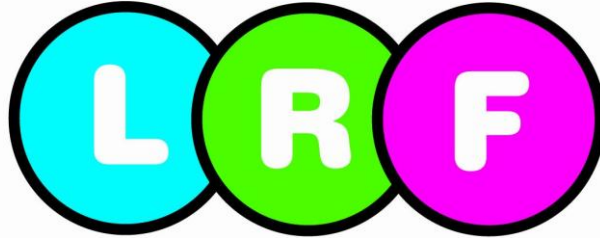


Devon • Cornwall • Isles of Scilly



Local Resilience Forum

MULTI AGENCY FLOOD PLAN



LRF Multi Agency Flood Plan

All items in this document are classed as open under the Freedom of Information Act unless otherwise stated. All closed items include the relevant Freedom of Information Act exemption.

Title of document:	Multi Agency Flood Plan
Author:	Simon Wilkins
Lead Agency:	DCIOS LRF Flooding Sub Group
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This Plan is owned by the Devon, Cornwall and Isles of Scilly Local Resilience Forum (DCIoS LRF) and is maintained, and updated by the LRF Severe Weather Subgroup. All users are asked to advise the Secretariat of any changes in circumstances that may materially affect the plan in any way.

Details of changes should be sent to:

Devon, Cornwall and Isles of Scilly Local Resilience Forum Secretariat

Email lrf@devonandcornwall.pnn.police.uk

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1. INTRODUCTION

1.1 *Background*

This plan supersedes all previous Local resilience Forum Flood Plans and provides a strategic overview of actions, roles and responsibilities specific to flooding and tactical information based on Local Authority boundaries. The risk of flooding has been assessed as very high in the Devon, Cornwall and Isles of Scilly Local Resilience Forum (DCIOS LRF) area. More information about the risk is contained in section 3 of this plan.

1.2 *Aim*

The purpose of this plan is to set out the principles that govern the multi agency response to a significant flooding incident in the 'DCIOSLRF area.

1.3 *Plan Objectives*

- To provide an agreed common framework, protocol and process for all agencies responding to a major flooding incident within the DCIOSLRF area
- To set out the response issues that should be considered at both Strategic and tactical levels in responding to a major flood incident
- To provide a clear and concise procedure for the assessment of weather warnings that may lead to flooding, together with a corresponding escalation procedure and plan activation process
- To provide flood specific roles, responsibilities and actions for all agencies involved in the response to a flood incident
- To identify the flood risks within the DCIOS LRF area and provide mitigation through this plan
- To specify the scope of the plan in order to cover all forms of flood risk
- To reflect the risk of each type of flooding incident occurring within the DCIOS LRF area
- To identify communities within the DCIOS LRF area at risk of flooding and to pre-plan the local response to a flooding event

1.4 *Scope*

This document is intended for organisations within the DCIOSLRF that would participate in and support, the response and recovery of communities affected by a flood incident.

It does not replace or supersede the LRF Combined Agencies Emergency Response Protocol (CAERP). This plan should be read and activated in the context of CAERP by which all emergencies (as defined by the Civil Contingencies Act 2004) are managed in the LRF area. CAERP outlines the roles and responsibilities of the organisations, which may be involved in an emergency within the LRF. Roles and responsibilities of organisations involved in the response to a flood incident are contained within this document at **Annex A**

The core components of the plan are

- The multi agency flood plan for DCIOS LRF
- Annexes for Cornwall, Devon (including Plymouth and Torbay) and the Isles of Scilly
- Appended to the annexes will be plans for identified High Risk Communities as outlined in **Annex K**

1.5 Organisational Responsibilities

All organisations involved in responding to a flood incident are to make their own arrangements both internally and with outside organisations to ensure that they are able to respond.

1.6 Critical Success Factors

The effectiveness of this plan is dependent on the following critical success factors:

- An effective public information and warning system
- An assembly either physical or via conference call of multi-agency incident commanders and liaison officers during the flood warning phase
- A dynamic risk assessment of the developing situation to determine the need, timing and priorities for implementing evacuation or shelter measures
- The timely mobilisation of staff
- The timely provision of transportation for evacuees especially the vulnerable
- An effective traffic management plan to divert non-essential traffic away from flood risk areas.
- Effective and timely recovery plan for each affected community

These should be considered in line with the response objectives.

1.7 Audience

The intended audience is all organisations that may respond to flooding within the LRF area. The document has specific relevance to organisations participating at Gold and Silver Command.

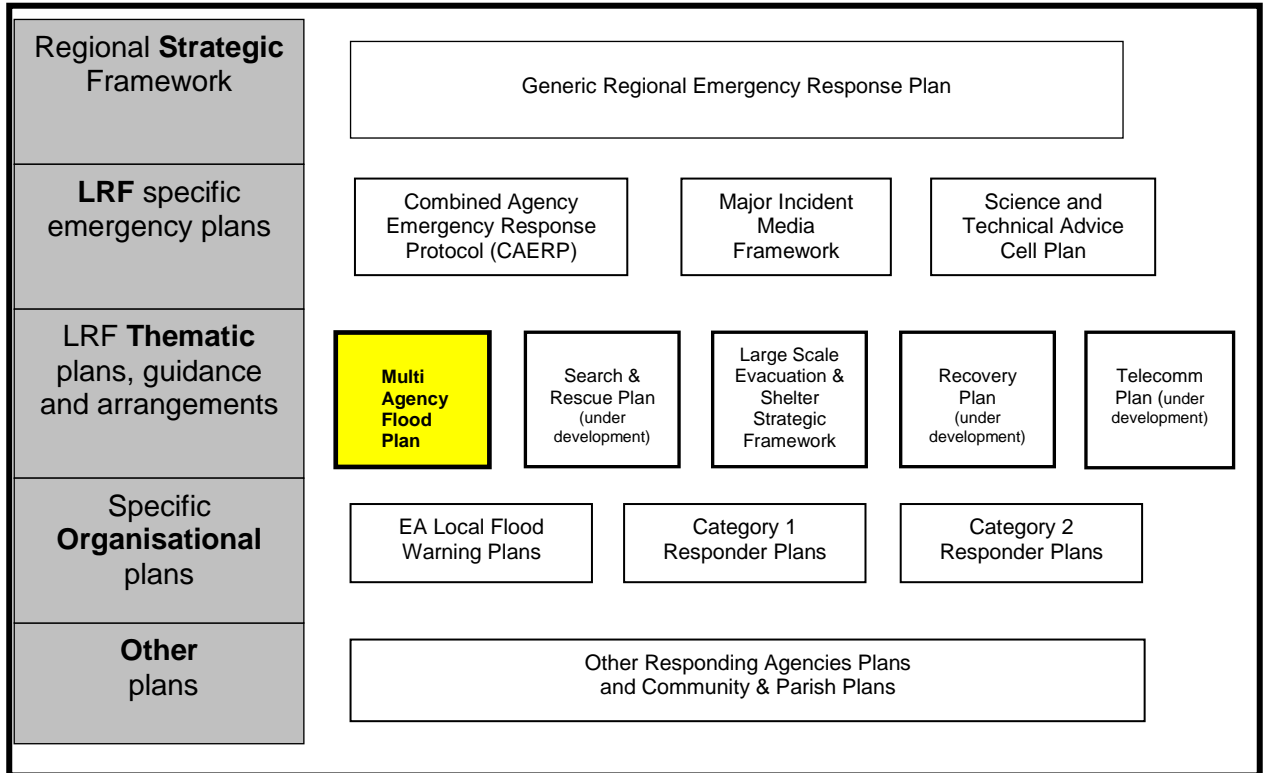
1.8 Review and Update

As a minimum this plan should be updated and reviewed a least every three years. Relevant updates should be inserted when they become available.

2. RELATED AND INTERDEPENDENT PLANS & PLANNING ASSUMPTIONS

2.1 Plans Overview

The relationship between this and other related LRF plans



This is the Devon, Cornwall and Isles of Scilly Multi Agency Flood Plan

Associated with this are annexes for Devon (including Torbay Council and Plymouth City Council areas), Cornwall and the Isles Of Scilly (under development) see **Figure 2a**.

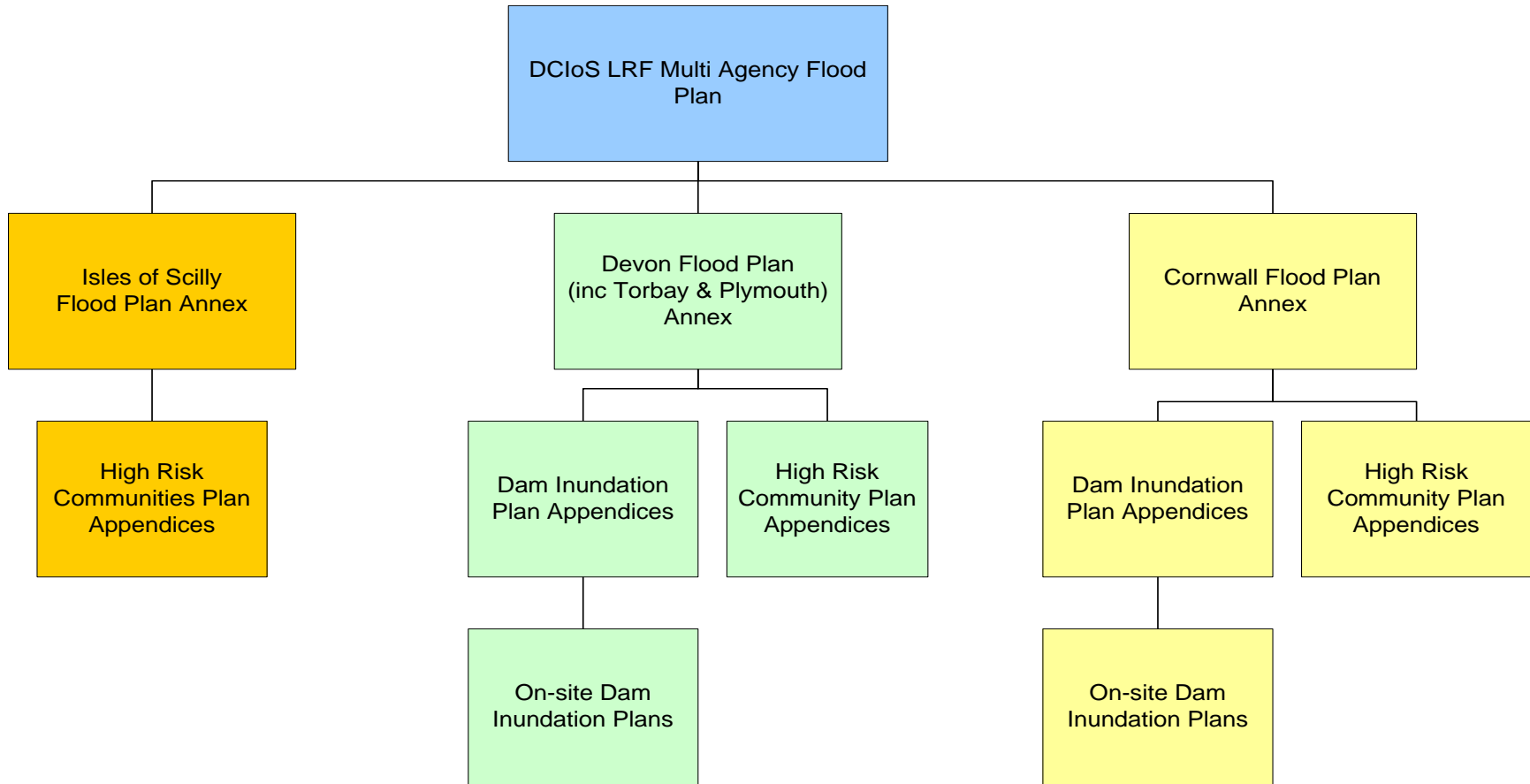
Appended to the annexes are High Risk Community Plans (under development). These are defined as where the community is at risk from:

- A. Major Tidal/coastal flooding affecting more than 100 properties for 1 to 7 days
- B. Major fluvial flooding affecting more than 100 properties for 1 to 7 days
- C. Communities may also be considered for a High Risk Community Plan, if there are other risk factors such as, high numbers of properties at risk of surface water flooding, flash flooding, or there are other factors which means flooding is likely to have a significant impact

The list of these locations are contained in **Annex K**. The recommended list of plans will develop over time as more information on risks to particular communities becomes available, particularly in reference to rapid response (flash flooding) and surface water flooding.

Figure 2a

LRF Flood Plan Structure



2.2 Response Considerations

The following bullet points are possible characteristics of flood incidents:

2.2.1 Generic flooding

- People stranded over a large area and in need of rescue. This may only be possible using boats, helicopters or high-clearance vehicles. Rescue efforts may be hampered by severe weather
- People requiring evacuation and/or shelter
- Fatalities and casualties are likely to occur and locating missing persons (reuniting people) would be necessary
- Widespread structural damage, debris (including sediments) is likely to block roads and bridges, leading to significant transport disruption and the closure of primary transport routes within the affected areas
- Contamination of water supplies and loss of other essential services (water; electricity; telecommunications) for a period
- Drainage systems would 'back-up', forcing water to spill out of foul sewers and inside homes and buildings leading to health hazards
- Flooding of homes and businesses would create a requirement for temporary accommodation for up to 18 months
- Cordoned off areas would need to be maintained for up to 14 days. Many will try to return to hazardous areas to collect belongings
- There will be a significant movement of people. Many will self disperse but there will be those who require assistance both to move and to find accommodation
- Death of livestock, and consequently dead animals requiring disposal
- In addition to the immediate consequences of flooding, it may take between 6 and 18 months before business as usual conditions are restored due to the time required to dry-out buildings and repair the damage caused

2.2.2 Specific coastal and tidal flooding

- Inundation from breaches in defences would be mostly unpredictable, rapid and dynamic with minimal warning and less than 1 hour to evacuate. The depth and flow velocity would be unpredictable
- Inundation from overtopping of defences would be predictable at some locations but unpredictable in many others. Emergency services may have up to 8 hours to evacuate but is likely to be less depending on forecast information
- Salt damage to infrastructure and some destruction of property (including a significant number of mobile homes) leading to people needing alternative accommodation. In coastal flooding scenarios, up to 41800 residents are at direct risk from tidal flooding . However more residents may be at indirect risk due to loss of essential services such as water, sanitation and electricity
- People (including tourists) in coastal villages and towns evacuated from flooded sites will require assistance with sheltering or returning home. In Cornwall during the peak season, there are an estimated additional 290,000 visitors to the county in any given day. In addition there are 14 known licensed caravan and camp sites located within the tidal flood risk area, with the capacity of up to 437 Touring caravans, 398 static Caravans/Chalets/Park Homes and 666 tent pitches. In Devon during the peak season, there are an

estimated additional 200,000 visitors to the county on any given day. In addition there are 26 known caravan and campsites at risk of fluvial flooding

2.2.3 Specific fluvial (river) flooding

- The event may include major flooding of a large built up area
- Inundation from overtopping of defences would be predictable at some locations but unpredictable in many others. Emergency services may have up to 3 hours to evacuate in some catchments but this is likely to be considerably less in most locations
- Properties could be flooded within built up areas and across a wide rural area
- The water depth and flow velocity would be variable and fast flowing water could necessitate the closure of bridges, road and rail links
- Most people would try to evacuate themselves and some could become stranded but it is still estimated that up to 110,000 people may need to be evacuated some of whom could require assistance with sheltering for up to 12 months
- In Cornwall during the peak season there are an estimated 290,000 visitors to the county in any given day. In addition there are 39 known licensed caravan and camp sites located within the fluvial flood risk area, with a capacity of up to 128 Touring Caravans, 1882 Static Caravans/Chalets/Park Homes and 1965 tent pitches. In Devon during the peak season there are an estimated additional 200,000 visitors in the county in any given day. In addition there are 74 known caravan and campsites at risk of fluvial flooding
- Due to the number of catchments susceptible to flash flooding and without an Environment Agency Flood Warning Service many properties could be flooded in isolated communities due to very heavy local rain, typically thunder storm conditions. Deep water and high velocities could be experienced with very little warning posing a significant risk to life

2.2.4 Specific pluvial (surface water) flooding

- Flooding occurs very rapidly and often without warning. Flood waters may be deep and fast flowing depending on the local topography but are likely to subside quickly, usually within minutes rather than hours
- This type of flooding is most common in built up areas where large areas of concrete are unable to absorb excess water, however can also be a problem in rural areas, particularly when catchments are saturated causing water to run-off fields onto roads and into property or where there are rapid response catchments with settlements situated downstream from steep valleys where heavy localised rainfall occurs
- Forecasting of this type of flooding is difficult
- Indicative maps of the area at risk of this type of flooding are now available for emergency planning

2.3 Warning time

In areas where the Environment Agency Flood Warning Service is offered for communities affected by fluvial flooding warnings are issued with between 0.5 and 2 hours notice of flooding occurring. In areas where the Environment Agency can

provide a Flood Warning Service for communities affected by tidal flooding warnings are issued with between 4 and 8 hours warning.

For many communities no warning service is available and awareness raising by issuing of press releases and weather forecast information can provide up to 24 hours warning.

For communities affected by flash flooding no warning is available particularly for summer thunder storm conditions which are very difficult to forecast.

3. THE RISK OF FLOODING

3.1 Background

This plan is a major element of the response to potential flooding in Devon, Cornwall and Isles of Scilly.

In this document risk is a function of both the chance or likelihood of a hazard becoming a reality and the consequences or impact of that occurrence. The consequence will depend upon the exposure of people and property to the hazard and their respective vulnerability to harm.

Because of climate change, both the chance and consequences of flooding are increasing. Sea level rise, more frequent and higher storm surges, increased winter rainfall, and more intense summer rainfall will add to existing risk and it may not prove possible to improve fixed defences sufficiently to maintain or raise protection standards.

Floods are mostly natural events that result either from excessive rainfall that leads to pluvial flooding, rivers overflowing their banks, or from tidal storm surges on the coast or in estuaries. They cause death and damage only because human activity takes place in areas such as river valleys or estuaries where floodwater spreads. In built up areas, man made drainage systems may have inadequate capacity or become blocked leading to flooding also.

To limit both risk of flooding, the historic response has been to construct fixed, raised defences in the form of walls or embankments or other structural measures such as bypass channels or pumped drainage systems. These do not eliminate the chance of flooding entirely. They may though, lead to a false sense of security or complacency in those living or working in the defended areas, who would be unprepared for a flood should one occur.

3.2 Sources of Flooding

The Devon, Cornwall and Isles of Scilly Local Resilience Forum (LRF) area is potentially at risk to flooding from a number of sources:

3.2.1 River (Fluvial) Flooding – is usually caused by prolonged periods of heavy rainfall or intense rain over an area. The area affected by fluvial flooding has been mapped by the Environment Agency.

Within the DCIOS LRF area, there are around 37000 properties at risk from a 1 in 100 year event (Flood Zone 3) and 50000 properties at risk from a 1 in 1000 year event (Flood Zone 2). There are no properties believed to be at risk from fluvial flooding for the Isles of Scilly.

3.2.2 Tidal and Coastal Flooding – The combination of high astronomic tides and adverse weather conditions can cause storm surge and wave overtopping of defences. In severe events this may result in the breach of sea defences and inundation of the surrounding area.

Risk to life can be high with the potential for people being caught in fast flowing waters and currents adding to the usual risks associated with flooding. In vulnerable areas there is potential for significant damage to property from high-energy waves.

There are 15000 properties at risk from a 1:200 year event and 19000 properties at risk from a 1:1000 year event within Devon and Cornwall. The number of properties at tidal risk on the Isles of Scilly is unknown.

3.2.3 Reservoirs Breach/Dam Inundation – This refers to a failure of a reservoir dam. There are a number of these within the Devon and Cornwall area. Flooding from these could occur with little or no warning.

In Devon and Cornwall there are currently 33 identified reservoirs (over 25,000m³). There are no reservoirs (over 25,000m³) identified for the Isles of Scilly.

Inundation maps are available from the Environment Agency and are held by the reservoir owners. These maps are only available to those who have the appropriate security clearance and authorisation to view them.

At the time of writing this plan (March 2010) the Environment Agency is in the process of identifying the top 100 highest risk reservoirs in England and Wales, which will require specific on and off site emergency plans to be written. We have not been informed whether or not any of these high risk sites are in the DCIOS LRF area.

3.2.4 Groundwater Flooding – Groundwater flooding is the result of a rise in the water table to above the rock or soil that makes up the land surface. The problem is most common in areas with chalk strata but can occur in any area with underlying permeable deposits, including sands and gravels.

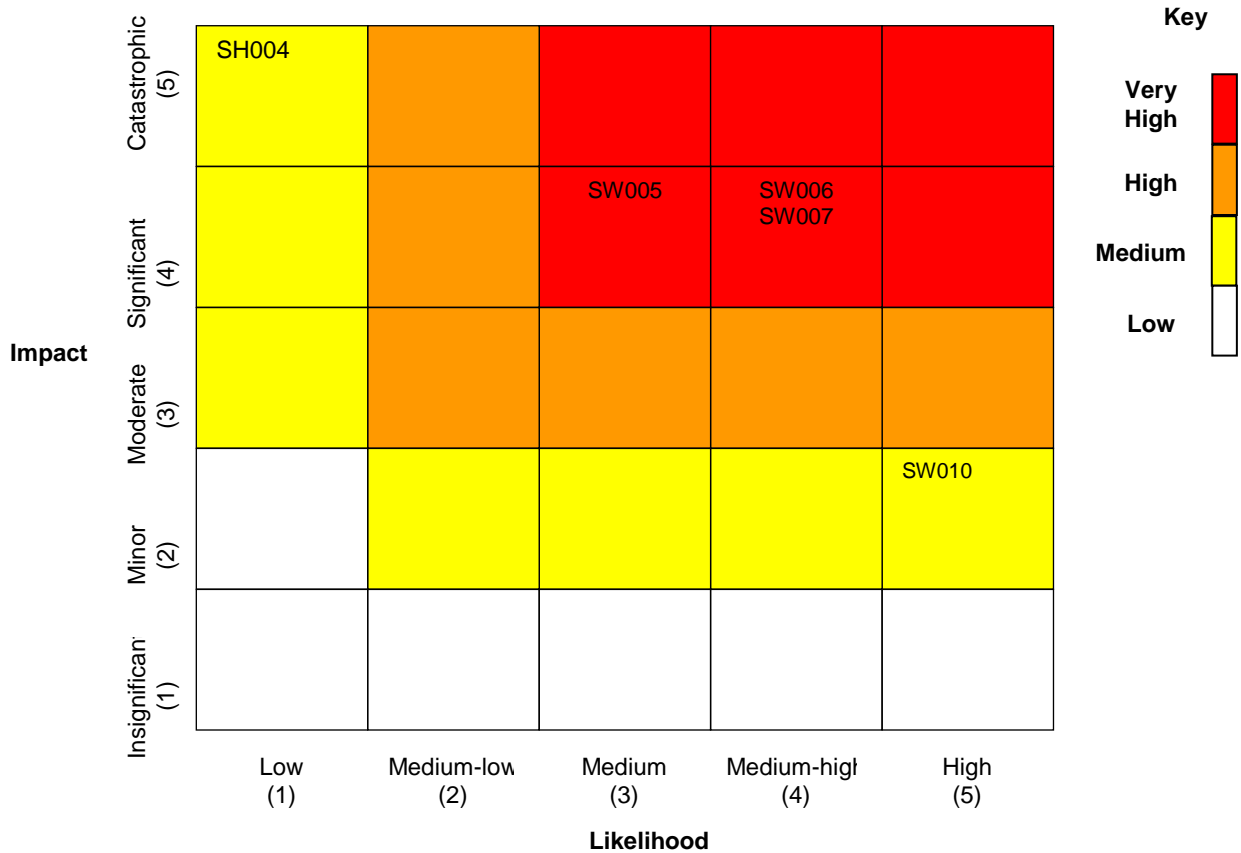
The DCIOSLRF area is not at significant risk from this type of flooding.

3.2.5 Surface Water (Pluvial) Flooding – This usually happens where drainage systems are unable to cope with heavy spells of rainfall. It will be most problematic when catchments are already saturated or frozen and in built up areas with impermeable surfaces. It will usually occur rapidly, but may be relatively short lived in areas where the water can quickly drain away.

Indicative surface water maps are available from the Environment Agency for emergency planning.

* All at risk property number data is approximate. Additionally in large areas of Devon, Cornwall and Isles of Scilly properties are at risk from both fluvial and tidal events, either if they occur independently or simultaneously. These properties are counted in both the fluvial and tidal figures.

3.3 Flooding Risk Rating Matrix



3.4 Table of Risk Reference Numbers

Ref No:	Hazard or Threat Category
SW005	Major coastal & tidal flooding
SW006	Major fluvial flooding
SW007	Localised fluvial Flooding (flash flooding)
SW010	Localised flooding from other sources
SH004	Major Reservoir dam failure caused by internal erosion or overtopping

3.5 Forecasting Flooding

Flood forecasting is undertaken by the Environment Agency in their Regional Flood Warning Office in Exeter in conjunction with the Devon Area Office in Exminster and the Cornwall Area Office in Bodmin. Note: No flood forecasting service is currently provided for the Isles of Scilly.

The elements which the Agency monitors are:

For fluvial events:

- River levels monitored remotely by telemetry from Flood Warning Stations. Note: Many smaller watercourses do not have telemetry and no specific warning is provided for these.
- Actual rainfall - monitored remotely from rain gauges throughout the catchments.
- Predicted rainfall - by monitoring weather radar and studying Met Office forecasts.
- The Catchment Wetness Index (CWI) i.e. the degree of saturation of a catchment, which indicates how it will respond to rainfall.

For tidal events:

- Predicted tide heights from Proudman Oceanographic Laboratory charts.
- Predicted residual surges provided daily by the Met Office.
- Predicted wave heights provided daily by the Met Office.
- Actual tidal levels monitored remotely by telemetry from Tide Gauges.

3.6 Defence operations by the Environment Agency (EA)

The Environment Agency maintains and operates a range of flood defence assets, such as flood barriers, gates, pumping stations, sluices and trash screens that contribute to reducing flood risk. For further information on the location of these defences refer to the Environment Agency. Note: the Environment Agency does not own or operate any flood defence assets on the Isles of Scilly.

In the event of a flood, the Environment Agency will deploy resources to ensure the continued and safe operation of these assets and as far as possible will ensure they perform the role for which they were designed. Should the performance of any of these assets falter, the Environment Agency will act appropriately to either maintain protection standards or warn the appropriate agencies and public at risk of the likely consequences.

The Environment Agency will also inspect raised defences to check on their continued integrity. They will take action to strengthen any that give cause for concern and will alert the relevant agencies and the public if this does not succeed.

The responsibility for the condition and operation of private flood defences rests with the owner. In the event of their failure and inaction of the owner, the Environment Agency may use its powers to repair the defence and seek redress through appropriate channels.

The Environment Agency has agreements with several organisations who operate EA defences on their behalf, typically this is the operation of Flood gates by Parish/Town Council groups in response to flood warnings.

3.7 Temporary measures by the Environment Agency

The Environment Agency maintains a limited stock of sandbags and sand for its own operational use. The Environment Agency policy does not provide for the provision of sandbags to others. However, in the context of support for the civil authorities, the

Environment Agency will make resources available as Environment Agency priorities and circumstances allow, and this may include sandbags.

At the present time, the Environment Agency does not maintain a reserve stock in this region of proprietary demountable defences or similar temporary equipment.

3.8 Flood warning by the Environment Agency

The Environment Agency operates a flood forecasting and warning service which relies on direct measurements of rainfall and river levels, tide levels, in-house predictive models, rainfall radar data and information from the Met Office. This service operates on a 24 hour, 365 day basis and the warning arrangements are described in brief under Section 5 earlier in this document and in the Local Flood Warning Plan. Some businesses and property owners and occupiers are registered with Floodline Warnings Direct and receive direct warnings through this system.





3.8.1 Flood Warnings

The Environment Agency operates a flood warning service in areas at risk of flooding from rivers or the sea (excluding the Isles of Scilly).

If flooding is forecast, warnings are issued using a set of four easily recognisable codes. Comprehensive details are contained in the Devon, Cornwall and Isles of Scilly Local Flood Warning Plan. A description of the codes is shown below.

Note: The Environment Agency flood warning codes are due for replacement during summer 2010. The Environment Agency currently provides an informal tidal flood warning service for the Isles of Scilly.

3.8.2 Warning Codes

<p><u>Flood Watch</u></p> 	<ul style="list-style-type: none"> • Issued when flooding of low lying land and roads is expected. The alert is issued in order that the public at risk and the emergency services and civil authority are aware of increasing chance of flooding and take appropriate preparatory action. Flash flood risk from summer thunderstorms is such that Flood Watches may be issued for catchments before rainfall has commenced.
<p><u>Flood Warning</u></p> 	<ul style="list-style-type: none"> • Issued when flooding of homes and businesses is expected. Property owners, the public at risk, the emergency services and the civil authority should act to protect life and property. • In most instances, a Flood Warning will not escalate to a Severe Flood Warning, but Category 1 responders should be alert to that possibility and liaise with the Environment Agency in that respect.
<p><u>Severe Flood Warning</u></p> 	<ul style="list-style-type: none"> • Issued when severe flooding is expected and there is extreme danger to life and property. This could relate either to extreme water depths or velocities, or when 100 or more properties are expected to be flooded in a particular flood warning area. In such circumstances, it is likely that there would be considerable disruption to traffic movement due to extensive road flooding. • Property owners, the public at risk, the emergency services and the civil authority should act to protect life and property. This is likely to involve an enhanced response and the commitment of significant resource. • In the event of a breach in defences or an intense summer thunderstorm, a Severe Flood Warning may be issued without prior issue of either a Flood Watch or a Flood Warning. • The issue of a Severe Flood Warning will trigger Major Incident arrangements (see below) as provided for in the Devon, Cornwall and Isles of Scilly “Strategic Response Plan” and the emergency response plans of other Category 1 responders.
<p><u>All Clear</u></p> 	<ul style="list-style-type: none"> • Issued when there are no Flood Watches or Flood Warnings in force.

Other information with regard to flood warning can be found in **Annex C**

4. COMMUNICATION PLAN

4.1 Multi Agency Communication Arrangements

The LRF Telecommunications Plan (under development), will detail multi agency arrangements, but in essence the primary means of communicating between the Devon, Cornwall and Isles of Scilly Local Resilience Forum (DCIOS LRF) members is by fixed telephone, mobile phones or e-mail. Emergency Service Staff in the field will use mobile and Airwave.

4.2 Media

The media interest in any significant flood event, based upon historical experience, is likely to be very high. The Strategic Co-ordination Group's media response will be in line with the agreed LRF Major Incident Media Framework.

Upon declaration of a Major Incident the Strategic Co-ordination Group may if appropriate, initiate and maintain a link with the Government News Network to ensure that a common communications message is produced.

4.3 Warning the Public

The Environment Agency has a responsibility to issue flood warnings to the public (see section 3.8.2).

The issuing of guidance and information to the public following a flood incident will be co-ordinated by the police, with advice from the organisations represented at the Strategic Co-ordination Group.

The LRF Warning and Informing Strategy (under development) deals with raising public awareness to flooding, including details of what the public should do to help themselves prior to, during and post a flooding incident.

Vulnerable people may require different and specialist communication methods.

Gold/Silver should consider the most appropriate agency(s) to set up a help line to respond to queries from members of the public.

5. PLAN ACTIVATION – THRESHOLDS AND TRIGGERS

5.1 Protocol for convening a Strategic Co-ordinating Group (SCG) meeting prior to a flood incident. (see figure 5a)

- 5.1.1 EA/MET Office National Flood Forecasting Centre or the MET Office Public Weather Advisor issues a warning that there is a risk and probability of flooding or local circumstances dictate that there is an increased risk of flooding above that which might normally be expected.
- 5.1.2 EA and relevant Local Authority(s) discuss current information and consider there is a risk of flooding in their area and the relevant LA/EA need to share this information with multi-agency partners at LRF Level. This decision will take into account the risk and probability of flooding.
- 5.1.3 LA/EA requests Police via the Force Incident Manager (Control Room) to co-ordinate a SCG meeting to ensure the information is shared with all relevant LRF partners. In most instances this initial meeting is likely to be a teleconference. This will be co-ordinated by the duty Gold Chief of Staff or nominated deputy.
- 5.1.4 Meeting to be chaired by senior Police Officer. **NB: This meeting should be attended by senior emergency planning practitioners and other appropriate officers as this will still be the planning phase.**
- 5.1.5 Consideration must be given to the timescale for subsequent individual agency conference calls and concurrent activity, which may need to be held by partners to cascade this information.
- 5.1.6 Multi agency conference calls to disseminate this information will not be resourced by some agencies once a SCG has been held to discuss the possibility of flooding.

5.2 No Notice flood event

- 5.2.1 In the event of a no notice flood event the command and control as outlined in Figures 6b or 6c should be implemented and all relevant agencies notified by the police.
- 5.2.2 Partners should contact the Police Control Room and request Silver/Gold as appropriate is established immediately (unless notification has already been received).

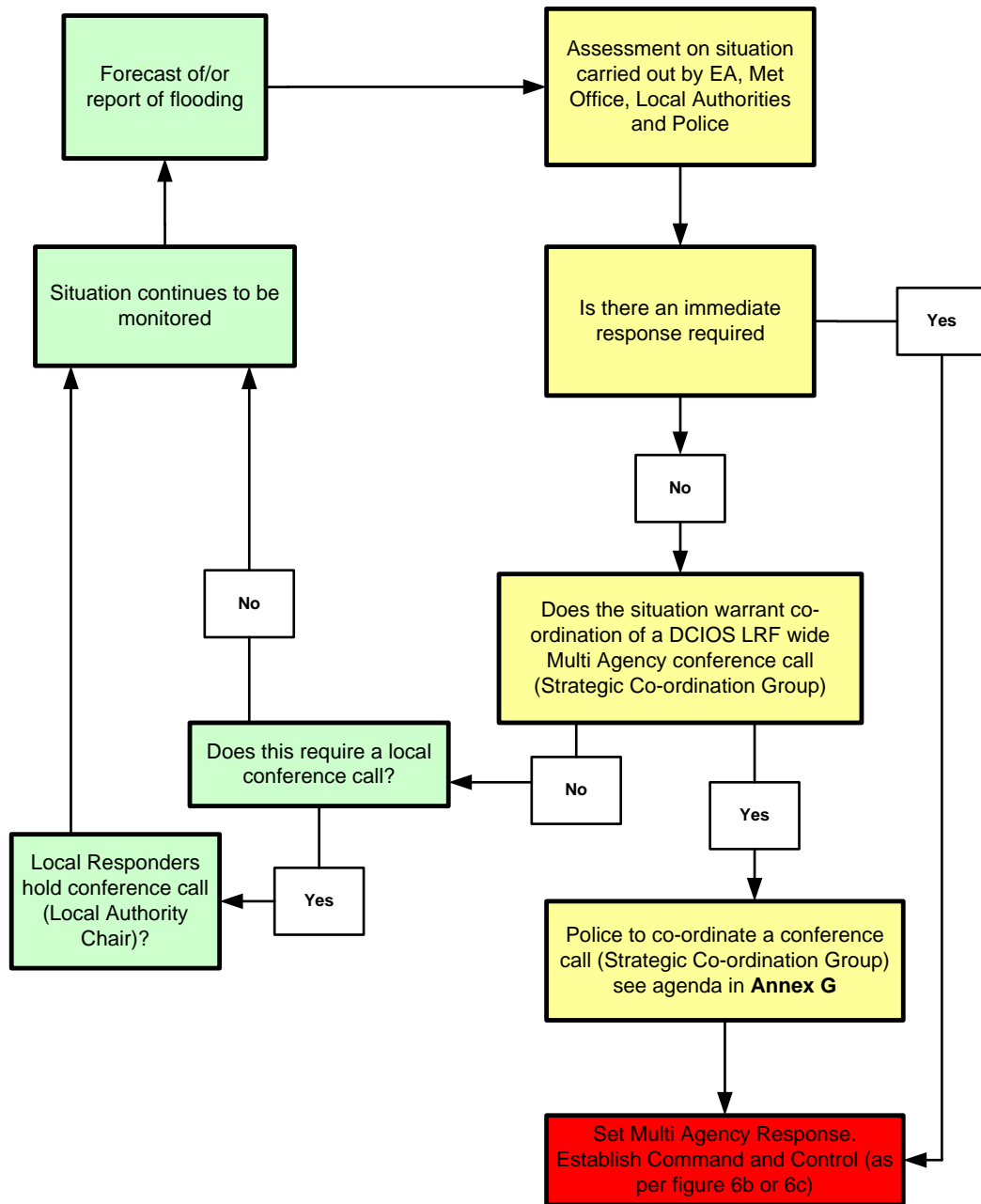
5.3 Roles and Responsibilities

- 5.3.1 Specific roles and responsibilities of LRF partners can be found in **Annex A** . These are in line with those outlined in the Devon, Cornwall and Isles of Scilly Combined Agency Emergency Response Protocol (CAERP) section 3.

5.4 Reservoir Inundation

5.4.1 On receipt of information that a Dam Inundation incident is likely to happen or has happened Gold and Silver should be informed and convened.

Figure 5a – Assessment Process



NB: For extreme events Command & Control will be established from the onset

Figure 5b - Response level definitions

An alert level describes the expected scale of response to a flood incident. These are defined as:

Response Level	Actual or forecast Impact	Response
0. (Low flood risk)	<ul style="list-style-type: none"> No flooding 	<ul style="list-style-type: none"> No specific response, normal awareness of possible flood risk.
1. (Moderate flood risk)	<ul style="list-style-type: none"> Fast flowing rivers Bank-full rivers Flooding of fields and recreation land Minor road flooding Car park flooding Farmland flooding Surface water flooding (linked to river flooding). Spray/wave overtopping on coasts. Overland flow from rivers and streams Localised flooding due to heavy storms 	<ul style="list-style-type: none"> Consider the need for Strategic Co-ordination Group. Individual responders flood plans and procedures may be activated Some routine or preparatory responses may be underway, e.g. diversion of minor roads, duty officers put on standby, resources mobilised Heightened awareness if flood risk EA Issue Flood Watch
2. (Substantial flood risk)	<ul style="list-style-type: none"> Flooding of homes Flooding of businesses Flooding of cellars and basements Rail lines vulnerable in tunnels and cuttings Flooding of major road infrastructure Flooding of rail infrastructures Significant wave/spray overtopping on coasts Significant flood plain inundation (high risk to caravan parks or campsites) Flooding of major tourist/recreational attractions 	<p>As for level 1, plus:</p> <ul style="list-style-type: none"> Consider the need for Strategic Co-ordination Group Multi-agency flood plan activated if required. Responders undertake actions continued in MAFP if activated. EA Issue Flood Watch & Flood Warning
3. (Severe flood risk)	<ul style="list-style-type: none"> Large numbers (at least 100) of homes/businesses expected to flood Large numbers of people are likely to be affected by flooding 	<p>As for level 2, plus:</p> <ul style="list-style-type: none"> Convene Strategic Co-ordination Group Police co-ordinate multi-agency response

Multi Agency Flood Plan

	<ul style="list-style-type: none"> • Highest risk to life • Severe adverse impact on local infrastructure anticipated: e.g. transport, hospitals & utilities • Significant impact on the capacity of professional partners, organisations and the public (e.g. vulnerable groups) to effectively respond • Flood defence failures or overtopping, which could result in extreme flooding 	<ul style="list-style-type: none"> • Multi-agency control centres open • EA issue Flood Watch, Flood Warning & Escalated Warnings.
<p>4. (Recovery)</p>	<ul style="list-style-type: none"> • Flood water receding. 	<ul style="list-style-type: none"> • Local authority to facilitate rehabilitation of the community and restoration of the community.

6. COMMAND AND CONTROL

6.1 Principles of Command and Control

The DCIOS LRF's CAERP details the command and control structure for dealing with a major incident. To summarise they are:

- Gold Command (Strategic)
- Silver Command (Tactical)
- Bronze Command (Operational)

The command and Control structure of a single location flood incident is contained in **Figure 6b**

The Command and Control structure of a multi location flood incident is contained in **Figure 6c**

6.2 Gold (Strategic) Command

The response to a flooding incident will, by necessity, involve a combined response by a range of local agencies operating from a multi-agency Strategic Command Centre (SCC).

The senior officers of the agencies represented at the Strategic Co-ordination Group (SCG), chaired by the Gold Commander, are responsible for determining the combined, strategic response to the incident, formulating policies and setting objectives, together with being responsible for the executive response by their respective agencies.

The Gold Commander will be the senior police officer. The SCG will be located at Police headquarters at Middlemoor. The SCG will comprise of senior representatives from some or all of the following agencies:

- Police
- Fire and Rescue Services
- Ambulance Service
- Local Authorities (including highways)
- Primary Care Trust
- Acute or Foundation hospital Trust
- Environment Agency
- MET Office
- Highways Agency
- Health Protection Agency
- Government Office for the South West
- Joint Regional Liaison Officer
- Royal Air Force Liaison Officer
- Maritime and Coastguard Agency
- Animal Health
- Water Companies
- 'Infrastructure' representative(s) (e.g. telecommunications/utilities)
- other organisations as required

6.3 Science and Technical Advice Cell

The role of the Science and Technical Advice Cell (STAC) is to ensure timely co-ordinated scientific and technical advice during the response to an emergency.

The establishment of a STAC is likely to be particularly important where there may be significant wider health and environmental consequences.

The STAC should bring together technical experts from those agencies involved in the response and who may provide scientific and technical advice to the Gold Commander.

The STAC would be expected to advise on issues such as the impact on health of the population, public safety, environmental protection and sampling and monitoring of any contaminants.

Please refer to the Devon, Cornwall and Isles of Scilly LRF Science and Technical Advice Cell Plan.

6.4 Strategic Co-ordination Group - Initial Meeting Agenda

Details of the agenda for the initial meeting can be found at **Appendix F**.

6.5 Silver (Tactical) Command

The role of silver is to implement the policies and strategic decisions made by Gold. Silver may also be known as the Incident Control Point.

For flooding incidents Silver Command may be established at a Police Station or other suitable premises or location. The location for Silver will be chosen with regard to the nature and extent of the flooding, possible locations to consider are detailed in paragraph **6.8**

6.6 Silver – Activation

Any organisation may request that the police set-up silver control.

The Police will notify partner agencies of the establishment of a silver control.

Agencies required to attend / be represented:

- Fire and Rescue Services
- Ambulance Services
- MCA / RNLI
- Environment Agency
- Highways Agency
- Local authority
- Electricity suppliers (National and Local)
- Gas suppliers
- Telecommunications providers
- Water and sewerage service providers
- Primary Care Trust

- Health Protection Unit

Consideration should be given to the attendance of:

- Network Rail
- Voluntary agencies
- Port Authorities
- COMAH site operators
- National Farmers Union (NFU)
- Military Liaison Officers
- Nuclear site operators

6.7 Silver Control Resources

Organisations attending Silver Control must initially be self-sufficient. They should be able to provide their own:

- Communications with own organisation
- Appropriate mapping requirements
- Administration support
- Stationery, logs etc
- Appropriate protective, bad weather clothing
- Relief staff

6.8 Protocols for Operating at Silver

The nominated Silver (tactical) manager from each agency will work within the Silver co-ordination structure at the designated Silver Control.

Only that person or their nominated deputy will attend Silver meetings.

The role of Silver is to implement the policies and strategic decisions made by the Gold Co-ordination Group.

Each Silver commander will manage their organisations response at tactical level.

Depending on the nature of the incident this may be established at a fixed SILVER location based on Police Basic Command Unit (BCU) areas.

Cornwall and Isles of Scilly BCU	Cornwall Council Emergency Centre, New County Hall, Truro, TR1 3AY
Plymouth BCU	Crownhill Police Station, Budshead Road, Plymouth, PL6 5HT
Devon BCU	Heavitree Police Station, Heavitree Road, Exeter, EX1 2LR and/or Paignton Police Station, Southfield Road, Paignton, TQ3 2SP
Isles of Scilly Flood Incident only	Town Hall, St Mary's, Isles of Scilly, TR21 0LW

A Search and Rescue Cell should be established in support of SILVER(s) to ensure the best assets are being used. This should be chaired by a Police POLSA.

6.9 Silver Command - Initial Meeting Agenda

The generic agenda for the initial Silver Command meeting can be found at **Annex I**. The agenda also includes a number of other considerations that the group may wish to consider.

6.10 Search and Rescue Cell (SAR Cell)

The purpose of a SAR Cell is to co-ordinate all search and rescue (SAR) taskings and resources involved in an incident where multiple SAR resources are involved in responding to that incident. This avoids duplication of effort and resources by various agencies who would ensure all taskings received by their own agencies are fed into the SAR Cell.

The SAR Cell will contain a representative from all the SAR agencies involved and will be co-ordinated by the police. This will be a Force POLSA who will have knowledge of the operational capabilities of all responding agencies.

The composition of the SAR Cell will be decided by the POLSA in consultation with the incident Silver and other agencies and will include a loggist to record taskings and decisions.

The SAR Cell co-ordinator will be responsible to the incident Silver and will meet regularly to discuss operational matters and deployments. This allows Silver to concentrate on the co-ordination of all other agencies and processes at the incident.

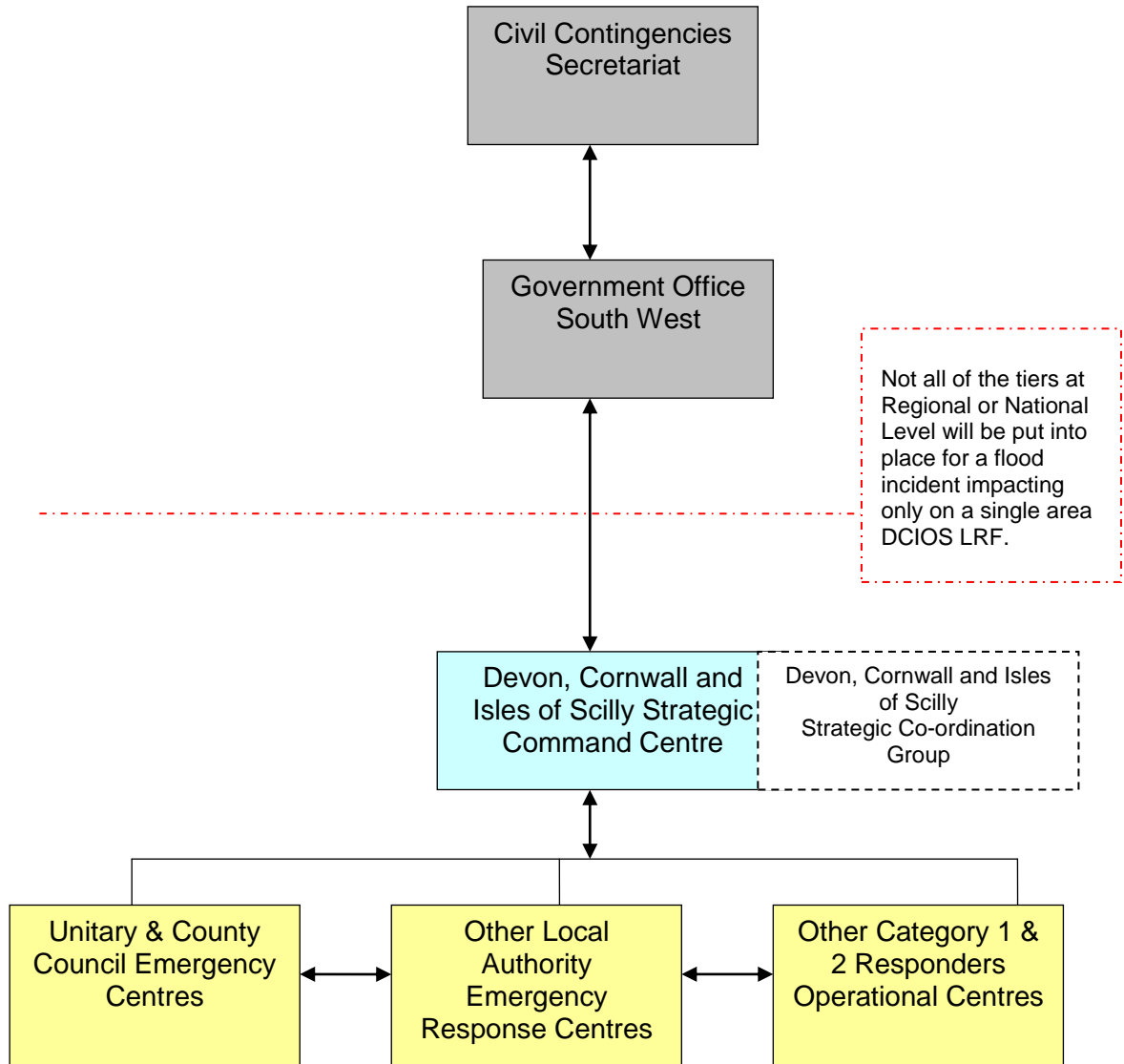
6.11 Operational ('Bronze') Command

Generally located at the incident site, the operational or 'Bronze' Commanders implement directives given by Silver Command and execute operational orders. It is highly likely that there will be several Bronze Commands and although it is likely that a multi-agency Bronze Command will be established (with command being vested in the most appropriate agency, probably the police or fire service), it is also possible that several agency specific Bronze 'Commands' will be established, in order to undertake agency specific tasks.

6.12 Command and Control Structure

At the declaration of a Major Incident, the command and control of the multi agency response will follow national guidelines. The structure for flood response is shown in **figure 6a**.

Figure 6a – Flood Response Structure



For Environment Agency Internal flood incident response structure see Annex D

Figure 6b

Single Location Flood Incident Command & Control

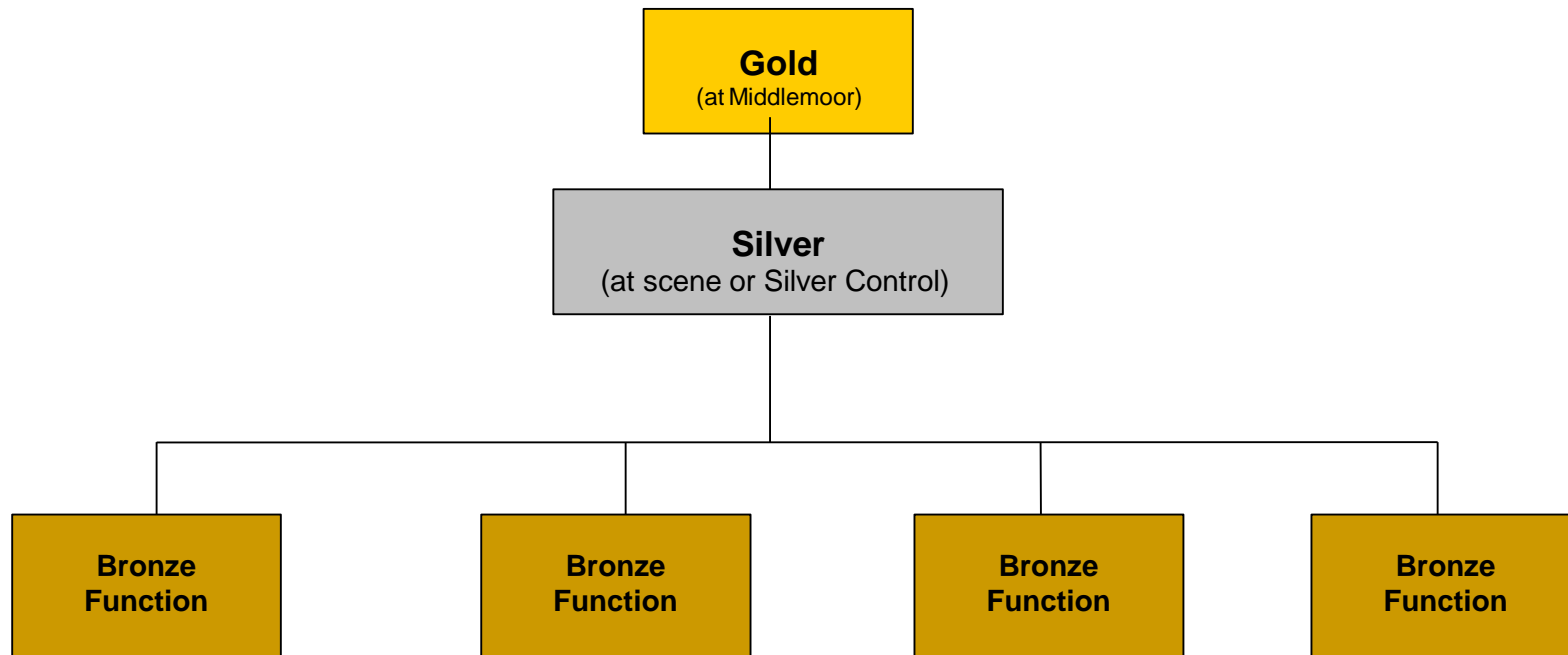
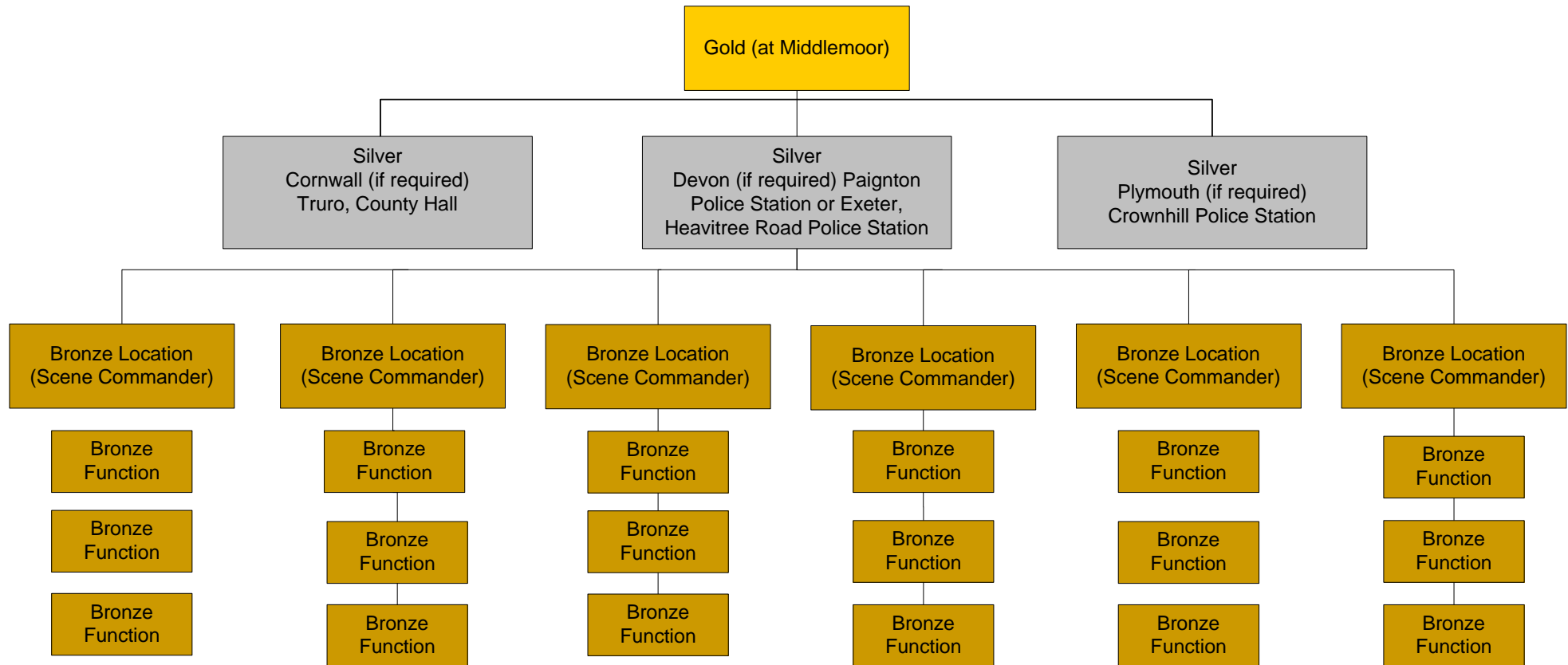


Figure 6c

Multi Location Flood Incident Command & Control



7. VULNERABLE PEOPLE AND GROUPS

7.1 Vulnerable People

Vulnerable people lists are held and maintained by individual organisations and establishments and will be made available to the SCG upon request.

7.2 Data Sharing and Handling Protocols

The LRF data sharing and handling protocol is in place to ensure effective sharing of information prior to and during the emergency response.

This protocol documents outlines the principles of identifying and building relationships with bodies responsible for vulnerable people, so that the potential scale and mechanism for a response can be agreed before an emergency occurs. The procedures are flexible and able to adjust to changing circumstance and will provide clear triggers between responders.

7.3 Vulnerable Group Locations

Detailed locations of facilities / buildings for vulnerable groups (e.g. schools, nurseries, care homes) but not individuals' homes are contained, where necessary, within the High Risk Communities Annexes. A list of the vulnerable locations for the DCIOS LRF area is held by the LRF Coordinator..

8. KEY INFRASTRUCTURE

8.1 Critical National Infrastructure

Details of critical national infrastructure sites on known flood zone areas are held securely by Devon and Cornwall Constabulary and will be made immediately available upon request by the SCG, they include some but not all;

1. Electrical Sub Stations
2. Water Treatment Works
3. Sewage Treatment Works
4. Telephone Exchanges
5. Gas / Fuel Depots
6. COMAH / REPPIR Sites

LRF Multi Agency Plans for dealing with the impacts that the loss of these sites might have on local communities are under development and will be held securely on behalf of the LRF by Devon and Cornwall Police and made immediately available upon request by the SCG.

8.2 Other Key Infrastructure & Vulnerable Sites

A high level overview of a number of other key infrastructure and vulnerable sites are located in the appendices for the High Risk Communities (see Annex K)

This will include:

1. Police Stations
2. Fire Stations
3. Hospital / Accident and Emergency Departments
4. Ambulance Stations
5. Local Authority Offices and Depots
6. Prisons
7. Airports
8. Harbours / Docks and Marinas
9. Railway Stations / Tracks
10. Motorways / Major Trunk Roads
11. Schools
12. Universities
13. Residential / Care Homes
14. Children's Homes
15. Sheltered Housing
16. Hostels
17. Caravan / Holiday Parks
18. Electrical Sub Stations
19. Water Treatment Works
20. Sewage Treatment Works
21. Telephone Exchanges
22. Gas / Fuel Depots

9. EVACUATION AND SHELTERING OF PEOPLE

9.1 Evacuation and Shelter Plan

The decision to evacuate or shelter the community should be taken at an early stage with information being supplied by all relevant agencies. The needs of vulnerable people must be considered at an early stage as this may reflect the priority of those who need to be evacuated and the time this process will take. This plan is based on the pre evacuation of communities at risk from flooding.

The LRF Large Scale Evacuation and Shelter Strategic Framework details the generic multi-agency arrangements to evacuate shelter, accommodate and care for people displaced by evacuation.

Specific information in relation to flooding is contained within the High Risk Community Flood Plans and where necessary includes;

- safe evacuation routes and rendezvous points, (preferably marked on a map)
- traffic management arrangements for known flood zone roads
- shelters/reception centres to accommodate displaced victims (plus any valuables they may bring, including essential medication and pets)
- issues regarding the evacuation and sheltering of pets, welfare of livestock and zoos.(The Animal Welfare Act 2006 places a duty of care on anyone taking responsibility for the care of animals. As such a separate pet area should be established for at least one shelter, under the control of a designated local authority animal warden. Plans should be put in place for communicating to owners that animals will not be allowed into the main shelter for health and safety reasons. More information on evacuation and pets can be found in the LRF Evacuation and Shelter Plan)

9.2 Evacuation Briefing Centres (EBC)

The EBC acts as a BRONZE CONTROL to co-ordinate the activities of the organisations involved in the evacuation for each High Risk Community. These locations will be pre identified in the High Risk Community Plans and will need to be identified at other locations where flooding has occurred or is likely to occur (locations where detailed plans do not exist).

The role of the EBC is to act as the central location for all responding agencies and Voluntary Organisations to attend, be equipped and briefed before carrying out the evacuation.

If specialist Search and Rescue resources are required to carry out the evacuation at this location and a number of other locations a Search and Rescue Cell should be set up at SILVER or GOLD to task the most appropriate resources and to prevent duplications of taskings.

9.3 Evacuation Assembly Points (EAP)

The Police, in conjunction with the Fire and Rescue Service will identify as many EAP's as necessary to achieve a controlled and co-ordinated evacuation of the area.

The relevant Local Authority will need to be informed early in this process to arrange transport for those being evacuated.

The aim of the EAP is to provide locations for evacuated persons to RV before moving to a Rest Centre or other accommodation.

The Police will advise the relevant local authority which locations will be used as early as possible.

All evacuation assembly points will be managed by the police, assisted by other relevant organisations.

These locations will be pre identified in High Risk Community Plans and will need to Identified at other locations should flooding occur or is likely to occur.

9.4 Rest Centre Plans

Detailed Rest Centre Plans are held and maintained by Local Authorities.

As soon as the decision is made to evacuate the Police should request the relevant local authority open rest centres to shelter displaced people.

Information should also be provided on the approximate number of people being evacuated and the estimated length of time shelter will be required.

The decision as to which rest centres will be used will be reached by discussion between the Police and relevant Local authority.

The Local Authority will organise the appropriate staffing of any rest centres.

9.5 Transport Arrangements

If transport, specialist or otherwise, is required by the Police for the evacuation they will ask the relevant Local Authority to arrange this, in conjunction with other organisations including private sector providers.

In most cases travel is likely to be in evacuees own vehicles or on foot excepting the need for additional support for vulnerable persons.

All agencies should be aware that roads, which may be required for transporting their own staff or evacuees, may not be passable.

9.6 Return Home of Evacuees

The decision to allow persons to return to their homes must be made by appropriate representatives of the Tactical Co-ordinating Group. However this may require a Policy decision to be made by the Strategic Co-ordinating Group.

Police will inform the Local Authority Officer responsible for Rest Centre Management as soon as it is safe for people to return home, so the manager can advise staff and evacuees and start the deregistration process.

It may not be possible for all evacuees to return to their properties due to damage and the Local Authority should seek to provide them temporary accommodation.

No announcements about returning to homes should be made to evacuees until Rest Centre Managers warn staff.

Rest Centre Managers will identify people needing assistance to return home and will make necessary arrangements.

9.7 Casualty Clearance

Should there be significant numbers of casualties resulting from a flooding incident they should be dealt with as described in CAERP Section 10.

10. RECOVERY

10.1 Recovery

At, or shortly after the declaration of a Major Incident, the LRF will convene a Recovery Co-ordination Group, led by the local authority to prepare for the management of the post response activity that is aimed at restoring and rebuilding affected communities in the aftermath of a major flood event. This process will be managed in line with the LRF Recovery Plan (under development).

10.2 Handover of Strategic Co-ordination

At the end of the immediate emergency response and relief phases of an emergency, where there is no longer threat to life and property, the responsibility for co-ordination of multi-agency response will transfer from the Police to a lead Local Authority for the remediation and reconstruction of the community.

The transition is likely to be formalised through the multi-agency Strategic Co-Ordination Group, known as 'Gold'. This may occur within hours, days, or even weeks, of the incident. At this time, the Police will hand over responsibility to the most appropriate Local Authority to continue recovery actions through the Recovery Co-ordination Group (RCG). The form in Appendix J should be used to hand over specific areas to the relevant district or unitary Local Authorities in phases.

It is important prior to this being agreed that the effects on that area are evaluated and that there is no threat from secondary issues such as loss of utilities etc.

10.3 Relief (Short Term)

The priority of the Relief Phase is to provide initial relief to those people affected by the incident, often this phase commences during the Reaction Phase of the Response process through the provision of Rest Centres.

The relief requirements may vary considerably depending on the nature of the emergency and as such it is important that a continual assessment of need is conducted.

The relief phase will also look at medium term measures that may be required by the emergency, such as the provision of temporary housing, health and wellbeing support (including psychological) and aftercare.

It should be acknowledged that one of the most critical requirements of those who have been affected by the incident will be for information, particularly regarding what has happened, what will happen shortly and the whereabouts of loved ones. It is important that responders attempt to provide as much accurate information as possible without compromising other aspects of response operations.

Key actions required by the Relief Phase include:-

- Assessment of the relief needs generated by the emergency
- Assessment of the health and wellbeing needs generated by the emergency

- The provision of Rest Centres
- Development of medium term measures where necessary
- Provision of information to those affected by the emergency
- Consultation with Community Independent Advisory Group (s)

10.4 Remediation (Medium Term)

Key actions for the RCG to consider during the Remediation Phase include:

- Detailed impact assessment of the emergency
- Engagement with affected communities/welfare needs/housing/elected members and community leaders etc.
- Media message
- Public health issues
- Monitor the impact of the flooding on the health and wellbeing of those affected by the flooding
- Site clearance/control of clean up operation/waste disposal
- Assessing the “downstream” consequences of the emergency
- Restoration of Utilities
- Assistance with VIP visits
- Insurance Issues
- Reallocation of senior staff responsibilities/maintain critical services through Business Continuity Management measures
- Implementing mutual aid arrangements
- Prioritising & managing resources
- Managing the financial implications
- Delivery of normal services
- Assistance to local business
- Establishment of Community Representation Group(s)
- Focus for decisions on Appeals
- Developing a specialist Co-ordination Group for long term regeneration work
- Determining medium and long term priorities/set strategies

Consider involving representatives of the Association of British Insurers (ABI) in the rehabilitation process at a strategic level.

10.5 Recovery Co-ordination Group Membership

- Senior representatives attend as relevant from:
- Regional Government Office
- Chair of Community Recovery Committee (if formed)
- County Council / District/Borough/ Unitary Authority
- Environment Agency
- Food Standards Agency
- Primary Care Trust (to represent all NHS organisations)
- Social Care Representative
- Health Protection Agency
- Animal Health Service
- Utility Companies

- Transport Providers
- Association of British Insurers
- Maritime and Coastguard Agency
- Police
- Fire and Rescue
- Regional Development Agency
- Ministry of Defence
- Natural England
- Site Operator (If relevant)
- Health and Safety Executive
- Chairs of Sub-Groups including the chair of the STAC
- Voluntary Organisation Representative
- Government Decontamination Service (GDS) (If contamination issues)

10.6 Regeneration Phase (Long Term)

Key actions for the Regeneration Phase include:

- Consideration of appropriate memorials
- Introducing measures to promote economic regeneration
- Engagement of the community and other affected parties
- Long-term health and wellbeing monitoring
- Consideration of the wider consequences of the emergency

Strategic Focus

Operations progress from immediate response to recovery. There are a number of issues to be considered at a Strategic level. It is important to recognise that it is unlikely that it will be possible to go back to the pre-existing condition and as such the incident should be treated, from a recovery perspective, as an opportunity to improve the area. It is desirable that representatives of the Association of British Insurers (ABI) are involved in the Recovery process

- Key issues for consideration:
- Strategies for delivery of normal services
- Reallocation of senior staff responsibilities
- Determining short, medium and long term responsibilities
- Managing the financial implications
- Implications of and solutions to any lack of resources
- Implementing mutual aid arrangements
- Comprehensive liaison
- Engagement with affected communities
- Assistance to local business
- Focus for decisions on appeals, memorials and anniversaries.

10.7 Insurance Industry

Following an emergency, the insurance industry will provide the following:

- Facts and figures about who and what is covered by household and business insurance

- Specific guidance on the issues likely to arise after a flood event
- Details of the protocol between the insurance industry, the police and other emergency responders on communication and co-operation after a major event
- Key contact details of the organisations that represent the insurance industry.

11. TRAINING AND EXERCISING

11.1 Flood Response Exercise

This plan will be exercised as part of the Devon, Cornwall and Isles of Scilly Local Resilience Forum (LRF) training and exercise strategy. Due to the risk posed by flooding there should be a minimum of one multi agency flood exercise annually unless there is an activation of the plan due to a real incident.

11.2 Training

It is the responsibility of each agency to ensure that their staff are aware of the roles and responsibilities of their organisation and the actions required.

Should there be a requirement for training in any aspects included in this document then these should be brought to the attention of the LRF Training and Exercise Sub Group.

12. REFERENCES

Civil Contingencies Act (2004)

<http://www.ukresilience.info/preparedness/ccact.aspx>

HM Publication Emergency Preparedness - Part 1 of the Civil Contingencies Act (2004)

<http://www.ukresilience.info/preparedness/ccact/eppdfs.aspx>

HM Publication Emergency Response and Recovery

<http://www.ukresilience.info/preparedness/ccact/errpdfs.aspx>

HM Publication Evacuation and Shelter Guidance (2006)

http://www.ukresilience.info/upload/assets/www.ukresilience.info/evac_shelter_guidance.pdf

Home Office Publication Exercise Planners Guide (1998)

<http://www.ukresilience.info/preparedness/exercises/plannersguide.aspx>

Freedom of information Act (2000)

<http://www.dca.gov.uk/foi/guidance/index.htm>

Data Protection Act (1998)

<http://www.informationcommissioner.gov.uk>

Identifying People who are vulnerable in a crisis – Guidance for Emergency Planners and Responders

http://www.cabinetoffice.gov.uk/media/132976/vulnerable_guidance.pdf

13. GLOSSARY OF TERMS

A glossary of terms and abbreviations used within the guidance text

Term or abbreviation	Meaning or definition
ALL CLEAR	Issued when there are no Flood Watches or Flood Warnings in force
CATCHMENT AREA	The entire geographical area drained by a river and its tributaries; an area characterized by all runoff being conveyed to the same outlet
CBRN	Chemical, Biological, Radiological and Nuclear
CCC	(Cabinet Office) Civil Contingencies Committee
CCS	(Cabinet Office) Civil Contingencies Secretariat
COBR	Cabinet Office Briefing Room
COMAH	Control of Major Accident Hazards Regulations
DECC	Department of Energy and Climate Change
DCIOS LRF	Devon, Cornwall and isles of Scilly Local Resilience Forum.
EMERGENCY POWERS	The powers taken by the Government under the Energy Act 1976
ERAS (Extreme Rainfall Alert Service)	The Met Office and Environment Agency working in partnership have developed an Extreme Rainfall Alert Service (ERAS) delivered by their joint Flood Forecasting Centre
FLOOD DAMAGE	Flood damage is usually classified as tangible or intangible. Tangible damages are the replacement costs or monetary loans resulting from the effects of floodwater and debris on crops, soil, buildings, furnishings, goods, roadways, utilities and levees; the added costs of protective efforts, evacuation and emergency care; and losses because of the interruption of commercial activities. Intangible damages are those which are difficult to measure in monetary terms, such as harm to life and health, inconvenience and discomfort

FLOODPLAIN	The lowland areas, which border a river, usually dry but subject to flooding. Also the portion of a river valley which has been inundated by a river during historic floods
FLOODPLAIN MANAGEMENT	A program that uses corrective and preventative measures to reduce flood and erosion damage and preserve natural habitat and wildlife resources in floodprone areas. Some of these measures include: adopting and administering Floodplain Regulations, resolving drainage complaint, protecting riparian habitat communities, and assuring effective maintenance and operation of flood control works
FLOOD WATCH	Issued when flooding of low-lying land and roads is expected. The alert is issued in order that the public at risk and the emergency services and civil authority are aware of increasing chance of flooding and take appropriate preparatory action.
FLOOD WARNING	Issued when flooding of homes and businesses is expected. Property owners, the public at risk, the emergency services and the civil authority should act to protect life and property.
FRS	Fire and Rescue Service
FSA	Food Standards Agency
GDS	Government Decontamination Service
GNN	Government News Network
GROUNDWATER FLOODING	Groundwater flooding is the result of a rise in the water table to above the rock or soil that makes up the land surface. The problem is most common in areas with chalk strata but can occur in any area with underlying permeable deposits, including sands and gravels.
LRF	Local Resilience Forum
MCA	Maritime Coastguard Agency
PROPERTIES	All residential dwellings and commercial premises, including occupied mobile homes and caravans sites in low-lying coastal zones (including summer tourists)

PROPERTIES AFFECTED	A residential or commercial building where flood water has affected the utilities (energy and water) that supply that property
PROPERTY FLOODED	A residential or commercial building where flood water has entered to a level that has resulted in damage or limitation of use, including basements that are habitable or of commercial use
PROPERTY IMPACTED	A residential or commercial building where flood water that has entered the boundary of land but not resulted in the property itself being flooded
RCG	Recovery Co-ordinating Group
RDPH	Regional Director of Public Health
REGIONAL RESILIENCE TEAM (RRT)	Regional Resilience Teams based in GORs which monitor their regional supply position and liaise with their Local Resilience Forums or their equivalents and BERR.
REPPIR	Radiation (Emergency Preparedness and Public Information) Regulations
RESERVOIRS BREACH	This refers to a collapse of a reservoir dam. Flooding from these would be instantaneous with significant movement of debris (including vehicles) and sediment. The impact is likely to be devastating to anything in the floods wake. It is likely that there will be little or no warning.
RIVER (FLUVIAL) FLOODING	A river bursting its banks leading to flooding is usually caused by prolonged periods of heavy rainfall. Fluvial flooding can be both deep and high velocity, depending on the nature of the river catchments.
RNLI	Royal National Lifeboat Institute
SCG	Strategic Co-ordinating Group
SEVERE FLOOD WARNING	Issued when severe flooding is expected and there is extreme danger to life and property. This could relate either to extreme water depths or velocities, or when 100 or more properties are expected to be flooded in a particular flood warning area. In such circumstances, it is likely that there would be considerable disruption to traffic movement due to extensive road flooding. Property owners, the public at risk, the

Multi Agency Flood Plan

	emergency services and the civil authority should act to protect life and property. This is likely to involve an enhanced response and the commitment of significant resource.
STAC	Scientific and Technical Advice Cell; Health, scientific and technical advice at the SCG level will be provided through the Science & Technical Advice Cell (STAC), which brings together experts from all agencies to provide advice to the Gold Commander.
STORM SURGE	A storm surge is a high flood of water caused by wind and low pressure, most commonly associated with hurricanes. It is primarily caused by the extremely high winds, which push the water rapidly, building it up into a huge wave. At the same time, the low pressure caused by a hurricane also causes the water level to rise up in the lowest-pressure spots and to sink in areas of higher pressure, exacerbating the wave buildup caused by the winds. Additionally, the shape of the ocean floor may affect how high the waves of the storm surge are when they reach land
SURFACE WATER FLOODING	This usually happens where drainage systems are unable to cope with heavy spells of rainfall. It will be most problematic when catchments are already saturated or frozen and in built up areas with impermeable surfaces. It will usually occur rapidly, but be relatively short lived.
TIDAL AND COASTAL FLOODING	The combination of high astronomic tides and adverse weather conditions can cause storm surge and wave overtopping of defences. In severe events this may result in the breach of sea defences and inundation of the surrounding area.

Annex A - Flood Specific Roles and Responsibilities

Organisation	Risk	Pre-planning	Emergency Response			Recovery
			Minor flood (medium consequence)	Major flood (high consequence)	Notes	
Environment Agency	Tidal, fluvial, surface water	Prepare and maintain Local Flood Warning Plan; Advise on development proposals; update flood risk maps; support LRF flood risk assessments; maintain watercourse capacity; maintain flood management structures; Develop and improve Flood Warning arrangements; Help inform DCIOS LRF multi-agency flood plan; Inform the public of risk and recruit to Flood Warnings Direct	Monitor catchments; Issue warnings to other responders, public and media; Operate EA defences; Liaise with other agencies and advise of likely escalation, Share understanding of catchments with other responders to help inform the response; Support LA's and Emergency Services, respond as necessary to other environmental impacts	(As for minor flood) Attend Gold and Silvers as requested so long as resources allow.		Support LA's and community as resources allow; Repair any damaged defences; Carry out reconnaissance to improve service for subsequent events

<p>Fire and Rescue Services</p> <p>(Cornwall FRS/Isles of Scilly FRS/ Devon & Somerset FRS)</p>	<p>Tidal, fluvial, surface water</p>	<p>DCIOS LRF multi-agency flood plan.</p> <p>Standard operational response to a special service.</p> <p>Responsibilities under: Fire and Rescue Services Act 2004 The Fire and Rescue Services (England) Order 2007 Civil Contingencies Act 2004 (including business continuity plans) local IRMPs</p> <p>Direct receipt of flood warnings from EA and weather advisories from the Met. Office.</p>	<p>Liaise with other agencies and prioritise response and resources.</p> <p>Give assistance with pumping with priority to flooding involving a risk of life, fire or explosion, (e.g. hospitals and homes for the elderly, public utilities and food storage, heritage sites).</p> <p>Environmental issues (e.g. chemicals).</p>	<p>As with minor flood.</p> <p>Proactive resource allocation including:</p> <p>mutual aid via Sections 13/16 of the FRS Act 2004; National Mutual Aid Protocol for Serious Incidents National Resillience and other FRS assets (e.g. boats) via FRSNCC in West Yorkshire.</p> <p>Assess resources.</p> <p>Follow DCIOS LRF procedures.</p> <p>Attend SCG and other co-ordinated response meetings.</p>	<p>No current statutory duty on FRSs for flood rescue; provision in line with local IRMPs.</p>	<p>Assist other agencies to minimise the impact on the community.</p>
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Multi Agency Flood Plan

Devon and Cornwall Police	Tidal, fluvial, surface water flooding	Prepare and maintain operational response plans and with other organisations and partners review and exercise in accordance with the Community Risk Register	Establish communication with the Environment Agency and inform the emergency services, local authority and other organisations affected. Co-ordinate the emergency response and establish a multi agency Silver. Identify locations for the multi agency Forward Control Point and Silver.	As with Minor Flooding (Medium consequence) Set up Gold and refer to the basic principals for dealing with a Major Incident in the Force Major Incident Guide		Support the Local Authority in their role of Co-ordinating the recovery and assist in making the communities feel safe and be safe.
Maritime Coastguard Agency	coastal/tidal	Responsibilities under the Civil Contingencies Act 2004. Direct receipt of flood warnings from EA and weather advisories from the Met. Office. Operational coordination staff available 24/7	Act upon local contingency plans as required in liaison with other agencies. For other areas liaise with other agencies as requested Attend SCG and other co-ordinated response meetings	As for minor flooding		<ul style="list-style-type: none"> ▪ Participate in Community Flood Surgery's as requested.

<p>South Western Ambulance Service Trust</p>	<p>Tidal, fluvial, surface water flooding</p>	<p>Met office weather warning system in place.</p> <p>Major incident plan in place.</p> <p>Business continuity plan in place.</p> <p>On call officer cadre in place.</p> <p>Pager / SMS system in place.</p> <p>Airwave radio major incident deployment in place.</p> <p>Health on call cadre rota up to date.</p> <p>HPA on call cadre rota up to date.</p> <p>Fall back control facility in place.</p> <p>Identified premises at risk of flooding and consider impact on service delivery</p> <p>EA mapping information received by emergency planning unit for distribution</p>		<p>Attend</p>		
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Multi Agency Flood Plan

<p>Local Authorities</p>	<p>Tidal, fluvial, surface water flooding</p>	<p>Up to date vulnerable persons and sites database</p> <p>Pre-determined rest, And reception centres</p> <p>Multi-agency pre-planning re; RVP's, transport routes etc.</p> <p>Pre-arranged communication strategy</p> <p>Updated information on council web site</p> <p>Pre-arranged information help line and trained staff</p> <p>Pre-arranged help line for staff – (should they come in to work or not – is it safe?)</p> <p>Review of council properties at risk</p> <p>Sand bag policy (District Councils in Devon)</p>	<p>Co-operation with emergency services and EA to co-ordinate the Response</p> <p>Liaison with utility and transport companies especially water company to ensure provision of clean drinking water to residents</p> <p>Transport of public / evacuees to rest centres</p> <p>Provision and staffing of rest / reception centres and associated services</p> <p>Provision of anti-flooding measures and workforce to construct and maintain mitigating measures</p>	<p>Co-operation with emergency services and EA to co-ordinate the response</p> <p>Warning and informing the public</p> <p>Activation of information help-line for public</p> <p>Liaison with utility and transport companies especially water company to ensure provision of clean drinking water to residents</p> <p>Provision of information centre / media centre</p> <p>Co-ordinate response from faith and voluntary groups</p> <p>Transport of public / evacuees to rest centres</p>	<p><i>As required after immediate actions;</i></p> <p>Provision of temporary sanitary facilities?</p> <p>If applicable, provision of emergency mortuary and / or activation of mass fatalities plan (see separate plan for details)</p> <p>Local authority seek mutual aid from other local authorities</p>	<p>Removal of mud / Debris</p> <p>Structural and condition surveying of council properties damaged by the flooding; remedial action to repair such properties</p> <p>Consultation with health authorities on hygiene and environmental health issues in affected areas</p> <p>Provision of temporary or longer-term accommodation for residents made homeless by the flooding</p> <p>Assisting residents in removal of damaged furniture and household goods</p>
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Multi Agency Flood Plan

<p>Local Authorities cont'd</p>				<p>Provision and staffing of rest / reception centres and associated services Providing signage for road closures</p> <p>Maintaining traffic flows (in conjunction with police) especially for emergency services and repair effort</p> <p>Provision of anti-flooding measures and workforce to construct and maintain mitigating measures</p> <p>Provision of resources</p>		<p>Assisting in rearranging education of pupils affected by school closures</p> <p>Invoking council's business recovery plan if council premises are affected</p> <p>Provision of welfare advice</p>
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Multi Agency Flood Plan

<p>Primary Care Trusts</p>	<p>Tidal, fluvial, surface water flooding</p>	<p>Contribution to MAFFP, planning for community health resources</p> <p>Met office weather warning system in place</p> <p>Major incident plan in place</p> <p>Business continuity plan in place</p> <p>On call officer cadre in place</p> <p>Fall back control facility in place</p>	<p>Engage with multi agency Silver if required</p>	<p>Coordination of primary care resources, including:</p> <p>Primary Care Teams to attend rest centres and provide primary care medical support to evacuees;</p> <p>Coordination of community hospital resources;</p> <p>Coordination of community nursing and other community health service resources;</p> <p>Links with Acute and Foundation Hospital Trusts</p> <p>Maintaining links with Social Services regarding rest centre medical requirements;</p>		<p>Participate in Community Flood Surgery's as requested.</p>
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<p>Strategic Health Authority</p>	<p>Tidal, fluvial, surface water flooding</p>			<p>Coordinate the overall NHS response and resources;</p> <p>Maintain links to Regional Office of the South West and Department of Health</p>	<p>The Strategic Health Authority may initiate command and control measures in a widespread or severe event where:</p> <p>More than one PCT is involved in responding</p> <p>One or more of involved PCTs is unable to cope</p> <p>The incident is so widespread or severe that it requires a strategic response, and/or Regional or National command and control measures have been implemented.</p>	
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<p>Health Protection Agency</p>	<p>Tidal, fluvial, surface water flooding</p>	<p>Risk assessments on vulnerable populations and critical infrastructures, focusing on risks to exposure to microbial and chemical contaminations, disruption to mains water, power and health risks.</p> <p>Ensure robustness of flood alert system, that HPA is within alerting cascade for multi-agency partners</p> <p>Make sure emergency plans are in place and known about, and they are consistent among organisations.</p>	<p>Maintain a rota for 24 hour cover set up</p> <p>Provide public health support and advice to NHS organisations, particularly primary care trusts and the RDPH, and other agencies involved in responding or managing the incident at a local level</p> <p>Provide surveillance of infectious disease</p> <p>Provide advice on chemical decontamination</p> <p>Provide impartial and authoritative advice to health professionals, other agencies and the public</p> <p>Carry out chemical contamination risk assessment</p>	<p>As for minor flooding, plus;</p> <p>Support the management of the incidents and support the co-ordination of the NHS response through attendance at control centres, including the strategic co-ordination centre</p> <p>Provide specialist input to incident management teams, including STAC if called.</p>		<p>Provide advice on clean-up of standing floodwater</p> <p>Continue to provide surveillance of infectious disease</p> <p>Continue to provide advice on chemical decontamination</p> <p>Carry out chemical contamination risk assessment</p> <p>Monitor short-term and long-term health risks associated with flooding (mental health issues from displacement)</p>
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<p>Power & Gas Distributors</p>	<p>Tidal, fluvial, surface water flooding</p>	<p>Identify critical infrastructure in predicted flood zone e.g. sub-stations, cable tunnels, joint bays, regulators – medium to low pressure.</p> <p>High pressure gas installations COMAH sites – storage (SW to delegate action).</p> <p>Vulnerable persons database – use system to pull off all addresses in a predicted area by post code.</p>	<p>Set up bronze command at site.</p> <p>Work with blue lights to isolate supplies. Make safe.</p> <p>Wait for water to recede.</p> <p>Re-establish supplies.</p>	<p>As previous with additional silver and gold level command within company. Possible reconfiguration of supplies where possible.</p> <p>Possible lock-out of regulators to maintain pressures in gas mains.</p> <p>Invoke mutual aid and resource plans.</p> <p>Prepare for recovery.</p>		
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<p>Water & Sewerage Service Providers (South West Water & Council of Isles of Scilly)</p>	<p>Tidal, fluvial, surface water flooding</p>	<p>Prepare and maintain operational response plans</p> <p>Control room response to severe weather and flood warnings in place</p> <p>Vulnerable customer database in place</p> <p>Pre arranged response teams available</p> <p>Able to identify critical infrastructure in predicted flood zones</p>	<p>Operational and tactical teams to prioritise response and resource</p>	<p>As for minor plus Strategic team available</p> <p>Attendance at gold and silver teams so long as resources allow this.</p> <p>National mutual aid scheme in place with other water companies.</p>		<p>Support local authority in recovery process</p> <p>Provide clean up services as appropriate</p>
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<p>BT</p>	<p>Tidal, fluvial, surface water flooding</p>	<p>Flood warning received Environment Agency and distributed to key players and operational in BT and/or</p> <p>People and operations at risk identified</p> <p>BT holds copies of flood plain information and this can be mapped to BT buildings.</p> <p>BT key operational buildings flood plan activated upon notification from the Environment Agency. BT critical access network assets [underground] to be affected identify and plans in place for service provision in the event of a major flood BT service controls workforce determine on customer driven</p>	<p>Possibility of water ingress to BT building</p> <p>People and operations at risk identified following risk assessment</p> <p>Activation of BT Group Incident response process</p> <p>Co-operation with emergency services and EA</p> <p>Provision of anti-flooding Workforce tasked to site if safe to do so</p> <p>Communications to workforce on action to take</p> <p>Key personnel identified as part of Incident management process</p> <p>Customer impact identified and mitigation plan enabled</p>	<p>Ingress into BT building which threatens BT equipment</p> <p>People and operations at risk identified following risk assessment</p> <p>Activation of BT Group Incident response Process</p> <p>Co-operation with emergency services and EA Provision of anti-flooding measures (e.g. sandbags)</p> <p>Workforce tasked to site if safe to do so</p> <p>Forward Control Point Manager appointed/ Engaged</p> <p>Local Liaison Managers working with government incident teams feeding back to BT operational teams</p>	<p>Risk assessment vital for People, operations and buildings</p> <p>Information for Government vital from which to base risk assessment</p> <p>Safety of BT people is paramount and may precluded BT teams attending on site.</p> <p>Customer service prioritisation as important part of the process to ensure ongoing communications.</p>	<p>Once safe action may be taken to remove water</p> <p>Building closed to BT teams</p> <p>Water tested for contaminates.</p> <p>Remedial action taken if contaminates found</p> <p>Building is dried out</p> <p>Structural survey if required</p> <p>Equipment tested</p> <p>Building re opened</p> <p>Ongoing review of impact on networks and customer service – regular reports</p> <p>Incident management level reduced and timescale for Business As Usual Identified</p>
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Multi Agency Flood Plan

<p>BT cont'd</p>		<p>service priorities review requirements for blue light service communications</p> <p>BT threat Assessment Review Group [TARG] in place working with Government on increasing threat.</p> <p>BT Business Continuity Management structure and Group wide prioritisation put in place with BT to engage all Lines of Business in Impact of flood on service work stack scoped to identify impact on wet joints</p>	<p>Local Liaison Managers [LLMs] and Regional managers [RMs] working with Government</p> <p>Regional leads to coordinate on the ground requirements to feed into BT Incident response Teams</p> <p>BT Controls team rescheduling work flow and prioritising all customer service requirements</p> <p>BT liveried fleet to be repositioned outside the danger zone where possible</p>		<p>All to be managed through activated Incident management response</p>	<p>Ongoing risk assessment</p>
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Multi Agency Flood Plan

<p>Highways Agency</p>	<p>Fluvial, surface water flooding & groundwater flooding on M5, A30, A38, A303</p>	<p>Highways Agency is undertaking a national project identifying locations vulnerable to flooding on HA road network. When complete this will be used to manage/mitigate the risks</p> <p>Service Provider (who manages the network on behalf of the HA) Contingency Plans identify locations vulnerable to flooding and details the command structure on managing incidents.</p> <p>Access to EA data on areas susceptible to surface water flooding (CDs).</p> <p>Direct receipt of Met Office severe weather alerts and EA flood warnings and acting upon these to ensure our Service Providers are monitoring and reacting.</p> <p>Rigorous maintenance of highway drainage on HA network</p>	<p>Engage with multi-agency Silver if required</p> <p>Implement road closures on HA network with Devon and Cornwall Police when required.</p> <p>Implement diversion routes in liaison with Local Highway Authority</p>	<p>Engage with multi-agency Silver and/or Gold if required</p> <p>Managing Agent Contractor's staff to attend any incident affecting HA network and assist as appropriate</p> <p>Implement road closures on HA network with Devon and Cornwall Police when required.</p> <p>Implement diversion routes in liaison with Local Highway Authority</p>		<p>Clear and repair HA network road surface as required as flood waters recede</p> <p>Clear and repair any highway drainage as required as flood waters recede</p>
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Multi Agency Flood Plan

<p>DEFRA</p>	<p>Fluvial, Tidal, Groundwater, Surface water, Reservoir</p>	<p>Ensure that structures and resources are in place to ensure that Flood Management Division and other parts of Defra can play their part in responding to a flooding event.</p> <p>Encourage Regional Government Offices and Local Resilience Forums (LRFs) to prepare appropriate emergency plans for flooding and providing guidance.</p> <p>Ensure central Government has appropriate national planning assumptions for flooding and that annual National Risk Assessments are maintained with CCS.</p> <p>Direct reservoir undertakers to produce flood plans</p>	<p>Use EA Reports to anticipate events (and their likely scale) as far as possible to provide triggers for the right levels of preparedness in central Government.</p> <p>Initiate communications across central government, including press offices and providing situation reports.</p>	<p>Advise Defra Senior Management, Ministers, CCS and other Government Departments and agencies on the developing scale of events.</p> <p>Ensure effective communications with Parliament, the news media and others (see Annexes 4 & 5).</p> <p>Collect briefing on the impacts of the flooding on all Defra interests.</p> <p>Work with CCS in escalating or de-escalating the central Government response (see Table 2).</p> <p>Co-ordinate the cross-Government and multi-agency response to the flooding (supporting CCS if event escalated to COBR).</p> <p>Facilitate Ministerial and other VIP visits to the affected areas.</p> <p>Ensure that clear responsibilities are established for overseeing</p>	<p>Advise on follow-up Ministerial/VIP visits.</p> <p>Ensure arrangements are in place for identifying any lessons to be learned.</p> <p>Liaise with Association of British Insurers on insurance issues.</p>
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Annex B - Affects of Flooding on Utilities

1. Western Power Distribution

If the floodwater affects Western Power Distribution's main substations electricity supplies to a significant area are likely to be lost. As well as affecting the supplies to properties, this will also result in the street lighting and traffic lights not working. There would be no mains electricity supply to any South West Water, Wales and Western, and BT installations within the affected area (although they may have standby generation). The time necessary to restore supplies would be dependent on the ability to travel within the affected areas.

Rising floodwaters may reduce the clearances from overhead lines. Over a road the minimum clearance for lines with a voltage of 33,000 volts or less is 5.8 metres, otherwise it is 5.2 metres.

Access to underground apparatus may be lifted by the water pressure. Live conductors should not be exposed as a result of this but there will be the hazard of open covers.

Underground cables should be relatively unaffected. However, if there is significant subsidence or ground movement near cables this may cause the cable to fail.

Flooding in properties may damage the internal electrical wiring. If the electricity supply is not switched off this may result in fires or persons receiving electric shocks. Properties affected by floodwater will need to have the internal wiring checked by a competent electrician before the main switch is back on.

2. South West Water and Council of the Isles of Scilly

2.1 Affect on Water Treatment Works

Flooding of Water Treatment Works could lead to disabling of Air Blowers, Re-circulation Pumps, Wash Water Return Pumps and the Main Power Supply Transformers. This would mean an extended shut down for the Treatment Works and no water could be supplied to its dependent area.

2.2 Supply to Taps

Provided no significant burst mains occurred, there would be unlikely to be a problem with maintaining a portable water supply. It would be prudent, if the situation were serious, for pressure tests to be taken at strategic points, thus confirming the maintenance of positive pressure in the system.

2.3 Bursts

Questionable pressure readings would point to a burst main or mains. Small/medium bursts in the flooded area could not have their locations

determined until well after the flows had abated. In the event of a serious trunk main failure, every effort would be necessary to both find the point of failure and to instigate a repair. This would require significant number of sandbags, etc., to protect the area during the work. For either eventuality, a Boil Water notice would be in effect. It may be possible to valve-off some small-medium burst provided the valve positions were determinable, although this would certainly require extensive mains disinfection on reinstatement of supplies.

2.4 Back-Siphonage

Back-siphonage, although possible is unlikely whilst mains pressure remained positive. As a precaution, we would take random bacteriological samples during the period of flooding. If the results of the pressure tests suggest back-siphonage, either within the flow area or on higher ground, then we would declare our own incident and instigate Boil Water restrictions immediately over the affected area. The size of the affected area would depend on conditions at the time but could include all the properties in the flooded area and many outside it.

2.5 Emergency Tankers/Bowsers

These would certainly be extensively deployed in the first instance, it would be necessary to locate bowsers outside the flow area but the greater concern would be if a trunk main failed in which case areas very remote from the flood area might easily be affected.

2.6 Waste Water - Main Drainage

Any area under some feet of water would totally overload the public sewers with the floodwaters becoming contaminated with sewage - a number of properties would become flooded directly from water escaping from the sewers. Storm overflows would also have triggered resulting in pollution of streams and rivers and therefore floodwaters. Any sewage pumping stations within the catchment would be overloaded and, assuming they continued to work, would pump continuously, either to another part of the catchment, another catchment or to a treatment works. It is also most probable that overflows from the pumping stations would also be triggered. Some flooded areas could receive raw sewage but the dilution would probably be great and the environmental impact from this cause relatively light.

If sewers and other drainage systems became blocked during the event and also if pumping stations had failed due to flooding or damage to electrical equipment, it could take a considerable amount of time to return systems to normal. So much so that its possible problems could continue owing to the inability of the system to cope after floodwaters have subsided.

Getting to the various locations would be extremely difficult. Some manhole covers would lift causing hazards underfoot.

3. British Telecommunications (BT)

A major flood would certainly have an impact upon BT's infrastructure but this would vary depending on the level of the water and the force with which it arrived. The underground cable network is in the main waterproof although prevention of water ingress cannot be guaranteed and thus faults may well become apparent immediately or in the longer term.

Roadside cabinets are vulnerable as they only afford splash protection to the terminating cables. If water reached the air vents in the cabinet then service to customers could be lost or severely disrupted. An increase in water level could also affect BT buildings such as telephone exchanges and repeater stations.

The apparatus contained in the exchange could itself be damaged and any loss of power either from the mains or from standby engines would cause loss of service. The provision of expedient service would be difficult as faults due to the constant exposure to water could only be effectively repaired once the area had dried out.

Any switch, transmission or power equipment damaged by the ingress of water into an exchange would also have to be replaced. The likelihood of failure in the longer term would make this an imperative in order to establish the true cost of the incident. An additional problem could be sewage-contaminated water in underground structures. Customer fault rates would be high during the incident and continue to increase as people return to their homes and attempted to make calls, possibly to find that their line was not working.

Once the water level had receded, any cables or equipment that had been exposed would have to be renewed before corrosion takes a hold. This would also include plug and socket terminals in customer premises.

BT, like many other organisations, would also find it difficult to deploy resources into the affected areas due to road blockages and collateral damage.

4. Wales and West Utilities/National Grid

4.1 Immediate Problems

A major flood may have an effect on Wales & West Utilities low pressure infrastructure but this would depend on the level of flood water. The pipeline network is resistant to water ingress but in the event of either third party interference damage or failure as a result of ground movement it is possible that water ingress would occur.

4.2 Flooding at a Pressure Reduction Station

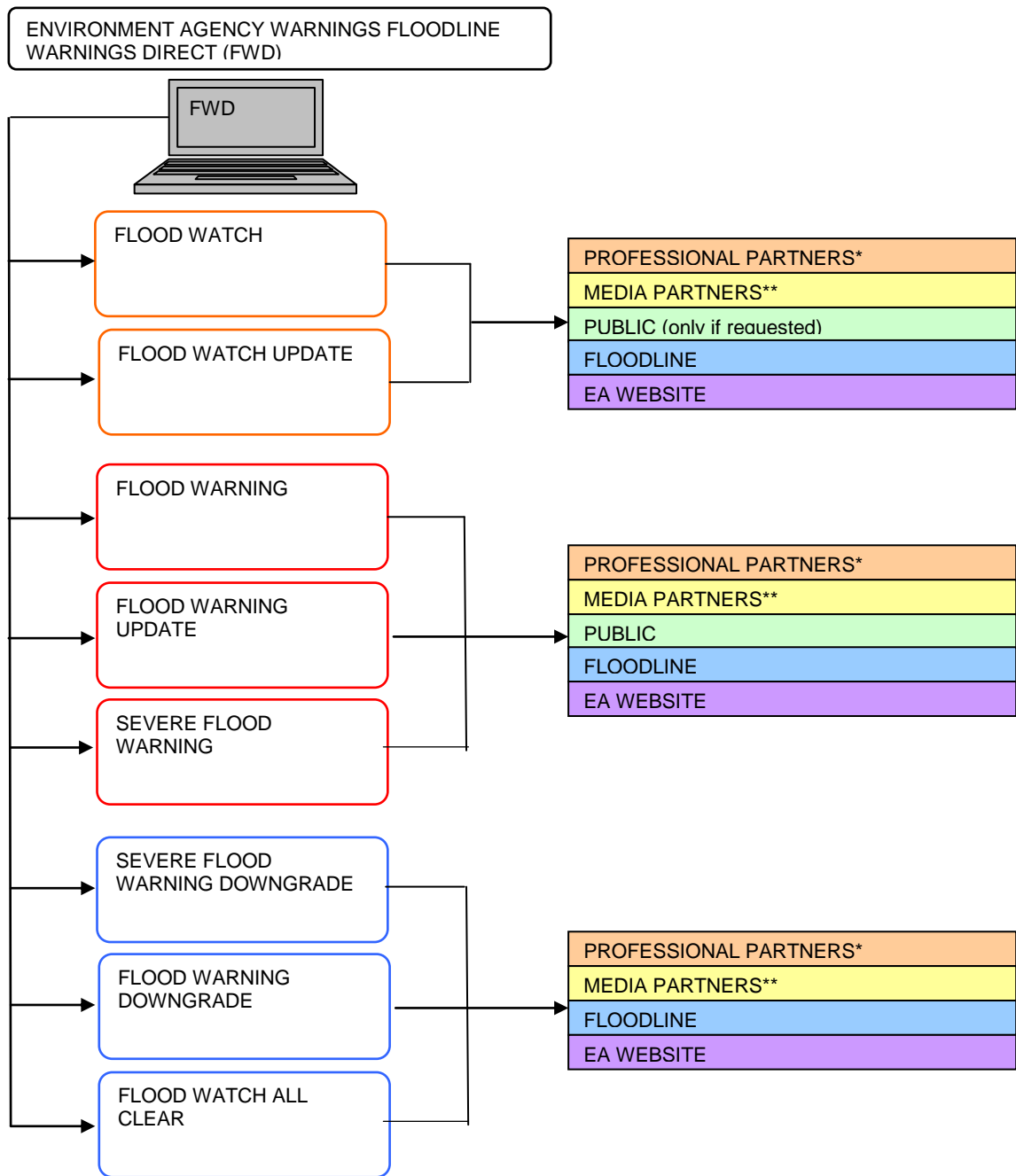
It is possible that a pressure reduction station could be affected by floodwater if the equipment open ventilation pipes were breached. However, this is very unlikely as this would require the flood water to be at a depth of approximately

2 metres at the point of the installation. If this were to occur site attendance would be necessary and may result in the plant being isolated in a controlled manner, causing a loss of the gas supply to the affected areas.

4.3 Long Term Problems

If no system water ingress was recorded it is anticipated that there would be no long term problems with the pipeline network associated with a flooding incident. If water ingress were to occur or ground movement as a result of flooding incident caused damage to pipelines, the repairs would take priority in line with the operators safety and security of supply policy. The clearance of water following an incident of water ingress is a difficult engineering process and depending on the area affected may be a lengthy procedure, which may also be dependent on our ability to access the area following any flood damage.

Annex C Environment Agency Flood Warning & Informing Cascade



Messages sent as:

TELEPHONE
FAX
EMAIL
SMS (TEXT)
PAGER

1. Severe & Extreme Weather Warnings

Severe weather events are not unusual and are experienced on a number of occasions throughout the year, but more commonly winter months. They will impact on individual areas, but often not significantly. Extreme weather events are unusual and only happen around three or four times per year. They have a significant impact on infrastructure and may lead to casualties.

The Met Office National Severe Weather Warning Service (NSWWS) for Severe Weather and Extreme Weather events uses a three and four colour “traffic light” type alert system which indicate varying levels of risk of impacts and a comment on actions to take at each level, as detailed in Figure 2 and 3.

Detailed severe weather warnings are available for up to five days ahead.

- **Advisories** are issued by 11:00 daily as routine and indicate confidence of expected severe or extreme weather. Early and Flash warnings supercede advisories when confidence levels reach 60% or greater.
- **Early warnings** of severe weather will normally be issued up to several days in advance whenever the overall risk of widespread disruption in any UK region is 60% or greater.
- **Flash warnings** of severe weather are issued when confidence of an event reaching specified criteria is above 80%, and should give a minimum of two hours notice.

A table of types of severe weather warnings and potential effects can be found at Appendix D.

2. Extreme Rainfall Alert Service

The Met Office and Environment Agency working in partnership have developed an Extreme Rainfall Alert Service (ERAS) delivered by their joint Flood Forecasting Centre. The Service uses the latest Met Office forecasting technology, combined with Environment Agency expertise, to advise of the risk of surface water flooding from extreme rainfall.

The Service comprises two products

- **Guidance** - issued when there is a 10% or greater chance of extreme rainfall.
- **Alert** - issued when there is a 20% or greater chance of extreme rainfall.

Confidence levels will increase closer to the rainfall event and when the meteorological situation becomes clearer. The table below outlines the trigger thresholds:

Extreme Rainfall Alert Service Trigger Thresholds

	Guidance	Alert
Probability of thresholds being exceeded. Either: 30mm per hour 40mm in three hours or 50mm in six hours	Very low 10% or greater	Low/Moderate 20% or greater
Guidance to responders on receipt	Extreme rainfall may lead to surface water flooding. Be prepared should the situation worsen.	Extreme rainfall may lead to surface water flooding. Consider activating your emergency procedures.

The above thresholds are considered to be thresholds above which surface water flooding becomes likely, particularly in built up areas.

Alerts may be issued without being preceded by Guidance in a rapidly developing situation. Similarly, guidance will not always be followed by an Alert, for example if weather conditions improve.

3. Limitations

Surface water flooding has very short lead times and is complicated by processes involved in overland flow, such as interaction with local topography and drainage infrastructure.

The Service cannot provide a site-specific real time surface water flood forecast, but does offer a county level alert of an impending rainfall. It is based on probability of an event occurring and is not certain.

Met Office Weather Warning Overview

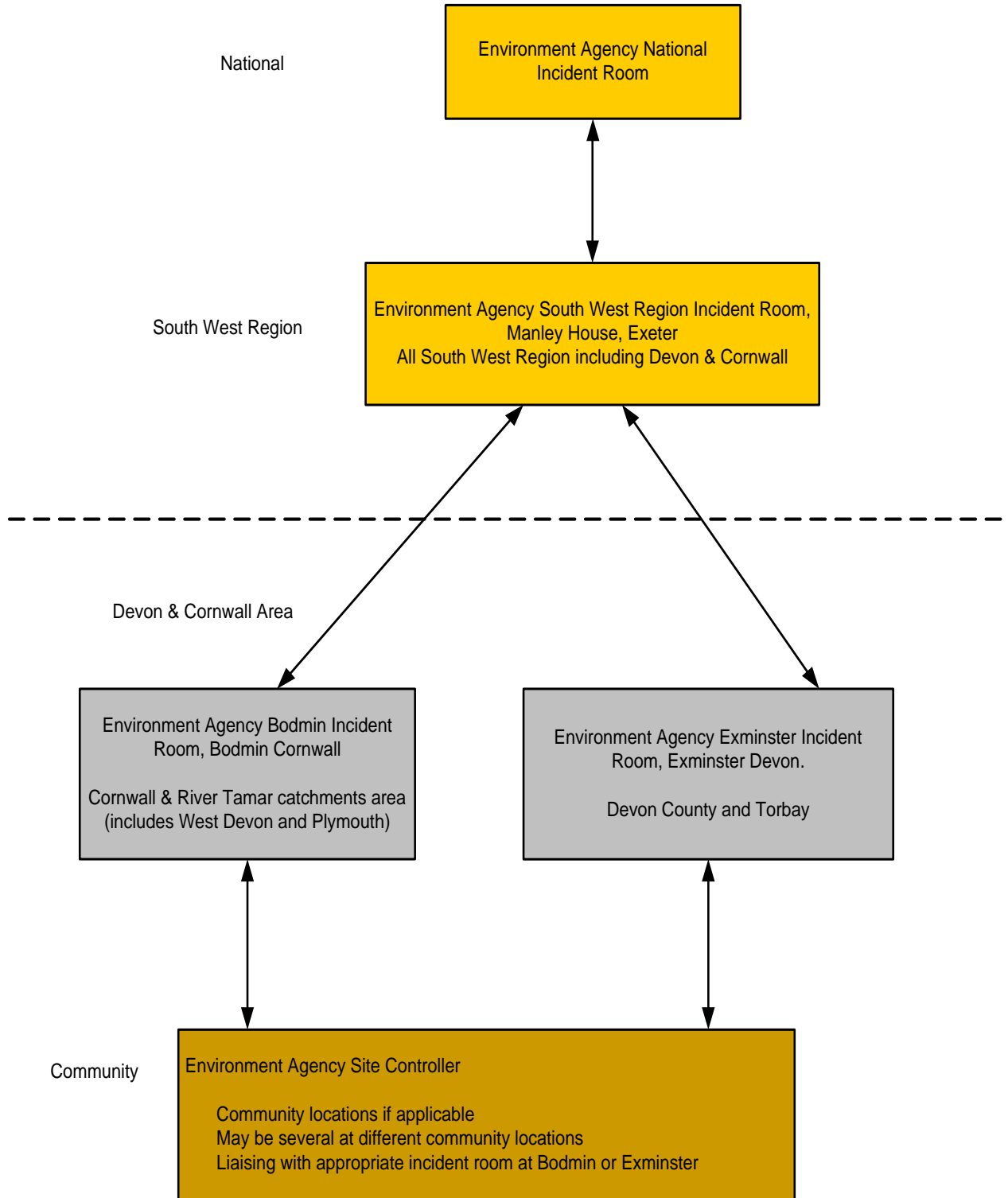
Severe Weather Events

Colour and risk levels for severe weather events (can often occur, particularly in Winter)					
	Green		Yellow	Amber	
Warning	None		Advisory	Early	Flash
Risk	Very low <20%	Low ≥20% <40%	Moderate ≥40% <60%	High ≥60% <80%	Very high >80%
Headline	No severe weather expected		Moderate risk of severe weather	High risk of severe weather	Severe weather is imminent or is occurring
Impact			Moderate risk of some damage to infrastructure and local disruption	High risk that there will be some damage to infrastructure and local disruption	Very high risk that there will be some damage to infrastructure and local disruption
Advice			Ensure you access the latest weather forecast	Remain vigilant and ensure you access the latest weather forecast (See Figure 5d)	Ensure you access the latest weather forecast and take precautions where possible

Extreme Weather Events

Colour and risk levels for extreme weather events (these are rare)					
	Green	Yellow	Amber	Red	
Warning	None	Advisory	Advisory	Early	Flash
Risk	Very low <20%	Low ≥20% <40%	Moderate ≥40% <60%	High ≥60% <80%	Very high >80%
Headline	No extreme weather expected	Low risk of extreme weather	Moderate risk of extreme weather	High risk of extreme weather	Extreme weather is imminent or occurring
Impact		Low risk of major damage to infrastructure and the environment	Moderate risk of major damage to infrastructure and the environment	High risk of major damage to infrastructure and the environment. Casualties are possible	Major damage to infrastructure and the environment is likely. Casualties are possible
Advice		Ensure you access the latest weather forecast	Remain vigilant and ensure you access the latest weather forecast	Remain extra vigilant and access the latest weather forecast. (See Figure 5d) Be aware of risks that might be unavoidable. Follow any advice given by authorities	Remain extra vigilant and access the latest weather forecast. Follow orders and any advice given by authorities under all circumstances and be prepared for extraordinary measures

Annex D - Environment Agency Internal Flood Incident Response Structure



Annex E – Public Advice

Summary of advice to provide to the public:

1. *Pre-flood*

- Prepare Flood Plan
- Prepare a flood kit – warm clothes, torch (check batteries), radio (wind up or battery powered), food, water and other drink, personal medication, mobile phone (input useful numbers if time allows) and First Aid Kit
- Identify alternative accommodation (friends and Family outside affected area) if at all possible.
- Keep valuables and sentimental items out of harms way, upstairs if possible
- Move pets to a safe place
- Alert neighbours and assist the elderly, infirm and those with small children
- Move your car to higher ground if possible
- Block doorways and air bricks
- Switch off electricity and gas if flooding is imminent
- Avoid walking and driving through floodwater, there could be hidden hazards
- Keep up to date with local radio and Floodline 0845 988 1188

2. *During a flood*

- Continue to listen for situation updates
- Keep dry, out of floodwater if possible
- Stay in your property, if safe to do so, until advised otherwise by the emergency services or floodwater has receded
- Do not walk or drive through flowing floodwater
- If it is necessary to walk through shallow floodwater, take care for hidden holes, obstacles or other hazards
- Do not walk on river banks, sea defences or cross bridges over fast flowing rivers
- Avoid contact with floodwater and wash exposed skin before handling food or attending to wounds

3. *Post flood*

- Contact your insurers and follow their advice
- Check the safety of electricity and gas before use
- Boil all tap water until the supply is declared safe by the water supply company
- Dispose of all contaminated food, including defrosted food

- Avoid contact with any remaining floodwater or items having had contact with floodwater unless wearing protective clothing. Wash thoroughly afterwards
- Ventilate your property whilst taking care for security
- Seek medical assistance if any health issues appear, especially flu like symptoms

4 Useful Contacts for the Public

- The Environment agency's Floodline warnings direct system
- The Environment agency website at www.environment-agency.gov.uk/flood
- Contacting Floodline on 0845 988 11 88 – information is provided by recorded information and live call operators.
(Minicom Textphone : 01904 692 297)
- Met Office www.metoffice.gov.uk
- Via the media
- Health Protection Agency www.hpa.org.uk
- AA Roadwatch will also be used to broadcast warnings
- Highways Agency Information line (HAIL) 08457 50 40 30 & email
- HA Traffic England Website
- Leaflets produced and distributed by the EA, which provide information and advice on flood warning arrangements
- Information & Advice regarding Repair and Restoration of buildings following floods from www.ciria.org/flooding and from www.floodforum.org.uk
- Information & advice regarding Recovery Procedures and activities from the British Damage Management Association www.bdma.org.uk
- The Flood Forum www.floodforum.org.uk

Annex F – Types of severe weather warnings and potential effects

Warnings are issued using a set of fixed weather criteria for the whole of the UK

	Met Office Criteria	Possible cause	Possible effects
Severe Gales	Repeated gusts of 70 m.p.h. or more over inland areas.	<ul style="list-style-type: none"> ▪ Depressions (areas of low pressure) ▪ Tip: <i>Stronger gusts are possible in the vicinity of heavy precipitation, thunderstorms and weather fronts</i> 	<ul style="list-style-type: none"> ▪ High-sided vehicles at risk of being blown over ▪ Some trees uprooted ▪ Tiles, slates and chimneys dislodged from some buildings
Storms	Repeated gusts of 80 m.p.h. or more over inland areas.	<ul style="list-style-type: none"> ▪ Depressions (especially quick-moving depressions) ▪ Tip: <i>Stronger gusts are possible in the vicinity of heavy precipitation, thunderstorms and weather fronts</i> ▪ Tip: <i>If ground is already waterlogged and /or trees are still in leaf, there is a higher likelihood of toppling trees.</i> 	<ul style="list-style-type: none"> ▪ Cars blown out of lanes on roads ▪ Widespread removal of branches from trees; many trees uprooted ▪ Tiles, slates and chimneys dislodged from many buildings; some structural damage • Where wind is forecast above 90 m.p.h. the following may occur: <ul style="list-style-type: none"> ▪ Collisions whilst driving ▪ Widespread uprooting of trees ▪ Injury due to flying debris ▪ Widespread damage to buildings; some buildings collapse
Heavy Snow	Snow falling at a rate of 2 cm/hour or more expected for at least two hours.	<ul style="list-style-type: none"> ▪ Weather fronts. ▪ Tip: <i>If the weather has been cold for some time, precipitation falling through that cold air, is more likely to reach the ground as snow.</i> 	<ul style="list-style-type: none"> ▪ Increased journey times ▪ Minor accidents
Very Heavy Snow	Snow falling at a rate of 2 cm/hour or more expected for at least two hours, accumulating to 15 cm or more.	<ul style="list-style-type: none"> ▪ Weather fronts. ▪ Tip: <i>Watch out if fronts are slow moving or semi-stationary.</i> ▪ Tip: <i>Warm fronts/occlusions can produce large amounts of snow.</i> 	<ul style="list-style-type: none"> ▪ Local routes impassable ▪ Local loss of power and telecommunication lines
Blizzard	Moderate or heavy snow accompanied by winds of 30 m.p.h. or more, with visibility reduced to 200 m or less; or drifting snow giving rise to similar conditions.	<ul style="list-style-type: none"> ▪ Depressions. ▪ Tip: <i>Lying or banking snow adjacent to roads can create a hazard if strong winds blow the snow across or onto the carriageway.</i> 	<ul style="list-style-type: none"> ▪ Major routes impassable ▪ Local loss of power and telecommunication lines
Severe Blizzard	Heavy Snow accompanied by winds of 30 m.p.h. or more, reducing visibility to near zero.	<ul style="list-style-type: none"> ▪ Deep or fast-moving depressions. ▪ Tip: <i>Previously-fallen powder snow can compound visibility reduction.</i> ▪ Tip: <i>Significant wind-chill possible.</i> 	<ul style="list-style-type: none"> ▪ Transport infrastructure paralysed ▪ Regional loss of power and communication lines
Heavy Rain	Rain expected to continue for at least two hours and to give at least 15 mm within a three hour period or, following previous heavy rain events, 25 mm/day.	<ul style="list-style-type: none"> ▪ Weather fronts. ▪ Tip: <i>Flooding risk can be higher if ground is already waterlogged from previous rain, or is hard – e.g. due to drought in summer or front in winter.</i> 	<ul style="list-style-type: none"> ▪ Aquaplaning ▪ Flooding
	Warning may be triggered by thunderstorms (warnings will state this if expected).	<ul style="list-style-type: none"> ▪ Thunderstorms ▪ Top: <i>Slow-moving thunderstorms (especially in summer) increase the risk of localised flooding.</i> ▪ Tip: <i>Other hazards include hail, strong winds and lightning risks.</i> 	<ul style="list-style-type: none"> ▪ Squally winds or tornadoes may remove roof tiles or chimneys ▪ Power surges

Multi Agency Flood Plan

Fog	Visibility below 50 metres (restricted to heights where major roads occur).	<ul style="list-style-type: none"> ▪ Clear skies overnight allow radiation fog to form. ▪ Cold air drainage from hills overnight. ▪ Changes in wind may bring fog from elsewhere (advection fog) ▪ Anticyclones (areas of high pressure) 	<ul style="list-style-type: none"> ▪ Difficulty identifying distances and speed of movement leading to increased journey times ▪ Road traffic accidents
Widespread Icy Roads, Glazed Frost, Freezing Rain	When rain falls onto surfaces with temperatures at or below zero; or condensation occurs on surfaces at or below zero; or already wet surfaces fall to or below zero. The ice is usually clear and difficult to distinguish from a wet surface. It usually forms in sheets. Warnings are issued when any depth of ice is expected over a widespread area.	<ul style="list-style-type: none"> ▪ Weather fronts (especially warm fronts/occlusions) ▪ Tip: <i>Watch out if fronts are slow moving or semi-stationary.</i> ▪ Tip: <i>The only reliable method of clearing this ice is by thawing – it is usually a case of waiting until the warm air behind the front arrives over the area.</i> 	<ul style="list-style-type: none"> ▪ Damage to power and telecommunication lines ▪ Driving difficulties ▪ Difficulty when walking
Heatwave (NHS Heat-Health Watch)	Expectation of significantly higher than average temperatures in one or more regions of England and Wales; thresholds are pre-determined regionally via the Heat-Health Watch system	<ul style="list-style-type: none"> ▪ Tropical Continental air mass in summer ▪ Top: with time, air pollution can cause respiratory problems 	

Annex G – Pre Event SCG meeting (following EALA request)

1. Introductions and Apologies
2. FOIA – Classification
3. Lead Agency Briefing (planning stage currently EA/Met Office)
4. Mitigation activities to be carried out by partners and partner information
5. Command and Control
6. Warning and Informing of partners and communities (including leads)
7. Media Strategy
8. External liaison
9. Business Continuity issues
10. Next meeting
11. Summary of Key points and Actions

EA Briefing Format

1. Meteorological Forecast/Flood Risk
2. Flood warnings/professional Partner Liaison
3. Areas at risk/Vulnerable sites
4. Asset Management

Annex H – Initial Strategic Co-ordination Group Agenda

Standing Agenda

1. Introduction and apologies
2. Items for Urgent Attention
3. Update on current flood / anticipated flood position and weather
4. Reports from Silver(s)
5. Impact on communities
6. Infrastructure issues
7. Key Issues and Strategic Decisions
8. Communication and Media Strategies
9. Business Continuity
10. Finance and Logistics
11. Recovery and Medium/Long Term Issues
12. Any Other Business
13. Time of Next Meeting/Organisations Attending Next Meet

Annex I - Silver Control Initial Group Agenda & Considerations

Standing Agenda

1. Introduction
2. Items for Urgent Attention (inc has a major incident been declared or does it need declaring)
3. Update on current flood / anticipated flood position and weather
4. Reports from Silver Control Group Members
5. Requirement for Strategic Co-ordination Group activation and/or decisions required
6. Health and safety risks, issues and advice
7. Key Operational Issues (inc evacuation, security etc)
8. Warning, Informing and media
9. Recovery Group update
10. Any Other Business
11. Time of Next Meeting/Organisations Attending Next Meet

Other Considerations

- Identify decisions requiring to be made:
 - (Timely decisions on evacuation are crucial)
 - Now (this meeting)
 - Next 2 hours
 - Next 4 hours
- Specific warnings to the public
- General advice to the public
- Water rescue resources
- Identification of vulnerable populations (LAs and PCTs)
- Evacuation
- Transport
- Rest centres
- Identification of safe routes
- Rendezvous points (RVPs)
- Confirmation of communications, contact numbers etc
- Identification of potential future problems
- Press and media policy
- Future admin of Silver control (accommodation, feeding, communications, feedings, shifts etc)
- Timings of inter-agency updates / SITREPS

Annex J – Handover Document

Operation *Insert Name*
Insert Location to be handed over.
Insert Date

Handover Document

In line with agreed protocol (Combined Agencies Emergency Response Protocol) established by the Devon, Cornwall and Isles of Scilly Local Resilience Forum, the Devon & Cornwall Police assumed responsibility as the lead co-ordinating agency from the time a Major Incident was declared on the *Insert date of incident*

Devon & Cornwall Police have continued in that role during the reaction, rescue and retrieval phases of the incident. The Devon & Cornwall Police has now completed the retrieval phase to the best of our knowledge and belief.

Therefore, in accordance with the above protocol, the Devon & Cornwall Police now relinquishes the role as lead co-ordinating agency, which is passed to the relevant local authority, in this case, *insert name of relevant Local Authority*.

From the time and date shown below, all responsibility for the co-ordination of the remediation and regeneration phases of the incident pass to *insert name of relevant Local Authority*, including all further responsibility for the safety of the public, provision of adequate resources, and all financial arrangements relating to this Major Incident.

Signed on behalf of the
Devon & Cornwall Police

Signed on behalf of the
Insert name of relevant Local Authority

Time.....

Date.....

Annex K High Risk Communities

It has been agreed by the Devon, Cornwall and Isles of Scilly Local Resilience Forum (DCIOSLRF) that site specific tactical flood plans are required for communities where the flood risk has been defined in the LRF Community Risk register as High or very High.

This means the community is at risk from:

- A. Major tidal/coastal flooding affecting more than 100 properties for 1 to 7 days.
- B. Major Fluvial flooding affecting more than 100 properties for 1 to 7 days
- C. Communities may also be considered for High risk Community Plan, if there are other risk factors such as, high numbers of properties at risk of surface water flooding, flash flooding, or there are other factors which means flooding is likely to have a significant impact

Communities may also be considered for site specific flood plans if there are significant numbers of vulnerable sites and/or infrastructure.

Cornwall

Location	Status
Bodmin	Extant Plan 2003/4
Bude and Statton	Extant Plan 2003/4
Flushing	Under Development
Hayle	Under Development
Helston	Extant Plan 2003/4
Launceston	Extant Plan 2003/4
Looe	Under Development
Mevagissey	Under Development
Par and St Blazey	Extant plan 2006 - Under Revision new plan due for publication April 2010
Penryn	Extant Plan 2003/4
Penzance	Under Development
Perranporth	Under Development
Portreath	Under Development
St Austell	Under Development
Truro	Extant Plan 2003/4
Wadebridge	Extant Plan 2003/4

Isles Of Scilly

Location	Status
St Marys	
Hugh Town	Under Development

Devon (including Torbay and Plymouth)

Location	Status
East Devon	
Axminster	Under Development
Axmouth	Under Development
Beer	Under Development
Budleigh Salterton	Under Development
Colyton	Under Development
East Budleigh	Under Development
Exmouth	Under Review
Feniton	Under Development
Honiton	Under Development
Lympstone	Under Review
Newton Poppleford	Under Development
Otterton	Under Development
Ottery St Mary	Under Review
Seaton	Under Review
Sidmouth	Under Review
Stoke Cannon	Under Review
Woodury	Under Development
Exeter City	
Exeter	Under Review
Topsham	Under Development
Mid Devon	
Bampton	Under Development
Crediton	Under Development
Cullompton	Under Review
Hemyock	Under Development
Tiverton	Under Development
North Devon	
Barnstable	Under Review
Berrynarbor & Watermouth Cove	Under Development
Braunton	Under Review
Brendon	Under Development
Combe Martin	Under Development
Ilfracombe and Hele	Under Review
Lynton/Lynmouth	Under Development
South Moulton	Under Review
Plymouth City	

Multi Agency Flood Plan

Plymouth Barbican	Extant Plan 2003/4
Plymouth Marsh Mills	Extant plan 2003/4
South Hams	
Dartmouth	Under Review
Harbertonford	Under Review
Ivybridge	Under Development
Kingsbridge	Under Review
Salcombe	Under Review
South Brent	Under Development
Totnes	Under Review
Teignbridge	
Abbotskerswell	Under Development
Ashburton	Under Review
Bovey Tracy	Under Development
Buckfastleigh	Under Review
Dawlish	Under Development
Dawlish Warren	Under Development
Exminster	Under Development
Kingskerswell	Under Review
Kingsteignton	Under Review
Newton Abbot	Under Review
Shaldon	Under Review
Starcross	Under Review
Teignmouth	Under Review
Torbay	
Brixham	Under Development
Paignton	Under Review
Torquay	Under Development
Torridge	
Bideford	Under Review
West Devon	
Okehampton	Under Review
Tavistock	Under Development