

# FLOOD RISK REGULATIONS 2009

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## BRIGEND COUNTY BOROUGH COUNCIL PRELIMINARY FLOOD RISK ASSESSMENT REPORT



**Bridgend Town Centre 1960**

Cyngor Bwrdeistref Sirol



Bridgend County Borough Council  
Civic Offices  
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**Document Control Sheet**

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**Revision History**

Date	Version No.	Summary of Changes
March 2011	0.01	Draft
May 2011	0.02	Final
June 2011	0.03	Minor Amendments post EA initial check
August 2011	0..04	Removal of specific address details
Nov 2017	0.05	PFRA Review see Addendum

**Approvals**

Approved by	Signature	Date	Version
BCBC Cabinet		31/5/11	0.02
Project Manager	Glyn Jenkins	17/8/11	0.04
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BCBC Cabinet			0.05

**Distribution**

Name	Title	Date	Version

## Preliminary Assessment Report

### Executive Summary

Under the Flood Risk Regulations 2009, Bridgend County Borough Council, as a Lead Local Flood Authority, is required to carry out a high level overview of flood risk from local sources (groundwater, ordinary watercourses, surface water) and where these occur as an interaction with other sources (main rivers and the sea). This Preliminary Flood Risk Assessment report and spreadsheets has been prepared to meet this first stage of the requirements of the Regulations.

The Environment Agency has used the national methodology set out by DEFRA to identify Indicative Flood Risk Areas based on significant numbers of properties, businesses or critical assets at risk of flooding within a certain area.

Bridgend County Borough has no areas that reach the thresholds required to nominate indicative flood risk areas, although there are areas throughout the County Borough that are at risk of flooding. These areas will form the basis of local flood risk management strategies, supported by the continuing collection of information on flood risk and local flood events.

In order to develop an understanding of flood risk across the County Borough flood risk data and historic record data was collected from various sources and reviewed by an internal officer group.

The information relating to flood events from local sources was collated although due to the varying detail of information recorded it was difficult to assess whether any had "significant harmful consequences" (although any incident will have consequences for those involved). From the incidents identified and the records available none are considered to have had significant harmful consequences. These incidents have been added to a new MapInfo based database and any new flooding incidents will be recorded in the format prescribed in the guidance, which will make this assessment more reliably consistent in future.

There is, however, a high risk of flooding from local sources across the Borough and based on national surface water modelling approx 1250 properties and 650 businesses are estimated to be at risk from flooding to a depth of 0.3m during a rainfall event with a 1 in 200 annual chance of occurring. Local strategies will be required, in consultation with stakeholders, to manage such risks which will need to include consideration of flood warnings, emergency plans and resources.

**ADDENDUM 2017 Review****Update to the preliminary flood risk assessment report for Bridgend County Borough Council**

The preliminary flood risk assessment (PFRA) for Bridgend County Borough Council was reviewed during 2017, using all relevant current flood risk data and information, and agreed with Natural Resources Wales on 19<sup>th</sup> October 2017.

The below statements describe the review of the assessment of risk since the preliminary assessment report was published in 2011.

**Past flood risk**

There has been a review of flooding experienced since the publication of the first Preliminary Flood Risk Assessment Report in 2011 and there have been no floods experienced that caused locally significant harmful consequences.

**Future flood risk**

There has been no new information identified since the publication of the first Preliminary Flood Risk Assessment Report in 2011 that has led to a change in understanding of future flood risk.

**Flood risk areas (FRAs)**

The cycle 1 FRAs in Wales will be reviewed as part of a detailed consolidated PFRA that will cover all sources of flood risk by 22<sup>nd</sup> December 2018.

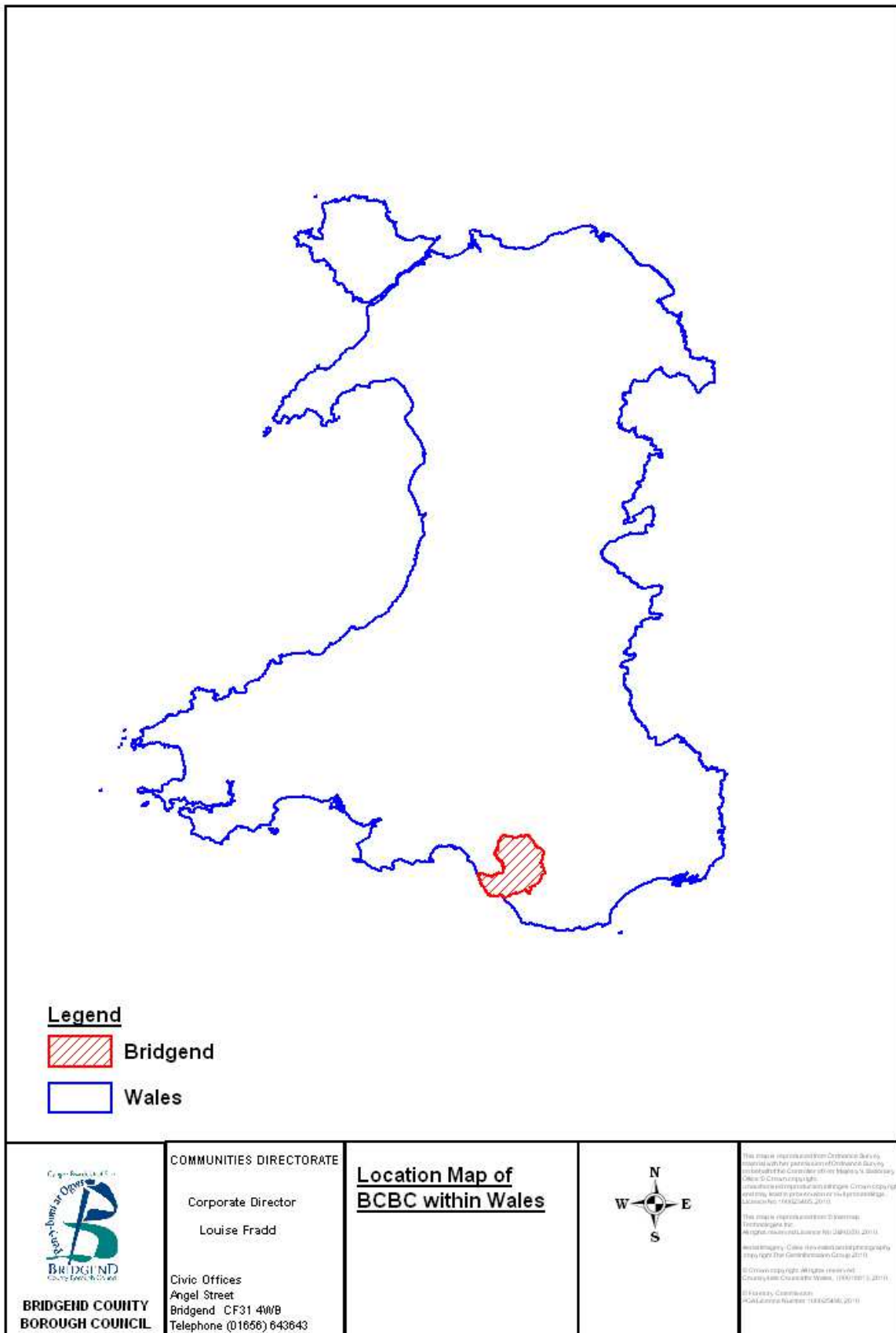
## Preliminary Assessment Report

	Page
1. Introduction	6
2. Lead Local Flood Authority responsibilities	8
3. Methodology and data review	9
4. Past flood risk	10
5. Future flood risk	15
6. Review of indicative Flood Risk Areas (Not Required)	19
7. Identification of Flood Risk Areas	19
8. Next steps	19
9. References	20
Annexes	
Annex 1 Record of past floods (intentionally blank)	
Annex 2 Future floods	
Annex 3 Flood Risk Areas (Not Required)	
Annex 4 Review checklist	

## **1. Introduction**

- 1.1 Bridgend County Borough is a unitary authority in South Wales with a population of over 128000 and an area of 285 square kilometres. The area centred on Bridgend the main town includes three former mining valleys and a coastal strip with the economy of the County Borough largely reliant on manufacturing, distribution, retail, tourism and farming. The area is covered by the Ogmore to Tawe Catchment Flood Management Plan. (See location Map 1.1)
- 1.2 The purpose of this Preliminary Flood Risk Assessment (PFRA) Report is to provide an assessment of potential flood risks for which Bridgend County Borough Council (BCBC), as Lead Local Flood Authority (LLFA), has responsibility. These include the assessment of the risk of flooding from surface water, ground water, ordinary watercourses and small reservoirs. Flood risk is the combination of the probability of a flood occurring and the consequences the flooding would cause if it occurred.
- 1.3 The potential flood risk from main rivers, the sea or large raised reservoirs is assessed by the Environment Agency (EA) and is not to be considered in this report, except where these impact on other sources of flooding.
- 1.4 The Flood Risk Regulations, 2009 transposes into domestic law the provisions of the European Commission Floods Directive (Directive 2007/60/EC) on the assessment and management of flood risks across European Union Member States.
- 1.5 The aim of the Flood Risk Regulations is to reduce the likelihood and consequence of flooding. Part 2 of the Regulations requires the preparation of a PFRA Report and the identification of Flood Risk Areas, areas where the risk of flooding is considered significant.
- 1.6 The objective of this PFRA is to identify local Flood Risk Areas in Bridgend CBC to inform the later stages of the Regulations and the Flood and Water Management Act, and to support any local flood risk management strategy. To this end internal departments and external partners have been consulted and historic information checked and assessed and this information together with that provided by the EA has been used to produce the Report.

### Map 1.1 Location of BCBC Study Area within Wales



Not to scale

## **2. Lead Local Flood Authority responsibilities**

2.1 As part of the new duties arising from the Flood and Water Management Act 2010 and the Flood Risk Regulations 2009, BCBC is the LLFA, acting in co-operation with EA Wales, Dŵr Cymru/Welsh Water (DCWW) and by 22<sup>nd</sup> June 2011 must prepare a PFRA Report focusing on local flood risk from surface water, groundwater ordinary watercourses and canals, identifying any flood risk areas that are considered to pose significant risk using the national criteria and guidance provided.

2.2 This document and annexes were placed before the Council's Cabinet on 31<sup>st</sup> May 2011.

2.3 Other responsibilities have arisen as a result of the new Regulations and Act and a timetable has been set for the commencement, these include:

A duty to liaise and co-operate with partner organisations and undertake public engagement and consultation with regard to local flood risk management plans.

A requirement to investigate, record and publish details of flooding incidents, including notifying risk management authorities and recording any actions or proposals for dealing with or managing the risk.

A duty to prepare and maintain an asset register of structures or features which are considered to have an effect on flood risk, including details on ownership and condition and to make the register available for inspection.

The LLFA is to be designated the SuDS (Sustainable urban Drainage Systems) approving body for any new surface water drainage system, with a requirement to approve, adopt and maintain any new sustainable drainage systems within their area.

A requirement to develop, maintain, apply and monitor a local strategy for flood risk management, building upon national risk assessments using a consistent risk based approach.

A power to undertake works to manage flood risk from surface water (SW) run-off and groundwater, consistent with local flood risk management strategies developed.

A power for LLFAs and the EA to designate structures and features that have an effect on flooding or coastal erosion in order to safeguard assets that are relied on for coastal erosion or flood risk management.



### **3. Methodology and data review**

- 3.1 The EA has provided details of areas of the Ordnance Survey National Grid of 1 km squares considered above the flood risk threshold. These areas were checked against information held by BCBC and information provided by other agencies as detailed below.
- 3.2 BCBC holds information, on Map Info, provided by CADW, CCW, Forestry Commission, DCWW, giving details of their assets. Details of past flood events of local significance are also available.
- 3.3 The EA has provided:
- Flood Map for Surface Water showing areas which could flood from surface water in storms with a 1 in 30 or 1 in 200 chance of occurring in any year.
  - Areas Susceptible to Surface Water Flooding
  - Flood Map showing the extent of flooding from rivers with a catchment of more than 3 km<sup>2</sup> with a 1 in 100 and 1 in 1000 chance of occurring in any year.
  - National Receptor Dataset providing information on social, economic, cultural and environmental receptors.
- 3.4 DCWW has provided details of past incidents of sewer surcharging due to surface water and will provide details of future incidents to inform the review process.
- 3.5.1 Information collated by BCBC for this report is held on MapInfo and on an electronic based filing system. (Any existing hard copy information will be used to populate the database as far as possible and be scanned and retained for historic archive purposes)
- 3.6 The information collated has been circulated between internal departments (Highways, Grounds Maintenance, Regeneration, Emergency Planning, etc.) for verification.

#### **4. Past flood risk**

- 4.1 BCBC holds records of past flooding incidents, (information gathered from Pre-feasibility flood studies, customer care records, highways records, sand-bag deployment, etc.) These have been collated and assessed in the light of “significant harmful consequences”, as determined by the Welsh Assembly Government (WAG) Minister, and for local significance. Guidance received indicates that for an incident to have significant harmful consequences it should involve numerous properties and/or important infrastructure assets, or occur on a frequent basis. Our records do not contain any incidents that could be considered to have significant harmful consequences, however, details of incidents will be maintained on the database and will be re-assessed should further flooding incidents occur at that site and/or the event be found to extend to include additional properties, or, assets.
- 4.2 Data is available on past floods, for surface water/watercourse flooding provided by BCBC and for sewer surcharging provided by DCWW. The records available are not exhaustive due to the various formats and standards of recording information in the past, for example some records indicate the deployment of sand-bags, but do not record whether this was as a pre-emptive measure, or whether a flood was prevented or actually occurred. All future incidents will be recorded on a database in accordance with the prescribed format to ensure that, as far as is possible; details of any floods, depths, effects are recorded, the source investigated and any mitigation measures recorded.
- 4.3 The spreadsheet in Annex 1 has not been populated as none of the floods for which records exist were considered to have significant harmful consequences. Summary details of floods recorded are, however, noted below in Table 4.1. Map 4.3 shows the locations of past surface water flooding and Map 4.4 shows locations of sewer surcharging.
- 4.4 **Addendum** There has been a review of flooding experienced since the publication of the first Preliminary Flood Risk Assessment Report in 2011 and there have been no floods experienced that caused locally significant harmful consequences.

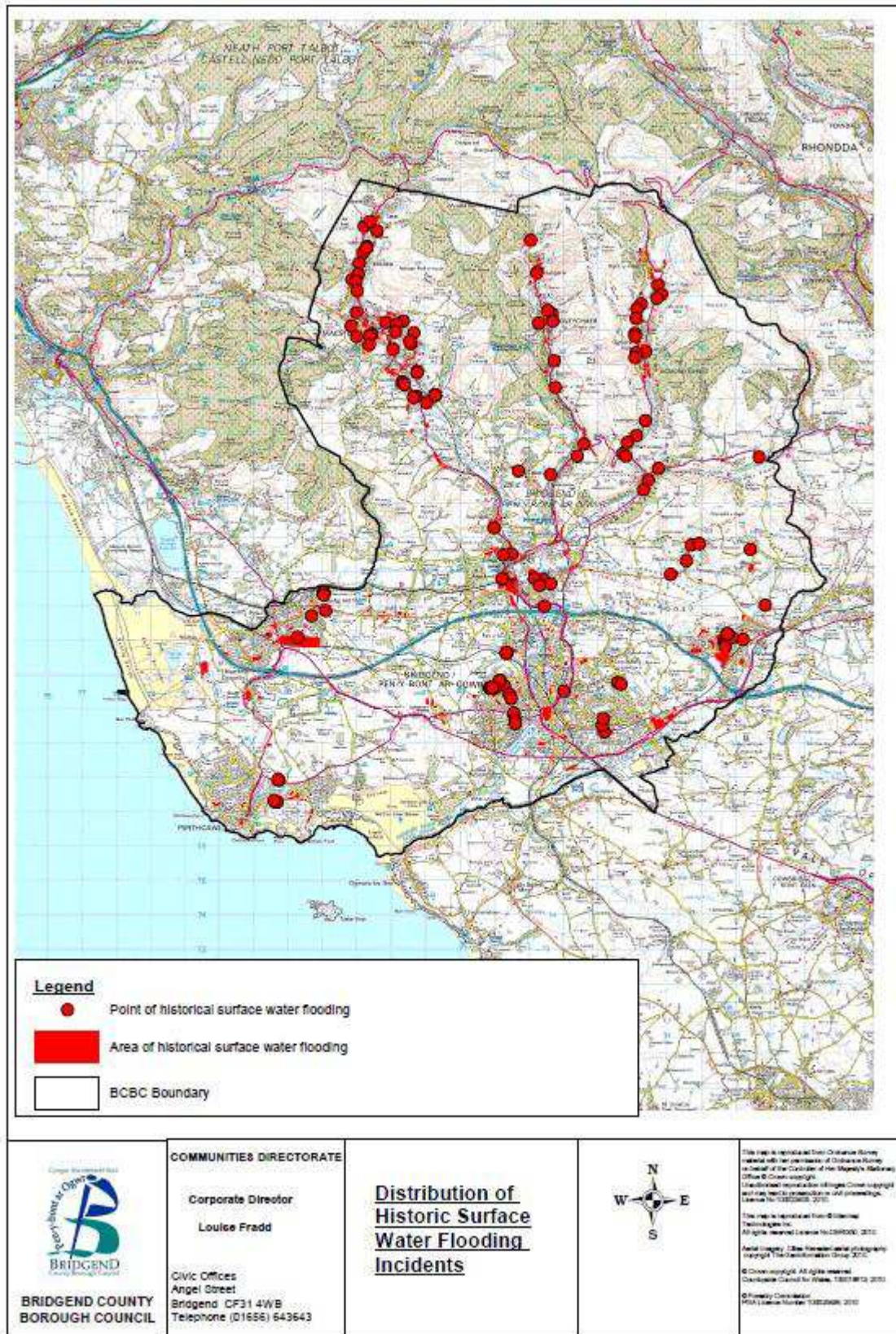
**TABLE 4.1 - Summary of past flooding - clusters**

<b>Flood ID</b>	<b>Name</b>	<b>Description</b>
1	St John's Drive, Porthcawl	SW run off from agricultural land up-stream (U/S) of Wilderness Pond, although the pond has not overtopped – Oct 1998 – 4 properties internally flooded.
2	St John's Drive, Porthcawl	SW run off from agricultural land U/S of Wilderness Pond, although the pond has not overtopped - October 1998 - 2 properties internally flooded.
3	Mount Pleasant Cottages, Aberkenfig	SW run off from hillside and un-surfaced lane Oct 2000 - 3 properties internally flooded.
4	Neath Road,	Fluvial Aug 1998, October 2000 – 2 properties where sand-bags prevented internal flooding
5	Salisbury Road, Maesteg	Fluvial - culvert inlet unable to cope with flows October 2000 3 properties where sand bagging prevented internal flooding.
6	Litchard & Brackla Ind Est	Pluvial - 31/10/1998, 27/11/00, no internal flooding
7	Heol-Y-Bryn, Llangynwyd	Pluvial - Feb 1998, April 2000, - 4 properties internally flooded
8	Heol-Y-Bryn, Llangwynydd	Pluvial - Feb 1998, April 2000, Oct – 2 properties internally flooded
9	Nant Cefn-Glas - Oaklands Close, Bridgend	Fluvial - 22nd October 1998 3 properties internally flooded
10	Nant Cefn Glas, Bridgend	Fluvial - 22nd October 1998 4 properties internally flooded
11	Alma Terrace, Ogmere Vale	Pluvial/groundwater - 12/01/2011 – 4properties internally flooded
12	Cemetery Road,Ogmere Vale	Pluvial/groundwater - 12/01/2011 – 2 properties internally flooded
13	New Road Porthcawl	Pluvial SW run-off from agricultural land – Oct 1998
14	Crown Road & Little Station Road Kenfig Hill	Fluvial - Inundation of SW culvert - 31/10/1998 4 properties internally flooded (culvert defect identified and repaired Dec 2010)
15	Y Dderwen Bridgend	Pluvial – Oct 2000
16	Ffordd-Yr-Afon	Fluvial - Overtopping from culvert inlet – Oct 1998 4 Properties affected
17	Beach Road, Pyle	Fluvial – blocked Network Rail Culvert – 8 <sup>th</sup> October 2010 (external flooding and damage to garden wall) 4 Properties affected
18	LLynfi Road Maesteg	Fluvial – culvert failed due to major blockage – Jan 08 (highway flooding and 2 properties flooded internally) – culvert repaired and inlet grid fitted.

**Summary of past flooding – Individual properties**

<b>ID</b>	<b>Location</b>	<b>Record Date</b>	<b>Flood Source</b>
1	Village Farm Industrial Estate Heol Treth	13/06/1998	Fluvial – possible incapacity in culvert – included flooding to highway
2	New Road Porthcawl, Ty'n Y Stepsa, Pen y Fai	Oct-98	Pluvial - SW run off from agricultural land
3		Dec 99, Feb 2001, Oct 2001	Pluvial - SW run-off from agricultural land
4	Pont Rhyd-y-Cyff	Sept 98, Nov 98, Feb 2000, Apr 02	Fluvial - from Nant Cwm-du one commercial premises
5	Mill View, Maesteg	Sep-07	Pluvial - SW run off from hillside – one property
6	Mill View, Maesteg	Sep-97	Pluvial - SW run off from hillside – one property
7	Woodstock Gardens, Pencoed	Oct 98, Feb 99, Dec 99	Pluvial - overland flows from agricultural land, SW rises over bund & overtops (bund/drain impls carried out 2010) one property affected
8	Spelter Ind Est	08/10/1998	Pluvial - SW sheeting off former railway track-bed & land reclamation scheme one unit affected
9	Spelter Ind Est	Dec-98	Pluvial - SW sheeting off former railway track-bed & land reclamation scheme one unit affected.
10	Spelter Ind Est	Aug-01	Pluvial - SW sheeting off former railway track-bed & land reclamation scheme one unit affected.
11	Heol Y Cyw	Annually (up to 4/year)	Fluvial, SW & highway (Highway drainage impls carried out 2011) one property affected.
12	Heol Y Cyw	Annually (up to 4/year)	Fluvial, SW & highway (Highway drainage impls carried out 2011) one property affected
13	Pleasant View, Heol Y Cyw	Annually (up to 4/year)	Fluvial, SW & highway (Highway drainage impls carried out 2011)
14	Westminster Way	31/10/1998	Fluvial - overtopping of culvert inlet structure one property affected
15	Westminster Way	23/12/1999	Fluvial - overtopping of culvert inlet structure one property affected
16	Marlpit Lane	31/10/1998	Pluvial - SW run off from agricultural land
17	Marlpit Lane	24/12/2000	Pluvial - SW runoff from agricultural land
18	Maesteg Rd, Cwmfelin	Oct-00	Pluvial - SW run off from agricultural land
19	Maesteg Rd, Cwmfelin	Oct-00	Pluvial - SW run off from agricultural land
20	Maesteg Rd, Cwmfelin	Oct-00	Pluvial - SW run off from agricultural land
21	Heol-Yr-Enfys	22/10/1998	Fluvial - Overtopping from culvert inlet
22	Barnes Avenue	Oct1998 – Oct 2000	Initially SW & subsequently fluvial
23	Iron Way, Tondu	12/01/2011	Fluvial - blocked culvert backing up into buried MH
24	Bridgend Road Aberkenfig	07/01/2011	Pluvial - snow melt & SW run-off
25	Bridgend Road Aberkenfig	07/01/2011	Pluvial - snow melt & SW run-off

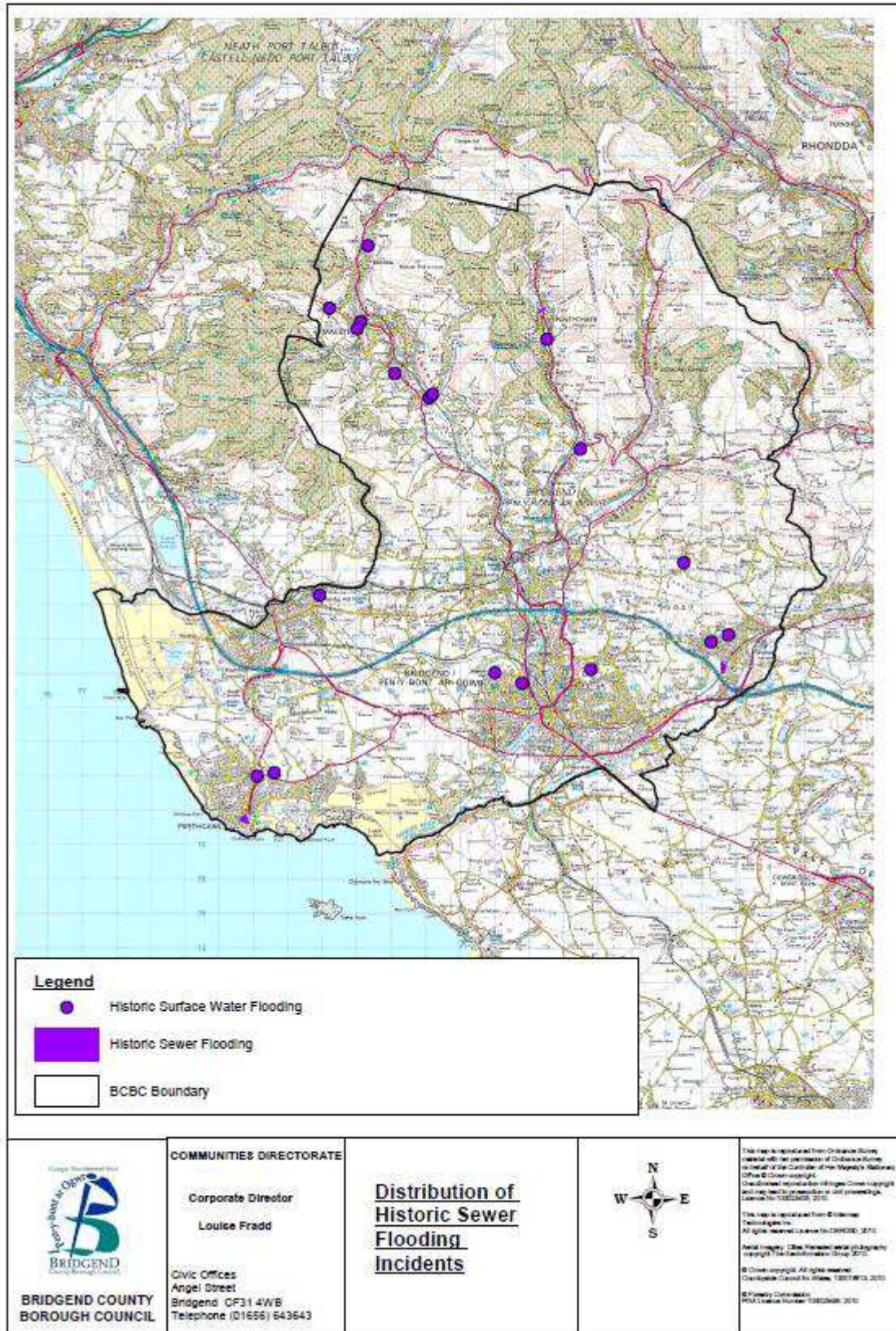
### Map 4.3 – Historic Surface Water Flooding



Not to scale



### Map 4.4 – Historic Sewer Flooding



Not to scale

## 5. Future flood risk

- 5.1 The Flood Map for Surface Water, 1 in 200 possibility of occurring and depth greater than 300mm, provided by the EA, is considered to be the locally agreed surface water information. (See Map 5.1) The key flood risk indicators (which consider the impacts of flooding on Human Health, Economic Activity, Cultural Heritage and Environment) have been assessed by the Environment Agency and this information has been included in Annex 2 of the Preliminary Assessment Spreadsheet.
- 5.2 Local drainage capacity has been designed to accommodate a 1 in 5 to 1 in 30 storm event. Bridgend County Borough also contains deteriorating, post-industrial drainage assets, many of these are unrecorded and a programme has commenced to locate identity and assess the condition and effects on the local drainage network.
- 5.3 This information is considered to be the best available information to detail those areas in the County Borough to be at a locally significant risk of flooding in the future. It must be emphasised that flooding from ordinary watercourse and surface water flow will not necessarily be confined to these areas – flooding may occur almost anywhere.

### 5.4 **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 PFRA 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 Intergovernmental Planning on Climate Change (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).

#### 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 25mm) 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 and 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.

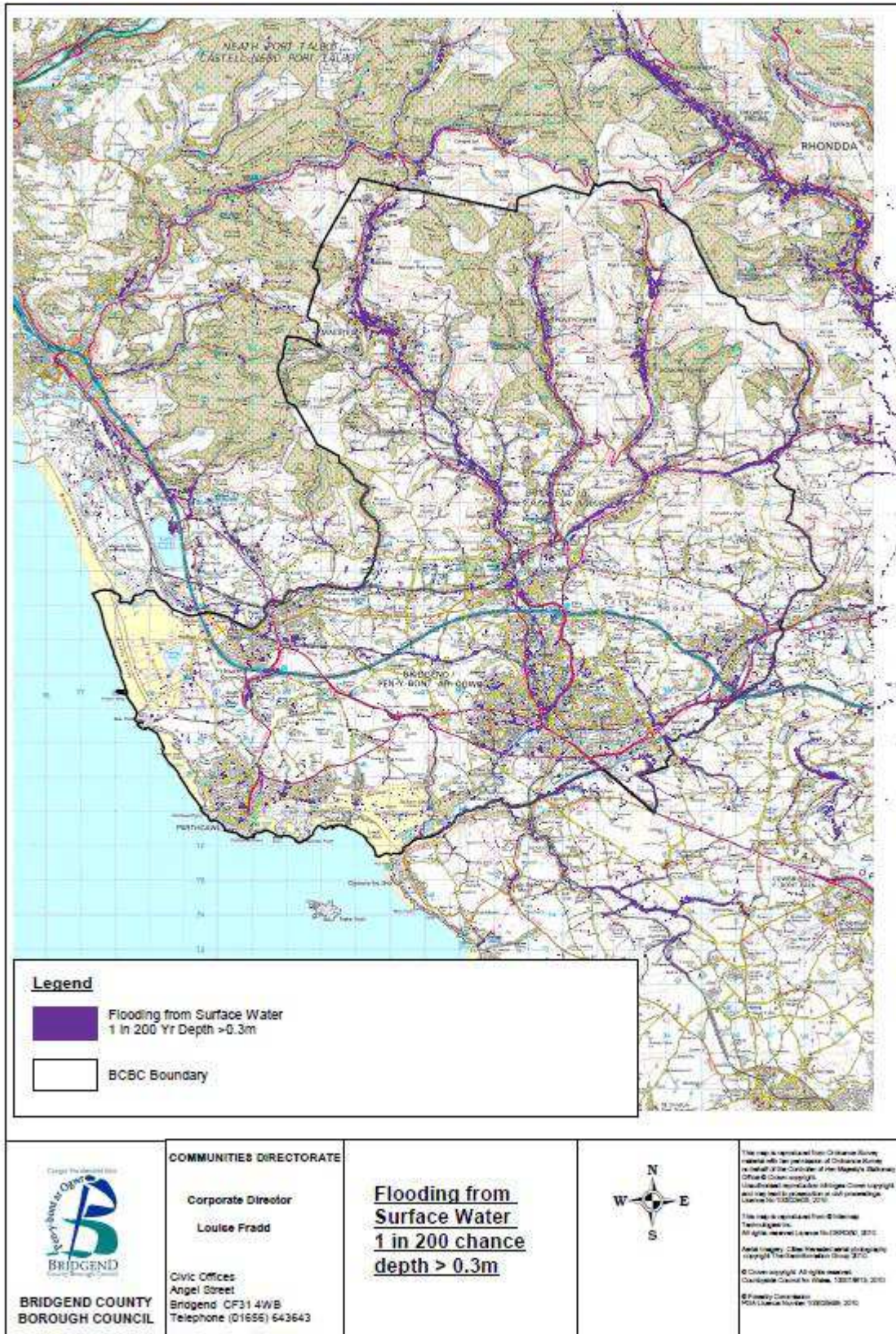
Certain key processes such as localised convective rainfall are not represented within this modelling so there is still considerable uncertainty about rarer extreme rainfall events for the UK. We can be more certain that heavy rainfall will intensify in winter compared to summer. The proportion of summertime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

## **5.5 Addendum**

There has been no new information identified since the publication of the first Preliminary Flood Risk Assessment Report in 2011 that has led to a change in understanding of future flood risk



### Map 5.1 – Locally agreed surface water information



Not to scale

## 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, an increase in precipitation intensity of 40% or more by the 2080s is plausible across the UK at the local scale.

## 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 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 developments 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 (LPA) 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.

Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Avery, M. Tignor and H.L. Miller (eds.). Summary for Policymakers. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 9. Available for download from <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>

SJ Brown, M Beswick, E Buonomo, R Clark, D Fereday, D Hollis, RG Jones, EJ Kennett, M Perry, J Prior and AA Scaife. Met Office Submission to the Pitt Review – Executive Summary, The extreme rainfall of Summer 2007 and future extreme rainfall in a changing climate. 08/01/2008

Defra (2006) Flood and Coastal Defence Appraisal Guidance, FCDPAG3 Economic Appraisal, Supplementary Note to Operating Authorities – Climate Change Impacts October 2006.

<http://www.defra.gov.uk/environment/flooding/documents/policy/guidance/fcdpag/fcd3climate.pdf>

## **6. Review of indicative Flood Risk Areas**

- 6.1 Not required, there are no indicative Flood Risk Areas identified for Bridgend County Borough.

## **7. Identification of Flood Risk Areas**

- 7.1 No new Flood Risk Areas have been identified.

## **8. Next steps**

- 8.1 Review of the information contained in this report is required to be undertaken by 22nd June 2017 and every six years thereafter.\* (see addendum in executive summary)
- 8.2 Environment Agency Flood Mapping  
The list of receptors within the EA flood outline will be amended as the EA update their flood mapping and will inform the review of any flood risk management strategies undertaken as a consequence of this report. Any changes will be notified to the relevant Partner.
- 8.3 Flood Mitigation Measures  
As notification of mitigation measures undertaken to alleviate the probability of flooding are received, amendments to the assets at risk mapping will be made and will inform the review of the Flood Risk Areas, and places above the flood risk threshold and management strategies.
- 8.4 Reported flooding incidents  
Initial reports via customer-care and Inspectors will be stored electronically and recorded as point and/or polygon data on a GIS layer where links to any photographs and supporting reports will be made and Excel spreadsheet information can be extracted.

All flooding incidents will be investigated and details recorded to identify the date, locations, source, depth, duration and effects of flooding and any course of action taken.

Over time, information on flooding incidents will accumulate and be added to the database. This will provide a picture of the location of incidents. Where there are a number of flooding reports in one area, depending on the severity of the perceived consequences, it may be necessary to review the list of places above the flood risk threshold and possibly amend the list of Flood Risk Areas.

### **8.5 Addendum Flood risk areas (FRAs)**

The cycle 1 FRAs in Wales will be reviewed as part of a detailed consolidated PFRA that will cover all sources of flood risk by 22<sup>nd</sup> December 2018.

## **9. References**

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>

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/>

United Kingdom Climate Projections 2009 (UKCP09)

<http://ukclimateprojections.defra.gov.uk/>



**Abbreviations/Glossary**

BCBC	Bridgend County Borough Council
DCWW	Dŵr Cymru/Welsh Water
EA	Environment Agency
Fluvial	Watercourse flooding
IPCC	Intergovernmental Planning on Climate Change
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
NRW	Natural Resources Wales
PFRA	Preliminary Flood Risk Assessment
Pluvial	Overland surface water run-off
SuDS	Sustainable urban Drainage Systems
SW run-off	Surface Water run off
TAN15	Technical Advice Note
U/S	Up-stream
UKCP09	United Kingdom Climate Projections 2009
WAG	Welsh Assembly Government