

CAERPHILLY COUNTY BOROUGH COUNCIL



## **Preliminary Flood Risk Assessment Report (PFRA)**

**May 2011**

# **Preliminary Flood Risk Assessment Report**

## **Executive Summary**

Under the Flood Risk Regulations (2009) and the Flood and Water Management Act became law in April (2010) Caerphilly Council Borough Council (CCBC) has been identified as a Lead Local Flood Authority (LLFA) and has been given a number of key responsibilities, including the preparation of a Preliminary Flood Risk assessment Report (PFRA).

To satisfy the Regulations CCBC have identified a number of Partners including The Environment Agency, Dwr Cymru/Welsh Water and the emergency services from outside of the Authority and Emergency Planning Section, Highways Division and Drainage Division within the Authority. Significant quantities of data have been collected from these partners.

The Environment Agency has identified an indicative Flood Risk Area within CCBC of 131km<sup>2</sup>. This area has been reviewed by CCBC using all the information collected and as a result the Flood Risk Area has remained the same.

In order to fulfil the requirements of the legislation and regulations this report has been completed together with Annexes 1- 5 of the Flood Risk Assessment Spreadsheet and a GIS layer providing details of the CCBC Flood Risk Area.

# Preliminary Flood Risk Assessment Report

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# Preliminary Assessment Report

## 1 Introduction

1.1 The Flood Risk Regulations came into force in December 2009 and the Flood and Water Management Act became law in April 2010. Under this legislation Caerphilly Council Borough Council (CCBC) has been identified as a Lead Local Flood Authority (LLFA) and has been given a number of key responsibilities.

1.2 The purpose of the Flood Risk Regulations is to transpose the European Commission (EC) Floods Directive (2007/60/EC), on the assessment and management of local flood risk, into domestic law in England and Wales and to implement its provisions. In particular it places duties on the LLFAs to prepare a number of documents including:-

Preliminary Flood Risk Assessment Report	22 <sup>nd</sup> June 2011
Flood Hazard and Flood Risk Maps	22 <sup>nd</sup> June 2013
Flood Risk Management Plans	22 <sup>nd</sup> June 2015

1.3 The purpose of this Preliminary Flood Risk Assessment Report is to identify areas subject to significant flood risk within CCBC. This information will then be used to inform the later stages of the Regulations including the Flood Hazard and Flood Risk Maps and the Flood Risk Management Plans

1.4 It is the responsibility of the Lead Local Flood Authorities (LLFA) to consider the risk from the following sources:-

1. Ordinary watercourses
2. Surface runoff
3. Groundwater
4. And any interaction these have with drainage systems and other sources of flooding

The report does not consider flooding from main rivers, the sea or large raised reservoirs, which are the responsibility of the Environment Agency.

1.5 The area identified as being subject to significant risk is referred to as The Flood Risk Area.

The PFRA report must consider floods which have significant harmful consequences for human health, economic activity and the environment

1.6 Caerphilly County Borough Council (CCBC) is a Unitary Authority situated within the valleys of South East Wales. It has a population of approximately 170,000 and an area of 27,763 hectares. The Borough is a mix of rural and urban communities generally built on the steeply sloping hillsides or within the valley basins. See Figure 1. All Wales Map

1.7 The study area is served by one water company – Dwr Cymru / Welsh Water and has three major catchment which drains into the River Rhydney, Sirhowy and Ebbw Fawr.

- 1.8 The PFRA is a high level screening exercise to locate areas in which the risk of surface water and groundwater flooding is significant and warrants further examination through the production of flood hazard and risk maps and management plans.

The aim of the PFRA is to provide an assessment of the local flood risk across the study area, including information on past floods and the potential consequences of future floods.

The key objectives may be summarised as follows:-

1. Identify relevant partners involved in future assessment of flood risk and summarise means of stakeholder engagement.
2. Describe arrangements for partnership and collaboration for the collection, assessment and storage of flood risk data
3. Provide a summary of the systems used for data sharing and storage, and provision for quality assurance, security and data licensing arrangements.
4. Summarise the methodology adopted for the PRFA with respect to data sources, availability and review procedures.
5. Assess historic flood events within the study area from surface water, groundwater and ordinary watercourses, and the consequences and impact of these events.
6. Collect and integrate historic information, which will be built upon in the future and used to support and inform the preparation of the CCBC Local Flood Risk Strategy
7. Assess the potential harmful consequences of future flood events within the study area.
8. Review the provisional national assessment of the indicative Flood Risk Area provided by the EA and provide explanation and justification for any amendments required in order to produce the final Flood Risk Area

## 2 Lead Local Flood Authority Responsibilities

- 2.1 In order to satisfy CCBC's local code of governance an information document outlining the requirements of The Flood Risk Regulations and the Flood and Water Management Act, will be presented to the Scrutiny Committee on 5<sup>th</sup> July 2011.

The Preliminary Flood Risk Assessment Report, details of the Flood Risk Area and the Preliminary Assessment Report Spreadsheets will be placed before a cabinet member for CCBC on 22<sup>th</sup> June 2011

- 2.2 As part of the PFRA CCBC has sought to engage partners which includes those listed below:-

1. The Environment Agency – Wales
2. Dwr Cymru / Welsh Water
3. Local Emergency Services – including fire and police

In addition significant collaboration has been stimulated between the various departments within CCBC as listed below:-

1. CCBC Emergency Planning Department
2. CCBC Highway Operations Group (part of highways and drainage)
3. CCBC Engineering Project group
4. CCBC Structures Department (part of Engineering projects group)

In addition significant interaction and collaboration has been established with neighbouring LLFAs within south Wales

- 2.3 It is recognised that members of the public may also have valuable information to contribute to the PFRA and the Local Flood Risk Strategy. Collaboration with the public can afford significant benefits including building trust, gaining access to additional local knowledge and increasing the chance of stakeholder acceptance of the local risk management plans.

To date the public have not been engaged on this project but the importance of collaboration is recognised. It is proposed that CCBC will follow the guidelines outlined in the EA's "Building Trust with Communities" document, which provides a useful process to communicate risk including the causes, probability and consequences to the general public and professional forums.

- 2.4 In addition to the Preliminary Flood Risk Assessment Report, Flood Hazard and Flood Risk Maps and Flood Risk Management Plans the Flood and Water Management Act and the Flood Risk Regulation have placed on Lead Local Flood Authorities a number of other significant responsibilities including the following:-

1. **Investigating and recording flood incidents and significant flood events** - including the identification of which authorities have flood risk management functions and what they have done or intend to do with respect to the incident. Notifying the risk management authorities where necessary and publishing the results of any investigations carried out.
2. **Maintain an Asset Register of features or structures** which are considered to have an affect on flood risk, including ownership and condition.
3. **SuDS Approving Body (SAB)** - to approve, adopt and maintain any new sustainable drainage systems.
4. **Local Strategy for Food Risk Management** - develop, maintain, apply and monitor the strategy.
5. **Work Powers** - The LLFA have powers to undertake work to manage flood risk
6. **Powers to Designate Structures** which may affect flooding in order to safeguard assets that are relied upon for flood risk management.

### 3 Methodology and Data Review

3.1 The following organisations were identified and contacted to obtain information for the preparation of the PFRA:-

Environment Agency – Wales  
 Geostore  
 National Receptor Dataset

Utilities  
 Dwr Cymru / Welsh Water  
 Western Power  
 British Telecom  
 Wales & West Utilities

Emergency Services  
 Fire Service  
 Police

Within Caerphilly County Borough Council  
 Emergency Planning Department  
 Highway Operations Group (Part of Highways and drainage)  
 Engineering Projects Group  
 Structures Department (Part of Engineering Project Group)  
 GIS - IT Services

**Table 1 - Key Flood Risk Indicators**

<b>Impact of flooding on</b>	<b>Flood Risk Indicators</b>
Human Health	Number of residential properties Critical Services including hospitals, police, fire and ambulance stations, schools, nursing homes
Economic Activity	Number of non-residential properties Length of road or rail Area of agricultural land
Cultural Heritage	Ancient Monuments Listed Buildings
Environmental	Designated sites – SSSIs and SINCs Nature reserves Landscape of historic interest

The above indicators have been selected by Defra, WAG and the Environment Agency in order to identify areas where flood risk and potential consequences exceed a pre-determined threshold. Indicative Flood Risk Areas have been identified where more than 5,000 people are at risk of flooding

**Table 2 – Data Collected**

	Data	Description
Environment Agency - Wales	Areas Susceptible to Surface Water Flooding	First generation national mapping, outlining areas of risk from surface water flooding with three susceptibility bandings - less, intermediate and more
	Flood Map for Surface Water	Second generation national surface water flood mapping which includes two sets of data - 1 in 30 and 1 in 200 year rain fall events with two bandings for each - greater than 0.1m and greater than 0.3m
	Flood Zones	Maps showing flood zones 2 and 3
	Areas Susceptible to Groundwater Flooding	Coarse scale mapping showing areas susceptible to groundwater flooding
	Historic Flood Map 22	Showing locations of areas of past flooding
	National Receptor Dataset	This data set gives details of social, economic, environmental and cultural receptors including residential properties, schools, hospitals, and electrical substations
	EA Blue Square	Squares which the EA have identified as being susceptible to flooding of significant consequences
	Indicative Flood Risk Area	Nationally identified flood risk area based on the Defra documentation
	River network	Map of main rivers
	Flood defences	Location of existing flood defences and land protected
	Historic Sewer Flooding	Location of incidents of fould sewer flooding
	Historic Surface Water Flooding	Location of incidents of surface water flooding
	Cultural	Coarse scale map of listed buildings and scheduled monuments at risk of flooding
	Environmental	Coarse scale maps of PPC sites with potential risk of flooding,
	Historic landfill	Areas used for land fill
Utilities	Welsh Water DG5 Register	Incidents of flooding within properties and outside
	Welsh Water Services	Location of pumping stations, service reservoirs and treatment works
	Western Power	Location of substations
	British Telecom	Location of telephone exchanges
	Wales & West Utilities	Location of critical infrastructure
Emergency Services	Fire Service	Incidents of flooding
	Police	Incidents of flooding
Caerphilly CB Council	Highway Operations Group - Drainage Section	Incidents of flooding to property Areas of historic flooding
	Planning Section - cultural	Listed buildings, ancient monuments,
	Planning Section - environmental	SSSI, nature reserve, SINC, landscape of historic interest
	GIS	Contours at 5m intervals
	Emergency Planning Section	Incidents of flooding to property
	Emergency Planning Section	Location of schools, care homes, doctors surgeries, fire stations, police stations, ambulance stations
	Highways Division	Highway classification and routes

- 3.2 Information from the Environment Agency was readily available on CD, email and down loads from the EA Geostore. This information was in a form which allowed it to be easily imported into our GIS system

Incidents of flooding from Dwr Cymru / Welsh Water were provided on request and was in a form which allowed easy importation into our GIS system. Their services location data arrived much later but was in a suitable electronic format.

Following a request to South Wales Fire and Rescue Service, logs of flooding incidents they attended for the years 2005 to 2010 were provided. The information was received in Microsoft Excel format with grid references. The information was corrected and converted into datasets to enable plotting into the Authority's GIS system.

Information from the Emergency Planning Section was in an electronic format and readily imported into GIS.

Flooding information from engineers were limited in numbers, some Information was in an electronic format and readily imported into GIS, however some electronic information were without grid references. This data had to be manually entered into the GIS system. There are considerable gaps in this information where years of records have been misplaced. Further searches may reveal additional data during the preparation of the Local Flood Risk Strategy.

Information from the Highways Division and Planning Section was in electronic format and readily imported into GIS.

It is the intension of CCBC to gather much more information on future flooding incidents which will be compatible between all departments and sections and will also be in electronic format suitable for importation into our GIS system

- 3.3 We currently operate with Esri GIS system and all our information is now stored in electronic format suitable for importation as layers within Esri GIS. For easy input of data we are currently using Microsoft Excel Spreadsheets and Microsoft Word as a word processor.

- 3.4 Although the amount of data recording past incidents of flooding and historic flooding is limited Figure 3 CCBC Flooding Incidents and Historic Flooding shows a high degree of correlation between these data sets and the Blue Squares identified by the EA and CCBC shown on Figure 2.

- 3.5 The information received from the EA is restricted by the terms imposed by the EA

Information provided by CCBC on Ordnance Survey maps is subject to the normal licensing agreement with them.

We are not aware of any other restrictions on the data available to CCBC.

## 4 Past Flood Risk

- 4.1 Data of incidents of past flooding has been collected for this report as detailed in Section 3 above. Historical flood events and flooding hotspots were collected across CCBC administrative area. A summary map highlighting the locations of these past events is illustrated in Figure 3. These events came from a range of flood sources, and in many cases the source of flooding was unknown or not recorded. A summary of information specific to each source of flooding as part of the PFRA is included below.

During the data collection stages over 2355 records of flooding were identified across CCBC. The PFRA requires that only past floods events which have a significantly harmful consequence and which could occur again be recorded.

For the PFRA reporting purposes only flood events with significantly harmful consequences based on various national guidance and best practices will be included within this report. CCBC understands that every flood incident impacts on local people and each flood record will be reviewed as part our longer term local Flood Risk Management strategy.

To decide on the significance of an individual flood Defra/WAG/EA have set key flood risk indicator which define a Flood Risk Area in Wales as having 5,000 people at risk or an individual 1km square where at least 200 people or 20 businesses or more than 1 critical service might be flooded to a depth of 0.3 metres and above by a rainfall event with a chance of 1 in 200 of occurring in any given year

CCBC as a LLFA has set the key flood risk indicator of people at risk of flood at a threshold of 200 (equivalent to 85 properties) to decide if a flood is of significance.

A flood event of this magnitude is at least one level of consequence down from the national threshold but still represents a flood of considerable magnitude. Such a flood could occur as a very intense localised area such as a 1km square or cover the whole of the borough in less a intense rainfall event.

The data readily available has been analysed to give the number of properties flooded in each incident and there are no records of flooding which affects 85 or more residential properties. And therefore no floods have been recorded in annex 1 as a result of this process.

- 4.2 **Surface water flooding** - Occurs when heavy rainfall exceeds the capacity of local drainage networks and water flows across ground. Information on surface water flooding incidents was obtained from a number of sources, detailed in section 3.

**Data limitability** – Some records did not list how many properties had been flooding or for how long. And there was often low confidence as to the precise location of properties affected in flood events as often only street names had been recorded.

**Historic surface water events** – During the PFRA data gathering process over 2355 records of surface water flooding was collected with the majority of flood events dated back to 2002 onwards. Figure 3. Shows the spatial distribution of the historic surface water flood events.

Areas affected by surface water flooding which have not been classified as having a significant harmful consequence will be reviewed as part of our local longer-term strategy.

- 4.3 **Groundwater flooding** - Occurs as a result of water rising up from the underlying aquifer or from water flowing from abnormal springs. This tends to occur after long periods of sustained high rainfall, and the areas at most risk are often low-lying where the water table is more likely to be at shallow depth. Groundwater flooding is known to occur in areas underlain by major aquifers, although increasingly it is also being associated with more localised floodplain sands and gravels. South Wales Geosyncline that includes coal measure rock dominates the solid geology of Caerphilly County Borough Council.

**Past flood events** - There are no historic groundwater flooding records with consequences although many properties have raised issues with cellars and room below ground becoming damper that we attribute to demise of underground mining pumping.

- 4.4 **Foul and Sewer water flooding** - Is often caused by excess surface water entering the drainage network. DG5 registers of reported sewerage flooding provided from Welsh Water were analysed to investigate the occurrence of sewer flooding incidents across Caerphilly Borough Council. It was found that there was a total of 306 sewerage flooding events that have been recorded by Welsh Water over the past decade. Figure 4 shows the sewer flooding within CCBC.

**Data Limitability** – Although the data provided by Welsh Water included over 300 flood records it is understood that some flood records were not reported by members of the public and are therefore not recorded in the DG5 register.

**Historic Foul water and sewer flooding** – There is over 300 records of sewer floods across CCBC. Once a property has been identified on the DG5 register, it typically means that the water company can put funding in place to take it off the DG5 register. Figure 5 shows the spatial distribution of the historic foul and sewer water flood events.

This PFRA has concluded that there are no past foul sewer water floods that had a significant harmful consequence and which could occur again within CCBC.

Areas affected by foul sewer flooding which have not been classified as having a significant harmful consequence will be reviewed as part of our local longer term strategy.

- 4.5 **Ordinary watercourses** – LLFR's are responsible for assessing risk from sources of flooding other than main rivers, the sea, reservoirs and canals within CCBC. CCBC area does incorporate some key watercourses as Rhymney, Ebbw Fawr, Nant Gledyr and Sirhowy and the key ordinary watercourses as Nant Cylla and the Nant Caeach. Which generates the main fluvial flood risk for the area. Prior to work being completed on some of the main rivers and ordinary watercourses by various agencies and authorities, flooding did occur in CCBC from rivers although the risk is now significantly lower.

**Data Limitability** – There was little historic data available, distinguishing between main river flooding and ordinary watercourse flooding, however, there is evidence to suggest that surface water flooding is exacerbated in some areas, such as Risca or Caerphilly during high tidal cycles when gravity drains and outfalls are blocked with high tidal waters.

**Ordinary watercourse past flood events** – There have been very few reported ordinary watercourse fluvial flood events recorded in CCBC in recent history. As such there are no significant harmful consequences recorded.

Areas affected by ordinary watercourse flooding which have not been classified as having a significant harmful consequence will be reviewed as part of our local longer-term strategy.

**Interaction with main rivers and the sea** – Insufficient data was available to draw definitive conclusions at this point. However, there is anecdotal evidence to suggest that surface water flooding is exacerbated in some areas such as Risca or Caerphilly during high tidal cycles when gravity drains and outfalls are blocked with high tidal waters.

**Analysis of Historic Flooding in Caerphilly** - We have little documented history from predecessor authorities information has come from staff who have worked for predecessor authorities.

**Consequences of Historic** – Insufficient data is available to draw a definitive conclusion on the impacts and consequences of historic flood events on people, the economy and the environment. Due to the lack of information available, no historic flood events have been considered to have significant harmful consequences and therefore none will be recorded in Annex 1 of the Preliminary Assess Spreadsheets. However a complete record of locations where flooding has occurred will be kept by CCBC as future evidence base. This base will be built up in the future through ensuring full details of flood events are recorded; this will then be used to support and inform future PFRA cycles as well as CCBC Local Flood Risk Management Strategy.

## 5 Future Flood Risk

- 5.1 CCBC has no information, which is currently available regarding future flooding other than that provided by the EA, as listed below. It is the intension of CCBC to carry out electronic modelling within the Flood Risk Area as part of the preparation of Flood Hazard and Flood Risk Maps and the Flood Risk Management Plan for the borough.
- 5.2 The Environment Agency has produced two sets of flood maps giving an assessment of flood risk for the whole of England and Wales. The first generation mapping referred to as Areas Susceptible to Surface Water Flooding (AStSWF) containing three levels of banding with a 1 in 200 chance of occurring. A second generation of maps have since been prepared and issued by the EA referred to as the Flood Map for Surface Water (FMfSW). This revised model contains two flood events 1) 1 in 30 and 2) 1 in 200 annual chance of occurring. Each data set is further subdivided to give areas likely to flood to a depth greater than 0.1m and greater than 0.3m.
- 5.3 The EA have carried out validation checks on the two mapping system and for the type of terrain within CCBC, which is mostly steeply sloping hillsides it is considered that the Flood Maps for Surface Water are the most appropriate to use for this PFRA.  
Figure 5. CCBC Flood Map for Surface Water 1 in 200 shows the flooding predicted by this model
- 5.4 At this stage CCBC does not have details of the capacity of the local drainage but this information will be calculated as part of the preparation work for the Flood Hazard and Flood Risk Maps and the Flood Risk Management Plans.
- 5.5 Annex 2 of the Preliminary Flood Risk Assessment Spreadsheet has been completed for a 1 in 200 year storm flooding to a depth greater than 0.3m
- 5.6 As no other information is available the second generation of maps prepared and issued by the EA referred to as the Flood Map for Surface Water (FMfSW) have been accepted as the locally agreed surface water information.
- 5.7 **The impacts of climate change**  
The impact of climate change on local flood risk is relatively poorly understood. Several national flood maps have informed the preliminary assessment report - specifically the Flood Map for Surface Water (surface runoff), Areas Susceptible to Surface Water Flooding (surface runoff), Areas Susceptible to Groundwater Flooding (groundwater) and Flood Map (ordinary watercourses). These do not show the impact of climate change on local flood risk.

There was consensus amongst climate model projections presented in the IPCC fourth assessment report for northern Europe suggesting that in winter high extremes of precipitation are very likely to increase in magnitude and frequency. These models project drier summers with increased chance of intense precipitation — intense heavy downpours interspersed with longer, relatively dry periods (Solomon et al. 2007).

## 5.8 UKCP09

United Kingdom Climate Projections 2009 (UKCP09) provides the most up to date projections of future climate for the UK (<http://ukclimateprojections.defra.gov.uk/>). In terms of precipitation, the key findings are:

By the 2080s, under Medium emissions, over most of lowland UK

Central estimates are for heavy rain days (rainfall greater than 25 mm) to increase by a factor of between 2 and 3.5 in winter, and 1 to 2 in summer.

By the 2080s, under Medium emissions, across regions in England & Wales

The central estimate (50% probability) for winter mean precipitation % change ranges from +14 to +23

Central estimate for summer mean precipitation % change ranges from -18 to -24.

Certain key processes such as localised convective rainfall are not represented within this modelling so there is still considerable uncertainty about rarer extreme rainfall events for the UK. We can be more certain that heavy rainfall will intensify in winter compared to summer. The proportion of summertime rainfall falling as heavy downpours may increase. The impact of these changes on local flood risk is not yet known.

## 5.9 Appraisal guidance

Current project appraisal guidance (Defra, 2006) provides indicative sensitivity ranges for peak rainfall intensity, for use on small catchments and urban/local drainage sites. These are due to be updated following the UKCP09 projections above. They describe the following changes in peak rainfall intensity; +5% (1990-2025), +10% (2025-2055), +20% (2055-2085) and +30% (2085-2115). This was reviewed by the Met Office in 2008 using UKCP09 models (Brown et al., 2008). They suggest that, on the basis of our current understanding, these levels represent a pragmatic but not a precautionary response to uncertainty in future climate impacts. In particular for a 1 in 5 year event, increases in precipitation intensity of 40% or more by the 2080s are plausible across the UK at the local scale.

## 5.10 Long term developments

It is possible that long term developments might affect the occurrence and significance of flooding. However current planning policy aims to prevent new development from increasing flood risk.

In England, Planning Policy Statement 25 (PPS25) on development and flood risk aims to "ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Where new development is, exceptionally, necessary in such areas, policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall."

In Wales, Technical Advice Note 15 (TAN15) on development and flood risk sets out a precautionary framework to guide planning decisions. The overarching aim of the precautionary framework is "to direct new development away from those areas which are at high risk of flooding."

Adherence to Government policy ensures that new development does not increase local flood risk. However, in exceptional circumstances the Local Planning Authority may accept that flood risk can be increased contrary to Government policy, usually because of the wider benefits of a new or proposed major development. Any exceptions would not be expected to increase risk to levels which are "significant" (in terms of the Government's criteria), but should be recorded here so that they can be reviewed in the future.

## 6 Review of indicative Flood Risk Areas

- 6.1 In order to ensure consistence of approach, Defra and WAG have identified a number of key risk indicators and their thresholds to establish significant to determine the existence of indicative Flood Risk Areas.
- 6.2 The methodology is based on using the flood maps produced by the EA to identify 1km squares where flood risk exceeds a defined threshold. These squares are known as Areas above Flood Risk Threshold (Blue Squares). The key flood risk indicators and their thresholds are as follows:-

- 1. a minimum of 200 people
- 2. a minimum of 20 businesses
- 3. 2 or more critical services

The EA have identified 59 squares within CCBC, which are Areas above the Flood Risk Threshold.

- 6.3 A cluster of these blue squares is an indication that an area of concentrated flood risk has been identified. Where there are four or more touching blue squares within a 3km x 3km square the whole 3km x 3km square has been considered as an area which could form part of an indicative Flood Risk Area.

The key flood risk indicator for establishing an indicative Flood Risk Area is numbers of people at risk of being affected by flooding. If there is a minimum of 5,000 people within a series of connecting 3km x 3km grids, as identified above, then an indicative Flood Risk Area has been established.

- 6.4 On the basis of the 59 blue squares, 47 of which are within the indicative Flood Risk Area, and the methodology defined above, the EA have identified an indicative Flood Risk Area within CCBC of 132km<sup>2</sup>.

The blue squares and indicative Flood Risk Area identified by the EA within CCBC are shown on Figure 2. EA Indicative Flood Risk Area and Blue Squares for CCBC.

- 6.5 In order to review the indicative Flood Risk Area all 277 km squares within CCBC were reviewed by studying each layer of information as listed in Table 2 – Data Collected. CCBC is satisfied that all the squares which have been identified, by the EA, as Areas above the Flood above Flood Risk Threshold have been correctly identified.

- 6.6 The Key Flood Risk Indicators for CCBC have been calculated by the EA as follows:-

Human health consequences – Number of people (2.34 multiplier)	16654
Other human health consequences – Number of critical services flooded	69
Economic consequences – number of non-residential properties flooded	1955

## 7.0 Next steps

- 7.1 In order to continue to fulfil the role as Local Lead Flood Authority, Caerphilly County Borough Council are required to investigate future flood events and ensure continued collection, assessment and storage of flood risk data.

It is essential that all new records of flood events are documented in accordance with the INSPIRE Directive (2007/2/EC). The format of the records will be compatible between department's sections within CCBC and will also be in an electronic format suitable for importation to our GIS system

- 7.2 An Information document will be submitted to the Scrutiny Committee of CCBC on the 5<sup>th</sup> July. Prior to this the Cabinet member will review the Preliminary Flood Risk assessment report with engineers prior to it being submitted to the Environment Agency on the 22 June 2011. Prior to the report being sent to the EA it will be thoroughly reviewed within the Engineering Department.

- 7.3 Under the Flood Risk Regulations the Environment Agency has been given a role of reviewing, collating and publishing all PFRAs.

The EA will undertake a technical review of the PFRA which will focus on instances where Flood Risk Areas have been amended and ensure the format of these areas meets the appropriate standards. The PFRAs will finally be signed off by the Environment Agency Regional Director before they are signed off, collated, published and submitted to the European Commission

- 7.4 Following the submission of the PFRA by CCBC, which must be completed by 22<sup>nd</sup> June 2011, work will commence on the flood Hazard and Flood Risk Maps, to be completed by 22<sup>nd</sup> June 2013 and finally the Flood Risk Management Plans to be finalised by 22<sup>nd</sup> June 2015.

Once this cycle has been completed the review procedure will commence which will result in a more detailed Flood Risk assessment report being submitted to the European Commission by 22<sup>nd</sup> December 2017.

## 8 References

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

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

Preliminary Flood Risk assessment (PFRA)  
Final Guidance  
Report –GEH01210BTGH-E-E  
Environment Agency  
<http://publications.environment-agency.gov.uk/>

Preliminary Flood Risk Assessment (PFRA)  
Annexes to the final guidance  
Report – GEH01210BTHF-E-E  
Environment Agency  
<http://publications.environment-agency.gov.uk/>

Selecting and Reviewing Flood Risk Areas for local sources of flooding  
Guidance to Lead Local Flood Authorities  
Flood Risk Regulations 2009  
Defra / Welsh assembly Government  
<http://ww2.defra.gov.uk/environment/flooding/>

## **Annexes**

### **Annex 1 - Records of past floods and their significant consequences (preliminary assessment report spreadsheet)**

Refer to Annex 1 of the Preliminary Assessment Spreadsheet

### **Annex 2 - Records of future floods and their consequences (preliminary assessment report spreadsheet)**

Refer to Annex 2 of the Preliminary Assessment Spreadsheet

### **Annex 3 - Records of Flood Risk Areas and their rationale (preliminary assessment report spreadsheet)**

Refer to Annex 3 of the Preliminary Assessment Spreadsheet

### **Annex 4 - Review checklist**

Refer to Annex 4 of the Preliminary Assessment Spreadsheet

### **Annex 5 - GIS layer of flood risk area**

GIS layer sent separately to the Environment Agency