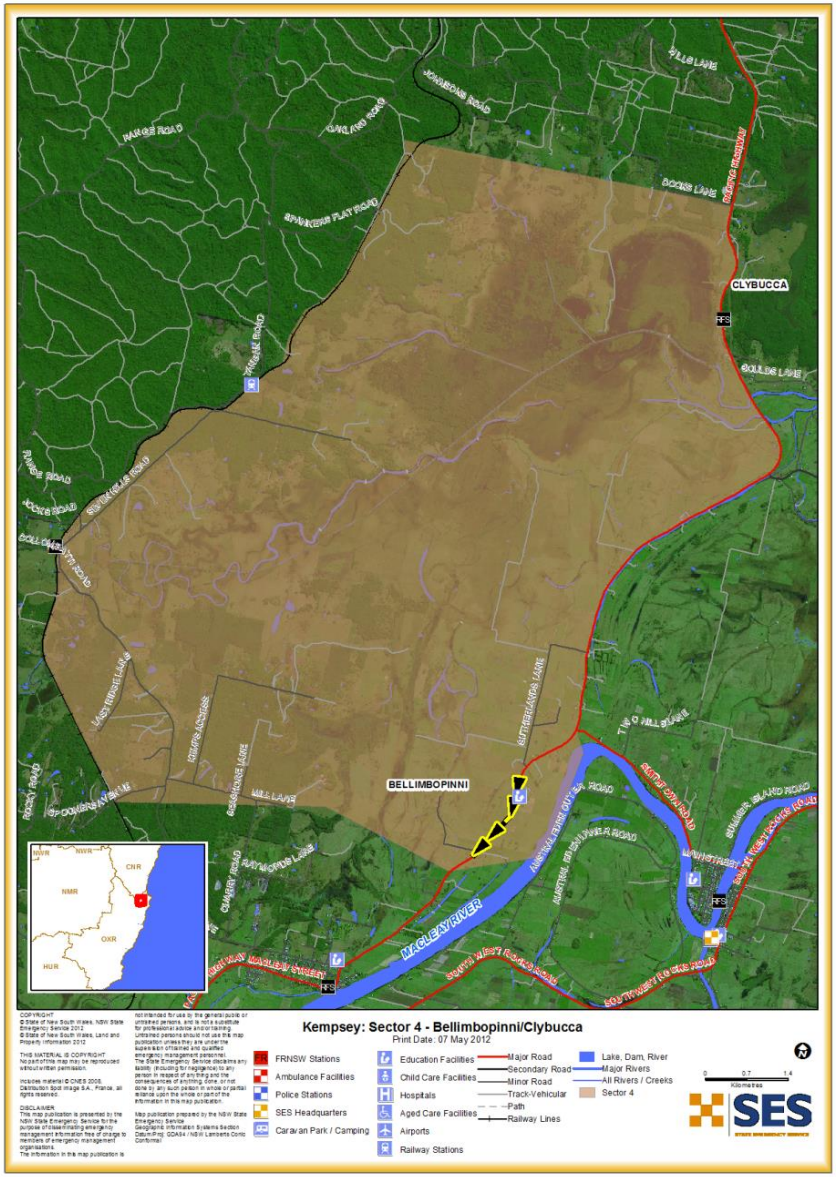
Georges Creek Gauge -206024			**Bellbrook Gauge -** 206019			**Kempsey Gauge -**			**Command**	**Sector Control**
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	Kempsey SES LGA IC	Kempsey SES
6.00m	8.00m	10.00m	6.50m	10.50m	13.50m	4.50m	5.70m	6.65m		

Trigger	**Flow Time**	**Trigger**	**Flow Time**	**Trigger**		**General Strategy**
11.90m	15-23Hrs	10.65m	9-15hrs	5.20m		Warnings & Evacuation
River Heights and Flow times are approximate, and indicate height and time to reach Kempsey Traffic Bridge						

Evacuation Routes	**Evacuation Route Closure**	**Evacuation/Assembly Point**	**At Risk Properties**
• To Kempsey • Pacific highway • Smithtown Rd, Plumber s Lane Summer Island Road • To Macksville • Pacific highway	• To Kempsey • Commence to close around 5.70m. (Kempsey Bridge Gauge) • Will Close South of Clybucca	• SWR Anglican Hall – 15 McIntyre St, South West Rocks • Kempsey High School – Broughton St, Kempsey 2440 • Melville high School – Nicholson St, Kempsey 2440	• Rural farming land

Key Risks / Consequences	Early road closure in smaller events will create properties to be isolated. This will then require rescue in events >6.80m (Kempsey gauge)	**Property Protection**	**Specific property protection measures:** Bellimbopinni to Clybucca Property protection options are very limited due to the large number of properties that can be affected and the depth of floodwaters
			Protection of essential infrastructure: Nil required

Information and Warnings	**Method of Evacuation**
• Flood Warning bulletin will be issued upon BOM warnings • Advice to property owners on isolation and livestock movements at 5.20m if unable to give predictions of expected river heights	



Pre-deployment of Resources

Flood Rescue

- Due to early road closures in major events rescue will be required around Summer Island

Resupply

- Resupply operations are normally not required until isolation has continued for over 5 days & these will be carried out by aviation support the local store.
- Medical evacuations may force an earlier response.

Aircraft Management

Helicopter Landing Points.

- This will be dependent on flooding

GLADSTONE/SMITHTOWN/SEVEN OAKS/KINCHELLA AREA SECTOR 5

Community:	Lower Macleay
Flood Management Sector:	Gladstone/Smithtown Sector
At Risk Population:	1300 (Glad 364, Smith 591, Kin 320)
Flood Affect Classification:	Low Flood Island
Hazard:	Riverine Flooding

Sector Description: This sector covers Smithtown, Gladstone, Seven Oaks, Austral Eden, Kinchela and the Belmore River area. Gladstone and Smithtown are twin towns separated by the Macleay River. Many dwellings would not experience over-floor inundation in a 1%ARI but could become involved if higher levels were reached. This sector becomes Isolated early due to road closures. Surrounding rural Low Lying area becomes affected early in events and require warnings.

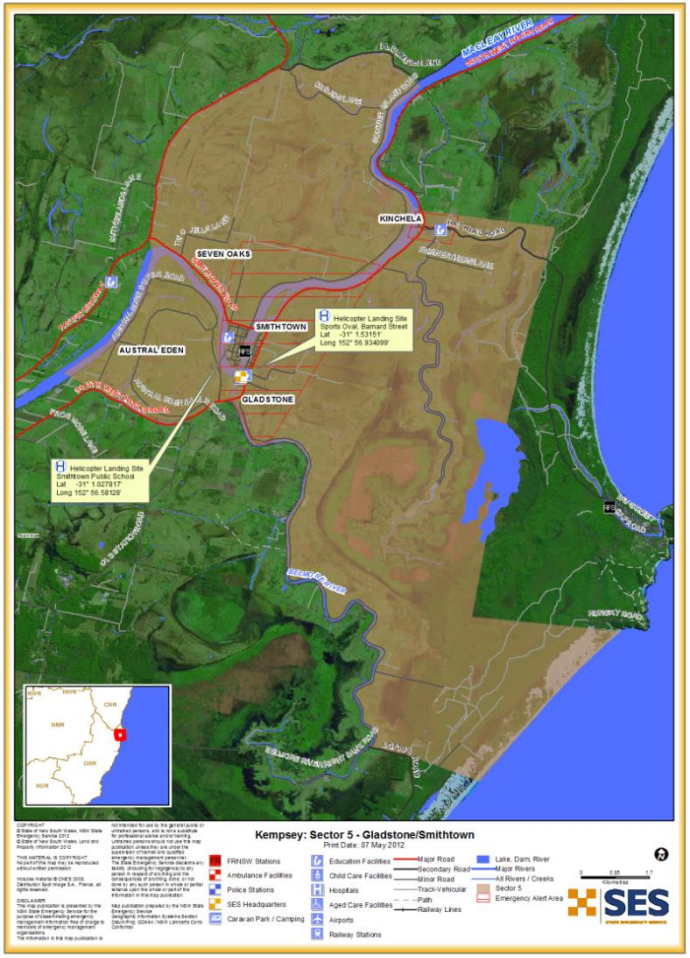
Georges Creek Gauge -206024			**Bellbrook Gauge** - 206019			**Kempsey Gauge** -			**Smithtown Gauge**		
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**
6.00m	8.00m	10.00m	6.50m	10.50m	13.50m	4.50m	5.70m	6.65m	3.50m	4.00m	4.20m
Trigger	**Flow Time to Kempsey**		**Trigger**	**Flow Time to Kempsey**		**Trigger**	**Flow to Smithtown**				
11.90m	15-23Hrs		10.65m	9-15hrs		5.20m	1-4hrs				
River Heights and Flow times are approximate, and indicate height and time to reach Kempsey Traffic Bridge									**General Strategy**		
Command	Kempsey SES LGA IC		**Sector Control**	Gladstone Unit					Evacuation		

Evacuation Routes	**Evacuation Route Closure**	**Evacuation/Assembly Point**	**At Risk Properties**
• Roads to Kempsey, Smithtown-Gladstone & South West Rocks are all cut in floods	• 5.70m Kempsey bridge Gauge	• SWR Anglican Hall – 15 McIntyre St, South West Rocks • Kempsey High School – Broughton St, Kempsey 2440 • Melville high School – Nicholson St, Kempsey 2440	• Inundation of blocks on which dwellings are located within Smithtown/Gladstone, Upper and Lower Kinchela begins about 6.0m at the Kempsey Traffic Bridge gauge.

Key Risks / Consequences	Decisions to trigger evacuations must take into account the separate influence of the Belmore River, Connection Creek, Kinchela Creek and the tides and ocean	**Property Protection**	**Specific property protection measures:** Property protection options are very limited due to the large number of properties that can be affected and the depth of floodwaters **Protection of essential infrastructure:** Nil

	The land area of Smithtown and Gladstone must be regarded as being covered in floods reaching about 7.5m. (Kempsey gauge). At this level the entire community would require total evacuation		• Gladstone Public School • Smithtown Public School • Lower Macleay Pre-School • Gladstone Police Station • Gladstone SES unit

Information and Warnings	Method of Evacuation
• Flood Warning bulletin will be issued upon BOM warnings • Door Knock Smithtown then Gladstone with warning at 4.90m • Community Action Group to assist	Evacuees are to use their own transport where possible prior road closure @5.70m Aviation will then be the main form to undertaken evacuation to either South West rocks or Kempsey South.



Pre-deployment of Resources

Sand/Sandbags to:

- RFS Kinchela Street - Gladstone
- Boat Ramp Main St - Smithtown
- South West Rocks Rd - Kinchela

Flood Rescues

Extra resources to be located in Gladstone.

Resupply

In Moderate events resupply operations are normally not required until isolation has continued for over 5 days & these will be carried out by air to support the local stores in the communities.

Aircraft Management

Helicopter Landing Points.

- Gladstone - Sports oval - Bernard Street.
- Smithtown – Smithtown public School

CRESCENT HEAD SECTOR 6

Community:	Lower Macleay
Flood Management Sector:	Crescent Head Sector
At Risk Population:	1966
Flood Affect Classification:	High Flood Island
Hazard:	Isolation

Sector Description:
This sector covers South from and Including Crescent Head road heading North to & Inclusive of Belmore/Seale Roads. West from Kempsey By Pass heading East to Ocean of Crescent head. Highly populated in the summer seasons. Crescent Head become isolated in moderate flooding events and apart from a few low-lying properties along Killick Creek in Willow St and the adjacent Caravan Park which could be affected by storm surge conditions remains relatively flood free.

Telegraph Point Gauge			Maria River Gauge			Kempsey gauge			Command	Sector Control
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	Kempsey SES LGA IC	Kempsey SES (Crescent Head RFS)
-	-	-	-	-	-	4.50m	5.70m	6.65m		

Trigger	Flow Times	Trigger	Flow Times	Trigger	Flow Times	General Strategy
1.80m	-	1.80m	-	5.40m	-	Resupply
Gauges not Classified – Use this as a guide when road access may be lost						

Evacuation Routes	Evacuation Route Closure	Evacuation/Assembly Point	At Risk Properties
Crescent Head Rd Connection Creek	Not linked to a gauge see above triggers heights	Crescent Head primary School	Low-lying properties along Killick Creek in Willow St

Key Risks / Consequences	• Isolation to community • Medical Emergencies • Influx of tourist in holiday Seasons	**Property Protection**	**Specific property protection measures:** • Property Protection generally not required **Protection of essential infrastructure:** • Nil required

Information and Warnings	Method of Evacuation
• Flood Warning bulletin will be issued upon BOM warnings • Kempsey unit Contact business Supermarket when Flood Warning issued on the Macleay River or when the Maria River may indicate flooding. • Assistance with RFS in delivering warning and advice	• Generally not required • If isolated Medical by aviation

Pre-deployment of Resources

Sand/Sandbags: Nil

Personnel: SES Liaison Officer sent to the RFS Shed in Crescent Head upon indication that Crescent head may be Isolated.

Boat: Punt deployed by Tilt tray to the Corduroy

Flood Rescue

The only hazard is along Crescent Head road when access is cut at the Corduroy

Resupply

Generally people have 4wd beach access to Port Macquarie if the Hastings is not in Flood.

Resupply operations are normally not required until isolation has continued for over 5 days or beach access is lost.

This will be carried out by aviation drops to support the local stores in Crescent Head.

Aircraft Management

Helicopter Landing Points.
Crescent Head Country Club - S31 11.367 E152 58.745
(Safety arrangement will need to be put in place with Club prior)

MARIA RIVER SECTOR 7

Community:	Lower Macleay
Flood Management Sector:	Maria River Sector
At Risk Population:	100
Flood Affect Classification:	Low Flood Island
Hazard:	Isolation/Inundation

Sector Description:
This sector covers the Maria River South from Port Macquarie Shire boundary heading North to Crescent Head Rd. West from Maria River heading East to the Ocean. Flooding of the Maria Rivers is largely influenced by the flood levels within the Hastings River. Small rural properties mostly are two story who become Isolated in flooding events.

Telegraph Pt. Gauge			Maria River Gauge			-			Command	Sector Control
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	-	-	-	Kempsey SES LGA IC	Kempsey Unit
-	-	-	-	-	-					
Monitor/Trigger			**Monitor/Trigger**						**General Strategy**	
1.95m		-	2.30m		-	-		-	Resupply	
Gauges not Classified – Use this as a guide when Isolation may begin										

Evacuation Routes	Evacuation Route Closure	Evacuation/Assembly Point	At Risk Properties
• To Kempsey • Maria River Road to Crescent Head Rd. • To Port Macquarie • Maria River Road to Shoreline Drive then ferry.	• Not linked to a gauge • Road access is lost before any property Inundation. • Roads can close due to back up water from either the Macleay or Hastings Rivers	• Crescent Head Primary School	• 3.00m (Maria river gauge) – Entire area will inundated • Most houses are two stories with living above flood waters.

Key Risks / Consequences	BOM provide no warning to this area	**Property Protection**	**Specific property protection measures:** Property protection is limited due to widespread nature of flooding
	The floodwater gradient is typically very flat, with floodwaters "backing-up" along the Maria River from the Hastings River confluence.		**Protection of essential infrastructure:** Nil

Information and Warnings	Method of Evacuation
• Flood Warning bulletin will be issued when indication of flooding • Kempsey unit activates Phone Tree Warning network	Evacuation seldom required If required evacuation by Flood Rescue Boat

Pre-deployment of Resources

Sand: Nil

Flood Rescue

- Generally not required in this area
- All properties will be isolated early with inundated very late in any event.
- Medical emergencies will have to managed by Flood boat or Aviation

Resupply

- Resupply operations are normally not required until isolation has continued for over 5 days
- Most houses are built up
- Resupply will be by flood boat preferably, aviation landing sites will be restricted.

Aircraft Management

Helicopter Landing Points.

- Landing will be at individual properties if not inundated.

SOUTH WEST ROCKS SECTOR 8

Community:	Lower Macleay
Flood Management Sector:	South West Rocks/Jerseyville Sector
At Risk Population:	4600 (SWR 4100, JERS 100)
Flood Affect Classification:	Low Flood Island raising to High ground
Hazard:	Riverine flooding

Sector Description:
This sector covers South West Rocks, Stuarts Pt., Grassy Head, Rainbow Reach and Jerseyville. South West Rocks will become Isolated and is highly populated in holiday season. Jerseyville will require evacuation in a 1 % event due to Inundation. Grassy Head and Stuarts point community may be Isolated in extreme events due to back up water from the Macleay.

Georges Creek Gauge -206024			Bellbrook Gauge - 206019			Kempsey Gauge -			Command	Sector Control
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	Kempsey SES LGA IC	South West Rocks Unit
6.00m	8.00m	10.00m	6.50m	10.50m	13.50m	4.50m	5.70m	6.65m		
Trigger	**Flow Time to Kempsey**		**Trigger**	**Flow Time to Kempsey**		**Trigger**			**General Strategy**	
11.90m	15-23Hrs		10.65m	9-15hrs		5.20m			Resupply	
River Heights and Flow times are approximate, and indicate height and time to reach Kempsey Traffic Bridge										

Evacuation Routes	Evacuation Route Closure	Evacuation/Assembly Point	At Risk Properties
• South West Rocks Rd. • Stuarts Pt. Road to pacific Hwy • Grassy Head Rd to Scott's head	• 5.70m Kempsey bridge Gauge Roads to South West Rocks are all cut in floods	• SWR Anglican Hall – 15 McIntyre St, South West Rocks	• Properties in the lower area of Rainbow reach

Key Risks / Consequences	Lower parts of South West Rocks could be liable to flooding from the Macleay River flowing into Back Creek, and coinciding with high tides or storm surge activities A flood predicted to reach or exceed 7.0 metres (AHD) on the Kempsey Traffic Bridge would require evacuation the lower parts of the South West Rock itself	**Property Protection**	**Specific property protection measures:** • Property Protection generally not required in SWR Sector • Sandbagging of some properties in Jerseyville **Protection of essential infrastructure:** • Nil required

Information and Warnings	Method of Evacuation
• Flood Warning bulletin will be issued upon BOM warnings • Advice to Store owners by SWR unit on any Flood Warnings to prepare in case of isolation.	Evacuation not generally Required In major events evacuation will be into higher grounds in SWR

Pre-deployment of Resources

Sand and Sandbag:

- South West Rocks - Landsborough Street Car park
- Jerseyville – *Fish Coop on South West Rocks Road*

Flood Rescue

- Resource will be deployed form South West Rocks unit

Resupply

Resupply operations are normally not required until isolation has continued for over 5 days

This will be carried out by aviation drops to support the local supermarkets in South West Rocks.
(contact will be established by the South West Rocks unit upon any Flood warnings)

Aircraft Management

Helicopter Landing Points.

- South West Rocks Unit – S 30 53.327 E153 1.774
- Sports Field Phillip Drive – S 30 53.465 E 153 2.902
- Jerseyville - Fish Co-op car park S30 55.436 E153 2.193
    - (Beware Wires on east side near road)
- Stuart Pt. Sporting Oval behind School - S30 49.108 E 152 59.526

HAT HEAD SECTOR 9

Community:	Lower Macleay
Flood Management Sector:	Hat Head
At Risk Population:	299
Flood Affect Classification:	High Flood Island
Hazard:	Isolation

Sector Description:
This sector covers the community of the Hat Head community. Hat Head can be isolated for considerable periods by flooding over the road to Kinchela. There is no serious problem of inundation within the town.

Georges Creek Gauge -206024			Bellbrook Gauge - 206019			Kempsey Gauge -			Command	Sector Control
Minor:	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	**Minor:**	**Moderate:**	**Major:**	Kempsey SES LGA IC	Gladstone SES
6.00m	8.00m	10.00m	6.50m	10.50m	13.50m	4.50m	5.70m	6.65m		
Trigger	**Flow Time to Kempsey**		**Trigger**	**Flow Time to Kempsey**		**Trigger**			**General Strategy**	
11.90m	15-23Hrs		10.65m	9-15hrs		5.20m			Resupply	
River Heights and Flow times are approximate, and indicate height and time to reach Kempsey Traffic Bridge										

Evacuation Routes	Evacuation Route Closure	Evacuation/Assembly Point	At Risk Properties
• Kinchela Rd to South West Rocks rd.	• May close in moderate events	• SWR Anglican Hall – 15 McIntyre St, South West Rocks	• Nil

Key Risks / Consequences		Property Protection	
	• Isolation • There may be access to SWR via 4wd along beach if no storm surge.		**Specific property protection measures:** • Nil required **Protection of essential infrastructure:** • The hat head sewerage treatment works may fail in major events due to excessive water.

Information and Warnings	Method of Evacuation
• Flood Warning bulletin will be issued upon BOM warnings • Advice to community on possible Isolation in flooding events • Contact general Store and Advice of possible Isolation • Assistance with RFS in delivering warning and advice	• General evacuation not required. • Medical evacuation will be by air

Pre-deployment of Resources

Sand/Sandbags: Nil required

Flood Rescues

- No hazards known
- Will be managed from Gladstone Unit

Resupply

Resupply operations are normally not required until isolation has continued for over 5 days or beach access is lost.

This will be carried out by aviation drops to support the local general Store stores in Straight St hat Head.

Aircraft Management

Helicopter Landing Points.
Bowling Club Myrtle Street Hat Head - S 31 3.304 E 153 3.149
(Safety arrangement will need to be put in place with Club prior))

ANNEX L - CHILD CARE CENTRES

1. The following centres will need to be advised if flooding is expected to allow parents to collect children prior road closures.

Upper Macleay	Address		Sector	Flood Risk	Comment
Upper Macleay pre school	77 main St	Willawarrin	1	Isolation	
Central Kempsey					
Dalaigur pre-school	Nancy Ellis St	West Kempsey	2	Isolation	Community Becomes Isolated
Kempsey Kindy	32 Short Street	West Kempsey	2	Isolation	
Kempsey Kindy	269 River St	West Kempsey	2	Isolation	
ABC Child Care	Kemps Street	West Kempsey	2	Isolated	
The Cubbyhouse Child Care Centre	41 Polwood St	West Kempsey	2	Isolation	
The Kindergarten	51-53 North St	West Kempsey	2	Isolation	
South Kempsey Preschool	32 Nicholson St	South Kempsey	2	Isolation	Community Becomes Isolated
Kempsey Preschool & Nursery School	Verge & John St	Central Kempsey	2	Inundation	Within the Kempsey Levee. Will need to be advised prior evacuation warning
Kempsey community child Care	8 Austral St	Central Kempsey	2	Inundation	
Lower Macleay					
South West Rocks Pre –School	1 Trial St South	South West Rocks	8	Isolation	Community Becomes Isolated
Stuarts point community pre school	9 -11 Fourth Av	Stuarts point	8	Isolation	Community Becomes Isolated
Neighbourhood earl y learning centre	16 Wilfred Partridge St	South West Rocks	8	Isolation	Community Becomes Isolated
Lower Macleay Preschool	51 Belmore St	Smithtown	5	Inundation	Community becomes Isolated early in smaller events. Major events will have the entire towns inundated
Crescent Head Community Pre-School	Killuke Cres	Crescent Head	6	Isolation	Community Becomes Isolated

ANNEX M - KEMPSEY SHIRE SCHOOLS

1. The following Schools will need to be advised if flooding is expected to allow parents to collect children prior road closures.

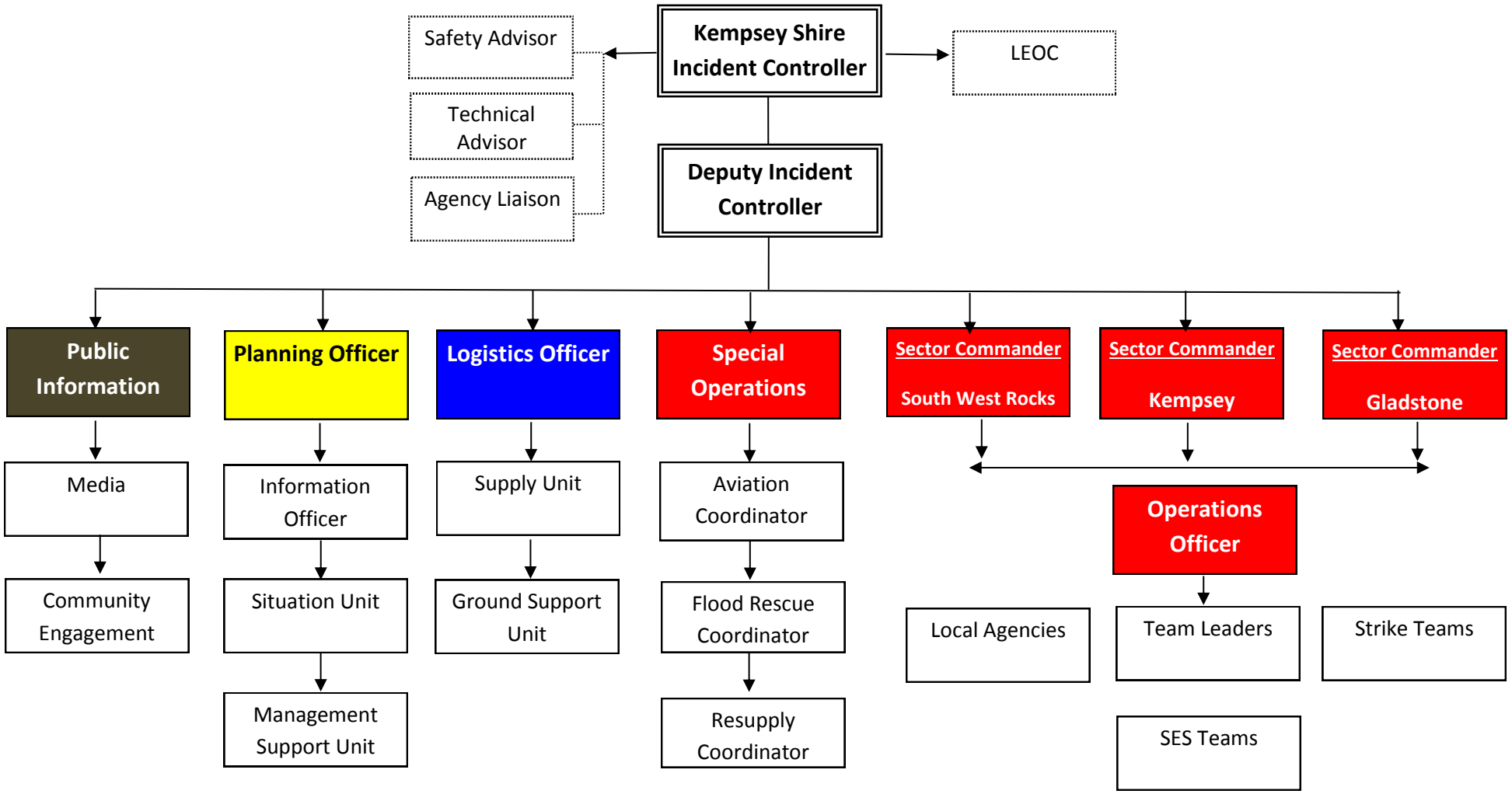
Upper Macleay	Address		Sector	Flood Risk	Comment
Bellbrook Public	Main Street	Bellbrook	1	Isolation	Roads closure in upper Macleay during flooding events will cause Isolation but not Inundation.
Millbank	Hickeys Creek Road	Millbank	1	Isolation	
Willawarrin Public	85-91 Main Street	Willawarrin	1	Isolation	
Central Kempsey					
Aldavilla Public	Sherwood Road	Aldavilla	2	Isolation	Community Becomes Isolated
Kempsey Adventist School	108 Crescent Head Road	East Kempsey	2	Isolation	Community Becomes Isolated
Kempsey East Public	Innes Street	East Kempsey	2	Isolation	
Kempsey South Public	21 Queen St	South Kempsey	2	Isolation	Community Becomes Isolated
Macleay Vocational College	11-13 Reginald Ward Street	South Kempsey	2	Isolation	
**Melville High	Nicholson Street	South Kempsey	2	Isolation	
Kempsey West Public	Marsh Street	West Kempsey	2	Isolation	Community Becomes Isolated
**Kempsey High	Broughton Street	West Kempsey	2	Isolation	
St Joseph's Primary	Kemp Street	West Kempsey	2	Isolation	
St Pauls high School	Sea Street	West Kempsey	2	Isolation	
North Coast TAFE	Dangar Street	West Kempsey	2		
Bellimbopinni Public	Pacific Highway	Bellimbopinni	3	Isolation	Community Becomes Isolated
Frederickton Public	Great North Road	Frederickton	3	Isolation	Community Becomes Isolated
Lower Macleay					
Smithtown Public	Cannane Street	Smithtown	5	Inundation	Community becomes Isolated only in smaller events. Major events will have the entire towns inundated.
Gladstone Public	Kinchela Street	Gladstone	5	Inundation	
Kinchela Public	5 Right Bank Road	Kinchela	5	Inundation	
**Crescent Head Public	44 Main Street	Crescent Head	6	Isolation	Community Becomes Isolated
South West Rocks Public	Gregory Street	South West Rocks	8	Isolation	Community Becomes Isolated
** Denotes Evacuation centre					

ANNEX N - AGED CARE FACITITIES

1. The following aged care centres will need to be advised if flooding is expected.

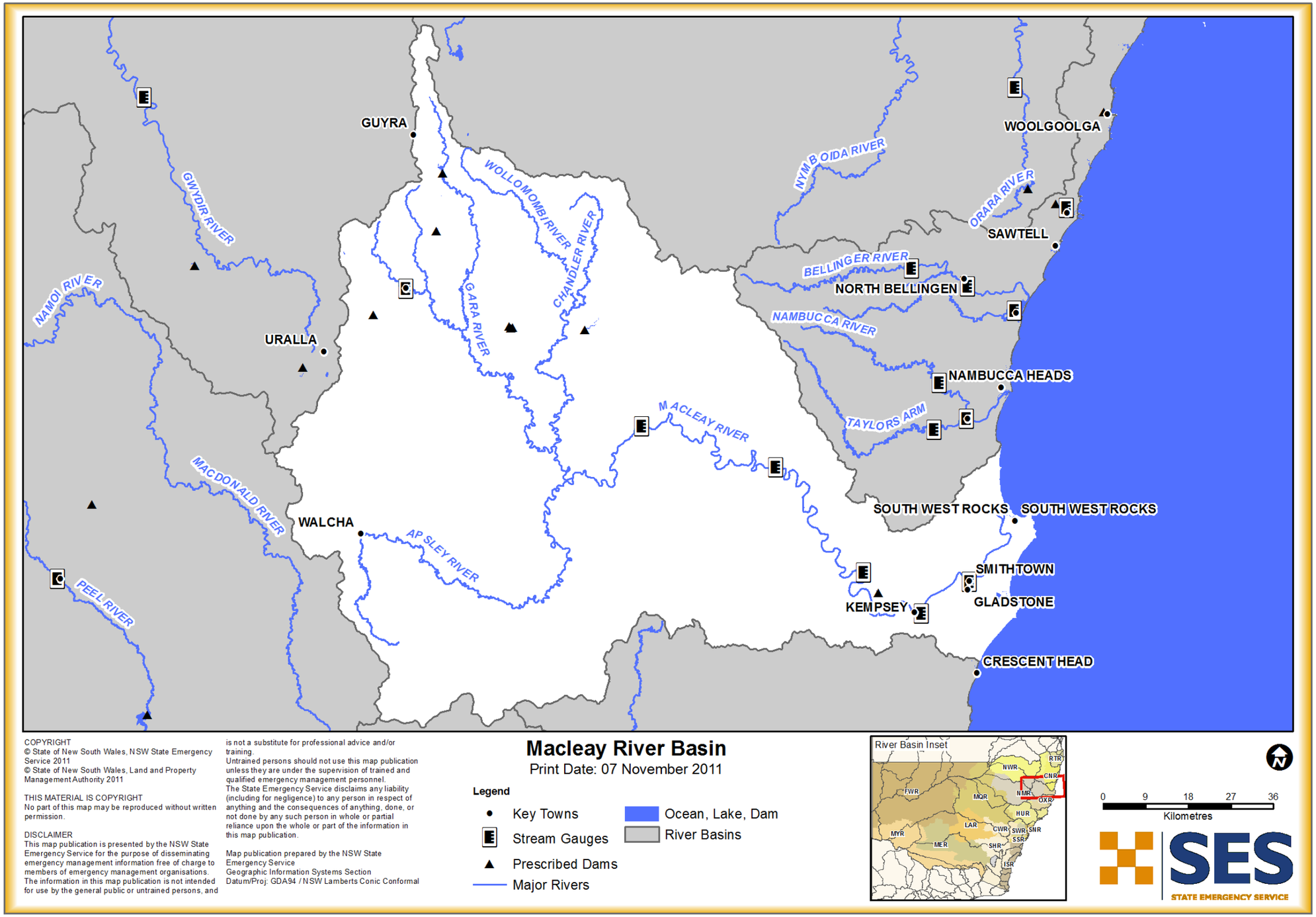
Name	Address		Sector	Flood Risk	Comment
Central Kempsey					
Bupa Care Services	70-97 Cochrane St	West Kempsey	2	Isolation	Community Becomes Isolated
Cedar Place Aged Care facility	58 Cochrane Street	West Kempsey	2	Isolation	
Booroongen Djugan Aboriginal Corporation	337 River Street	West Kempsey	2	Isolation	
Vincent Court	88 Leith Street	West Kempsey	2	Isolation	
Macleay valley Nursing Home	82-114 Macleay Street	Frederickton	3	Isolation	Community Becomes Isolated
Amity Nursing Home	63 Cochrane Street	Kempsey	2		
Lower Macleay					
South West Rocks Nursing Centre	110 Gregory Street	South West Rocks	8	Isolation	Community Becomes Isolated
Benelongs Haven	2054 South West rocks Road	Kinchela	5	Isolation	

ANNEX O - EXAMPLE – KEMPSEY SHIRE SES OPERATIONAL STRUCTURE



ANNEX P - MAPS

MAP 1 - MACLEAY RIVER BASIN



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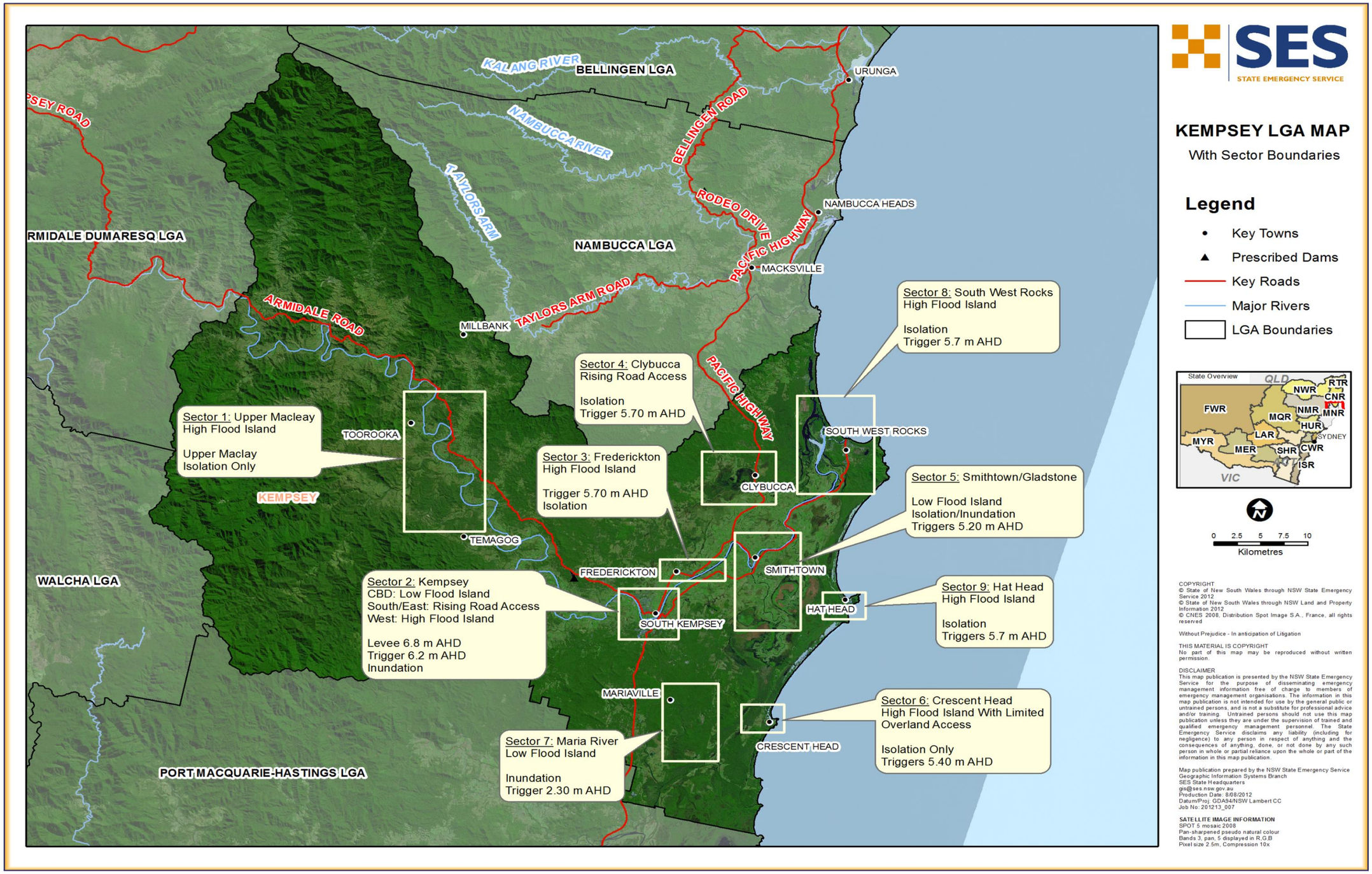
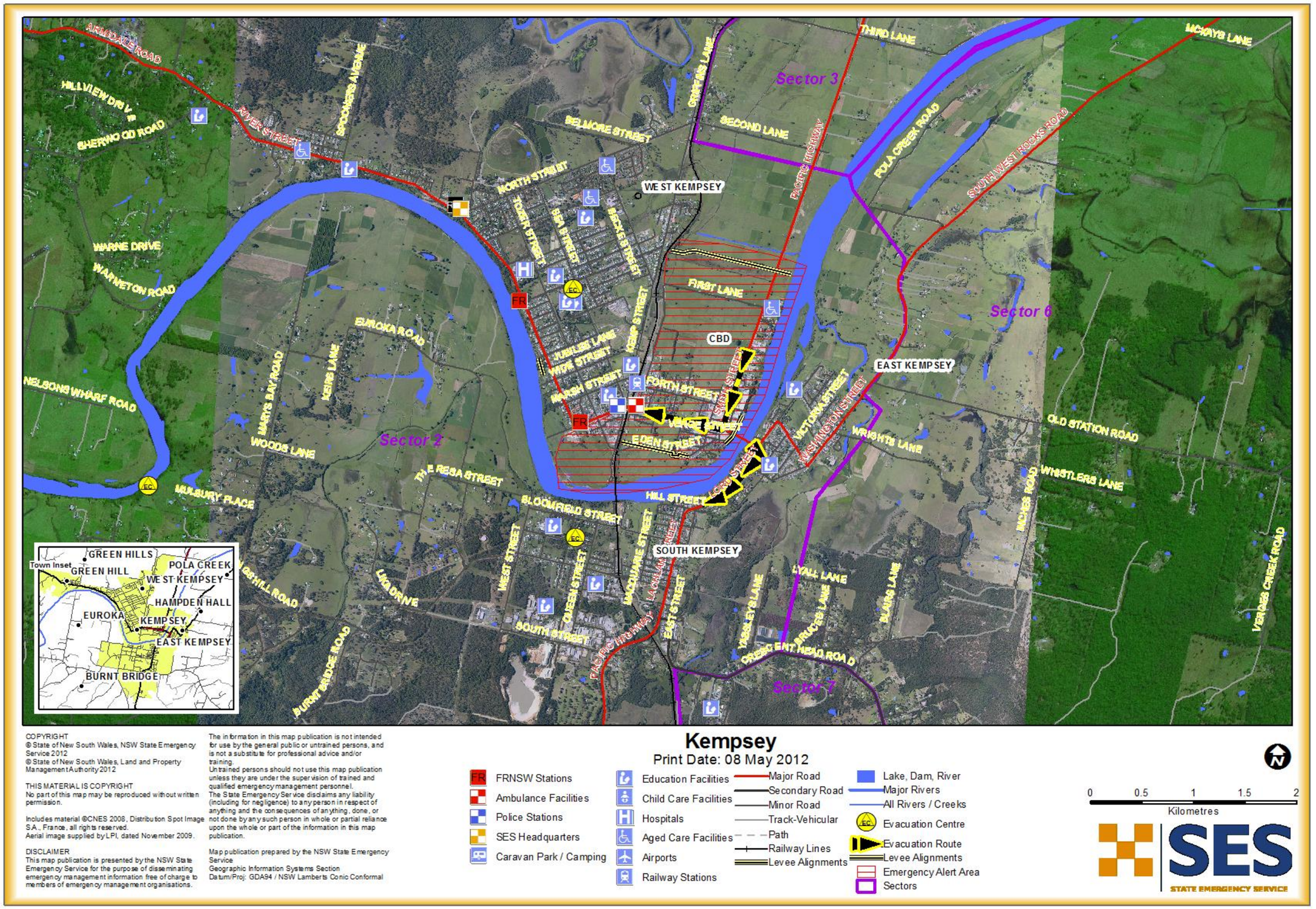
MAP 2 - KEMPSEY SHIRE COUNCIL AREA



MAP 3 - KEMPSEY TOWN MAP



MAP 5 - SMITHTOWN/GLADSTONE TOWN MAP

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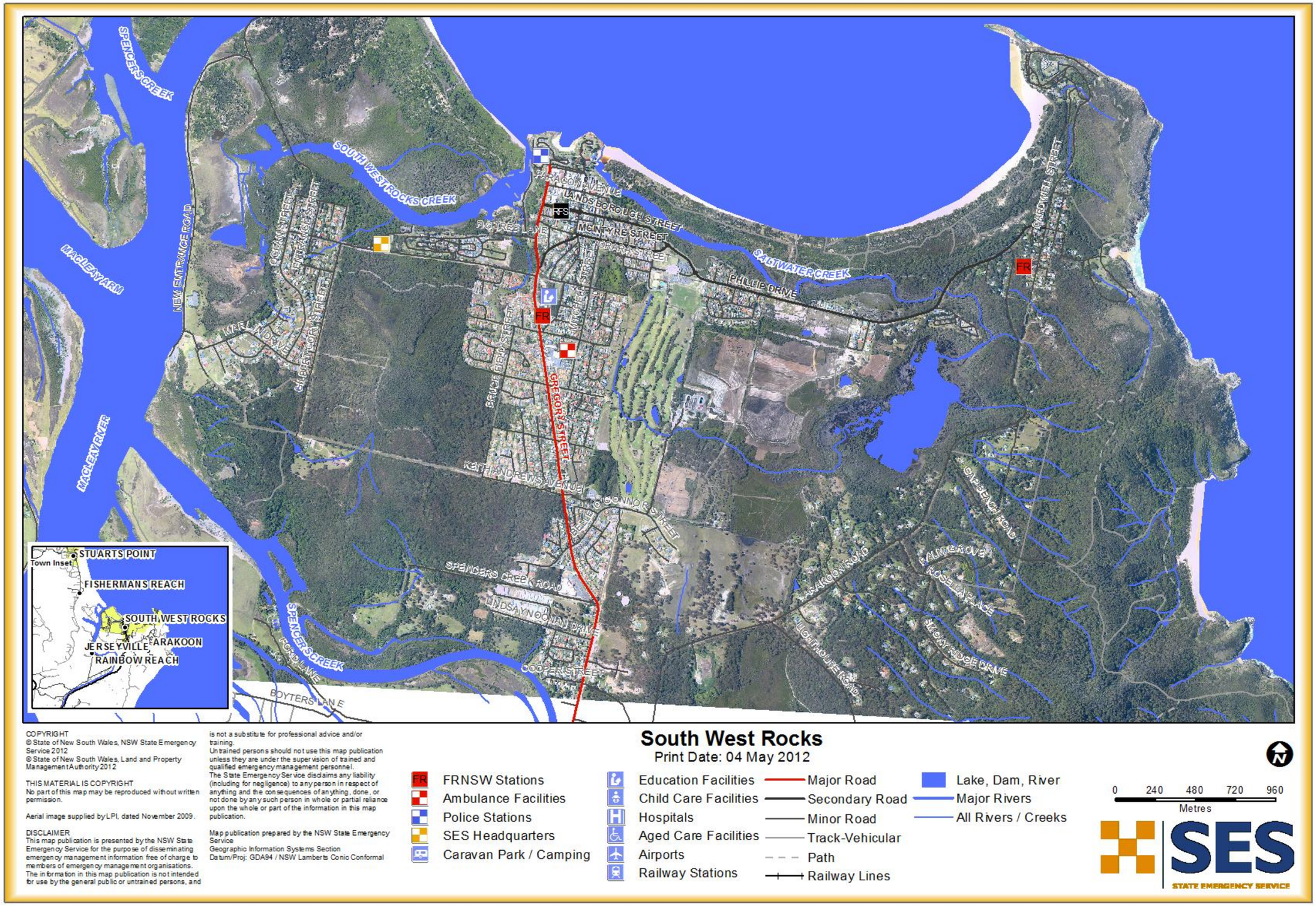
Smithtown/Gladstone
Print Date: 04 May 2012

- FRNSW 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
- Helicopter Landing Site

0 125 250 375 500
Metres

STATE EMERGENCY SERVICE

MAP 7 - SOUTHWEST ROCKS TOWNMAP



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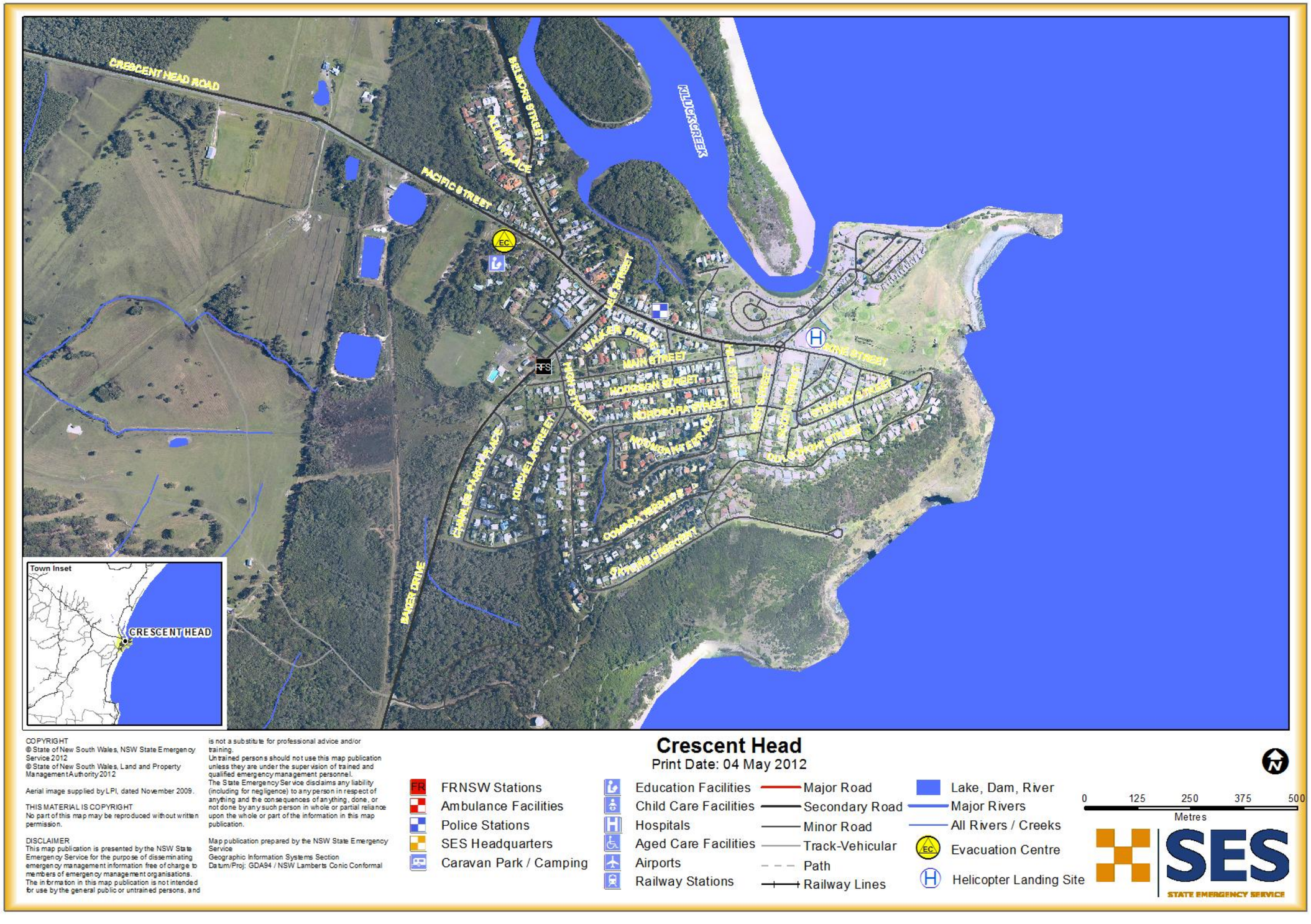
MAP 8 - CRESCENT HEAD TOWN MAP



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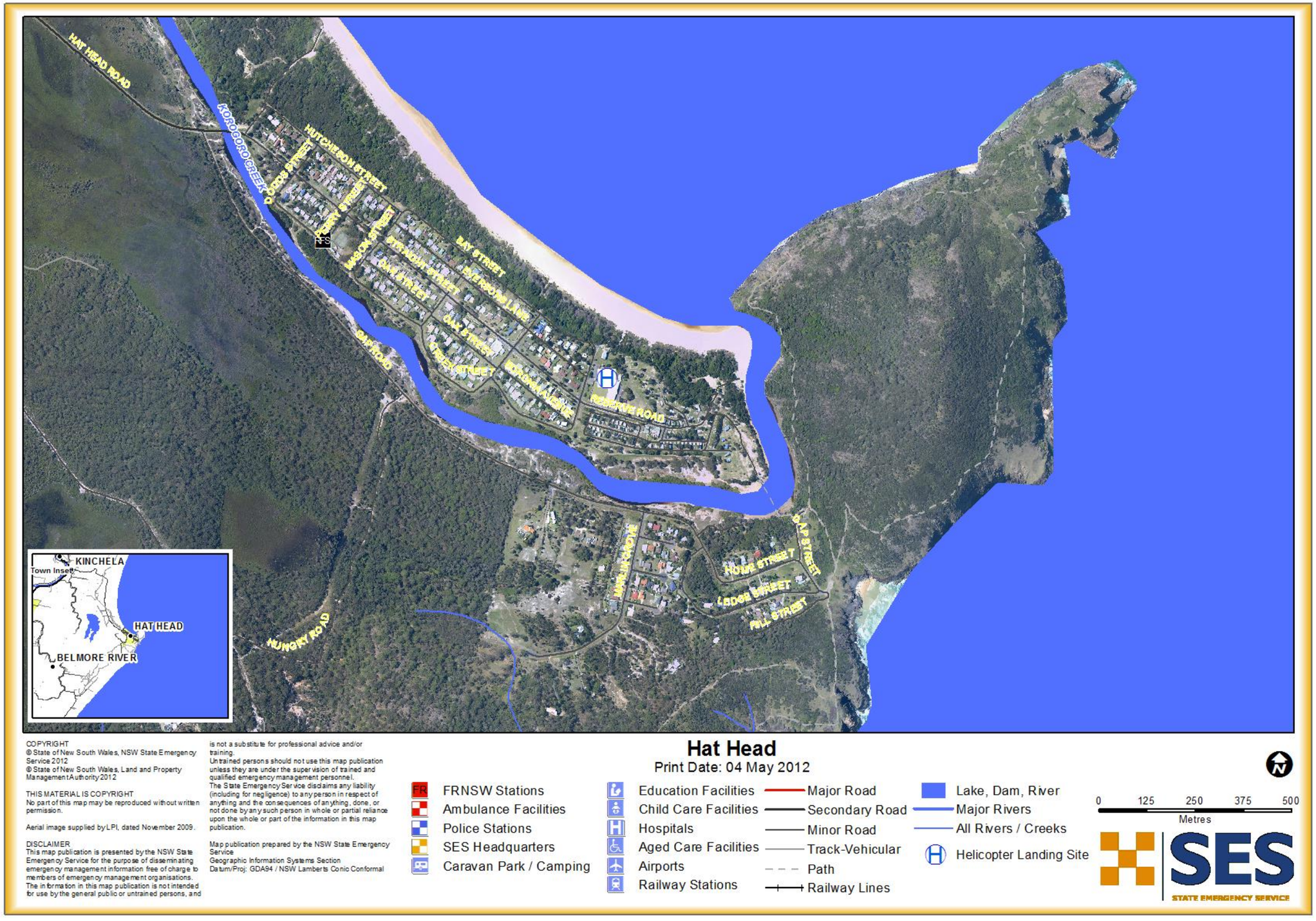
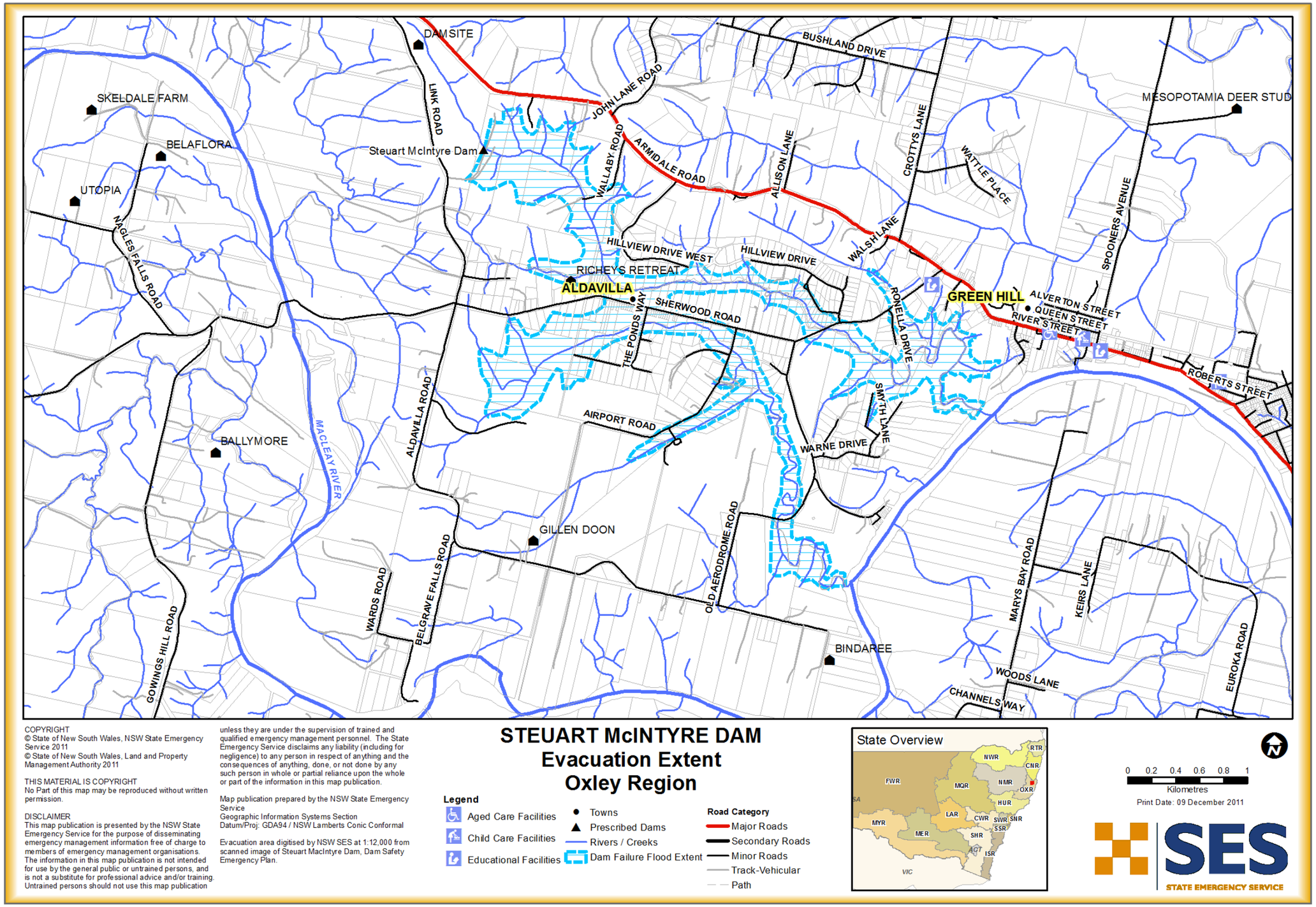
MAP 9 - HAT HEAD



MAP 10 - DAM BREAK INUNDATION MAP - STEUART MCINTYRE DAM



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Evacuation area digitised by NSW SES at 1:12,000 from scanned image of Steuart MacIntyre Dam, Dam Safety Emergency Plan.

STEUART McINTYRE DAM
Evacuation Extent
Oxley Region

Legend

- Aged Care Facilities
- Child Care Facilities
- Educational Facilities
- Towns
- Prescribed Dams
- Rivers / Creeks
- Dam Failure Flood Extent

Road Category

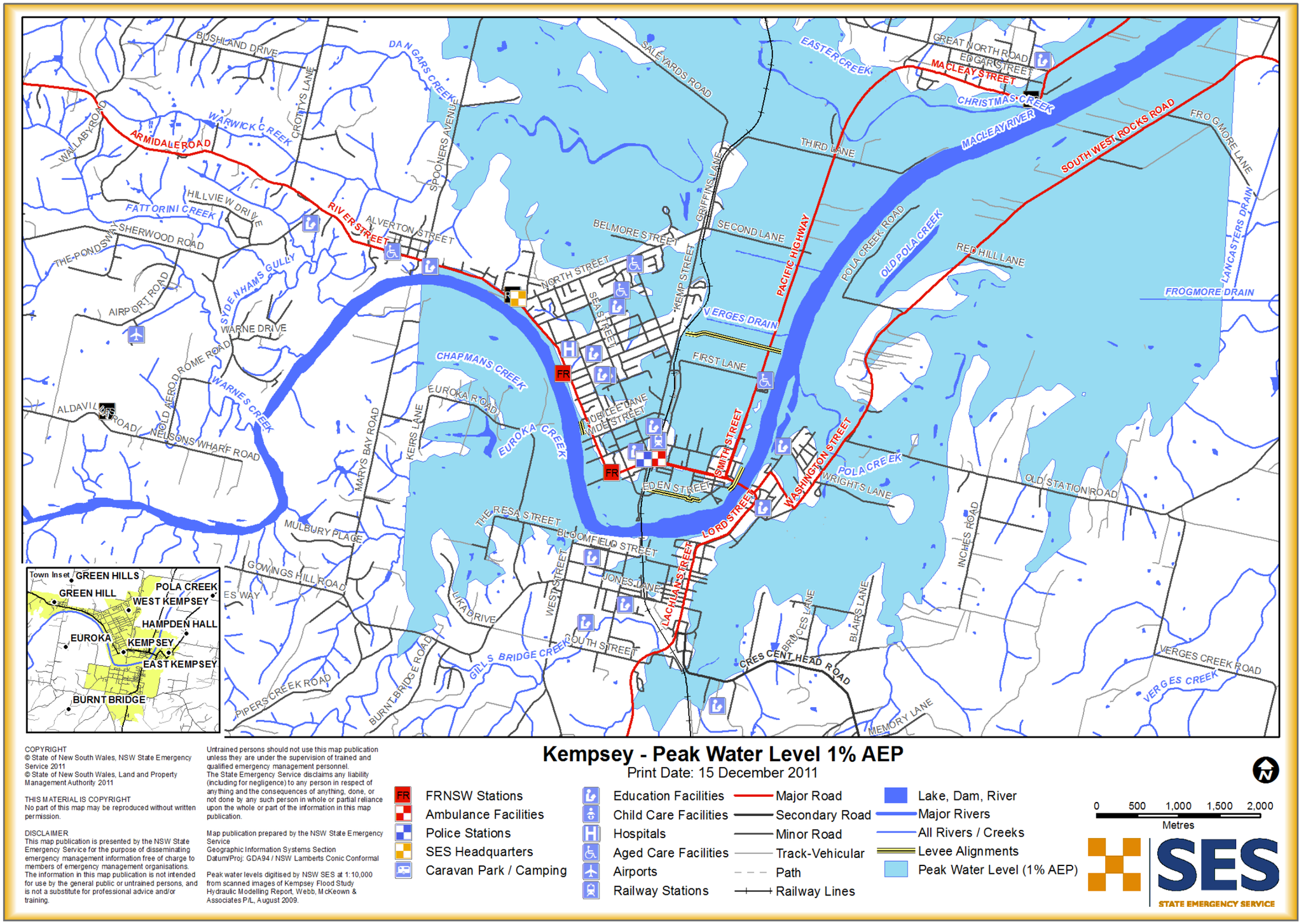
- Major Roads
- Secondary Roads
- Minor Roads
- Track-Vehicular
- Path

State Overview

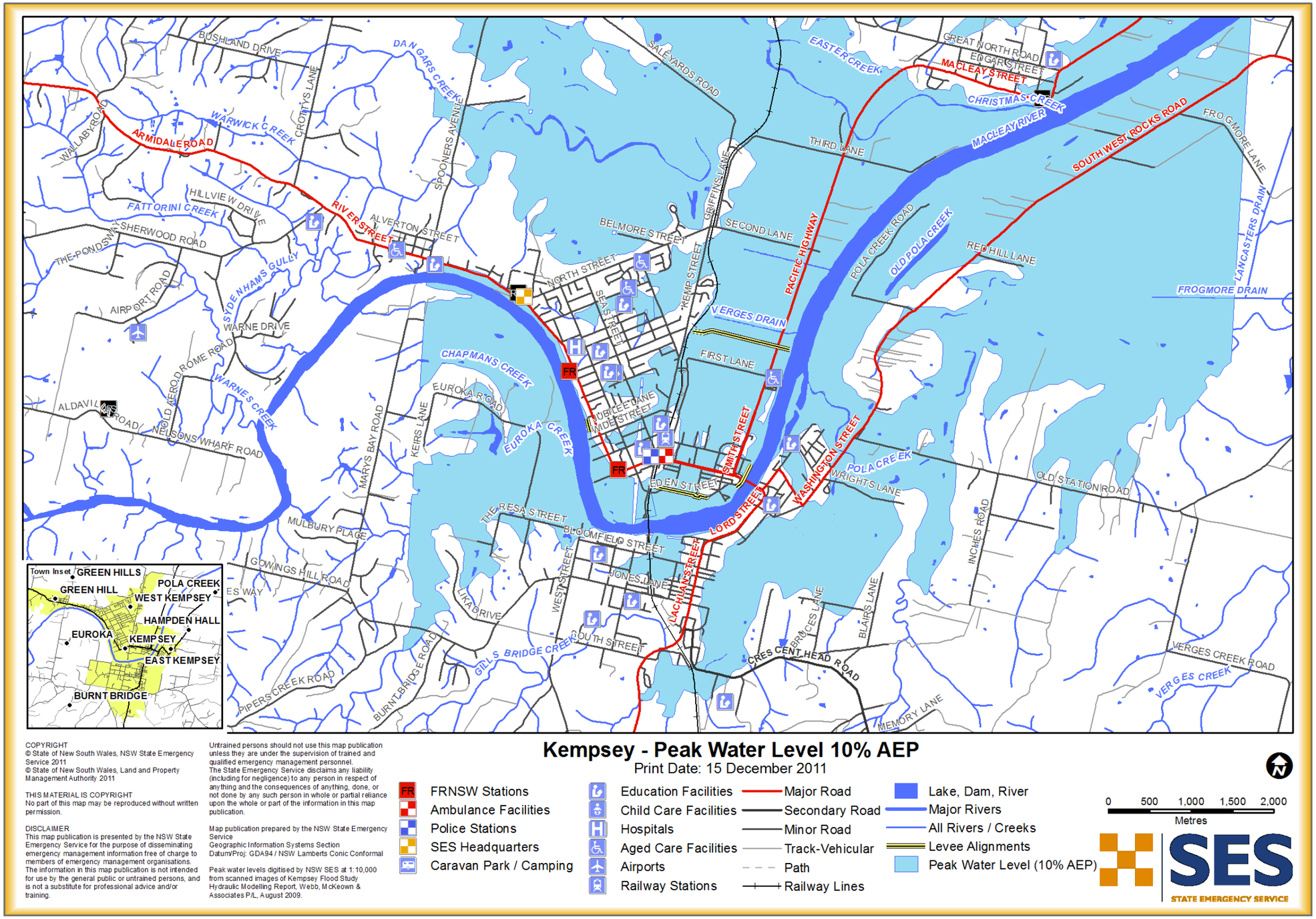
0 0.2 0.4 0.6 0.8 1
Kilometres
Print Date: 09 December 2011

SES STATE EMERGENCY SERVICE

MAP 11 - 1% FLOOD EXTENT MAP – KEMPSEY



MAP 12 - 10% FLOOD EXTENT MAP – KEMPSEY



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

Peak water levels digitised by NSW SES at 1:10,000 from scanned images of Kempsey Flood Study Hydraulic Modelling Report, Webb, McKeown & Associates P/L, August 2009.

Kempsey - Peak Water Level 10% AEP

Print Date: 15 December 2011

- FRNSW 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
- Levee Alignments
- Peak Water Level (10% AEP)

0 500 1,000 1,500 2,000 Metres

SES STATE EMERGENCY SERVICE

ANNEX Q - LIST OF REFERENCES

1. Macleay river Study 1980
2. Hat Head Hydraulic review may 1996
3. Investigation hat Head Levee report 1995
4. Lowe Macleay Flood Support Report Kempsey to Frederickton July 2004
5. Macleay River at Kempsey geomorphologic Assessment march 2008
6. Upper Belmore Floodplain Strategy 2000
7. Kempsey Hydraulic modelling Report August 2005
8. Source – [The Major Floods of the Macleay River, (Dutton, 2001)]
9. (Business in the Macleay, Commercial Flood Damage Kempsey 2001, Gissing, 2001)
10. (report Macleay Valley Flood Recovery 2009)
11. (Kempsey – 40 Years of Flood Forecasting, (McKay, 2001)
12. Webb, McKeown & Associates Pty Ltd
    a) Kempsey Levee gradient Assessment 26 March 2008
13. Webb, McKeown & Associates Pty Ltd 20046:R040720_
    a) KempseytoFredo.doc July 2004
14. Webb, McKeown & Associates Pty Ltd
    a) Kempsey Flood Study Hydraulic Modelling August 2009