CYNGOR SIR
CEREDIGION
COUNTY COUNCIL

LOCAL FLOOD RISK MANAGEMENT STRATEGY

OCTOBER 2014

CONTENTS

FOREWORD

We are all aware of the devastating effect that the 2012 floods had on communities within Ceredigion, and as the Cabinet Member for Transport, Waste and Carbon Management, I am very keen to see improvements in the management of flood risk within our county.

Flooding not only causes damage to property and infrastructure, but can cause considerable stress and disruption to people, and whilst we cannot wholly prevent flooding, its impacts can be reduced.

This Strategy is the first step in ensuring that we have a sound foundation for addressing future flood risk within Ceredigion, and identifies how we intend to develop sustainable measures to manage that risk by taking into account the needs of the local community, the local economy and the environment.

The impacts of climate change are well documented. The Council takes these seriously and has adopted a Carbon Management Plan as our contribution to the global effort to reduce carbon emissions. As part of their effect, flooding is becoming an increasing risk. Whilst we may not be able to hold back the forces of nature, we can put in place a sustainable strategy to prepare and protect our communities.

Climate change predictions suggest an increase in the intensity of rainfall and frequency of sudden storms in future and, as a result, the frequency of surface water flooding incidents are likely to increase and become more severe. It is therefore essential that we work together to plan and prepare for such events and respond to, and recover from, the flooding itself.

People usually associate major flooding incidents with rivers bursting their banks or coastal flooding, but local communities can face flood risk from many sources including the sea, rivers, surface water runoff and the surcharge of highway and drainage networks.

That is why we recognise that partnership working between the County Council, Natural Resources Wales, Dŵr Cymru and local communities is key to managing flood risk, delivering efficient and integrated solutions, and supporting communities to become more resilient to flooding.

This Strategy is not just about flood defences and maintenance. Non-structural solutions, including sustainable planning, development control, environmental enhancement and emergency planning, such as supporting communities to become more resilient to flooding, will be key components of our response to flood risk both now and in the future.

This Strategy outlines the actions that we need to take over the coming years to bring about a better, more sustainable approach that works with nature, helping us to plan for the likely impacts of climate change and reduce their effect on our communities.

Cllr. Alun Williams,
Cabinet Member for Transport, Waste and Carbon Management

EXECUTIVE SUMMARY

The introduction of the **Flood Risk Regulation 2009** and the **Flood and Water Management Act 2010** has changed the way that we look at flooding, and consequently the management of flood and coastal erosion risk. As the risks presented by flooding and coastal erosion are changing, then so must our response.

We can no longer simply continue to build bigger drainage systems and higher defences, and in recent years we have seen a move towards a response rooted in the principles of risk management, providing a holistic approach to managing the risks, their consequences and their wider impacts.

This is the first **Local Flood Risk Management Strategy for Ceredigion**, and is intended to complement the **National Strategy** launched by the Welsh Government in 2011, which contained four overarching objectives for the management of flood and coastal erosion risk:

- reducing the consequences from flooding and coastal erosion
- raising awareness and engaging people in the response to flood and coastal erosion risk
- providing an effective and sustained response to flood and coastal erosion events
- prioritising investment in the most at risk communities

Implementing these objectives will be the responsibility of everyone involved, from Ceredigion County Council and Natural Resources Wales (formerly Environment Agency Wales), through to local communities and individual property owners.

To achieve this, we need to work together to find sustainable solutions to local problems in order to deliver flood and coastal erosion risk management functions in a manner that:

- embeds sustainable development as the central organising principle
- is focused on the needs of individuals, communities and businesses
- supports the wider economic renewal programme
- promotes equality and does not exacerbate poverty
- is based upon a holistic understanding of the risks and consequences
- considers the full range of risk management responses
- contributes to the holistic management of water, land and marine resources
- facilitates effective prioritisation of investment, resources and actions
- takes account of the requirement of relevant legislation including the **Flood Directive (2007)**, the **Water Framework Directive (2000)** and the **Habitats Directive (1992)**

This **Strategy** sets out the roles and responsibilities of the various organisations which contribute to managing flood risk within Ceredigion, and also explains the duties of the public to protect themselves from the consequences of flooding.

INTRODUCTION

Ceredigion County Council's Local Flood Risk Management Strategy aims to help everyone who is affected by flooding, or who is responsible for managing the risk of flooding, to better understand flood risk within the County, and will focus on the 'local' sources of flooding, such as surface water, groundwater and ordinary watercourses.

These are generally caused by localised heavy rainfall, and are becoming an increasingly common form of flooding as evidenced by the flooding events in north Ceredigion in June 2012 and the Cardigan area in October 2012.

Current estimates show that one in six properties in Wales is at risk of flooding from rivers, the sea and/or surface water, and in some communities all the properties are at risk. The number of properties at risk from coastal erosion is less well defined than those at risk of flooding, but the second edition of the **Shoreline Management Plans** suggest that the numbers are significantly smaller, and that the majority of these would not be affected until the medium to long term (20-100 years).

Climate change projections suggest that Wales can expect to see different rainfall patterns in the future, in combination with rising sea levels. These projections suggest that we will experience more frequent and more severe flooding in the future, together with increased rates of coastal erosion. Communities at risk of flooding and coastal erosion can therefore expect to see those risks realised more frequently.

For those who suffer flooding, it matters little what type of flooding is causing the problem and so the Strategy will also aim to provide information about the various forms of flooding and the organisations involved in all aspects of flood risk management, from flood protection to dealing with a serious flooding event.

The **Ceredigion Local Flood Risk Management Strategy** will therefore set out who the Risk Management Authorities are in the area and their relevant functions.

Ceredigion County Council has always held certain responsibilities in relation to ordinary watercourses under **The Land Drainage Act 1991**, and in practice took the lead in dealing with surface water flooding incidents prior to the introduction of the **Flood and Water Management Act 2010 (The Act).**

Under the terms of **The Act**, Ceredigion has now become a Lead Local Flood Authority with responsibility for these 'local flood risks'. This is the first time responsibility for the risks of flooding from surface runoff has been allocated to any particular body in law.

However, flood risk management is not something that can be left solely in the hands

of certain organisations. Property owners and landowners must be aware of their responsibilities too.

Just as the risks presented by flooding and coastal erosion are changing, so is the response. It will not be possible to continue to build bigger drainage systems and higher defences. In recent years the Welsh Government has moved towards a response rooted in the principles of risk management, providing a holistic approach to managing the risks, their consequences and the wider impacts on our communities.

The money available for flood risk management is never going to be enough to deal with all existing flood risks and the increasing future risk brought about by a changing climate. Even if funding constraints were not an issue, it would still not be possible to prevent all floods or solve all concerns.

Simply constructing more and higher defences is not a sustainable solution environmentally, economically or socially and in some cases it can increase the risk to life and injury should they fail. The location of defences can sometimes harm the wider environment and constructing and maintaining defences is becoming more expensive, leaving less money available to protect other communities.

Both the **Foresight: Future Flooding Study** and the **Stern Review on the Economics of Climate Change** recommended a move towards a risk management approach to flooding and coastal erosion, which goes further than defence alone.

Working with natural processes where appropriate can contribute to a more sustainable ecosystem management approach, as promoted by the Welsh Government's **Natural Environment Framework**, and also help deliver the requirements of the **Water Framework Directive**.

A risk management approach encompasses a range of measures to help communities as well as the wider environment.

WHAT IS THE NATURE OF FLOOD RISK WITHIN CEREDIGION?

Flooding is a natural phenomenon, and the adverse effects of flooding can be made worse by poor management of the landscape and both the built and natural environment.

As communities have developed so has a significant network of flood defences, coastal protection and drainage infrastructure to help reduce the risks faced. Although these arrangements have generally worked well in the past, the pressure on our existing infrastructure will increase significantly in the future.

The problems can also be made worse if we fail to do anything about the risk.

Rainfall, and the subsequent flooding is, by its very nature unpredictable in both location and severity, and dealing with these uncertainties will be challenging, particularly in the case of surface water flooding.

However, flood risk is something that can generally be understood and its effects are usually more predictable, but even then, blockages in drainage systems can cause unusual and even less predictable flooding.

The nature of flood risk within Ceredigion is extremely varied and widespread across the county. Ceredigion has an extensive coast, a network of rivers, high and low lying land, and numerous river valleys, which, when combined with a few urbanised areas, means it is at risk of flooding from a variety of different sources.

The main sources of flood risk include:

Surface water flooding (also known as pluvial flooding) - when high intensity rainfall generates runoff which flows over the surface in low lying areas. It is usually associated with high intensity rainfall and can be exacerbated when the ground is either saturated or too dry to accept water, or when the drainage network has insufficient capacity to cope with the additional flow.

Groundwater flooding - when water levels in the ground rise above the ground surface. Flooding of this type tends to occur after long periods of sustained heavy rainfall and can last for weeks or even months.

River flooding (also known as fluvial flooding) - when a watercourse cannot cope with the volume of water that is flowing into it. Rivers are categorised into ‘Main Rivers’ and ‘Ordinary Watercourses’. Main rivers are usually large watercourses but also include smaller watercourses of strategic drainage importance.

Coastal flooding - usually occurs during storm surges when there is an increased risk of high sea levels causing overtopping or breaching of coastal flood defences. The greatest risk of coastal flooding is experienced when there is a combination of high tides and a storm surge.

Coastal erosion - wearing away of land and the removal of beach sediments by wave action or tidal currents. This risk falls outside the responsibility of the Lead Local Flood Authority and therefore outside the scope of this strategy. There may however be areas where erosion will lead to increased flood risk.

Sewer flooding – flooding that occurs when the sewer network cannot cope with the volume of water that is entering it or when pipes within the network become blocked. This type of flooding is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding.

Highway flooding - flooding caused by heavy rainfall or water overflowing from blocked or overloaded drains, soakaways and gullies causing water to pond within the highway network

It is often difficult to establish a single, precise cause for flooding and that is why a holistic approach to flood investigation needs to be taken.

FACTORS INCREASING FLOOD RISK

Flood risk is a combination of probability and consequence; and there are a number of factors which will lead to higher probability of flooding in the future and more serious potential consequences.

The factors leading to an increase in flood risk include:

- that climate change will lead to more frequent and more severe extreme weather, rising sea levels, and therefore to more extreme floods with more serious consequences

- deterioration in the condition and performance of existing drainage infrastructure and flood defence structures over time
- development and changes in land use, leading to an increase in impermeable surfaces and general loss of vegetation cover, causing increased levels of runoff during heavy rainfall events

LEGISLATION

Following a number of extreme flooding events during 2007, the **Pitt Review** was tasked with identifying better legislation for the effective management of flooding.

Published in June 2008 the **Pitt Review (Learning Lessons from the 2007 Floods)** contained 92 recommendations, including 15 urgent recommendations for improving the service offered to the public.

These recommendations provided the main driver for the measures contained in the **Flood and Water Management Act 2010** and hence the **National Strategy**.

This, combined with **The Flood Risk Regulations (2009)** which came into force in December 2009 placed greater responsibilities on Local Authority's for dealing with flood risk.

Flood Risk Regulations 2009

The **Flood Risk Regulations 2009** require all Councils (including Ceredigion County Council) to produce a **Preliminary Flood Risk Assessment (PFRA)**, identifying areas where people are at risk of surface, ground and ordinary watercourse flooding.

The **Preliminary Flood Risk Assessment** is a high level screening exercise that brings together readily available information from a number of sources on past and potential flooding to enable Ceredigion County Council to make informed judgments in relation to local flood risk.

Ceredigion County Council's **Preliminary Flood Risk Assessment** was completed in June 2011, and will be reviewed in 2017. Among the information used to inform the **Preliminary Flood Risk Assessment** were national datasets produced by the Environment Agency, flooding records held by Dŵr Cymru Welsh Water, historic flood information held by Ceredigion County Council, and information received from Town and Community Councils following a specific request for information made by Ceredigion County Council.

This information was not only used to provide an evidence base for **Preliminary Flood Risk Assessment**, but also to inform this **Strategy**.

Where the **Preliminary Flood Risk Assessment** identified areas of significant risk,

the regulations also require that the Lead Local Flood Authority produce hazard and risk maps, and flood management plans.

No areas within Ceredigion satisfy the national criteria for defining areas at significant risk. This is not because there is no identified risk, but because of the largely rural nature of the county, which means that the national criteria which defines significant risk has not been met.

Flood and Water Management Act 2010

Many of the recommendations from the Pitt Review have been implemented through the **Flood and Water Management Act 2010**. The Act gained royal assent in April 2010 and provides legislation for the management of risks associated with flooding and coastal erosion.

It places a greater responsibility on County Councils in respect of surface water management, and clearly defines their roles as Lead Local Flood Authorities.

The preparation of this **Local Flood Risk Management Strategy** is just one of a number of statutory duties placed upon the County Council under the Act, with the others being a duty to:

- comply with the **National Strategy**
- co-operate with other authorities (to include the sharing of data)
- investigate all flooding within its area (insofar as the Lead Local Flood Authority consider it appropriate)
- maintain a register of structures and features likely to affect flood risk
- contribute to sustainable development

In addition to these duties, each Lead Local Flood Authority has permissive powers.

These are permissive powers that allow them to do something, but do not compel them to, and include:

- powers to request information relating to flooding and drainage
- powers to designate certain structures that affect flood/coastal erosion risk
- powers to undertake works to include broader risk management actions
- the ability to cause flooding or coastal erosion under certain conditions

The Local Strategies are to be completed during 2013 for submission to, and approval by, the Welsh Government.

A **National Flood and Coastal Erosion Risk Management Strategy (NFCERM)** has been produced by the Welsh Government which sets out the principles that will guide local strategies and the activity of all flood authorities.

CEREDIGION'S LOCAL FLOOD RISK MANAGEMENT STRATEGY

The Welsh Government has produced a guidance document entitled ***'Local Flood Risk Management Strategies'*** which provides information to Lead Local Flood Authorities of key local flood risk management issues that should be considered in the development of their own strategies for local flood risk management.

In accordance with this guidance, the **Local Flood Risk Management Strategy** must therefore specify:

a) the risk management authorities in the authority's area
b) the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area
c) the objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the **Flood Risk Regulations 2009**)
d) the measures proposed to achieve those objectives
e) how and when the measures are expected to be implemented
f) the costs and benefits of those measures, and how they are paid for
g) the assessment of local flood risk for the purpose of the strategy
h) how and when the strategy is to be reviewed
i) how the strategy contributes to the achievement of wider environmental objectives

The main aim of the strategy is therefore to reduce the risk of flooding and the misery and economic damage that flooding causes in a sustainable manner. Also, that any flood management activities carried out should aim to enhance the built and natural environment.

The Local Strategy must also be consistent with the **National Strategy for Flood and Coastal Erosion Risk Management in Wales**, published in November 2011, and we must consult the following about our local flood risk management strategy:

- other risk management authorities that may be affected by the strategy
- the public

We must also publish a summary of our local flood risk management strategy (including guidance about the availability of relevant information), and submit a draft of the strategy and any guidance to the Welsh Ministers for review.

STRATEGIC ENVIRONMENTAL/HABITATS REGULATIONS ASSESSMENTS

Ceredigion has a number of nationally and internationally designated environmental sites in addition to locally important ecological areas and protected species.

Flood and coastal risk management have the potential to impact on these sites in a positive or negative way, or indeed, a mixture of both, and all activities therefore need to take due consideration of the natural environment, aiming to enhance biodiversity and water quality.

It is a legal requirement in the UK for certain plans and programmes stipulated by the **SEA Directive (2001/42/EC),** to undergo Strategic Environmental Assessment (SEA). The Directive is implemented in Wales by the **Environmental Assessment of Plans and Programmes (Wales) Regulations 2004**.

Local strategies are considered to be statutory plans and therefore **Ceredigion's Local Flood Risk Management Strategy** has been determined to require statutory Strategic Environmental Assessment by meeting the aforementioned criteria.

The purpose of the Strategic Environmental Assessment is to *'provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development'*. The Assessment:

- identifies, describes and evaluates the significant environmental effects of implementing the Plan and any alternatives
- identifies actions to prevent, reduce or as fully as possible offset any adverse effects
- provides an early and effective opportunity to engage in preparation of the plan – through consultation
- monitors the implementation of the plan to identify any unforeseen environmental effects and take remedial action where necessary
- reports all of the above in an environmental report

In Wales, the **Conservation of Habitats and Species Regulations (SI 490, 2010)**, often known as the **Habitats Regulations**, implements the EU **Habitats Directive (92/43/EEC)** on the conservation of natural habitats and of wild flora and fauna and certain elements of the **Birds Directive (2009/147/EC)**. This legislation provides the legal framework for the protection of habitats and species of European importance in Wales and England.

As the **Local Flood Risk Management Strategy** has the potential to result in significant effects on sites of international nature conservation importance (namely **Special Areas of Conservation (SACs)**, **Special Protection Areas (SPAs)** and **Ramsar** sites a Habitats Regulations Assessment has been undertaken in parallel with the Strategic Environmental Assessment.

RISK MANAGEMENT AUTHORITIES

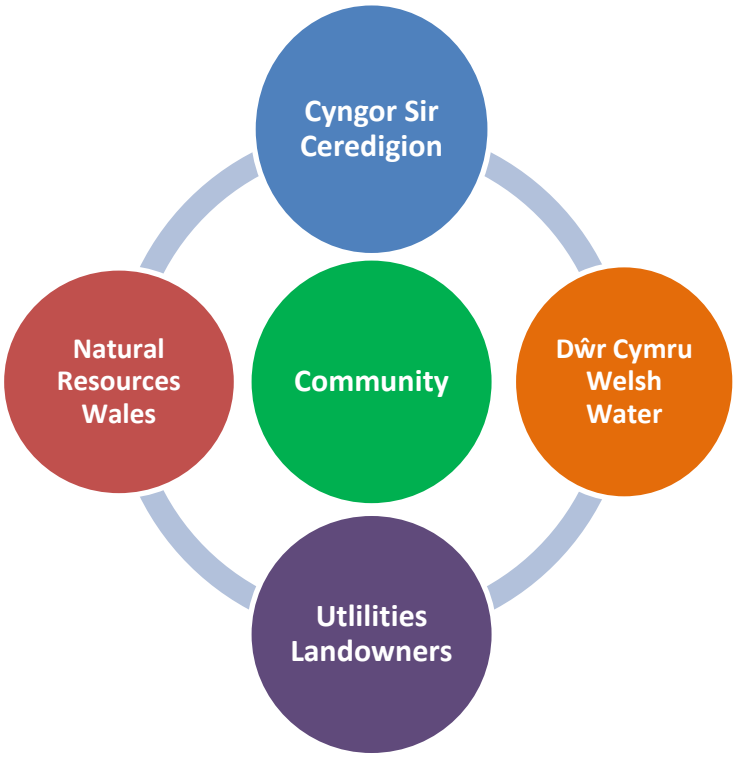
The **Flood and Water Management Act 2010** provides a definition of flood risk management authorities as **'organisations that have a statutory responsibility for managing flood and coastal erosion risk'**. In Ceredigion, these are:

- Ceredigion County Council (as the Lead Local Flood Authority)
- Natural Resources Wales
- Dŵr Cymru Welsh Water
- Ceredigion County Council (as the Highway Authority)
- North and Mid Wales Trunk Road Agent

Ceredigion County Council (as the Lead Local Flood Authority)	**Natural Resources Wales**
Ceredigion County Council Neuadd Cyngor Ceredigion Penmorfa Aberaeron SA46 0PA Tel. 01545 570881 E-mail: reception@ceredigion.gov.uk www.ceredigion.gov.uk	Natural Resources Wales Tŷ Cambria 29 Newport Road Cardiff CF24 0TP Tel. 0300 065 3000 E-mail: enquiries@naturalresourceswales.gov.uk www.naturalresourceswales.gov.uk
Dŵr Cymru Welsh Water	**Ceredigion County Council (as the Highway Authority)**
Dŵr Cymru - Welsh Water Pentwyn Road Nelson Treharris CF46 6LY Tel. 01443 452 300 www.dwrcymru.co.uk	Ceredigion County Council Neuadd Cyngor Ceredigion Penmorfa Aberaeron SA46 0PA Tel. 01545 572 572 E-mail: hpw@ceredigion.gov.uk www.ceredigion.gov.uk
North and Mid Wales Trunk Road Agent	
North and Mid Wales Trunk Road Agent Unit 7 Llys Onnen Parc Menai Bangor LL57 4DF Tel. 01286 685 186 www.northwales-tra.gov.uk	

FLOOD RISK MANAGEMENT AUTHORITIES' RESPONSIBILITIES

The **Flood and Water Management Act 2010** has identified certain organisations as 'risk management authorities' who have responsibilities associated with flooding, both new ones from the **Flood and Water Management Act** and longstanding ones from previous legislation.



Flooding can come from a number of different sources and under recent legislation the responsibility for managing the risk from these different sources falls with different Risk Management Authorities.

Ceredigion County Council, as the Lead Local Flood Authority, is responsible for taking the lead in managing flood risk from local sources. This includes surface water, groundwater and ordinary watercourses and also where there is an interaction between these sources of flooding and flooding from main rivers or the sea.

Surface Water

Ground Water

Ordinary Watercourse

It also has other related roles in relation to coastal erosion, planning, emergency planning, environmental protection and road drainage and these are detailed in sections below.

There are a number of other organisations who together with Ceredigion County Council manage flood and coastal erosion risks in Ceredigion:

Natural Resources Wales has responsibility for managing flood risk from main rivers, reservoirs and the sea, and it also has a strategic overview role over all flood and coastal erosion risk management. It also plays a key role in providing flood warnings to the public and protecting and improving the environment.

Coastal Flooding

Reservoir Flooding

Main Rivers

Dŵr Cymru Welsh Water has responsibility for providing water, and managing the foul and surface water sewerage within Ceredigion.

Sewer Flooding

The North and Mid Wales Trunk Road Agent has responsibility for managing flood risk on the A44 and A487 - for all other adopted roads, responsibility lies with Ceredigion County Council.

Highway Flooding

All of these authorities have the following 'universal' duties and powers:

- Duty to co-operate with other risk management authorities in the exercise of their flood and coastal erosion risk management functions, including sharing flood risk management data.
- Power to (by agreement) take on flood and coastal erosion functions from another risk management authority

But flood risk management is not something that can be left solely in the hands of these organisations and forgotten by everyone else.

It must be noted that although these organisations are responsible for managing flood risk from these sources, they are not liable for any damages caused by flooding. Property owners are responsible for protecting their property from flooding along with their rights and responsibilities as riparian owners.

Even with unlimited budgets, the Risk Management Authorities would still not be able to prevent all floods or solve all concerns. Residents, businesses and landowners all have their part to play too.

POWERS AND DUTIES OF CEREDIGION COUNTY COUNCIL

The main responsibilities of Ceredigion County Council are as:

1) Lead Local Flood Authority
2) Land Drainage Authority
3) Coastal Erosion Risk Management Authority
4) Emergency Planning Authority
5) Highways Authority
6) Planning Authority
7) A Landowner

1) As Lead Local Flood Authority

Ceredigion County Council is the Lead Local Flood Authority for the county, and has a strategic role in overseeing the management of local flood risk.

This involves developing a local strategy, ensuring that all organisations involved in flood risk management are aware of their responsibilities, monitoring progress and activity by all parties involved in flood risk management and co-ordinating communication with the public and between organisations.

The **Flood and Water Management Act 2010** gives Ceredigion County Council further duties and powers.

a) Development of a strategy for local flood risk management
b) Powers to request information from any person in connection with the authority's flood and coastal erosion risk management functions
c) A duty to investigate and publish reports on flooding incidents as appropriate, to identify which authorities have relevant flood risk management functions in relation to the incident
d) A duty to maintain a register of structures or features (asset register) which have a significant effect on flood risk in their area
e) Responsibilities as a SuDS Approval Body (SAB) with responsibility for approval, adoption and maintenance of new SuDS developments (date of implementation to be confirmed)
f) Consenting works on ordinary watercourses that may affect water flow
g) Power to do works to manage flood risk from surface runoff or groundwater
h) Power to designate structures and features that affect flooding

Together with a duty to:

- act consistently with the 'national strategy'
- aim to contribute towards the achievement of sustainable development

a) Prepare a Local Strategy for Flood Risk Management

Lead Local Flood Authorities are required to develop, maintain, apply and monitor a local strategy for flood risk management in its area.

The local strategy will build upon information such as national risk assessments and will use consistent risk based approaches across different local authority areas and catchments.

b) Powers to Request Information

Ceredigion County Council may request a person to provide information in connection with the authority's flood and coastal erosion risk management functions, and if that person fails or refuses to provide the information requested, then there are civil sanctions available to the Council in the form of enforcement notices and financial penalties.

c) Investigation and Recording of Flood Incidents

Lead Local Flood Authorities have a duty to co-ordinate the investigation and recording of significant flood events within their area.

The decision whether or not to investigate a flood is at the discretion of the Lead Local Flood Authority and the comprehensiveness of the investigation will be adjusted to reflect the significance of the incident and the resources available.

An investigation will normally be carried out where any of the following criteria are met, or it is in the public interest to do so:-

- where there is a risk to life as a result of flooding
- where there is ambiguity surrounding the source or responsibility of a flood incident
- where internal flooding of one property (domestic or business) has been experienced on more than one occasion
- where internal flooding of five properties has been experienced during one single flood incident
- where a transport link is totally impassable for a significant period, as a result of flooding
- where critical infrastructure was affected by flooding

In the event of very widespread, significant flooding affecting large areas, the ability to investigate every incident in detail is likely to be limited.

The aim is to bring all useful information together in one place, in order to provide a clearer understanding of situations, outlining possible causes of flooding and potential long-term solutions.

The duty to investigate does not guarantee that problems will be resolved and it cannot be used as a means to force other authorities to act.

d) Preparation of an Asset Register

Flood Risk Assets are structures or features which are likely to have an effect on flood risk.

Ceredigion County Council as a Lead Local Flood Authority is required to maintain a register of structures or features which are considered to have an effect on flood risk.

This register will be available for use by the relevant risk management authorities and for inspection by the public.

It will take time for this register to be comprehensive enough to be of real value in flood risk management, but steps are underway to develop a register within the council and to link up existing registers held by other authorities.

e) SuDS Approval Body (SAB)

Ceredigion County Council will take on the role of a **SuDS Approval Body (SAB**) under the **Flood and Water Management Act 2010** and it must:

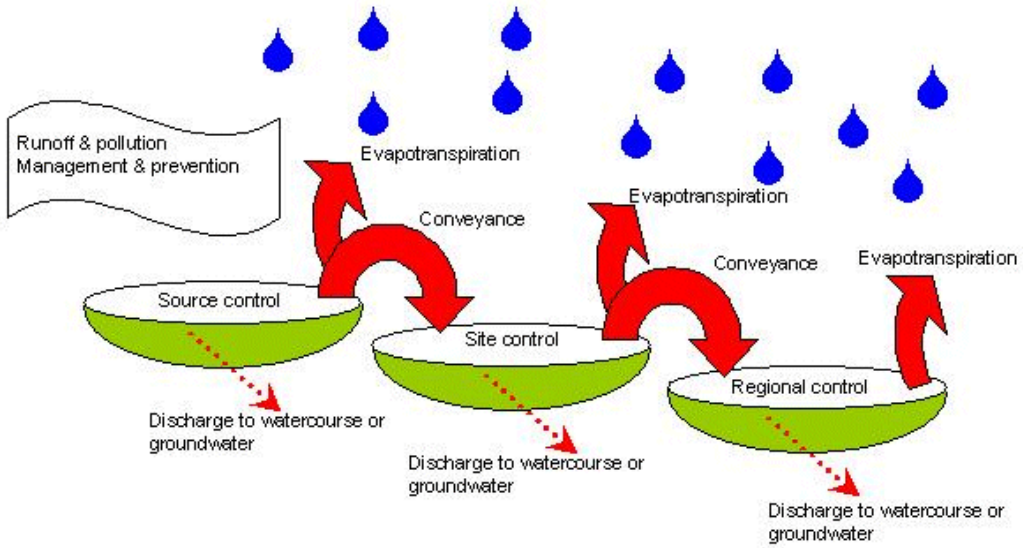
- Assess and Approve all construction work which has drainage implications to ensure compliance with national standards
- Adopt all SuDS schemes associated with surface water emanating from more than one property
- Ensure that all adopted SuDS Schemes are properly maintained

When this schedule of the Act is enacted full details of how this will be implemented will be agreed with partners and publicised widely.

SUDS Treatment Train

Sustainable Drainage Systems (SuDS) provide a mechanism for ensuring that any development takes place without causing drainage problems or increasing flood risk.

By retaining surface water runoff within the development and controlling it as near to its sources as possible, SuDS is an approach to managing surface water runoff which seeks to mimic the natural drainage system and reduce flooding in the catchment by promoting groundwater recharge. SuDS can also play an important role in assisting to improve water quality and amenity.



The SuDS Treatment Train

f) Consenting of Works on Ordinary Watercourses

Since 6 April 2012, Ceredigion County Council has been responsible for the regulation of ordinary watercourses within the County to ensure that flood risk is managed appropriately and to assess any proposed works for their effects upstream, downstream and to the environment.

The **Ordinary Watercourse Regulation** consists of two elements:-

- Issuing of consents for any proposed changes to a watercourse channel that are considered to obstruct or alter the flow of an ordinary watercourse
- Enforcement action to rectify unlawful culverting or damaging work to an ordinary watercourse

If riparian owners or other bodies want to undertake works within an ordinary watercourse, they should apply to the Lead Local Flood Authority for consent.

This is in order to ensure that obstructions and other works which may increase flood risk are not constructed. Natural Resources Wales continue to undertake the equivalent role on Main Rivers.

g) Designation of Assets

Ceredigion County Council and Natural Resources Wales are both 'designating authorities'.

They have powers to designate structures and features that affect flooding or coastal erosion in order to safeguard assets that are relied upon for flood or coastal erosion risk management

When an asset is 'designated' it cannot be altered or removed without the consent of the designating risk management authority. However, a designation does not mean that there is a duty for it to be maintained in its current condition.

h) Powers to do Works

The **Flood and Water Management Act** has amended certain powers that Ceredigion County Council held under the **Land Drainage Act 1991**, and as a result, the Council can now carry out works to install or improve a system of land drainage or make other owners carry out their obligations - but it does not have a duty to do so.

2) As a Land Drainage Authority

Ceredigion County Council has no responsibilities (except when it is a landowner) under the **Land Drainage Act 1991**, it does however have a number of permissive powers, which it can employ but is under no obligation to use. These include:

- Permissive powers to maintain or improve existing works or to construct new works in order to help mitigate flooding
- Permissive powers to serve notice on landowners requiring them to undertake works deemed necessary to help mitigate flooding. Failure to comply with such a notice may result in the Council undertaking the work and recharging the owner the costs incurred in undertaking the works
- Power to require works for maintaining flow of watercourse

3) As a Coastal Erosion Risk Management Authority

Responsibilities include:

- Development of a **Shoreline Management Plan**
- Delivery of coastal erosion risk management activities
- Working alongside Natural Resources Wales to develop and maintain coastal flood and erosion risk information
- Maintain a register of assets and features that help to manage coastal risks

4) As the Emergency Planning Authority

Ceredigion County Council's Civil Contingencies Unit supports the efficient delivery of civil preparedness and business continuity services. The unit provides expertise to enable the Council to meet its statutory responsibilities:

- Assess risks in accordance with the Community Risk Register
- Develop Ceredigion's Emergency Plans
- Maintain system for warning, informing and advising public in event of an emergency
- Share information and cooperate with other responders

During and after an emergency, Ceredigion County Council undertakes the following:

- Coordinates emergency support
- Deals with surface water, groundwater and ordinary watercourse flooding

- Works with the other responders as part of the multi-agency response to floods
- Coordinates emergency support from voluntary organisations
- Liaises with Welsh Government
- Liaises with essential service providers
- Opens rest centres
- Manages the local transport and traffic networks
- Provides emergency assistance.
- Deals with environmental health issues
- Coordinates the recovery process
- Manages public health issues
- Provides support and advice to individuals and businesses

5) As the Highways Authority

All Highways Authorities are Risk Management Authorities under the **Flood and Water Management Act**. Ceredigion County Council is the Highways Authority for most of the county's publicly maintained roads, with the only exceptions being:

- A44
- A487

These are the responsibility of the North and Mid Wales Trunk Road Agent. Highways authorities also have further responsibilities:

Responsibility to Maintain the Highways

Under the **Highways Act**, the Highways Authority has a duty to maintain the highway. This includes ensuring that highway drainage systems are clear and that blockages on the highway are cleared. As part of this duty, roads are regularly inspected and maintained.

Where flooding on a highway is caused by another person (e.g. an adjoining landowner), Ceredigion County Council will attempt to educate and advise landowners in relation to works to prevent or mitigate the flooding, but the Highways Authority can ultimately take action against the person responsible.

Powers to Deliver Works

The Highways Authority has powers (not a duty) to deliver works that it considers necessary to protect the highway from flooding. These can be on the highway or on land which has been acquired by the Highway Authority in the exercise of highway land acquisition powers for that purpose.

Again, where flooding on a highway is caused by another person, the Highway Authority can take action against the person responsible.

Response in an Emergency Flooding Event

In the event of an emergency or major incident the Highways Authority will aim to provide:

- The means for people to travel home or to a place of safety
- to restore the flow of traffic to the transportation network
- Use of established media contacts to keep the public informed on travel matters
- The means to inspect, repair or clear the highway network

6) As a Planning Authority

Ceredigion County Council is a Planning Authority with responsibilities for planning functions, and these affect Flood Risk Management in three key ways:

- Considering flooding concerns in developing local plans
- Working alongside developers and the soon to be formed **SuDS Approval Body** in ensuring that planning applications and drainage applications are complementary
- Considering flood risk assessments submitted in support of applications

Section 13 of **Planning Policy Wales** sets out principles with regards to flood risk and seeks to ensure that Local Planning Authorities (LPAs) consider flood risk as a material consideration. The overarching principles seek to ensure Local Planning Authorities work towards:-

- Avoiding the inappropriate development of areas where there is flood risk, as opposed to seeking to use flood defences and mitigation techniques
- Ensuring that development will not increase flood risk elsewhere and not impede water flow
- Infrastructure being capable of coping with the increasing risk of flooding
- Built development on flood plains currently unobstructed, should be exceptional and limited to essential transport and utilities infrastructure.

Technical Advice Note (TAN) 15: Development and Flood Risk

Technical Advice Note (TAN) 15: Development and Flood Risk provides a more in depth framework which can enable more informed assessment of flood risk which may arise from river, coastal or surface water run-off. TAN15 promotes a precautionary approach to the location of development in flood risk areas, this approach encompasses:-

- Directing development from areas at greatest risk of flooding
- The need to carry out justification tests to demonstrate that the location of a development in an area classified as being at high risk of flooding is of strategic importance and the consequences of flooding have been considered

There are two features of TAN15 which help to govern the precautionary approach:

- Development Advice Maps (DAMS) set out three different development advice zones which incur different planning actions depending upon the level of risk associated with the zone
- TAN15 sets out that certain types of development may not be acceptable in some areas with particular flooding consequences. To help identify the vulnerability of a development to flooding, TAN15 has categorised certain types of development into three categories:

    - Emergency Services – includes facilities which need to be accessible at all times, e.g. emergency services
    - Highly Vulnerable Development – includes developments where occupants may be limited in managing the risk of flooding to life and property (e.g. residential/ schools)
    - Less Vulnerable Development – includes developments where occupants have a greater opportunity to decide if they wish to accept such flood risks (e.g. commercial, employment, industrial and retail)

Planning Policy - Local Development Plan

The **Planning and Compulsory Purchase Act 2004** requires Local Planning Authorities to produce a **Local Development Plan** (LDP).

The **Local Development Plan** will aide planning officers in managing flood risk and inappropriate development in the flood plain. Policies and Supplementary Planning Guidance (SPG) should allow developers to be better informed of requirements for flood risk from the start, which may

remove the pressure put on stakeholders to deliver planning related comments on planning applications.

Co-operation between the Planning Authority and any future SuDS Approval Body requires the planning authority to:

- Consult with the SuDS Approval Body about drainage issues on the site
- Ensure that requests for outline planning permission are discussed with the SuDS Approval Body

7) Responsibilities as a Landowner

As an owner of land adjoining a watercourse, Ceredigion County Council has certain rights and responsibilities. In law, these are known as Riparian Rights and Responsibilities, and where these occur the Council is responsible for:

- Maintaining watercourse beds, banks, structures
- Allowing the flow of water to pass without obstruction
- Controlling invasive alien species such as Japanese Knotweed

NATURAL RESOURCES WALES (NRW)

N.B. *Since 1 April 2013, Natural Resources Wales (NRW) has taken over the responsibilities of the Environment Agency in Wales (EAW).*

Natural Resources Wales is a Welsh Government Sponsored Public Body, whose principal aim is to protect and improve the environment, and to promote sustainable development.

Historically, Environment Agency Wales had both a national strategic role and local operational roles when it came to flood and coastal erosion risk management, but with the introduction of the **Flood and Water Management Act 2010** it also had operational responsibilities in relation to coastal erosion and a wider overseeing role for all flood and coastal erosion risk management.

This change means that in Wales, Natural Resources Wales now has a dual role:-

- operational responsibilities for flooding from main rivers, the sea and coastal erosion
- oversight responsibilities in relation to all flood and coastal erosion risk management in Wales

The operational change has been undertaken in recognition of the links between coastal flooding and coastal erosion, particularly in terms of consequences.

As Welsh Government moves to introduce a national policy in relation to coastal change, including erosion, accretion, squeeze and managed realignment, allocating operational responsibility to Natural Resources Wales is intended to enhance existing partnership arrangements such as those seen in coastal groups and through the establishment of the second edition of the **Shoreline Management Plans**.

The oversight change is integral to the delivery of national policy on flooding and coastal erosion risk management and as part of that role Natural Resources Wales will lead on the provision of technical advice and support to the other Risk Management Authorities. They will also lead on national initiatives such as Flood Awareness Wales, the national raising awareness programme, and the single point of contact for enquiries and information on flood risk, currently being piloted via their Floodline Warning Service.

Natural Resources Wales will be the sole Risk Management Authority charged with monitoring and reporting on the **National Strategy's** implementation. In undertaking this role they will:

- collect data on progress from Risk Management Authorities
- report factual information to Welsh Government

- provide interpretive advice to the Welsh Government

In addition to their statutory duties, Natural Resources Wales has a number of permissive powers. These are powers that allow them to do something, but do not compel them to, and include:

- powers to request information;
- the ability to raise levies for local flood risk management works
- powers to designate certain structures/features that affect flood or coastal erosion risk
- the expansion of powers to undertake works to include broader risk management actions
- the ability to cause flooding or coastal erosion under certain conditions

This new allocation of responsibilities is also consistent with the Natural Resources Wales's role in relation to the **Flood Risk Regulations 2009**, which allocates specific responsibility for conducting assessments in relation to mapping and planning the risks of flooding from main rivers, the sea and reservoirs to the Natural Resources Wales as well as providing guidance to Local Authorities on these matters for flooding from other sources.

Under the **Regulations** Natural Resources Wales also take on an assessment and coordination role at a national level, ensuring the correct information is passed back to the European Commission.

There are no Internal Drainage Boards in Ceredigion, however there is a single Internal Drainage District (IDD) in the County (Borth IDD) which is directly administered by Natural Resources Wales, and as such they are responsible for managing the flood risk from all sources within the Internal Drainage District.

Local Operational Role

Natural Resources Wales's Local Operational Role includes emergency planning and managing flooding from main rivers, reservoirs and the sea.

Main Rivers

Natural Resources Wales has powers to carry out maintenance and improvement works on Main Rivers. It can also propose flood defence and will work with lead local flood authorities and local communities to shape schemes which respond to local priorities. The overall responsibility for maintenance of Main Rivers, however, lies with the riparian owner.

Reservoirs

Natural Resources Wales enforces the **Reservoirs Act 1975**, which is the safety legislation for reservoirs in the United Kingdom. Natural Resources Wales is responsible as the Enforcement Authority in Wales for reservoirs that are greater than 10,000m^3.

Responsibility for carrying out work to manage reservoir safety lies with the reservoir owner/operator.

Natural Resources Wales is also responsible for establishing and maintaining a register of reservoirs, and making this information available to the public.

Coastal Erosion Risk Management Authority

Natural Resources Wales is also a coastal erosion risk management authority with the power to protect land against coastal erosion and to control third party activities on the coast.

Emergency Planning

Natural Resources Wales also contributes to the development of multi-agency flood plans, which are developed by local resilience forums to help the organisations involved in responding to a flood to work better together.

It works to provide forecasts and warnings of flooding from rivers and the sea.

It also has a role in the operational management of flood risk assets and systems to reduce risk during a Flooding event.

Planning Process

Natural Resources Wales provides advice to planning authorities in relation to development and associated flood risk. It also provides flood warnings and supports emergency responders when floods occur.

DŴR CYMRU WELSH WATER (DCWW)

Dŵr Cymru Welsh Water is responsible both for the provision of water and for making appropriate arrangements for the drainage of foul water, the treatment of waste, surface water sewers and combined sewers.

Dŵr Cymru Welsh Water has primary responsibility for floods from water and sewerage systems, which can include sewer flooding, burst pipes or water mains or floods causes by system failures.

Whilst no changes have been made to the operational arrangements of Dŵr Cymru Welsh Water for water and sewerage management, the **Flood and Water Management Act 2010** places a number of statutory duties on it in relation to flood risk management, including:

- Responding to flooding incidents involving Dŵr Cymru assets
- Producing reports of the flood incidents
- Maintenance of a register of properties at risk of flooding due to a hydraulic overload
- Undertaking improvements to alleviate sewer flooding problems
- A duty to co-operate with other relevant authorities in the exercise of their flood and coastal erosion risk management functions
- Must have a regard to national and local flood and coastal erosion risk management strategies

Water and sewerage companies often hold valuable information which could greatly aid the understanding of flood risks faced by communities across Wales. They are required to maintain a register of properties and areas that have suffered internal flooding, the DG5 register, but may have access to significantly greater information from incident records, previous investigations and hydraulic modelling.

Dŵr Cymru Welsh Water recognises that it has a joint role with other flood risk management authorities to meet the responsibilities of the **Flood and Water Management Act** and that this approach offers wider benefits in a shared understanding of issues and a wider understanding of the benefits of working in partnership to achieve the most effective and sustainable flood risk management solutions.

Dŵr Cymru Welsh Water is responsible for flooding from public foul, combined or surface water sewers, and from burst water mains or floods caused by system failures.

The majority of sewer and water main flooding is reported to the respective Dŵr Cymru Welsh Water 24 hour operational call centres and where any incident involves its assets a field team will be dispatched.

Where there is a presence (or evidence) of flooding, details will be recorded and further investigated, which may lead to a recording on the DG5 Register. The DG5 register is a register of properties and areas that have suffered or are likely to suffer flooding from public foul, combined or surface water sewers due to overloading of the sewerage system. Investment in the alleviation of sewer flooding is closely allied to the DG5 register. Priority is given to frequent internal flooding problems where a cost beneficial and sustainable solution is available.

Temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded from the DG5 register.

UTILITY AND INFRASTRUCTURE PROVIDERS

Utility and infrastructure providers are not risk management authorities.

However they may have assets such as culverts, information about which needs to be shared with flood risk management authorities.

They already maintain plans for the future development and maintenance of the services they provide and it is important that they factor in flood risk management issues into this planning process.

RESIDENTS, LANDOWNERS AND BUSINESSES

It is the responsibility of householders and businesses to look after their property, and that includes protecting it from flooding. While in some circumstances other organisations or property owners may be liable due to neglect of their own responsibilities, there will be many occasions when flooding occurs even when all parties have met their responsibilities. It is important therefore that householders take steps to ensure that their house is protected.

These should include:

- Checking whether their property is at risk of flooding from rivers, watercourses, the sea or other sources
- Ensuring that preparations have been made in the event of a flood
- Take measures to ensure that their property is protected from flooding
- Take measures to ensure that their property is resilient to flooding
- Taking out flood insurance where possible

Information on whether households are at risk can be provided either by Natural Resources Wales (through the Environment Agency website) or Ceredigion County Council.

www.environment-agency.gov.uk/homeandleisure/floods/31650.aspx

Natural Resources Wales (through the Environment Agency website) also provides information on what to do to prepare for flood emergencies, and how to make your property more flood resilient:

www.environment-agency.gov.uk/homeandleisure/floods/38329.aspx
www.environment-agency.gov.uk/homeandleisure/floods/106769.aspx

'RIPARIAN' OWNERSHIP

Landowners, householders and businesses whose property is adjacent to a river, stream or ditch are likely to be Riparian Owners with associated responsibilities.

If a property backs onto a river or stream then the property owner is likely to be a riparian owner, owning the land up to the centre of the watercourse, with certain rights and responsibilities, which include:

Rights

- To receive a flow of water in its natural state, without undue interference in quantity or quality
- To protect your property against flooding from the watercourse and to prevent erosion of the watercourse banks or any nearby structures

Responsibilities

- To pass on flow without obstruction, pollution or diversion
- To maintain the banks and bed of the watercourse (including any trees and shrubs growing on the banks) and any flood defences that exist on it
- You must not build a new structure that encroaches upon the watercourse or alters the flow of water without first obtaining permission from your local authority or Natural Resources Wales

Further information on the rights and responsibilities of Riparian Owners can be found in the Environment Agency document 'Living on the Edge'.

TOWN AND COMMUNITY COUNCILS

Flooding affects communities as well as individuals, and the Community, as much as anyone know the risk that they face, having vital knowledge about the history of flooding in their respective areas.

New residents may not be aware of the risk of flooding in the locality, particularly if there has not been a recent history of flooding.

Town and Community Councils therefore have an important role to play in communicating flood risk to those who may be unaware of the risk, and to direct those individuals to Ceredigion County Council and Natural Resources Wales.

ASSESSMENT OF LOCAL FLOOD RISK

Floods pose a real risk to life and we have seen deaths across the UK and Europe during the floods of the recent past.

Beyond risk to life, and as we saw in Gloucester in 2007, Cumbria in 2009 and in Ceredigion and North Wales during 2012, a flood can destroy homes and businesses in minutes. Local economies can be devastated, residents made homeless and communities destroyed.

Whilst there has been historical localised, isolated flooding within areas of Ceredigion, the scale and extent of flooding witnessed in June 2012 was unprecedented, when over 200mm rain fell on the night of Friday the 8th and the early hours of Saturday the 9th over most of Northern Ceredigion.

During the incident numerous residential and commercial properties were affected as a number of rivers and watercourses were unable to cope with the level of rainfall experienced during the previous weeks which had resulted in saturated ground conditions, and in particular the rainfall in the preceding 24 hrs.

The effects, and particularly the impacts on health, can last for months, years or decades depending on the speed and impact of the flood.

The likelihood and risk of flooding depends on a number of factors, including weather patterns, geology, topography and land use.

Just as a period of prolonged rainfall is likely to result in higher river levels, increasing the likelihood that the rivers will overflow, then a very heavy or intense rainfall event can increase the likelihood of rapid flooding of rivers and surface water flooding as the ground struggles to absorb the water or the drainage system is not able to carry the volume of water.

Low lying coastal areas, or flood plains also have an increased likelihood of flooding as a result of their proximity to water sources.

With coastal erosion, the impacts often happen over a longer timescale, but are no less devastating for those affected.

As the risks of coastal erosion increase in the future we face the very real possibility of some coastal communities having to relocate further inland, or disappear.

All flood events carry a risk to life. Both for those directly affected and for those involved in attempting to help those directly affected, and the dangers of flood waters cannot be overstated.

Flood Type	Description	Responsible Authority
Coastal/Tidal Flooding	Coastal/tidal flooding usually occurs through a combination of coastal erosion, high tides, waves and severe weather.	Ceredigion County Council Natural Resources Wales
Ordinary Watercourses **e.g. streams and ditches**	Local, generally smaller watercourses.	Riparian owners Ceredigion County Council Natural Resources Wales (within the Borth Internal Drainage District)
Main Rivers	Principal watercourses and strategic smaller watercourses.	Riparian owners Natural Resources Wales
Reservoirs	Large water pounds with embankments represent a potential flood risk.	Natural Resources Wales
Surface water Flooding	High intensity rainfall giving rise to overland flow of surface water which can pond in low lying areas resulting in flooding. (also known as pluvial flooding)	Ceredigion County Council
Sewer/Drainage Flooding	The public sewer system has a finite capacity and at times of heavy rainfall surface water entering surface water sewers, combined sewers and foul sewers can become overloaded giving rise to surface flooding.	Dŵr Cymru Welsh Water Landowner (un-adopted foul and surface water drainage systems)
Groundwater Flooding	Geological conditions can cause surface water which has infiltrated into the ground to emerge at certain locations in the form of wells etc. Also high water tables can be present in locations where there are particular ground conditions. This type of flooding generally occurs after long periods of rainfall as water builds up in underground aquifers	Ceredigion County Council
Highway Flooding	Highways have extensive drainage systems and at times of heavy rainfall hydraulic overload can give rise to ponding of water which can in turn have an impact on property. The presence of water on roads can also give rise to problems for road users causing flooded roads to be closed at certain times.	Welsh Government (Trunk roads) via the North and Mid Wales Trunk Management Agent Ceredigion County Council (for all other public highways)
Railway Flooding	A rare occurrence, but at times of heavy rainfall there is the potential for hydraulic incapacity to give rise to flooding which can effect railway operations.	Network Rail

There are other consequences associated with flooding which must also be considered.

The economic impact of flooding on a personal, regional and national level is significant, but perhaps the most marked long-term impact is that on the wellbeing of those who have experienced flooding.

These effects can be particularly pronounced in certain vulnerable sections of the community. While flood water does not discriminate, and affects all sections of the community, certain groups are less able to cope with the effects of flooding. Elderly and disabled residents may require additional support during an event and temporary accommodation may not suit their health needs, making the effects of displacement even more marked.

For coastal erosion the impacts and consequences often take longer to become evident, but are no less devastating.

Historically coastal erosion has been low in Wales and it has been estimated that only 1.4 km² of land and three properties have been lost to coastal erosion over the last 100 years. With sea levels projected to rise by around a metre over the next 100 years, both coastal erosion and the impacts on coastal communities are set to increase significantly.

Historic Flooding

Detailed data on past surface water flooding is limited. What was available prior to the preparation of this strategy was used to inform our **Preliminary Flood Risk Assessment**.

Following the enactment of the various clauses contained with the **Flood and Water Management Act**, there is now a system in place to record all flooding incidents reported and this information will provide us with a better indication of where the main problem areas are within the County. This information, together with that derived from any flood investigations undertaken, will be reviewed on a regular basis to guide future work.

Localised floods have and will continue to occur in many areas of the county under severe weather conditions and with climate change it is likely to make these events more frequent and more severe. The aim is to try to predict and reduce the risks where possible and have emergency plans in place to deal with the exceptionally severe event.

Unlike main river flood situations, flooding caused by localised rainfall is much harder to predict and as yet there are no adequate warnings available to allow evacuation of an area at risk from this sort of event.

Potential Risk of Flooding

The **Preliminary Flood Risk Assessment (PFRA)** completed by Ceredigion County in June 2011 to satisfy its obligations under the **Flood Risk Regulations 2009** outlined where the potential risk of surface water flooding is thought to be greatest.

As there is no local information on predicted future flooding available, the *'locally agreed surface water information'* in respect of future flooding is considered to be the *'Flood Map for Surface Water, 1 in 200 annual chance'* of occurring dataset produced by the Environment Agency and reviewed in the preparation of the **Preliminary Flood Risk Assessment**, which gives an overview of the future flood risk from surface water.

It was agreed that this was the best information available to the Authority, and details those areas within the Authority which may be at a locally significant level of risk of flooding in the future.

It should be emphasised, that whilst this was the best available information in respect of predicted future flood risk, flooding from surface water and/or ordinary watercourses could occur almost anywhere.

However, it is not possible to look at every potential flooding location immediately, nor will it be possible to reduce all flood risk, and it is therefore necessary to identify places which will derive the most benefit, and prioritise accordingly.

The information collated regarding future flood risk was used to formally identify 'Flood Risk Areas' based on *flood risk indicators* to determine the impacts of flooding on human health, economic activity, cultural heritage and the environment.

The Key flood risk indicators are:

- **Human Health** - Number of residential properties.
- **Critical Services** - Hospitals, Police/Fire/Ambulance Stations, Schools etc
- **Economic Activity** - Number of non-residential properties
- **Length of road or rail**
- **Areas of agricultural land**
- **Cultural Heritage** - Cultural heritage sites/World Heritage Sites
- **Environment Designated Sites** - SSSIs, SACs, SPAs etc

The first three indicators above have been selected by the Welsh Government in order to identify areas where flood risk and potential consequences exceed a pre-determined national threshold.

The indicators used to identify places above the flood risk thresholds, based on the Flood Map for Surface Water (deep - for 1 in 200 annual probability rainfall) are:

- more than 200 No. people affected
  (based on residential property numbers x 2.34)
- at least 1 No. critical service affected
- more than 20 No. non-residential properties affected

within each 1km^2 square as based on the Ordnance Survey National Grid.

The agreed locations of the individual squares (or cluster of squares) within Ceredigion satisfying any of the above criteria are:

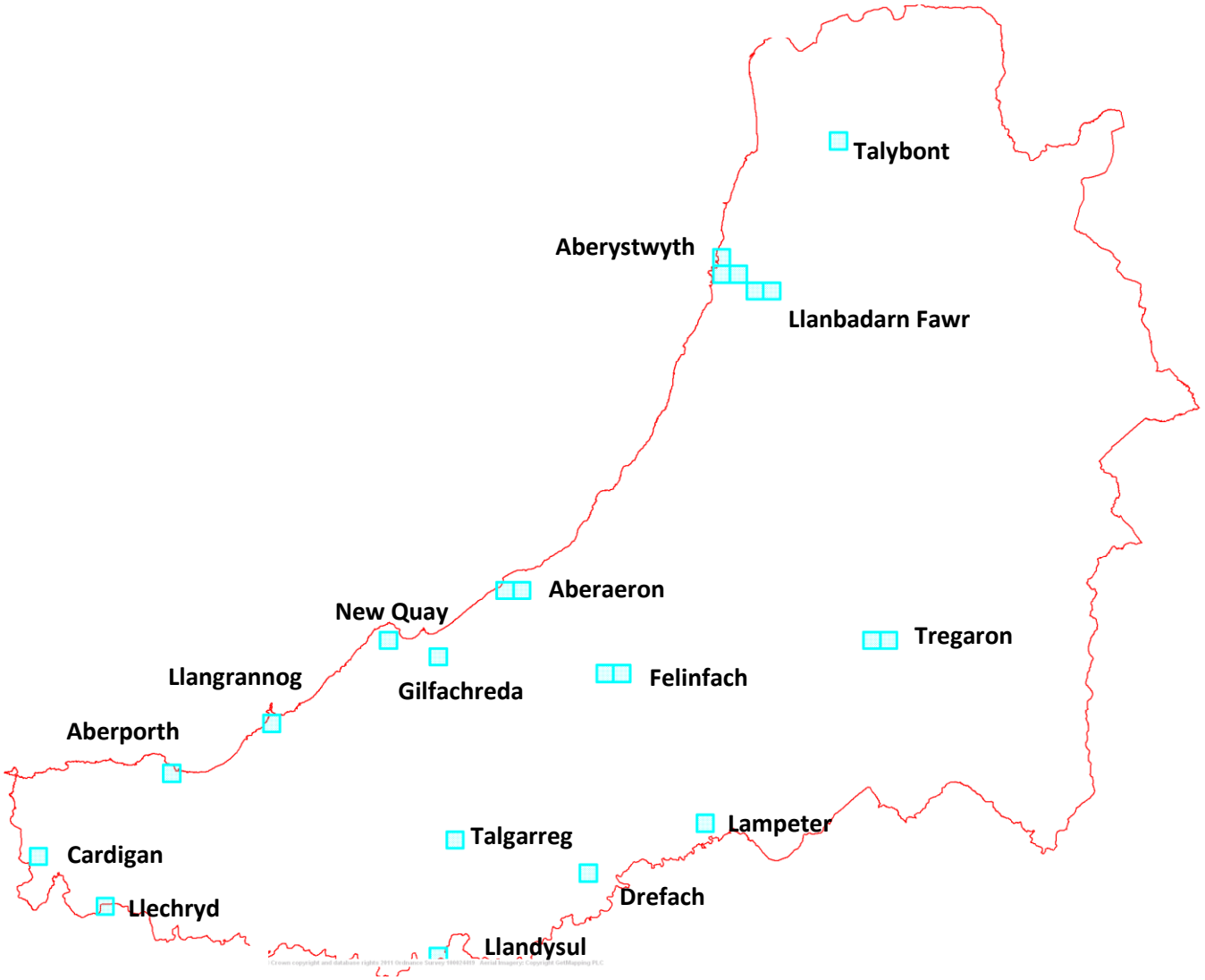
- Talybont
- Aberystwyth
- Llanbadarn Fawr
- Tregaron
- Lampeter
- Llandysul
- New Quay
- Cardigan
- Llangrannog
- Aberporth
- Llechryd
- Aberaeron
- Felinfach (Aeron Valley)
- Gilfachreda
- Drefach
- Talgarreg

These are indicated on the map overleaf

The identification of these clusters and single ‘blue squares’, together with the information on recorded flood incidents, provides a very useful starting point as to where particular effort should be focused in respect of further investigations and possible flood risk reduction measures.

As part of the follow up to the **Preliminary Flood Risk Assessment**, Natural Resources Wales will also produce Flood Hazard and Flood Risk maps on behalf of the Welsh Government, for those areas identified as at risk.

When these become available they will provide further information on surface water flooding that can be used to prioritise investment in those areas that will benefit most in social, economic and environmental terms.



Map 1 – Flood Risk Area satisfying national threshold criteria based on a 1 in 200 annual probablity rainfall event

Prioritisation

It will not be possible to look at every potential flooding location straight away. The resources available to manage flood risk are limited, and it is therefore necessary to prioritise locations where the focus of effort will derive the maximum benefit in terms of flood risk reduction.

Some factors which will need to be considered when allocating resources are:

- Population at Risk
- Critical Services at Risk
- Infrastructure at Risk
- Commercial Units at Risk
- Proposed development potential
- Static and Touring Caravan Sites
- Historic surface water, main river and tidal flooding areas
- Environmentally protected sites, historic buildings and ancient monuments
- Climate change mitigations

Interactions between the different sources of flooding

Whilst the primary focus of this Strategy is flood risk from 'local' sources such as surface water, ordinary watercourses and groundwater, flooding can arise from a number of different sources in combination, and for each source there may be a different flood risk management authority.

In most cases, the source of flooding is clear, and the relevant flood risk management authority will be the point of contact. However, in other cases the source of flooding cannot be as easily identified, with flooding possibly occurring from several sources. In those circumstances, Ceredigion County Council as Lead Local Flood Authority will take the lead, and will work with its partners to investigate the causes of the flooding.

Impact of Climate Change

The impact of climate change on local flood risk is relatively poorly understood.

Several national flood maps were used in the preparation of the preliminary assessment report – specifically the Flood Map for Surface Water (surface runoff), Areas Susceptible to Surface Water Flooding (surface runoff) and Flood Map (ordinary watercourses); however they do not include predictions of the impact of climate change on local flood risk.

There is a general consensus amongst climate model projections that in winter, high extremes of precipitation are very likely to increase in both magnitude and frequency.

These models predict drier summers with increased chance of intense precipitation – intense heavy downpours interspersed with longer, relatively dry periods.

Climate change projections suggest therefore that we will experience an increase in the intensity of rainfall with increased frequency of sudden storms, and when you consider these factors in combination with an expected rise in sea levels, we are likely to see an increase in the frequency and consequences of flooding and coastal erosion.

The evidence of increased risk from both flooding and coastal erosion is underpinned by a series of reports produced in the last few years including the **UK Climate Projections, 2009,** the **Foresight: Future Flooding Study**, the **Stern Review on the Economics of Climate Change** and the **Pitt Review into the Summer 2007 Floods**.

United Kingdom Climate Projections 2009 (UKCP09) provides the most up to date projections of future climate change for the UK with the key findings for Wales suggesting that by 2050 (http://ukclimateprojections.defra.gov.uk/):

- average annual temperatures are projected to increase by 2.3°C
- summer daily maximum temperatures are projected to increase by 3.4°C
- winter daily minimum temperatures are projected to increase by 2.5°C
- rainfall is projected to:
  - increase in winter on average by 14%
  - decrease in summer by 16%
- sea levels around Wales are predicted to rise by approximately 20cm
- storm intensity in summer and winter will increase, leading to more severe storms and larger waves attacking our shores

If the rate of climate change is faster than suggested, then the impacts are likely to be more severe. For example, higher sea levels than those suggested could result in even greater rates of erosion to our coast. Likewise, if the rate is slower then the impacts are expected to be less severe.

The projections are based on the best available information but there are still uncertainties. It is therefore important that we consider a range of possible future climate changes when investigating ways to manage the risks of flooding and coastal erosion.

The Welsh Government has also produced a **Climate Change Risk Assessment** and a **Climate Change Strategy for Wales**. These documents present the risks and opportunities from climate change facing the country and how they intend to prepare Wales for the impacts of climate change.

http://wales.gov.uk/topics/environmentcountryside/climatechange/publications/strategy/?lang=en
http://wales.gov.uk/topics/environmentcountryside/climatechange/publications/riskassess/?lang=en

OBJECTIVES FOR MANAGING LOCAL FLOOD RISK

The move towards flood and coastal erosion risk management in recent years has been made in recognition of the limitations of flood and coastal defence.

It is not possible to prevent all floods, but by working together and employing a wider range of risk management measures, improvements can be made to the way the impacts and consequences of flooding are managed.

The overarching aim is to reduce the risk to residents and businesses of suffering the misery and economic devastation that flooding can bring.

The Welsh Government expects the relevant Risk Management Authorities to deliver their flood and coastal erosion risk management functions in a manner that:

- embeds sustainable development as the central organising principle
- achieves a better quality of life for our own and future generations
- is focused on the needs of individuals, communities and businesses
- supports the wider economic renewal programme
- promotes equality and does not exacerbate poverty
- is based upon a holistic understanding of the risks and consequences
- considers the full range of risk management responses
- contributes to the holistic management of our water, land and marine resources
- facilitates long term resource and investment planning
- enables effective prioritisation of investment, resources and actions
- maximises opportunities to adapt to climate change
- takes account of the requirement of relevant European and domestic legislation

The **National Strategy for Flood and Coastal Erosion Risk Management in Wales** prepared by the Welsh Government under the terms of the **Flood and Water Management Act 2010** sets four overarching objectives for the management of flood and coastal erosion risk in Wales:

- reducing the consequences from flooding and coastal erosion
- raising awareness of and engaging people in the response to flood and coastal erosion risk
- providing an effective and sustained response to flood and coastal erosion events
- prioritising investment in the most at risk communities

These are supplemented and supported by 11 sub-objectives, and 53 measures.

Some of these sub-objectives and measures are for Lead Local Flood Authorities to deliver in support of the wider Objectives as set out by the Welsh Government.

Ceredigion County Council will assist in the delivery of three of these objectives, through the delivery of the sub-objectives outlined below:

THE OBJECTIVES	SUB-OBJECTIVES
Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion	Provide strategic leadership and direction at a local level
	Develop policies for effective land use management and enhanced development control procedures where appropriate.
	Establish regular maintenance schedules for flood and coastal erosion risk management assets.
Raising awareness of and engaging people in the response to flood and coastal erosion risk	Ensure that by 2026 everyone who lives in a flood risk area understands the flood risk they are subject to, the consequences of this risk and how to live with that risk
Providing an effective and sustained response to flood and coastal erosion events	Ensure the preparation and testing of Emergency Plans
	Respond to events in a timely and appropriate manner
	Facilitate recovery from flooding within the shortest possible timescales

At the highest flood management level, there are essentially three strategic options:-

- **Do Nothing** - acknowledging that flood risk will increase with climate change, increasing the risk of social, economic and environmental damage
- **Maintain** – keep at pace with climate change so that there is no net increase in flood risk; existing flood risk management infrastructure will need to be improved over time and all new development will need to take climate change into account
- **Reduce Flood Risk** - take action to reduce social, environmental and economic impact due to flooding

In order to comply with the high level objectives outlined in the **National Strategy**, Ceredigion County Council has set its high level strategy as **Reduce Flood Risk** in order to reduce the current flood risk wherever possible.

OBJECTIVE 1
REDUCING THE CONSEQUENCES FOR INDIVIDUALS, COMMUNITIES, BUSINESSES AND THE ENVIRONMENT FROM FLOODING AND COASTAL EROSION

SUB-OBJECTIVE
PROVIDE STRATEGIC LEADERSHIP AND DIRECTION AT A LOCAL LEVEL

Measures for Delivery of the Sub-Objective:

DELIVERY OF THE SECOND ROUND OF SHORELINE MANAGEMENT PLANS BY 2012 WITH PROPORTIONATE IMPLEMENTATION OVER THE LIFE OF THE STRATEGY

The **West of Wales Shoreline Management Plan** (SMP2) developed by Ceredigion County Council as a member of the Cardigan Bay Coastal Group covers the length of coastline between St Anne's Head in Pembrokeshire and the Great Orme in Conwy.

It was produced in combination with the Ynys Enlli to the Great Orme Coastal Group, with the lead authority role being taken by Pembrokeshire County Council.

The **Shoreline Management Plan** provides a large-scale assessment of the risks associated with coastal evolution and presents a policy framework to address these risks to people and the developed, historic and natural environment in a sustainable manner. In doing so, the **Shoreline Management Plan** is a high-level document that will form an important part of the strategy for flood and coastal defence for Ceredigion County Council.

The **Shoreline Management Plan** is a non-statutory policy document for coastal defence management planning, and is intended to inform wider strategic planning within existing planning initiatives and legislative requirements.

It aims to provide the context to, and consequence of, management decisions in other sectors of coastal management and as such, should inform all aspects of flood risk management.

Shoreline Management Plan 2 was approved by Cabinet on 31 July 2012, and will be returned to Cabinet for full adoption once the outstanding Welsh Government approvals processes have been completed.

Measure to Achieve the Objective

Ceredigion County Council will deliver the SMP2 by implementing the Action Plan following its approval by Welsh Government and subsequent adoption by the Council

DEVELOPMENT OF A LOCAL FLOOD RISK MANAGEMENT STRATEGY

The **Flood and Water Management Act 2010** places a responsibility on Lead Local Flood Authorities, to develop, maintain, apply and monitor a strategy for local flood risk management.

This document has been prepared to meet the requirements of this specific measure.

It will do this by acting as the evidence base for the decisions and actions required for managing flood risk, and should balance the needs of communities, the economy and the environment.

In combination with the **National Strategy**, the **Local Strategy** will encourage more effective risk management by enabling people, communities, business and the public sector to work together to:

- ensure a clear understanding of the risks of flooding and erosion
- set out clear and consistent plans for risk management
- encourage innovative management of flood and coastal erosion risks
- form links between the Local Flood Risk Management Strategy and local spatial planning
- ensure that emergency plans and responses to flood incidents are effective
- help communities to recover more quickly and effectively after incidents

All risk management authorities have a duty to act in a manner which is consistent with this strategy when exercising their flood and coastal erosion risk management functions.

Measure to Achieve the Objective

Ceredigion County Council has developed, and will continue to maintain, apply and monitor a strategy for local flood risk management

IMPLEMENTATION OF STATUTORY RESPONSIBILITIES SET OUT IN THE FLOOD AND WATER MANAGEMENT ACT 2010 AND THE FLOOD RISK REGULATIONS 2009

As various sections of the **Act** and **Regulations** are enacted, greater duties and responsibilities are being imposed on Ceredigion County Council as a Lead Local Flood Authority.

To date, the following Sections/Schedules of the **Flood and Water Management Act 2010** have been enacted:

Section 13 of the **Act** imposes a duty on the Council to co-operate with other risk management authorities.

Sections 14 and 15 of the **Act** deals with the powers provided to the Council to request information from a person, company or public body, and the ability to enforce that request.

Section 19 of the **Act** requires the Council to undertake flood investigations, outlining who has oversight of the particular problem and whether they are carrying out their duties.

Section 21 of the **Act** requires the Council to compile an asset register and record of all structures or features which, in the opinion of the Council, are likely to have a significant effect on a flood risk.

Schedule 1 of the **Act** gives the Council permissive power to designate a structure or feature (including third party assets) that affects flood risk, meaning that it cannot be altered or removed without permission.

Schedule 2 of the **Act** deals with the Council's role in relation to the consenting of works in ordinary watercourses.

Further Sections and Schedules of the **Act** will be enacted in the future, and as a result, Ceredigion County Council will ultimately also:

- have a duty to administer a system of approving and adopting new sustainable drainage systems, which will be required for all new development, and to maintain such systems after adoption

Under the **Flood Risk Regulations 2009**, Ceredigion County Council has also completed a **Preliminary Flood Risk Assessment**, which was published in June 2011 in accordance with the requirements of those **Regulations**.

As no *'indicative flood risk areas'* as defined by the Welsh Government were identified during that process, no further work is required of the Council at this time.

However, the Welsh Government and Natural Resources Wales are producing flood hazard and flood risk maps for publication in June 2013 which will assist with any revision of the **Preliminary Flood Risk Assessment**, whilst also increasing our understanding of local flood risk in the County.

The **Preliminary Flood Risk Assessment** is due to be revised in 2017 in accordance with the **Regulations**.

Measure to Achieve the Objective

Ceredigion County Council will implement all the provisions of the Flood and Water Management Act as and when they are brought in to force

OBJECTIVE 1
REDUCING THE CONSEQUENCES FOR INDIVIDUALS, COMMUNITIES, BUSINESSES AND THE ENVIRONMENT FROM FLOODING AND COASTAL EROSION

SUB-OBJECTIVE
DEVELOP POLICIES FOR EFFECTIVE LAND USE MANAGEMENT AND ENHANCED DEVELOPMENT CONTROL PROCEDURES WHERE APPROPRIATE

Measures for Delivery of the Sub-Objective:

DEVELOPMENT OF LOCAL DEVELOPMENT PLANS THAT INCLUDE ADEQUATE PROVISIONS IN RESPECT OF FLOOD AND COASTAL EROSION RISK

On 25 April 2013 Ceredigion County Council adopted a **Local Development Plan** (LDP) for the County of Ceredigion. The adopted **Local Development Plan** will form the development plan for the County of Ceredigion and will be the basis for decisions on land use planning within the County.

It sets out policies and proposals for the future development and use of land in the County up to 2022, and replaces the plans that the Council previously used, helping determine whether planning applications will be permitted or not in the future.

The **Local Development Plan** identifies a range of issues affecting the County that will need to be considered when determining development proposals, and has been prepared in full consultation with the Council's coastal and land drainage officers who have been providing appropriate advice in respect of flood and coastal erosion risk, and assisting with the identification of suitable development areas.

Measure to Achieve the Objective

Ceredigion County Council has an effective Local Development Plan in place which aims to minimise flood and coastal erosion risk

COMPLIANCE WITH THE REQUIREMENTS OF PLANNING POLICY WALES AND RELEVANT TECHNICAL ADVICE NOTES

The requirements of **Planning Policy Wales** and **TAN 14 & 15** have been considered during and incorporated into the **Local Development Plan**.

As a result, there is a general presumption against building in flood risk areas unless adequate mitigation measures are in place.

Measure to Achieve the Objective

Ceredigion County Council will continue to apply the requirements of TAN14 and TAN15 in respect of new development

PROVISION OF APPROPRIATE ADVICE ON FLOOD AND COASTAL EROSION RISK IN RELATION TO PLANNING APPLICATIONS

Ceredigion County Council's Coast and Rivers Section is consulted on all relevant planning applications, and provides advice on drainage, flooding and coastal erosion risk in relation to planning applications.

Natural Resources Wales is also a statutory consultee on all relevant planning applications, and will offer advice on guidance in relation to drainage matters, particularly where developments are proposed in areas of known flood risk.

Where development is proposed within areas of known flood and coastal erosion risk, the applicant will be required to provide an appropriate Flood Consequence Assessment which will be assessed as part of the planning approvals process.

Measure to Achieve the Objective

Ceredigion County Council will continue to advise on the impact new development will have on flood and coastal erosion risk

APPROPRIATE UNDERTAKING OF STRATEGIC FLOOD CONSEQUENCE ASSESSMENTS AND THEIR USE TO INFORM LOCAL DEVELOPMENT PLANS

Strategic Flood Consequence Assessments (SFCA) have been prepared by the Council for both the Aberystwyth and Cardigan areas.

The Strategic Flood Consequence Assessments assess the flood risk at candidate sites being considered for development within the **Local Development Plan** and to provide advice regarding management of the risk in order to meet requirements set by the Welsh Government, particularly those in **Technical Advice Note 15** (TAN15).

Measure to Achieve the Objective

Ceredigion County Council has prepared SFCA for Aberystwyth and Cardigan during the development of the LDP

APPROVAL AND ADOPTION OF SUDS DRAINAGE SYSTEMS BY THE SUDS APPROVING AND ADOPTING BODY

As has been referred to above, Ceredigion County Council will become the SuDS Approving Body (SAB) when Schedule 3 of the **Act** is implemented, and this is currently expected during 2014.

Working to Welsh Government guidelines (which will be consulted upon and published in due course), the Council will work in collaboration with other Flood Risk Management Authorities to develop and produce detailed guidance for planners, builders and developers.

There will be many different SUDS features available, to suit a variety of sites. Features may include natural features such as ponds, wetlands, ditches and swales, and harder features such as permeable paving, attenuation storage and soakaways.

SUDS design will aim to mimic the natural drainage of the site prior to development wherever possible, and will generally replace traditional piped systems.

Measure to Achieve the Objective

Ceredigion County Council will undertake the role of the SUDS approval body when the relevant provisions are commenced by Welsh Government

OBJECTIVE 1
REDUCING THE CONSEQUENCES FOR INDIVIDUALS, COMMUNITIES, BUSINESSES AND THE ENVIRONMENT FROM FLOODING AND COASTAL EROSION

SUB-OBJECTIVE
ESTABLISH REGULAR MAINTENANCE SCHEDULES FOR FLOOD AND COASTAL EROSION RISK MANAGEMENT ASSETS

Measures for Delivery of the Sub-Objective:

DEVELOPMENT OF A REGISTER OF NATURAL AND MANMADE STRUCTURES OR FEATURES LIKELY TO HAVE AN EFFECT ON FLOOD RISK

Ceredigion County Council has produced, and will continue to update a register of all known flood risk management and drainage assets.

This register will contain details of both publicly maintained and privately owned structures, and will be regularly updated as further information becomes available in light of recorded flood incidents. It is an aspiration of the Council that records of all drainage assets (both publicly maintained and private) are held on this register, but it accepts that this will be a longer term aspiration, and be dependent on funding and resources being made available.

Ceredigion County Council also has a register of Coastal Defence assets which are maintained by the Council, and this will also be updated as new assets are constructed, or existing ones replaced.

Measure to Achieve the Objective

Ceredigion County Council has produced, and will continue to update a register of all known flood risk management and drainage assets

ESTABLISHMENT OF A PROGRAMME OF REGULAR AND APPROPRIATE MAINTENANCE FOR FLOOD AND COASTAL EROSION RISK MANAGEMENT ASSETS

Inspection regimes are in place for all Council owned assets and are undertaken in relation to various prioritisation and maintenance requirements. Private assets are not generally inspected, but when problems are highlighted the Council has powers under the **Land Drainage Act 1991** that it may use if considered necessary to require the owner to maintain their structures and watercourses.

Measure to Achieve the Objective

Ceredigion County Council will continue its risk based inspection schedules for all flood and coastal erosion risk management assets

DESIGNATION OF NATURAL AND MANMADE STRUCTURES OR FEATURES LIKELY TO HAVE AN EFFECT ON FLOOD OR COASTAL EROSION RISK OVER THE LIFE OF THE STRATEGY

The **Flood and Water Management Act** has provided Ceredigion County Council and Natural Resources Wales with permissive powers for the designation of natural and manmade structures which they feel may have an effect of flooding risk.

It is envisaged that the permissive powers will be used only when a flood investigation highlights a private structure as having a significant effect on mitigating flood risk.

There is however, no requirement on the owner of any designated feature/structure to maintain it as the designation only relates to prohibition for its removal and/or alteration.

Measure to Achieve the Objective

Ceredigion County Council will use its permissive powers where appropriate to designate structures or features which provide a significant flood risk function

OBJECTIVE 2
RAISING AWARENESS OF AND ENGAGING PEOPLE IN THE RESPONSE TO FLOOD AND COASTAL EROSION RISK

SUB-OBJECTIVE
ENSURE THAT BY 2026 EVERYONE WHO LIVES IN A FLOOD RISK AREA UNDERSTANDS THE FLOOD RISK THEY ARE SUBJECT TO, THE CONSEQUENCES OF THIS RISK AND HOW TO LIVE WITH THAT RISK

Measures for Delivery of the Sub-Objective:

PROGRAMME OF COMMUNITY BASED AWARENESS AND ENGAGEMENT ACTIVITIES, UTILISING THE FLOOD RISK MANAGEMENT COMMUNITY ENGAGEMENT TOOLKIT

As communities and properties at risk of flooding and coastal erosion are identified, Ceredigion County Council working alongside Natural Resources Wales is committed to engaging with those communities and property owners, and to work with them in order to develop Community Flood Plans, and to identify and adopt appropriate resistance and resilience measures.

Community Flood Plans can be developed with assistance from Ceredigion County Council and Natural Resources Wales, and will help community members and groups plan how they can work together to respond quickly when flooding happens.

Resistance measures, or Individual Property Protection (IPP), are those which prevent water getting into a property. These could be installations such as flood gates/boards to protect doorways, air brick covers.

Resilience measures are measures which make it easier and quicker to undertake a clear-up following a flood, such as raising electrical sockets 1.5m above floor level and using water resistant cement rather than plaster on walls.

Measure to Achieve the Objective

Ceredigion County Council will develop a programme of awareness raising and engagement activities to ensure that all communities have been informed of the risks and consequences of flooding by 2026

IDENTIFICATION OF AT RISK GROUPS WITHIN COMMUNITIES, INCLUDING VULNERABLE INDIVIDUALS

The Cabinet Office has produced guidance for emergency planners and responders under the title **Identifying People Who Are Vulnerable in a Crisis (Feb 2008),** and Ceredigion County Council holds records on various at risk groups within the County's communities, and under the Councils **Emergency Flood Response Plan** would offer assistance to those groups, as well as vulnerable individuals within those communities.

The Council also manages some residential care homes and day centres.

Measure to Achieve the Objective

Ceredigion County Council will continue to review and update the information it holds in relation to at risk groups

OBJECTIVE 3
PROVIDING AN EFFECTIVE AND SUSTAINED RESPONSE TO FLOOD AND COASTAL EROSION EVENTS

SUB-OBJECTIVE
ENSURE THE PREPARATION AND TESTING OF EMERGENCY PLANS

Measures for Delivery of the Sub-Objective:

COMPLETE EMERGENCY PLANS FOR ALL SOURCES OF FLOOD RISK

Ceredigion County Council is a Category 1 responder under the **Civil Contingencies Act 2004**, as well as the Lead Local Flood Authority.

Ceredigion County Council has an **Emergency Response Flood Plan** which sets out the procedures to be followed and the persons to be contacted in the event of a flooding incident within the Ceredigion County Council area. It also has in place a **Major Incident Plan** and **Business Continuity Plan** which would be referred to in such instances.

This **Emergency Response Flood Plan** will be reviewed as more information is collected and developed on local sources of flooding in order to ensure that it remains fit for purpose.

The Dyfed Powys Local Resilience Forum has also developed the **Guidance on Recovery from Major Incident, Joint Major Incident Procedures Manual** and **Flood Arrangements Plan** documents which are referred to in response to any major incident.

Measure to Achieve the Objective

Ceredigion County Council will continue to review and update its emergency plans as and when necessary

LOCAL LEVEL EMERGENCY EXERCISE TO TEST RESPONSE AND RECOVERY ARRANGEMENTS OVER THE LIFE OF THE STRATEGY

Periodic exercises are already undertaken and facilitated by multi-agency collaboration to test response and recovery arrangements, and these will continue to be implemented as and when appropriate over the life of the Strategy.

Measure to Achieve the Objective

Ceredigion County Council will continue to hold emergency exercises in conjunction with our flood risk management partners to assist in the review of emergency plans

OBJECTIVE 3
PROVIDING AN EFFECTIVE AND SUSTAINED RESPONSE TO FLOOD AND COASTAL EROSION EVENTS

SUB-OBJECTIVE
RESPOND TO EVENTS IN A TIMELY AND APPROPRIATE MANNER

Measures for Delivery of the Sub-Objective:

EARLY AND APPROPRIATE RESPONSE TO EMERGENCY EVENTS

Ceredigion County Council operates both office and out-of-hours phone numbers that the public can use in the event of a flood incident.

During office hours, these calls are dealt with by the Authority's trained contact centre staff, whilst out-of-hours the telephone numbers are staffed by trained officers who can coordinate the Authority's response, and call on appropriate resources as deemed necessary.

The Council's legal duty is to ensure that the road network remains open. Sandbags may be made available in an emergency situation to assist in the protection of property from flood water, but the supply of sandbags is a voluntary service, and in a major flooding situation Ceredigion County Council cannot guarantee to meet every request for sandbags to support people in protecting their property.

Each request made to Ceredigion County Council will be considered and prioritised in relation to the prevailing circumstances, irrespective of the flooding source.

A copy of the Council's Sandbag Policy is attached in Appendix B

The Dyfed Powys Local Resilience Forum has also developed a document entitled **Guidance on Recovery from Major Incidents** which will be referred to during the response to an emergency flood event.

Ceredigion County Council's Emergency Planning section also participates in an out-of-hours on call rota serving Pembrokeshire, Powys and Ceredigion.

Measure to Achieve the Objective

Ceredigion County Council will continue to provide assistance where possible to the public during emergencies

DEVELOPMENT AND IMPLEMENTATION OF EFFECTIVE EVACUATION PROTOCOLS FOR EMERGENCY EVENTS

Ceredigion's **Emergency Flood Response Plan** outlines the organisations involved in the evacuation process, and outlines the procedures to be followed in such emergency events together with details of the primary evacuation routes.

Measure to Achieve the Objective

Ceredigion County Council will continue to review and update its evacuation plans to ensure that they remain relevant and fit for purpose

DEVELOPMENT OF MUTUAL AID PROTOCOLS FOR RESOURCES, EQUIPMENT AND RESPITE FOR EMERGENCY EVENTS

Ceredigion County Council is a Category 1 Responder, and has arrangements in place to provide assistance and to receive assistance as necessary and requested in the event of any serious emergency and will ensure that these arrangements are regularly updated, are fit for purpose and in a state of preparedness.

Measure to Achieve the Objective

Ceredigion County Council will continue to work with all bodies to ensure assistance can be provided if and when requested

IDENTIFICATION AND PROVISION OF SUITABLE RESPITE ACCOMMODATION AS APPROPRIATE OVER THE LIFE OF THE STRATEGY

Ceredigion County Council's **Emergency Flood Response Plan** ensures the provision of suitable respite accommodation during the event of an emergency incident, and that a wide range of specialist staff experienced with all aspects of social welfare that can provide support to evacuees.

Measure to Achieve the Objective

Ceredigion County Council will continue to update its rest centres plans as new flood risk information becomes available

OBJECTIVE 3
PROVIDING AN EFFECTIVE AND SUSTAINED RESPONSE TO FLOOD AND COASTAL EROSION EVENTS

SUB-OBJECTIVE

FACILITATE RECOVERY FROM FLOODING WITHIN THE SHORTEST POSSIBLE TIMESCALES

Measures for Delivery of the Sub-Objective:

DEVELOPMENT OF PROCEDURES FOR THE EFFECTIVE CLEARANCE OF DEBRIS

The Dyfed Powys Local Resilience Forum has developed a document entitled **Guidance on Recovery from Major Incidents**.

Ceredigion's **Emergency Flood Response Plan** also makes reference to specific roles for assistance in the general clean-up operation.

Following a flooding incident, Ceredigion County Council as the Highway Authority will implement a prioritised programme of works to clear roads of debris and ensure all affected highway culverts and drainage systems are clear and functioning correctly.

Measure to Achieve the Objective

Ceredigion County Council will continue to ensure that systems are in place to ensure that debris is cleared as soon as possible following emergency flood incidents

DEVELOPMENT OF REPAIR SCHEDULES INCLUDING PROVISION FOR THE INSTALLATION OF RESILIENT MEASURES BY 2015

Section 40 of the **Flood and Water Management Act** allows Welsh Government to make changes to the Building Regulations to ensure that any building works undertaken incorporate flood resistance and flood resilience measures.

Ceredigion County Council will be responsible for their implementation and enforcement once the changes have been adopted by Welsh Government.

Measure to Achieve the Objective

Ceredigion County Council will apply any amendments to the Building Regulation as and when they come into force

INVESTIGATIONS INTO THE CAUSES OF FLOODING TO BE UNDERTAKEN WHERE NECESSARY WITHIN ONE MONTH

The **Flood and Water Management Act** placed a new duty on Lead Local Flood Authorities to investigate flooding incidents to the extent it considers necessary or appropriate and determine which risk management authorities have relevant flood risk management functions and whether they are carrying out or intending to carry out those functions.

The **Flood Investigation Report** provides a summary of the actions being carried out by each of the risk management authorities in response to the flooding event, together with an indication of their suggested future actions.

More detailed investigations will obviously need to be undertaken by all the relevant risk management authorities to ascertain the exact nature of flooding at each location, which will involve the examination of both flood prevention and flood mitigation measures, but the FIR serves to bring all useful information together in one place.

The **Flood Investigation Reports**, together with the Flood Hazard and Flood Risk Maps being prepared by the Environment Agency Wales on behalf of the Welsh Government will provide valuable information for Ceredigion County Council during its revision of the **Preliminary Flood Risk Assessment** Report which is due in 2017.

Measure to Achieve the Objective

Ceredigion County Council will continue to undertake an investigation of significant flood incidents within an appropriate timescale

FURTHER MEASURES FOR LOCAL FLOOD RISK MANAGEMENT

In addition to the detailed objectives and sub-objectives outlined above, the Local Strategy guidance published by Welsh Government states that a wide range of measures should be considered to further improve the delivery of local flood risk management, and that these should include both structural and non-structural measures such as:

STRUCTURAL MEASURES

Flood walls

Flood embankments

Trash screens

Demountable flood barriers

NON-STRUCTURAL MEASURES

- Flood Warnings Systems
- Public awareness workshops
- Community engagement
- Surface Water Management Plans

Measures which will achieve multiple benefits, such as water quality, biodiversity and amenity benefits will be encouraged and promoted wherever possible.

Below are additional measures, together with some anticipated activities for their delivery which the Council will look to deliver in conjunction with other Risk Management Authorities, as it believes they will enhance and improve the delivery of local flood risk management (delivery of some of these activities will be subject to Welsh Government funding).

1. **Improve understanding of local flood and coastal risks and ensure that everyone is informed of their roles and responsibilities in reducing those risks**

    - Record all reported flooding incidents, and carry out flooding investigations where appropriate (in effect)
    - Utilise flood hazard and risk maps for areas known to be at risk of significant flooding (by 2015)
    - Develop a map based record of flood risk assets, historical flooding and areas at risk of flooding (by 2015)

2. **Reduce the impact of flooding and coastal erosion on individuals, communities, businesses and the environment**

    - Identify vulnerable groups within the community, and prepare action plans in the event of flooding (in effect)
    - Educate the public on options for protecting their properties through flood prevention, resistance and resilience measures (in effect)
    - Assist and provide support following a flood event (in effect)

3. **Work in partnership with all bodies to reduce local flood risks**

    - Identify responsibilities of riparian owners for managing their assets, through public engagement and educate them in relation to measures to reduce the risk of flooding (in effect)
    - Develop effective communication systems to ensure collaborative working and data sharing (in effect)
    - Continue to meet with the South-West Wales Local Flood Risk Management Authorities to share knowledge, data and lessons learnt (in effect)

4. **Ensure planning decisions continue to be properly informed by flooding issues and the impact future development may have on flood risk management and long term developments**

    - Continue to provide clear guidance to the Planning Section when assessing planning applications (in effect)
    - Establish a SuDS Approval Body (SAB) (await WG guidance)
    - Develop policies for effective land use management and enhance development control procedures where appropriate (in effect)

5. **Adopt a sustainable and holistic approach to flood and coastal management, delivering wider environmental and social benefits, climate change mitigation and improvements under the Water Framework Directive**

    - Ensure the environmental impacts of implementing the **Local Flood Risk Management Strategy** are considered alongside the technical, economic and social benefits (in effect)
    - Consider the use of attenuation through wetlands to increase the length of flow durations, store water and provide amenity and ecological benefits (in effect)
    - Consider the use of bio-retention areas to remove sediment and pollutants (in effect)

6. **Work sympathetically with natural processes where appropriate**

    - Adopt natural flood-risk management techniques, to include SuDS, where possible (ongoing – await WG guidance)
    - Explore new and innovative technologies for flood defence, coastal erosion and flood management (in effect)
    - Develop and implement a non-culverting policy (in effect)

7. **Encourage maintenance of privately owned flood defences and ordinary watercourses, and minimise unnecessary constrictions in watercourses**

    - Ensure riparian owners are aware of their duties to keep watercourses flowing freely (in effect)
    - Administer a process for consenting of new structures and maintenance of existing structures on watercourses (in effect)
    - Provide guidance to people who wish to maintain watercourses and/or improve flood defences on private land (in effect)

8. **Ensure officers have the appropriate skills and on-going training to effectively manage flood risk**

    - Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the **Flood and Water Management Act** (by 2014)
    - Invest in appropriate software and hardware (in effect)
    - Collaborate and provide support, training and network of staff across the region (in effect)

ENVIRONMENTAL OBJECTIVES

The main purpose of this report is to set out the strategy for implementing flood risk management measures across Ceredigion.

However there is an opportunity to derive significant benefit in respect of county and country-wide aspirations in the context of sustainability, environmental and social improvement. The aim being to provide better environments for residents and businesses as well as improving biodiversity and local habitats for wildlife.

Delivering multiple benefits will require working with partners to identify local priorities and opportunities. Where appropriate, and in line with the principles of the **National Strategy**, contributions that help to deliver these additional improvements could be sought from those partners that benefit.

Strategic Environmental Assessments

It is a legal requirement in the UK for certain plans and programmes stipulated by the **SEA Directive (2001/42/EC)**, to undergo Strategic Environmental Assessment (SEA). The SEA Directive is implemented in Wales by the **Environmental Assessment of Plans and Programmes (Wales) Regulations 2004.**

As the **Local Strategy** is a 'statutory plan', a Strategic Environmental Assessment is needed, which will appraise the potential environmental impacts of the **Local Flood Risk Management Strategy** and its objectives, prior to its approval and formal adoption.

The purpose of Strategic Environmental Assessment is to provide for a high level of protection of the environment, by ensuring the integration of environmental considerations into the preparation of the **Local Strategy** and to contribute to the promotion of sustainable development and environmental protection.

The environmental report produced as a result will:

- detail the findings of the SEA
- provide a description of the SEA process that was followed
- provide a description of the decisions taken
- detail the consideration given to other policies and legislation
- identify key environmental issues and trends

It should clearly set out the assessment of the effects of the **Local Strategy** together with relevant mitigation and enhancement measures, and should provide proposals for the monitoring and use of the resultant information to develop local strategies and influence future reviews.

Habitats Regulations Assessments (HRA)

Due to the potential of this strategy to have a significant effect on sites of international nature conservation, namely Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites, a Strategic Habitats Regulations Assessment (HRA) needs to be undertaken in parallel with the Strategic Environmental Assessment. The Habitats Regulations Assessment will be integrated within the Strategic Environmental Assessment process and the conclusions of the Habitats Regulations Assessment will be provided as a summary to the Strategic Environmental Assessment Environmental Report.

In Wales, the **Conservation of Habitats and Species Regulations (SI 490, 2010)**, often known as the Habitats Regulations, implements the EU **Habitats Directive (Directive (92/43/EEC)** on the Conservation of natural habitats and of wild flora and fauna) and certain elements of the **Birds Directive (2009/147/EC).**

This legislation provides the legal framework for the protection of habitats and species of European importance in Wales and England.

Regulation 9(5) of the **Habitats Regulations** requires that a competent authority must consider the requirements of **Habitats Directive** in exercising any of its functions.

Article 6(3) of the **Habitats Directive** defines the requirements for assessment of plans and projects potentially affecting European sites.

Measures to address specific flood risk identified during the implementation of this **Strategy** may also require separate Habitats Regulations Assessment, depending on the measure proposed. If a separate assessment is required, the Habitats Regulations Assessment will follow the following steps:-

- **Stage 1 – Screening**
  To assess the likely impacts of the measure proposed
- **Stage 2 – Appropriate Assessment**
  To consider the impact of the measure on any protected sites, and if adverse impacts are identified, any mitigation measures considered
- **Stage 3 – Assessment of Alternative Solutions**
  To determine whether alternative measures could be possible, which would have a lesser impact on the protected sites
- **Stage 4 – Imperative Reasons of Over-riding Public Interest (IROPI)**
  To consider whether the proposed project should continue and, whether compensatory works will need to be undertaken.

Water Framework Directive

The **Water Framework Directive** (WFD) is the most substantial piece of European water legislation to be produced. It requires all inland and coastal waters to reach 'good' ecological status by 2015 and it will achieve this by establishing a river basin structure, within which demanding environmental objectives will be set, including ecological targets for surface water.

The **Water Framework Directive** is designed to improve and integrate the way water bodies are managed throughout Europe. It came into force on 22 December 2000, and was transposed into UK law in 2003. Member States must aim to reach good chemical and ecological status in inland and coastal waters by 2015 subject to certain limited exceptions. It is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands which depend on the aquatic ecosystems
- promote the sustainable use of water
- reduce pollution of water, especially by 'priority' and 'priority hazardous' substances
- ensure progressive reduction of groundwater pollution
- conserve habitats and species that depend directly on water
- contribute to mitigating the effects of floods and droughts

Risk management measures can significantly benefit biodiversity in protecting designated sites and contributing to improving and maintaining these in a favourable condition. The **National Strategy** encourages the provision of biodiversity enhancements and minimising any adverse effects and so must also be considered within local strategies.

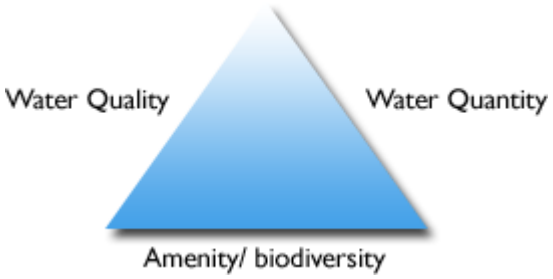
The **Water Framework Directive** establishes a strategic framework for managing the water environment. It requires a management plan for each river basin to be developed every 6 years. The plans are based on a detailed analysis of the impacts of human activity on the water environment and incorporate a programme of measures to improve water bodies where required.

The **River Basin Management Plans** in effect in Ceredigion are:

- Western Wales River Basin Management Plan
- Severn River Basin Management Plan

Although the measures included in this draft strategy for consideration are not site specific, certain flood risk management activities have the potential to assist in meeting the objectives listed above, such as:

- **Pollution prevention** – the use of SuDS and watercourse regulation can assist in the prevention of pollution from industrial/domestic sources
- **Reduction of sediment in water courses** – achieved by implementing land management techniques/ SuDS where soils are prone to erosion
- **Protection and enhancement of wildlife** – measures to protect and enhance wildlife and their habitats can be embedded within flood risk management schemes
- **Preservation of water resources** – by looking at the 'whole water cycle' as a key element of scheme appraisal.



Sustainable Development

The **Flood and Water Management Act 2010** includes a duty for local authorities, highways authorities, and internal drainage boards to contribute to sustainable development in discharging their **Flood and Coastal Erosion Risk Management** functions.

It does not prescribe a single approach to be followed, but provides a number of suggestions which make a contribution toward the achievement of sustainable development.

This is similar to the existing duty that Natural Resources Wales already has.

The Act also provides environmental powers for works that:

- have a net beneficial impact
- are consistent with the **National Flood and Coastal Erosion Risk Management Strategy**
- are deemed to:
    - be desirable for the natural environment
    - be desirable for historic environment
    - be desirable for landscape
    - have amenity or leisure benefits

Sustainable development within flood and coastal erosion risk management requires an approach which delivers four outcomes:-

- Maximises the long-term economic, social and environmental wellbeing of people and communities in Wales, whilst living within environmental limits
- Safeguards the continued provision of ecosystem services from our natural environment
- Avoids exposing current and future generation to increasing risk
- Improves the resilience of communities, the economy and the natural, historic, and social environment to current and future risk

In exercising a flood or coastal erosion risk management function, Ceredigion County Council will aim to make a contribution towards the achievement of sustainable development

Catchment Flood Management Plans

A **Catchment Flood Management Plan** (CFMP) is a high level, strategic plan which provides an overview of the flood risk across a particular river catchment, and sets out the policies to be adopted to manage flood risks now, and for the next 50 to 100 years by indicating who needs to do what action, where and when.

Catchment Flood Management Plans consider all types of flooding, whether from rivers, groundwater, surface water or sewers and are based on a standard approach to ensure that they provide a consistent assessment of flood risk and policy options. They also cover tidal flooding from rivers and estuaries but not flooding directly from the sea, which is covered by the **Shoreline Management Plans**.

Catchment Flood Management Plans take into account the likely impacts of climate change, how we use and manage the land, and how areas could be developed to meet our present day needs without compromising the ability of future generations to meet their own needs.

FUNDING

The risk and consequences of flooding and coastal erosion present a significant financial cost, both to the individuals affected and to the wider Welsh economy.

Effective implementation of the policies set out in both the **National** and **Local Strategies** requires adequate resource to be made available for both the management activities and capital projects.

As the climate changes, the costs and resource level required to keep pace with the risks and consequences of flooding and coastal erosion is expected to increase. Even if this strategy was being developed at a time of substantial funding resources it would still not be possible to eradicate flooding risk or to solve the concerns of the public.

The majority of funding for flood and coastal erosion risk management in Wales comes directly from the Welsh Government, either through Coast Protection Grants or Flood Alleviation Grants.

As the level and nature of risk changes in the future, Welsh Risk Management Authorities will need to find other sources of funding to ensure that communities across Wales receive the levels of funding they need to manage the risks they face.

The Local Flood Risk Management Strategy is required to provide an indication of the costs and benefits of any proposed measures. At this stage in the process, it is difficult to quantify the costs and benefits without knowing the exact scope of any required works, or which measures are able to reduce flood risk.

Costs and benefits of detailed measures will therefore be assessed during the development of the Flood Risk Management Plan which Ceredigion County Council intends completing by December 2015.

Ceredigion County Council already provides an element of funding from within its Revenue and Capital Budgets to fund feasibility studies, project appraisal reports, outline design and detailed design of coastal erosion and flood alleviation schemes, as well as making contributions toward the construction costs of such schemes, and will continue to attempt to do so in future.

However, other possible sources of funding will also need to be explored, and these could include:

- **Section 106 of the Town and Country Planning Act 1990**, which allows Local Authorities to enter into an agreement with developers to address issues necessary to make a development acceptable, and this could include flood and coastal erosion risk management works.

- The **'Community Infrastructure Levy'** which allows Local Authorities to raise funds from new development, based on the concept that all development has some impact on the local infrastructure and services. This mechanism could be used to raise funds for flood and coastal erosion risk management works.

- A **Partnership Approach** to providing flood and coastal erosion risk management works, which would involve the Flood Risk Management Authorities, the private sector and local communities coming together to provide the necessary funding.

Currently, Ceredigion County Council receives funding for flood and coastal erosion risk management purposes in two different ways:

- Through the Revenue Support Grant (RSG), which is the unhypothecated revenue funding given to local government by the Welsh Government, shared out between authorities on the basis of a population based distribution formula. A proportion of which is then allocated by Ceredigion County Council for flood and coastal erosion risk management

- By applying for scheme specific Flood Alleviation Grants

In addition to the sources of funding identified above, the Welsh Government has to date provided £280,000 to each Local Authority spread over three financial years, from 2011/12 to 2013/14, in acknowledgement of the additional duties placed on them as Lead Local Flood Authorities under the **Flood Risk Regulations 2009** and **Flood and Water Management Act 2010**.

These additional duties included:

- the preparation of a **Preliminary Flood Risk Assessment**
- the establishment of a register of structures
- the investigation of floods and flooding events
- the undertaking of consenting works on 'Ordinary Watercourses'
- preparation for its role as a SuDS Approval Body (SAB)
- the preparation of a **Local Flood Risk Management Strategy**

However, funding for such duties will not be ring fenced from 2014/15 onward, and as a result will need to be funded from within the Council's own resources.

Review of the Funding Prioritisation Methodology

The way Flood and Coastal Risk Management is funded is currently being reviewed by Welsh Government, and a group has been established to produce a **Single Investment Programme** with a view to consulting Lead Local Flood Authorities and Natural Resources Wales during 2013.

Currently, the Welsh Government allocates the majority of its budget for flood and coastal erosion risk management to Natural Resources Wales, with some funding retained for grants to local authorities, and to fund research and development, and to meet the costs of implementing new legislation.
In doing so, the Welsh Government also sets the proportion of the budget that is to be used for capital purposes (used for the construction of new defences) and revenue purposes (used for maintenance of existing defences).

In future years, Welsh Government investment in flood and coastal erosion risk management is expected to be more rigorously prioritised. In determining the type of risk management intervention required, the scale of investment and the share to be met by government, a range of factors, as listed below, will need to be considered:-

- risk to life
- longer term sustainability of the community, the approach taken and the wider environment
- economic impacts, costs and benefits
- impacts of flooding on the operational capacity of critical infrastructure;
- social impacts, costs and benefits
- frequency of flooding
- environmental costs and benefits derived from the work
- availability of appropriate compensation sites where work impacts designated habitats
- impacts on our wider cultural heritage
- multiple benefits in relation to human health and wellbeing

As part of the **National Strategy for Flood and Coastal Erosion Risk Management in Wales**, the Welsh Government is committed to establishing a clearer funding prioritisation methodology for Wales which sets out:

- what projects they will consider for funding
- how they will consider them
- how they will compare traditional hard engineering options against softer risk management options
- how they will take account of the use of alternative sources of funding or direct contributions
- who will be consulted in making investment decisions

It is intended that this will result in the establishment of a single Welsh Government funding scheme for all flood and coastal erosion risk management projects in Wales.

REVIEW

The way in which flood and coastal erosion risk management is delivered will continue to evolve over the coming years.

Whilst this **Strategy** has attempted to capture those changes in advance, and attempts to be flexible enough to incorporate those changes going forward, the increased recording, detailing and assessments of flood events, and the subsequent increase in our understanding of flood and coastal erosion events will ultimately mean that this **Strategy** will need to be reviewed, and as such the Strategy will be subject to continuous improvement/review as and when new and relevant data or information becomes available.

The **Flood Risk Regulations 2009** already places a duty on Lead Local Flood Authorities such as Ceredigion County Council to review their **Preliminary Flood Risk Assessments** on a six-yearly cycle, with the first review due in 2017.

Similarly, the **Flood Risk Regulations 2009** also place a duty on those Lead Local Flood Authorities who have a duty to prepare flood Hazard and Risk Maps (by June 2013) and Flood Risk Management Plans (by June 2015) to also review those documents every six years.

The Strategy will therefore be reviewed in 2015, and with the Welsh Government proposing a review of the **National Strategy for Flood and Coastal Erosion Risk Management** document in 2016, a further review for this Local Strategy will take place in 2017.

Reviews of the Strategy will similarly take place as and when the Preliminary Flood Risk Assessments, Flood Hazard and Risk Maps and the Flood Risk Management Plans are reviewed in accordance with relevant legislation.

By doing so Ceredigion County Council can ensure that a revised document can reflect any changes identified during the reviews and make reference to, and again be consistent with the **National Strategy**.

APPENDIX A
Sources of Flooding and Coastal Erosion

Appendix A

Sources of Flooding and Coastal Erosion

The main sources of flooding in Wales today are:

- sea flooding
- river flooding, including main rivers and ordinary watercourses
- surface water flooding

Sea Flooding

Flooding from the sea usually occurs through a combination of high tides and waves and severe weather. The most severe storm conditions occur when an atmospheric depression and high onshore wind speeds combine and coincide with a high astronomical tide, to cause an increase in the tide level known as a tidal surge. Such conditions can damage defences, cause defences to fail, or result in wave overtopping throwing sea water and boulders into coastal communities.

The flooding of Towyn in North Wales in 1990, where around 2800 properties were affected, was as a result of a failure of the sea wall during severe storms.

River Flooding

River flooding is generally described as flooding from the larger main rivers such as the Severn, the Taff and the Dee, as well as smaller rivers or streams often referred to as ordinary watercourses. River flooding from either source is probably the most commonly recognised and understood source of flood risk.

River flooding usually occurs when the capacity of a river channel cannot contain the volume of water entering it, and water overflows its banks. This is a natural event. When a river does overflow, the resultant flood water can be both deep and fast flowing and can cause widespread inundation of the flood plain. It may also carry debris, which can increase the damage.

The impact can be even worse if a flood defence, built to contain high river flows, fails suddenly, often called a breach, causing a risk to life or injury with little warning.

Surface Water Flooding

Surface water flooding is common in built up areas where development, including roads, buildings and multiple other hard surfaces, may result in a lack of open spaces and permeable surfaces able to absorb rainfall. It can also be a problem in rural areas where during heavy rainfall water tends to run off steeply sloping fields affecting rural communities and can lead to significant loss of soil.

Where rainfall cannot be absorbed by the soil, rain is directed into the drainage systems instead. Typically piped drainage systems are designed to deal with frequent, relatively short duration rainfall events. They are not designed to deal with longer storms or more intense rainfall and surface water flooding occurs when those systems are unable to cope with the volume of water entering them and are more likely to become blocked with debris and silt.

Other Sources of Flooding

While the three sources of flooding listed above are the most commonly experienced there are however other sources of flood risk including:

- the failure of dams;
- the failure of defence structures;
- canal breaches;
- groundwater and other water sources; and
- sewer flooding.

The likelihood of failure of a dam is very low. Strict monitoring, maintenance and safety regimes are in place and recent legislative changes (under the Flood and Water Management Act 2010) to further strengthen arrangements are being implemented. However, if a dam failure occurred there would be a risk of significant amounts of water being released from any associated reservoir.

While not a traditional source of flooding in the same way as a river or a dam, the failure of a defence structure could significantly increase the impacts or consequences of a flood or coastal erosion event. An area previously considered to be protected could be placed at a level of risk residents are unprepared for.

There are also some risks of flooding from lakes and other water bodies. Groundwater levels can also impact on other sources of flooding, reducing capacity to absorb surface water for example. Groundwater flooding is not a widespread issue in Wales, but can occur in some areas, with consequences for land use and access. For example, Cardiff Bay has a pumping station to stop basements flooding from ground water levels.

From time to time other local flood risks involving water held within the ground occur. An example is the event at Parys Mountain, where water was held within the mountain in mine workings; flooding occurred when the water levels within the mountain mine workings increased following the closure of local mines. There is separate legislation governing the management of water levels in mines.

Flooding from Sewers

The risk of sewer flooding is not directly addressed within this strategy as it is the responsibility of the water and sewerage companies. However, the Welsh Government recognises the impacts and consequences sewer flooding can have.

Sewers come in three types:

- foul sewers, which are designed to carry soiled water that has been used for washing and cooking purposes, as well as the contents of toilets and trade effluent
- surface water sewers, which are designed to carry rainwater runoff from roofs, yards and roads
- combined sewers, which receive a mixture of foul sewage and surface water

Flooding from foul sewers is generally caused by blockages or the failure of pumped systems and usually affects only limited numbers of properties.

Flooding from surface water and combined sewers occurs when any of these types of sewer becomes overloaded due to heavy rainfall (or sometimes snow melt), when sewers become blocked, or more rarely, when mechanical or electrical equipment breaks down. The likelihood and severity of sewer flooding caused by overloading depends on the capacity of the sewerage system of sewers in question, which can be affected by a range of factors, including pipe size and weather conditions.

All sewer systems have a finite capacity and one way of reducing the risks of sewer flooding is reducing the amount of surface water running into the sewer network, and placing additional strain on systems.

While the depth of flooding caused by sewers is generally much less than that for the main sources, flood water containing foul sewage means that it does cause significant distress to those affected.

Management of sewer flooding is primarily the responsibility of the water and sewerage companies, and they are taking steps to address the causes and concerns. One such approach is the Surface Water Elimination and Reduction programme led by Dŵr Cymru Welsh Water. However, to effectively manage the risks of sewer flooding, water and sewerage companies will require assistance and cooperation from other Risk Management Authorities.

In 2011 the Welsh Ministers legislated to transfer responsibility for all private sewers and lateral drains to water and sewerage companies. The transfer removes the risk of significant costs for maintaining and repairing private sewers falling on individuals and is intended to provide wider benefits through the integrated management of the sewerage system.

Coastal Erosion Risk

Coastal erosion is the term used to describe the loss of land on the coast due to the action of the sea. The shoreline is constantly changing shape due to the action of waves, tides and currents. These processes are causing long term changes but during coastal storms there can be dramatic loss of land like cliff falls.

The level of beaches can be lowered by waves and tidal currents moving sand and shingle along the coast. This sediment transportation can expose the landmass behind the beach to bigger waves and increased erosion.

The very shape of Wales has been determined by the sea. Since the last Ice Age ended 10,000 years ago, sea levels have risen some 60 metres, flooding lowland plains and valleys. Coastal erosion is progressive, and causes permanent irreversible loss to property and infrastructure. Such losses can undermine the viability of coastal communities and have significant impacts on the local economy.

The rate at which the coast erodes depends on a number of factors including the prevailing sea conditions, the frequency and severity of coastal storm events, the amount of sand shingle and beach and as well as the geology and topography of the coast and near shore zone. Hard rocks erode slowly, with impacts being more gradual. In contrast, softer rocks rock formations or sand dunes will erode faster, and this speed of erosion can pose a risk to coastal communities.

In some areas the risk of erosion is compounded by unstable coastal land. Coastal erosion at the bottom of an unstable coastal slope may lead to a landslip affecting land further inland.

The rate of coastal erosion in Wales is generally low compared with some parts of England. However, evidence from our emerging Shoreline Management Plans suggests that in the next 100 years we could see an increasing number of our coastal communities at risk from rising sea levels and eroding land.

The location of some of these communities will become unsustainable in the longer term, forcing those who live there to move.

Coastal squeeze

Coastal squeeze describes one of the consequences of sea level rise on our coast areas.

As sea levels rise, increasing wave height and intensity, sea waters move further inland with the consequential loss of low lying habitats and damage to the features of the habitat and associated species within it. This loss of intertidal habitat is referred to as coastal squeeze, and while generally referred to in relation to habitat, it can also have an impact on flood and coastal erosion risk.

Decreasing the extent of foreshore in front of a defence, for example, can create deeper water with a consequent increase in wave size. This can undermine defences or make it more likely that defences are overtopped.

Around the coast of Wales there are several significant areas where low lying habitat conservation sites are located between the sea and coastal defences, man-made structures and areas of higher ground. One example is the Newport coastline on the Severn Estuary. Many of these are protected by European and domestic legislation including the Water Framework Directive, the Habitats Directive and the Birds Directive.

It is important to note the role that coastal features like beaches and sand dunes can play in wider coastal protection. They can be significant natural buffers to sea flooding if considered as part of an integrated management strategy using natural processes and through this potentially reduce the maintenance costs or increase the lifespan of structures protected by them.

They also provide important ecological benefits such as fish nurseries, for example, as well as recreational and tourism opportunities for local communities. These habitats can provide multiple benefits to society, the economy, and the environment.

As some parts of the coast are washed away, others are enhanced. Coastal accretion is the name given to the process by which sediment which has been, transported by natural coastal processes, is deposited on the shoreline. Sand or shingle washed away from one beach is likely to drift further along the coast and be deposited elsewhere where it could form a new beach or raise the level of an existing one.

Combined Risk

Detailing individual sources of risk does not imply that flooding can only ever occur for one reason, or that coastal erosion only ever has one outcome. Any and all of these sources and facets can come together to produce what are called combination events.

An example of a combination flood is one occurring during a period of intense or prolonged rainfall. The rain would increase water levels in watercourses, saturate ground, increase flow through the drainage system and could enter the public sewerage system, increasing pressure. As all of these factors combine, watercourses, drains and sewers could all reach maximum capacity and with nowhere else to go the water could overflow from all of them, resulting in a combination of river, sewer and surface water flooding.

On the coast, a combination event could involve flooding from the sea where a storm delivers intense rainfall on the land and a storm surge and stormy seas, at the same time as a high tide. This results in an increase in tide and wave levels at the same time as flow from rivers to the sea increases. If the two meet, coastal communities could experience a mix of flooding from the sea and a river.

Depending on the intensity of the rainfall and the waves, such an event could also cause an increase in coastal erosion, resulting in long term damage to the coast, which could exacerbate future flood risks.

APPENDIX B
Sandbag Policy

Appendix B

CEREDIGION COUNTY COUNCIL - SANDBAG POLICY

Introduction

Sandbags are probably the best known means of keeping flood water out of a property during flooding events. They can be useful in helping to prevent overtopping of ditches and streams, and for diverting running water. Sandbags can be used to block doorways, drains and other openings into properties as well as to weigh-down manhole covers and to block sink, toilet and bath drains to prevent water backing up. They can keep water out for short periods and they are cheap and easy to obtain.

Sandbags are not always an effective measure in the event of flooding when compared to purpose-designed flood protection products.

However, their use does have some disadvantages:

- the filling is time consuming and requires two people
- they can be difficult to handle and may contain contaminent such as sewage
- the sacking material is biodegradable and will disintegrate with time

People are therefore strongly encouraged to use purpose made flood protection products, such as flood boards, non-return valves for plumbing and air brick covers.

It is the responsibility of property owners to take appropriate action to protect their property from flooding.

Purpose

This policy has been produced by Ceredigion County Council to ensure that reserves of sandbags are available to adequately respond to flooding incidents in order to protect public assets, and to make sandbags available for the general public to protect their property from flooding during extreme flooding events.

The policy sets out the priorities for the use and the distribution of sandbags and will establish procedures for the availability of sandbags, the management of stocks, their supply and disposal.

The policy also determines the approach to be taken in raising the awareness of the public and of businesses of their responsibilities in respect of protecting their own property.

Priorities

The public has a general expectation that in a period of likely flooding Ceredigion County Council will make sandbags available. This is not the case.

The primary responsibility for protecting property from the risk of flooding rests with the property owner. If the property is in a known flood plain or considered to be at risk of flooding, then property owners should purchase sandbags or other flood protection products in advance and follow the advice provided by the Environment Agency.

The supply of sandbags is a voluntary service, and in a major flooding situation Ceredigion County Council cannot guarantee to meet every request for sandbags to support people in protecting their property. In the event of severe weather and where there is a genuine risk of flooding Ceredigion County Council may provide filled sandbags to properties upon request. Each request made to Ceredigion County Council will be considered and prioritised in relation to the prevailing circumstances, irrespective of the flooding source.

The following priorities have been established:

1) Protection of life
2) Protection of the vulnerable, the elderly or infirm
3) Protection of key infrastructure (flood defences, sub stations, water supplies, highways etc)
4) Protection of key facilities and buildings within the community
5) Protection of business and commercial properties

Ceredigion County Council will also where possible respond to requests from the Emergency Services for sandbags for the protection of strategic properties.

Stocks

In the event of flooding Ceredigion County Council has made arrangements to hold stocks of sandbags for use where there is known to be a risk of flooding, and will, at all times, keep 500 filled sandbags in a serviceable condition, ready for deployment, at each of the following locations:

- Glanyrafon Depot, Llanbadarn Fawr, Aberystwyth
- Penrhos Depot, Llandysul

An additional minimum of 2,000 unfilled sandbags will be kept at each depot together with at least 20 tonnes of sand.

Please note – Under no circumstances are members of the public allowed to collect filled sandbags directly from any of the Council depots at any time

Supplies

Ceredigion County Council has a limited supply of sandbags and can therefore only give them to the homes at greatest risk. At times of high flood risk Ceredigion County Council will endeavour, on request, to deliver sandbags to occupied properties at imminent risk. However, this will not always be possible due to demand and/or weather conditions.

Please note that these requests will be subject to a risk assessment, which will need to consider the access to the property, the priority of need and the risk associated with flooding.

Sandbags will be provided free of charge during flooding emergencies, subject to the availability of resources. It must be emphasized that residents of Ceredigion County Council who live in identified flood risk areas should not rely upon the Council to respond to a threat of flooding to their property but should have their own flood protection plan in place.

Similarly, commercial premises are responsible for carrying out their own flooding risk assessment and for ordering their own supplies of sandbags.

Ceredigion County Council will not supply sandbags in advance based on forecasts.

Distribution

Subject to an assessment of need and risk of being flooded, Ceredigion County Council will consider sending sandbags on request.

Sandbags will not be provided for the protection of gardens, outbuildings or other structures. Delivery of sandbags will normally be to the nearest point of access to a property from the highway or access road.

Ceredigion County Council will accept no responsibility for the positioning of sandbags or any subsequent repositioning.

Disposal

When sandbags are provided, they become the absolute responsibility of the person receiving them. Ceredigion County Council will not be responsible for collecting or disposing of sandbags after flooding.

Sandbags are mostly made of polypropylene which can be recycled. Therefore the empty sandbags, if clean, can be recycled in the clear recycling bags provided by Ceredigion County Council. If the empty sandbags are not clean, they are considered as domestic waste and in small quantities can e disposed in black bags.

A larger amount of used sandbags can be disposed free of charge at the local household waste site. Sandbags from commercial premises can be disposed of in the orange bags or in larger quantities at the local household waste site at a charge.

Advice to public

Reliance on the County Council to provide sandbags should not be considered as being the primary means of protection. It is essential that the public are made aware of this policy and are encouraged to make their own arrangements to protect their property during potential flood conditions.

Businesses are expected to make their own arrangements and will not as a rule be supported by the provision of sandbags.

Owners of properties, that are at risk of flooding, are encouraged to keep, where possible, their own stock of empty sandbags together with sufficient stocks of sand to fill the bags at time of potential flooding.

If you require sandbags to protect your premises, these can normally be obtained from any building supplies retailer. Please be aware that some builders merchants consider sandbags a seasonal item and they may not always be available.

Ceredigion County Council encourages property owners in known flood areas to prepare in advance and respond to forecasts or flood warnings. Members of the public making enquiries for sandbags at these early stages are encouraged to look to local suppliers where they can purchase sand bags or possibly have them delivered. This will help preserve the stocks of sandbags held by Ceredigion County Council for genuine emergency response.

Links to self help guidance

Additional advice in relation to flooding and whether or not your property is at risk of flooding is available from the Environment Agency's website at www.environment-agency.gov.uk

There you can also find information on

- How to register for flood warnings through Floodline (0845 988 1188)
- How to protect your property against flooding
- Flood protection products and services
- How to use sandbags properly for flood protection
- How to reduce the potential damage to your property as a result from flooding

Policy Review

The policy will be reviewed annually and amended as necessary.

APPENDIX C
Culverting Policy

Appendix C

Culverting Policy

Ceredigion County Council is generally opposed to the culverting of watercourses because of the adverse ecological, flood risk, human safety and aesthetic impacts. Watercourses are important linear features of the landscape and should be maintained as continuous corridors to maximise their benefits to society.

The Authority seeks to avoid culverting as:

- the ecology of the watercourse is likely to be degraded by culverting
- culverting introduces an increased risk of blockage (with consequent increase in flood risk)
- it can complicate maintenance because access into the culvert is restricted (in some cases being classified as a confined space and requiring trained operatives and specialist equipment)

A blockage in a culvert can be very difficult to remove and likely to result in a severe flood risk. For these reasons the provision of a screen at the entrance to the culvert is often considered. Such a screen reduces the risk of a blockage inside a culvert, but introduces a significant maintenance obligation (to ensure that the screen is kept clean) which far exceeds the typical maintenance requirements of an open watercourse.

Impacts of Culverting:

Ecology	Culverts can be impassable to riverine fauna and can create barriers to the movement of fish. Culverting results in the loss of natural in-stream and bankside habitats through direct removal and loss of daylight.
Pollution	In urban areas, culverted watercourses are often highly polluted due to misconnected foul sewers, overflows from blocked sewers or discharges of contaminated surface water.
Morphology	Culverted sections may create or exacerbate downstream or upstream bank and bed erosion or promote sediment deposition, as a result of altered water velocities and disruption to the natural transport of sediment
Restoration	Culverts can hinder future restoration options. This is particularly significant where urban development results in the burial of once open watercourses beneath housing or commercial centres, or where new development is placed on top of existing culverted watercourses which otherwise might be available for restoration
Landscape and amenity	Culverting of urban waters leads to the loss and degradation of distinctive components of the local landscape. Culverting leads to the loss of green amenity space along river banks and reduced access for recreational opportunities such as angling, walking or canoeing.

The culverting of a watercourse requires the prior written approval and consent of Ceredigion Council under the terms of the Public health Act 1936, the Land Drainage Act 1991 and the Water Resources Act 1991.

We will consider each application to culvert a watercourse on its own merits and in accordance with our risk-based approach to permitting. We will only approve a culvert if there is no reasonably practicable alternative, or if we think the detrimental effects would be so minor that a more costly alternative would not be justified. In all cases where it is appropriate to do so, applicants must provide adequate mitigation measures and accept sole ownership and responsibility for future maintenance.

We will normally object to proposals to build over existing culverts because of health and safety considerations, increased maintenance costs, and because this would preclude future options to restore the watercourse.

Where appropriate we will encourage the restoration of culverted watercourses to open channels.

APPENDIX D
Further Sources of Legislation

Appendix D

Further Sources of Legislation

Legislation

Flood and Water Management Act 2010
http://www.legislation.gov.uk/ukpga/2010/29/contents/

The Flood Risk Regulations 2009
http://www.legislation.gov.uk/uksi/2009/3042/contents/made

Water Framework Directive:
http://www.wales.gov.uk/topics/environmentcountryside/epq/waterflooding/waterframework/?lang=en

Welsh Government

National Strategy for Flood and Coastal Erosion Risk Management in Wales
http://wales.gov.uk/docs/desh/publications/111114floodingstrategyen.pdf

Local Flood Risk Management Strategies - Guidance
http://wales.gov.uk/docs/desh/publications/111130floodinglocalstrategyen.pdf

Planning Policy Wales
http://wales.gov.uk/topics/planning/policy/ppw/;jsessionid=rnpSPzwBK7GxdPrTzqz1JG0KJfdzL1jRkVkk1tTrPVGyycByHyQT

TAN 14:
http://wales.gov.uk/topics/planning/policy/tans/tan14/;jsessionid=M2LVP9tXykhDsF9VNh9cnhxsktGJrNtnQbGrMkc7Qs4GgPzXH6vR

TAN 15:
http://wales.gov.uk/topics/planning/policy/tans/tan15/?lang=en

Community engagement toolkit
http://wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/communities/toolkit/;jsessionid=qpbMP9nhMqBC6qBL8Z1xPcPpJ5zyYgP7yBm547pVWCqcD16Zykhb!1858592419?lang=en

One Wales: One Planet
http://wales.gov.uk/topics/sustainabledevelopment/publications/onewalesoneplanet/?lang=en

Sustainable Development: – Guidance to Risk Management Authorities
http://wales.gov.uk/docs/desh/publications/111231floodingsustainableen.pdf

Flood Risk Management toolkit
http://wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/?lang=en

Climate Change

United Kingdom Climate Projections 2009 (UKCP09)
http://ukclimateprojections.defra.gov.uk/

The Stern Review on the Economics of Climate Change
http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/sternreview_index.htm

Learning Lessons from the 2007 Floods (The Pitt Review)
http://webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/pittrevi

ew/thepittreview.html

EA Publications

River Basin Management Plans
http://www.environment-agency.gov.uk/research/planning/33106.aspx

Catchment Flood Management Plans
http://www.environment-agency.gov.uk/research/planning/33586.aspx

Flooding in Wales:
http://www.environment-agency.gov.uk/research/library/publications/108958.aspx

Future Flooding in Wales: Flood Defences
http://www.environmentagency.gov.uk/research/library/publications/116654.aspx

Environment Agency Flood Map
www.environment-agency.gov.uk/homeandleisure/floods/31650.aspx

Working with natural processes to manage flood and coastal erosion risk
http://www.environment-agency.gov.uk/research/planning/116707.aspx

'Living on the Edge'
http://publications.environment-agency.gov.uk/dispay.php?name=GEHO0407BMFL-E-E

Community Flood Plans
www.environment-agency.gov.uk/homeandleisure/floods/38329.aspx

Personal Flood Plan
www.environment-agency.gov.uk/homeandleisure/floods/38329.aspx

Prepare your property for flooding - A guide for householders and small businesses
http://publications.environment-agency.gov.uk/PDF/GEHO1009BRDL-E-E.pdf

Environment Agency Working at Construction and demolition sites
PPG6 Pollution Prevention Guidelines
http://www.environment-agency.gov.uk/business/topics/pollution/39083.aspx

Coastal erosion mapping
http://www.environment-agency.gov.uk/homeandleisure/134808.aspx

National Flood Forum: Website 'blue pages' - a directory of flood protection products and services
http://www.bluepages.org.uk/

West of Wales Shoreline Management Plan
http://www.westofwalessmp.org/content.asp?nav=23&parent_directory_id=10

APPENDIX E
Flood Forecasting and Flood Warnings

Appendix E – Flood Forecasting and Flood Warnings

The Met Office

The Met Office is the UK's National Weather Service.

They provide the Public Weather Service (PWS), which provides forecasts for the public to help them make informed decisions about their day-to-day activities. The National Severe Weather Warning Service is also a part of this, providing advance notice of weather which could affect public safety.

They issue warnings for rain, snow, wind, fog and ice. These warnings will be given a colour depending on a combination of both the likelihood of the event happening and the impact the conditions may have.
The UK map will show warnings which are in force for the selected day. Clicking on a warning area on the map will provide the text of the warning and the regions affected on the right hand side. By selecting a region from the table on the right hand side you can view all the warnings in force for that area, this will also zoom the map into that area.

Visit: www.metoffice.gov.uk/public/weather/warnings/

The Environment Agency

The Environment Agency provide web based information on river and sea levels so people living in flood risk areas are better informed and can decide what actions to take as the water levels change.

The Environment Agency does this by publishing the latest data from their network of monitoring stations across England and Wales that measure the levels of rivers, lakes, sea and groundwater in real time.

This data is published on the Environment Agency website.

Visit: www.environment-agency.gov.uk/homeandleisure/floods/riverlevels/default.aspx

The Environment Agency also operates a Flood Warning service, to help the public and emergency responders take timely and effective action to reduce the impact of flooding. Using the latest available technology, the EA monitor rainfall, river levels and sea levels and making forecasts of river and coastal flooding using local forecasting models. This information is used by local Environment Agency Flood Incident Duty Officers (FIDO) to make decisions on the issuing of flood warnings to professional partners, the media and the general public.

If flooding is forecast, they issue warnings using a set of three different warning types - Flood

Alert, Flood Warning, and Severe Flood Warning.

Flooding is Possible Be Prepared

- **Stay Alert**
- **Stay Vigilant**
- **Early Precautions**

Floods Expected, Action needs to be Taken Immediately

- **Flooding Expected**
- **Take Action**
- **Protect Yourselves and Your Property**

Severe Flooding – Danger to Life

- **Significant Risk to Life**
- **Significant Disruption to Communities**
- **Protect Yourselves**

The Environment Agency also operates Floodline Warnings Direct, which is a free service that provides flood warnings direct by telephone, mobile, email, SMS text message, pager and fax. The service currently covers designated Flood Warning Areas in England and Wales at risk from river or tidal flooding.

Flood Warnings are generally issued for specific communities, Flood Alerts generally cover larger areas e.g. catchments or lengths of coastline.

APPENDIX F
Glossary

Appendix F

Glossary - Reproduced from the National Strategy

Act – a Bill approved by both the House of Commons and the House of Lords and formally agreed to by the reigning monarch (known as Royal Assent).

Accretion – The gradual extension of land by natural forces, as in the addition of sand to a beach by the sea, or the extension of a floodplain through the deposition of sediments by repeated flooding.

Assets – structures or a system of structures used to manage flood risk.

Bill – a proposal for a new law, or a proposal to change an existing law that is presented for debate before Parliament.

Building Regulations – The UK Building Regulations are rules of a statutory nature to set standards for the design and construction of buildings. Primarily to ensure the safety and health for people in and around those buildings, but also for the purposes of energy conservation and access to and about other buildings.

Catchment – An area that serves a river with rainwater; that is, every part of land where the rainfall drains to a single watercourse is in the same catchment.

CFMP – Catchment Flood Management Plans – plans that provide an overview of the flood risk across each river catchment and estuary. They recommend ways of managing those risks now and over the next 50-100 years.

Climate Change – any change in climate over time (usually decades or longer), whether due to natural variability or as a result of human activity.

Coastal erosion – the wearing away of coastline, usually by wind and/or wave action.

Coastal erosion risk – measures the significance of potential coastal erosion in terms of likelihood and impact.

Coastal erosion risk management – anything done for the purpose of analysing, assessing and reducing a risk of the wearing away of coastline.

Coastal Flooding – Occurs when coastal defences are unable to contain the normal predicted high tides that can cause flooding, possibly when a high tide combines with a storm surge (created by high winds or very low atmospheric pressure).

Coastal Squeeze – Where the coast is protected by engineering structures, the rising sea level results in a steepening of the intertidal profile, known as coastal squeeze.

Community Infrastructure Levy – a mechanism for raising additional funding at the local level.

Critical National Infrastructure – Infrastructure that supplies essential services, e.g. water, energy, communications, transport etc.

Cultural Heritage – Buildings, structures and landscape features that have an historic value.

Culvert – a covered structure under road, embankment etc, to direct the flow of water.

Defences – A structure that is used to reduce the probability of floodwater or coastal erosion affecting a particular area.

Deposition – The process whereby sediment is placed on the sea bed, shoreline, river bed or flood plain.

Draft Bill – a Bill published in draft before introduction before Parliament.

EA – Environment Agency – Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs

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FCERM – Flood & Coastal Erosion Risk Management.

Flood – any case where land not normally covered with water becomes covered by water.

Flood and Water Management Act 2010 – an Act of Parliament updating and amending legislation to address the threat of flooding and water scarcity, both of which are predicted to increase with climate change.

Flood risk – product of the probability of flooding occurring and the consequences when flooding happens.

Flood risk management – the activity of understanding the probability and consequences of flooding, and seeking to modify these factors to reduce flood risk to people, property and the environment. This should take account of other water level management and environmental requirements, and opportunities and constraints.

Flood risk management measures – The way in which flood risks are to be managed.

Flood risk management Wales – The Regional Flood and Coastal Committee (RFCC) for Wales.

Flood Risk Regulations 2009 – Regulations which transpose the EC Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) into domestic law and to implement its provisions.

Floodline Warnings Direct – is a free service that provides flood warnings direct to you by telephone, mobile, email, SMS text message and fax.

Groundwater – water held underground in the soil or in pores and crevices in rock.

Groundwater Flooding – Occurs when water levels in the ground rise above the natural surface. Low lying areas underlain by permeable strata are particularly susceptible.

IDB - Internal Drainage Board – Independent statutory bodies responsible for land drainage in areas of special drainage need in Wales and England. They are long established bodies operating predominantly under the Land Drainage Act 1991 and have permissive powers to undertake work to secure drainage and water level management of their districts.

Intertidal – The area between low and high water tides.

LLFA – Lead Local Flood Authority – (Local Authority) the County Council or the County Borough Council for the area.

Local Authority special levies – are paid to Internal Drainage Boards by local authorities within a drainage district in relation to the benefits of water level management for non-agricultural land.

Local Flood Risk: defined within the Flood and Water Management Act 2010 as including surface runoff, groundwater and ordinary watercourses.

Local Flood Risk Management Strategy: required in relation to Wales by Section 10 of the Flood and Water Management Act 2010 local flood risk strategies are to be prepared by lead local flood authorities and must set out how they will manage local flood risks within their areas.

LRF - Local Resilience Forum – a group required under the Civil Contingencies Act, 2004 who are responsible for the coordination of emergency planning in local areas.

Main River – A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers.

Managed Realignment – A coastal defence technique which aims to achieve sustainable flood defence by recreating eroded salt marsh and mudflat habitats.

NRW/EA – Natural Resource Wales and Environment Agency – Welsh Government sponsored Public Body responsible to the Welsh Ministers.

Ordinary Watercourse – all watercourses that are not designated Main River, and which are the responsibility of Local Authorities or, where they exist, Internal Drainage Boards.

Recovery – The process of rebuilding, restoring and rehabilitating the community following an emergency.

Reservoir – an artificial lake where water is collected and stored until needed. Reservoirs can be used for irrigation, recreation, providing water for municipal needs, hydroelectric power or controlling water flow.

Residual risk – the risk that remains after risk control measures have been put in place. For example: a flood defence may reduce the likelihood of flooding, but if the flooding behind the defences is very deep, the residual risk to people is very high, and further action may be necessary to reduce the residual risk further.

Resilience – The ability of the community, services, area or infrastructure to avoid being flooded, lost to erosion or to withstand the consequences of flooding or erosion taking place.

RFCC – Regional Flood and Coastal Committee – An Environment Agency committee, responsible for consenting medium and long term plans and operational plans to the Agency's Board and Head Office. Monitors and reports on progress. In Wales there is only one RFCC and this is the FRMW (Flood Risk Management Wales) group.

Risk – measures the significance of a potential event in terms of likelihood and impact. In the context of the Civil Contingencies Act 2004, the events in question are emergencies.

Risk Assessment – A structured and auditable process of identifying potential significant events, assessing their likelihood and impacts and then combining these to provide an overall assessment of risk to inform further decisions and actions.

Risk Management – anything done for the purpose of analysing, assessing and reducing a risk.

Risk Management Authority – A Welsh risk management authority is defined in Section 6 of the Flood and Water Management Act 2010 as the Environment Agency, a lead local flood authority, a district council for an area for which there is no unitary authority, an IDB for an internal drainage district that is wholly or mainly in Wales and a water company that exercises functions in relation to an area in Wales.

Risk Management Schemes – a range of actions to reduce flood frequency and/or the consequences of flooding to acceptable or agreed levels.

River flooding – occurs when water levels in a channel overwhelms the capacity of the channel.

Roll Back – as natural defences fail the coast will 'roll back' naturally, creating an opportunity for the expansion of intertidal and coastal habitats.

Sewer – An artificial conduit, usually underground, for carrying off sewage (a foul sewer) or rainwater (a storm sewer) or both (a combined sewer).

Shoreline Management Plans (SMPs) – A large-scale assessment of the risks associated with coastal processes and helps reduce these risks to people and the developed, historic and natural environments.

Statement of Environmental Particulars – A statutory requirement under the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004. It sets out how the findings of the Environmental Report have been taken into account and how views expressed during the consultation period have been taken into account during the development of the National Strategy.

SuDS – Sustainable Drainage Systems – Approach to surface water management which helps to deal with excesses of water by mimicking natural drainage processes and patterns

Surface Water Flooding – In the urban context, usually means that surface water runoff rates exceed the capacity of drainage systems to remove it. In the rural context, it is where surface water runoff floods something or someone.

Surface water runoff – This occurs when the rate of rainfall exceeds the rate that water can infiltrate the round or soil.

Technical Advice Note 14: Coastal Planning – TAN 14 supports Planning Policy Wales and covers all aspects of planning for new development and the coastal zone.

Technical Advice Note 15: Development & Flood Risk – TAN 15 supports Planning Policy Wales and makes it clear how local authorities should make decisions about different types of development on flood plains, providing clear tests for justification and acceptability of flooding consequences, and enabling the consideration of risks over the lifetime of the new development.

Third Sector – Voluntary and not-for-profit organisations.

Wales Flood Group – a sub group of a Wales Resilience Forum.

Water company – a company which holds an appointment under Chapter 1 of Part 2 of the Water industry Act 1991 or a licence under Chapter 1A of Part 2 of that Act.

Watercourse – A channel natural or otherwise along which water flows.

Welsh Local Government Association (WLGA) – represents the interests of Local Authorities in Wales. The three fire and rescue authorities, four police authorities and three national park authorities are associate members.

WFD – Water Framework Directive