

Conwy County Borough Council
Preliminary Flood Risk Assessment



Final Report
June 2011

Document Control Sheet

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Document History

Date	Version No.	Summary of Changes
April 2011	1.0	
9 May 2011	1.1	Clarification of data references, inclusion of 1993 Llandudno flood event
31 May 2011	1.2	Section 1.1 - Clarification of length of artificially protected coastline within Conwy. Section 1.9 – Source for Main River flooding information Section 4.1 – Historical flood extent criteria re-defined. Table 4.1– Table heading changed, inclusion of further flooded areas in 1993 flood event and the addition of a date column and number of properties at risk column. Table 4.2– Table heading changed, the addition of a date column and dates of completed flood alleviation works undertaken by the Environment Agency Wales and Conwy County Borough Council. Map 4.3 and 4.4 – Title headings changed.
15 June 2011	1.3	Inclusion of 2009 historic flooding events in Trefriw.

Preliminary Assessment Report

Executive Summary

This report has been prepared to assist County County Borough Council meet their duties to manage local flood risk and deliver the requirements of the Flood Risk Regulations 2009. Conwy County Borough Council, as the Lead Local Flood Authority (LLFA), is required to identify those areas in the county at risk of flooding with significant consequences – Flood Risk Areas. These are clusters of areas above the flood risk threshold with an affected population greater than 5,000 people at risk, as defined in the WAG/ Defra guidance document 'Selecting and Reviewing Flood Risk Areas for local sources of flooding – Guidance for Lead Local Flood Authorities'.

Three clusters have been identified by the Environment Agency Wales (EAW) in Conwy – Llanrwst, Colwyn Bay and Abergele. All three clusters have an affected population of less than 5,000 people and hence are not considered flood risk areas under the Regulations.

The three identified clusters and the other areas identified as being above the flood risk threshold (more than 200 people or more than 1 critical service or more than 20 non-residential properties in a 1km² area) will form the basis of local flood risk management strategies, supported by the continuing collection of information on local flood events.

Preliminary Assessment Report

	Page
1. Introduction	5
2. Lead Local Flood Authority responsibilities	6
3. Methodology and data review	6
4. Past flood risk	7
5. Future flood risk	14
6. Review of indicative Flood Risk Areas	18
7. Identification of Flood Risk Areas	18
8. Next steps	18
9. References	19

1. Introduction

- 1.1. Conwy County Borough Council (CCBC) is a unitary authority on the north Wales coast. CCBC has 56km of coastline, 37km of which is artificially protected; this comprises 1/5th of the artificially protected coastline in Wales, from Llanfairfechan in the west across to the River Clwyd in the east, extending down a variety of landscapes to Dolwyddelan and Cerrigydrudion in the south, covering a total of 113,000 hectares. The County Borough Council serves a total resident population of 111,800, 80% of whom are settled along the coastal strip in the larger towns of Abergele, Colwyn Bay (the second largest town in north Wales) and Llandudno. Away from the coastal strip, the area is predominantly rural, with the economy largely reliant on tourism.
- 1.2 The purpose of the Flood Risk Regulations is to transpose the EC Floods Directive (Directive 2007/60/EC on the assessment and management of flood risk) into domestic law in England and Wales and to implement its provisions. In particular it places duties on the Environment Agency and LLFAs to prepare a number of documents including:
- Preliminary Flood Risk Assessments (PFRA);
 - Flood hazard and flood risk maps;
 - Flood Risk Management Plans.
- 1.3 An excerpt from the Flood Risk Regulations 2009 regarding the duty to prepare PFRAs is shown in Figure 1.1; the section highlighted in red shows the responsibilities of LLFAs to produce PFRAs.

Figure 1.1: Excerpt from Flood Risk Regulations 2009 relating to the production of PFRAs

PART 2	
PRELIMINARY FLOOD RISK ASSESSMENTS	
<p>Duty to prepare preliminary assessment maps and reports: Environment Agency</p> <p>9.—(1) The Environment Agency must prepare in relation to each river basin district—</p> <ol style="list-style-type: none"> (a) a preliminary assessment map, and (b) a preliminary assessment report in relation to flooding from— <ol style="list-style-type: none"> (i) the sea, (ii) main rivers, and (iii) reservoirs. <p>(2) This regulation is subject to regulations 31 and 32.</p>	<p>Duty to prepare preliminary assessment reports: lead local flood authorities</p> <p>10.—(1) A lead local flood authority must prepare a preliminary assessment report in relation to flooding in its area.</p> <p>(2) A lead local authority is not required to include in its report information about flooding from a source mentioned in regulation 9(1)(b) unless the authority thinks that it may affect flooding from another source.</p> <p>(3) The Environment Agency—</p> <ol style="list-style-type: none"> (a) must review a preliminary assessment report prepared under this regulation, and (b) may recommend modifications. <p>(4) Following a review, a lead local flood authority may revise its preliminary assessment report.</p> <p>(5) The Agency's power to require information under regulation 36 includes power to require a lead local flood authority to provide a preliminary assessment report by a specified date.</p> <p>(6) This regulation is subject to regulations 33 and 34.</p>

- 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. 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 Preliminary Assessment Report and the identification of Flood Risk Areas, areas where the risk of flooding is considered significant.
- 1.5 The purpose of this Preliminary Assessment Report is to provide an assessment of potential flood risks. These include 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.
- 1.6 The objective of this Preliminary Assessment Report is to identify local Flood Risk Areas in Conwy to inform the later stages of the Regulations and the Flood and Water Management Act, and to support local flood risk management strategies.
- 1.7 The scope of this PFRA is to consider past flooding and possible future flooding only from the following local flood sources:
 - Surface water;
 - Groundwater; and
 - Ordinary watercourses
- 1.8 It should also be noted that the PFRA report must consider floods which have significant harmful consequences for human health, economic activity and the environment.
- 1.9 As described in Figure 1.1, flooding associated with the sea, main rivers and reservoirs is the responsibility of the EAW and does **not** need to be considered by the LLFA as part of the PFRA, unless it is considered that it may affect flooding from one of the sources listed above. Information about flooding from Main Rivers can be found in the Environment Agency's PFRA report.

2. Lead Local Flood Authority Responsibilities

- 2.1. CCBC is the lead local flood authority in the county of Conwy, acting in cooperation with EAW, Dŵr Cymru/Welsh Water (DCWW), and the North Wales Trunk Road Agency, on behalf of the Welsh Assembly Government, in the preparation of this report.

3. Methodology and Data Review

- 3.1 EAW has provided details of areas that exceed the flood risk threshold. These are areas of 1 square kilometre where more than 200 people or more than 1 critical service or more than 20 non-residential properties are considered to be at possible risk of flooding. These areas were checked against information held by CCBC and information provided by other agencies as detailed below.
- 3.2 CCBC holds information, provided by Countryside Council for Wales (CCW) and DCWW, giving details of their assets. Details of past flood events of local significance are also available.
- 3.3 EAW has provided:
 - Flood Map for Surface Water showing areas which could flood from surface water in storms with a 1 in 30 chance and 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 km² 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 Through the work done by the Conwy Drainage Group, DCWW provide details of incidences of sewer surcharging from surface water to CCBC and will continue to provide details of any future incidents through this Group to inform the review process.

4. Past Flood Risk

- 4.1 Conwy County Borough Council holds records of past flooding incidents. These have been collated and assessed for local significance. For the purpose of this report, two flood extent criteria have been defined as described below:

1. 5 or more residential properties have been flooded (see Table 4.1)

Note: Where fewer properties have been flooded but a Flood Feasibility Study (FFS) has identified a risk to 5 properties or more, these have also been included in this criteria.

2. Less than 5 properties have been flooded (see Table 4.2)

Note: Where works have been undertaken to alleviate flooding problems or where an incident does not meet the above criteria, that particular incident does not form part of this report. However, details of the incident will be maintained on the database and will be re-assessed should further flooding incidents occur at that site.

- 4.2 List of partners who have provided details of assets that may be at risk of flooding:

DCWW
EAW

- 4.3 Data is available on past floods, for surface water/river flooding provided by CCBC and for sewer surcharging provided by DCWW.
- 4.4 Those locations considered by CCBC to remain at a high risk of further flooding are noted below in Table 4.1. Incidents not considered as significant are shown in Table 4.2. Map 4.3 shows the locations of past flooding from ordinary watercourses and properties at risk in a 1:100 year event and Map 4.4 shows locations of surface water flooding and sewer surcharging and properties at risk in a 1:100 year event.

TABLE 4.1 - Summary of 5 or more residential properties that have historically flooded

Flood ID	Name	Description	No. of properties at risk from FFS	Year
1	Llandudno / Conwy area	A localised extreme rainfall event caused surface water flooding to a number of areas in Llandudno, Llandudno Junction, Deganwy, Conwy, Glan Conwy and Gyffin. The event was estimated to have a probability of less than 1 in 1000 per year.	-	1993
2	Melin y Coed	5 properties flooded from an ordinary watercourse and surface water runoff.	9	2001
3	Cae Person, Llanrwst	At least 4 properties and a chapel flooded from an ordinary watercourse.	17	2004
4	Cae Person, Llanrwst	5 properties flooded from surface water causing sewer surcharge.	-	2011
5	Chapel Street, Mochdre	8 properties and the gardens of a further 28 properties flooded from an ordinary watercourse.	-	2004
6	Maes Creiniog, Llansannan	1 property and the gardens of a further 7 properties flooded from an ordinary watercourse.	10	2002
7	Heol Ffynnon Asa, Eglwysbach	7 properties and the gardens of a further 2 properties flooded from an ordinary watercourse.	14	2004
8	Llansanffraid Glan Conwy	2 properties and the garden of a further property flooded from an ordinary watercourse.	21 residential 1 commercial	2002
9	Glanwydden	5 properties, a chapel and a pub flooded from an ordinary watercourse.	7	1993 / 2001
10	Penmaenmawr	4 properties and land associated with a further 17 properties (some commercial) flooded from an ordinary watercourse.	10 residential 20 commercial	2001
11	Nant yr Efail, Glan Conwy	13 properties and the gardens / land of a further 10 properties flooded from an ordinary watercourse.	30	c.2001
12	Victoria Drive, Llandudno Junction	(a) 6 properties and the gardens of a further 7 properties flooded from a combination of surface runoff, ordinary watercourse and foul sewer. (b) 6 gardens flooded.	14	(a) 2000 (b) 2004
13	Chapel Street / Water Street, Abergele	3 residential and 6 commercial properties flooded due to surface water runoff exceeding sewer capacity.	50 residential 40 commercial	2001
14	Graiglwyd Road, Penmaenmawr	9 properties and the gardens of a further 4 properties flooded from an ordinary watercourse.	-	2002
15	Station Road, Deganwy	3 properties flooded and access to 4 additional properties blocked due to flooding from an ordinary watercourse.	13	1994

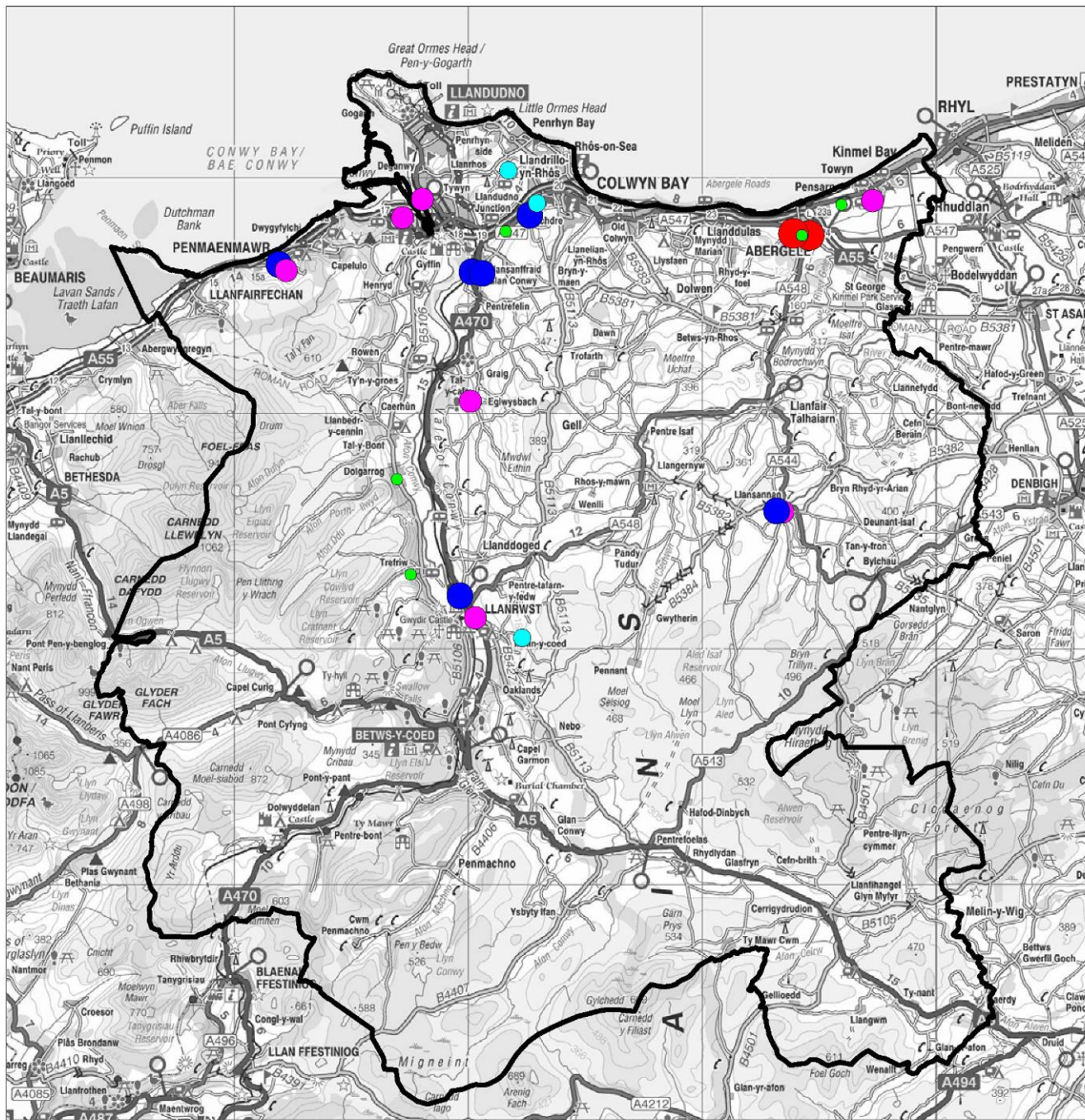
16	Plas Tirion Park, Towyn	3 properties flooded from an ordinary watercourse.	10	c.2001
17	Llansannan	14 residential and 1 commercial property flooded from an ordinary watercourse.	30 residential 2 commercial	2004
18	Church Street, Glan Conwy	5 properties flooded from surface water runoff exceeded highway gullies capacity.	12	2001
19	Tan yr Allt Avenue, Mochdre	7 properties flooded from an ordinary watercourse.	9	c.2001
20	Plas Isaf, Llanrwst	19 residential and 1 commercial property flooded from an ordinary watercourse.	-	2004
21	Bryn Elian / Llanelian Road, Old Colwyn	16 properties and the gardens of a further 8 properties flooded from an ordinary watercourse and surface water runoff.	-	c.2001
22	Eldon Drive / Derrie Avenue, Abergele	30 properties flooded from an ordinary watercourse.	50	c.2001
23	Mona Road, Conwy Morfa	3 properties and the gardens of a further 7 properties flooded from an ordinary watercourse.	15	c.2001
24	St. Andrews Avenue, Llandudno	7 properties flooded due to a pumping station failure causing the main sewer to be overwhelmed by surface water runoff.	-	2009

TABLE 4.2 - Summary of less than 5 residential properties that have historically been flooded

Name	Description	Year	Flood Alleviation Scheme Completed
Crafnant Road, Trefriw	1 property flooded from an ordinary watercourse.	1999	No
Sunray Avenue, Belgano	Gardens of 4 properties flooded.	2000	No
Market Street, Abergele	Gardens of 9 properties flooded from an ordinary watercourse due to maintenance issues and vandalism. Improved monitoring and maintenance put in place.	c.2001	No
Dolwyd	Flooding from an ordinary watercourse only. Known to have historically caused flooding to gardens and the A547. Maximum of 4 properties affected.	c.2001	No
Gerlan, Rowen	2 properties and the gardens of 2 further properties flooded from an ordinary watercourse and surface runoff. PFFS did not identify any further properties at risk.	c.2001	No
Queens Road, Craig y Don	4 properties flooded from surface water and an ordinary watercourse. PFFS did not identify any further properties at risk.	c.2001	No
B5106, Trefriw	21 properties flooded from ordinary watercourses in combination with main river flooding.	c.2001	Yes by CCBC in 2006 and by EAW in 2010
Glan Elwy, Llanfairtalhaiarn	3 properties flooded from an ordinary watercourse. Additional risk from surface runoff to 20 properties.	2001	Yes by CCBC in 2010
Maes y Dre, Abergele	2 properties and the gardens of 2 further properties flooded from an ordinary watercourse.	2002	No
Dolydd Terrace, Betws y Coed	9 properties flooded from an ordinary watercourse and 6 properties flooded from surface water runoff.	2004	Yes by CCBC in 2005
Tayler Avenue, Dolgarrog	Surface water flooding to 1 property and several gardens due to poor maintenance of watercourse which intercepts the flow. Residents made aware and are reminded to carry out maintenance.	2004	No
Cae Craig / Y Berllan, Llanrwst	24 residential and 4 commercial properties flooded from an ordinary watercourse. 27 residential and 4 commercial properties at risk.	2004	Yes by CCBC in 2010
Church Street / Bridge Street, Dolwyddelan	11 properties and the gardens of a further 30 properties flooded from an ordinary watercourse.	2004 / 2005	Yes by CCBC in 2006
Afon Bach, Llanrwst	PFFS had identified 40 residential and 18 commercial properties and 2 places of worship at risk.	2004 / 2005	Yes by CCBC in 2010

Flood Event January 2005	Significant local flooding at Dolwyddelan as indicated above where scheme has since been completed and Llanrwst but this was main river flooding (and EA have since completed scheme). No other areas reached significance threshold.	2005	Yes by EAW in 2010
Eglwysbach School	School flooded from an ordinary watercourse.	2005 / 2009	Yes by CCBC in 2011
Avallon Avenue, Llandudno Junction	1 property flooded by surface water due to sewer capacity being exceeded – Also foul sewer flooding.	2006 / 2007	No
B5106, Trefriw	Surface water/ Main river flooding to highway and adjoining houses. Access to Maes Y Haf farm flooded.	2009	Yes by EAW in 2010
B5106, Trefriw	Trefriw village centre flooded. 2 properties flooded from surface water.	2009	Yes by EAW in 2010
Flood Event November 2009	No flooding to significance threshold in any one area. Sandbags prevented flooding to significance threshold in several areas previously identified (e.g. Llansannan).	2009	No
Flood Event February 2011	Cae Person, Llanrwst identified as significant above. Eldon Drive, Abergele area already included on significant list. No additional flooding reached significance threshold.	2011	No
Dundonald Road / Park Road, Colwyn Bay	Known flooding problems from surface water exceeding sewer capacity.	Various	No
Ronald Avenue, Llandudno Junction	2 properties regularly flooded externally by surface water exceeding sewer capacity. Dwr Cymru have installed non-return valves and have offered water butts which have been refused.	Various	No
Lon Ty Bach, Llanfairfechan	1 property regularly flooded due to surface water from the highway.	Various	No
Sandbank Road, Towyn	1 property regularly flooded due to surface water exceeding sewer capacity.	Various	No

Map 4.3 – Risk of Ordinary Watercourse Flooding in Conwy Based on Historical Events (No. properties at risk in a 1:100 year event where FFS carried out)



County of Conwy

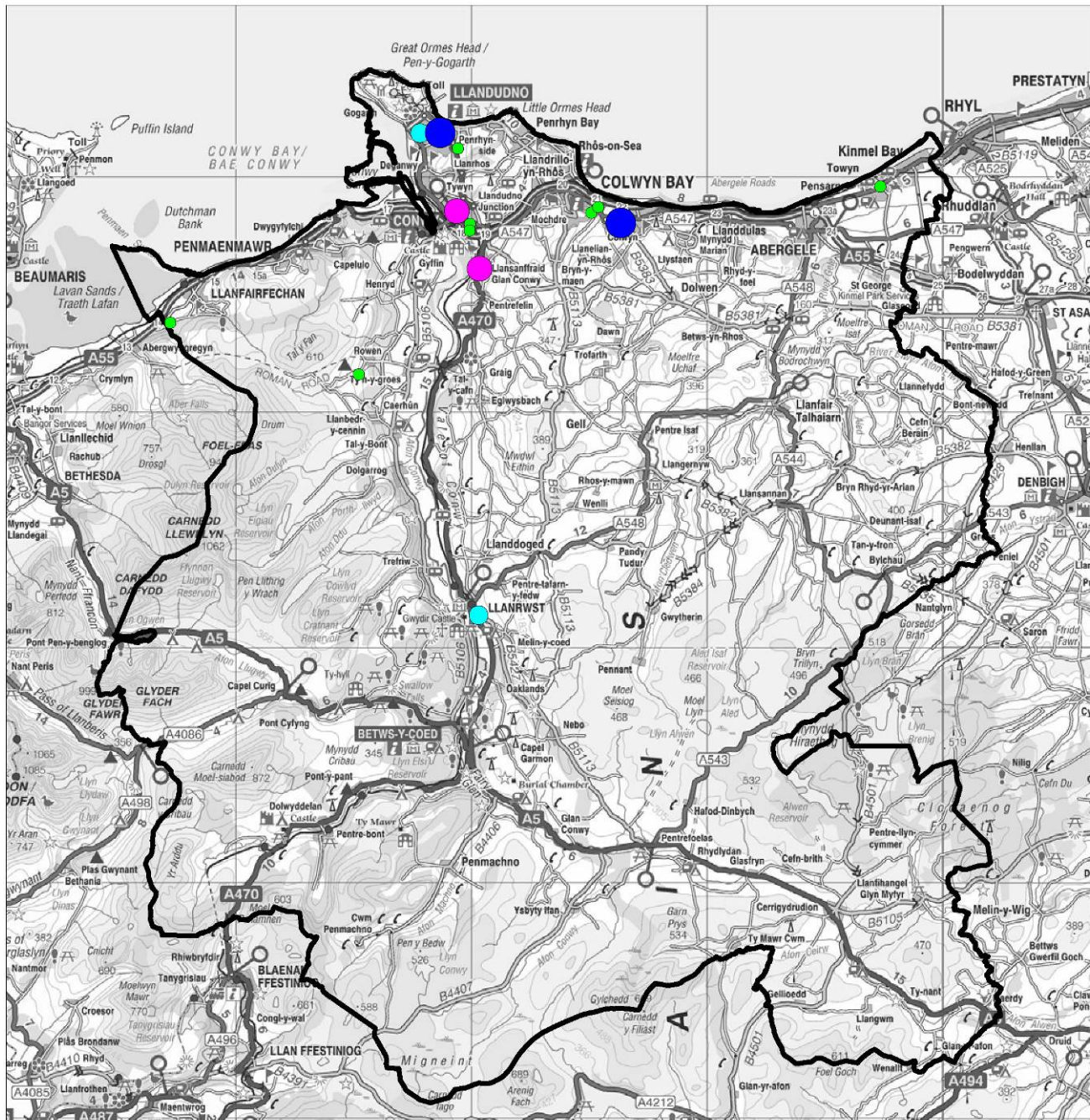
Historic Flooding from Ordinary Watercourses Magnitude

- Very high 40 properties or more
- High 20-39 properties
- Medium 10-19 properties
- Low 5-9 properties
- Not locally significant <5 properties

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Not to scale

Map 4.4 – Risk of Surface Water / Sewer Flooding in Conwy Based on Historical Events (No. properties at risk in a 1 in 100 year event where FFS carried out)



County of Conwy

Historic Surface Water Flooding Magnitude

- High 20 properties or more
- Medium 10-19 properties
- Low 5-9 properties
- Not locally significant <5 properties

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5. **Future flood risk**

5.1 The EAW Flood Map for Surface Water, 1 in 200 chance of occurring and depth greater than 300mm, is considered to be the locally agreed, by CCBC and the EAW, surface water information. (See Map 5.1)

5.2 The above information is considered to be the most accurate available information to detail those areas in the County of Conwy 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.

5.3 The number of properties at risk of surface water flooding in Conwy is 2,276. The count of properties at risk of future flooding from surface water in Conwy was calculated from Address Point GIS data, based on the EAW flood footprints identified on Map 5.1.

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 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).

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.

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, increase in precipitation intensity of 40% or more by the 2080s are 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 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 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 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).

River Basin Districts

The Evidence

There is clear scientific evidence that global climate change is happening now. It cannot be ignored.

Over the past century around the UK we have seen sea level rise and more of our winter rain falling in intense wet spells. Seasonal rainfall is highly variable. It seems to have decreased in summer and increased in winter, although winter amounts changed little in the last 50 years. Some of the changes might reflect natural variation, however the broad trends are in line with projections from climate models.

Greenhouse gas (GHG) levels in the atmosphere are likely to cause higher winter rainfall in future. Past GHG emissions mean some climate change is inevitable in the next 20-30 years. Lower emissions could reduce the amount of climate change further into the future, but changes are still projected at least as far ahead as the 2080s.

We have enough confidence in large scale climate models to say that we must plan for change. There is more uncertainty at a local scale but model results can still help us plan to adapt. For example we understand rain storms may become more intense, even if we can’t be sure about exactly where or when. By the 2080s, the latest UK climate projections (UKCP09) are that there could be around three times as many days in winter with heavy rainfall (defined as more than 25mm in a day). It is plausible that the amount of rain in extreme storms (with a 1 in 5 annual probability, or rarer) could increase locally by 40%.

Key Projections for Western Wales River Basin District

If emissions follow a medium future scenario, UKCP09 projected changes by the 2050s relative to the recent past are: -

- Winter precipitation increases of around 15% (very likely to be between 3 and 33%)
- Precipitation on the wettest day in winter up by around 12% (very unlikely to be more than 27%)
- Relative sea level at Swansea very likely to be up between 10 and 40cm from 1990 levels (not including extra potential rises from polar ice sheet loss)
- Peak river flows in a typical catchment likely to increase between 12 and 20%

Increases in rain are projected to be greater near the coast than inland.

Implications for Flood Risk

Climate changes can affect local flood risk in several ways. Impacts will depend on local conditions and vulnerability.

Wetter winters and more of this rain falling in wet spells may increase river flooding especially in the steep, rapidly responding catchments typical of Western Wales. More intense rainfall causes more surface runoff, increasing localised flooding and erosion. In turn, this may increase pressure on drains, sewers and water quality. Storm intensity in summer could increase even in drier summers, so we need to be prepared for the unexpected.

Rising sea or river levels may increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses.

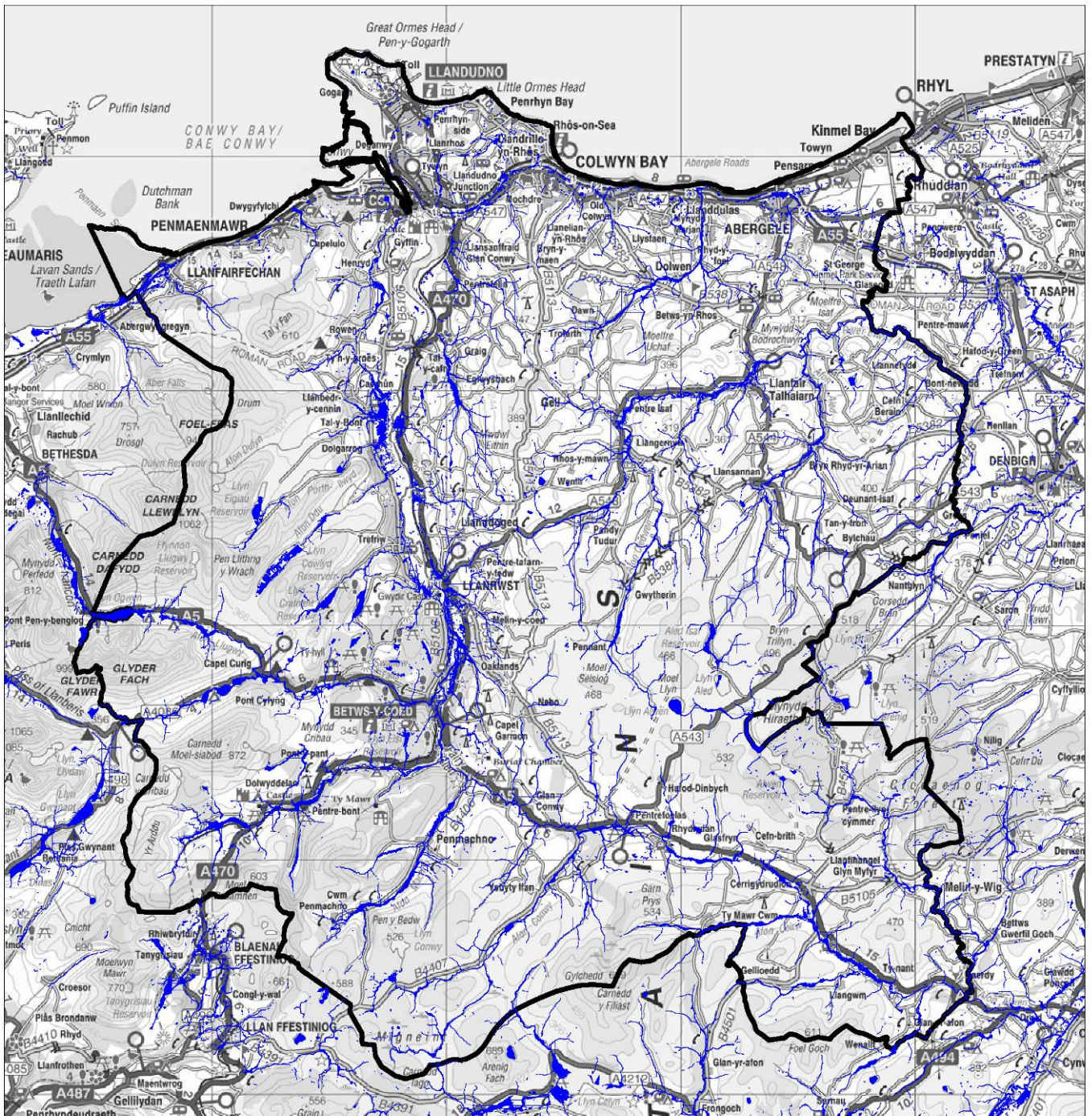
Where appropriate, we need local studies to understand climate impacts in detail, including effects from other factors like land use. Sustainable development and drainage will help us adapt to climate change and manage the risk of damaging floods in future.

Adapting to Change

Past emission means some climate change is inevitable. It is essential we respond by planning ahead. We can prepare by understanding our current and future vulnerability to flooding, developing plans for increased resilience and building the capacity to adapt. Regular review and adherence to these plans is key to achieving long-term, sustainable benefits.

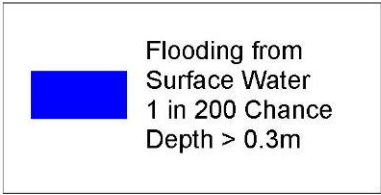
Although the broad climate change picture is clear, we have to make local decisions uncertainty. We will therefore consider a range of measures and retain flexibility to adapt. This approach, embodied within flood risk appraisal guidance, will help to ensure that we do not increase our vulnerability to flooding.

Map 5.1 – Locally agreed surface water information



County of Conwy

Locally Agreed Surface Water Information



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Not to scale

6. Review of indicative Flood Risk Areas

- 6.1 The EAW has not identified any indicative Flood Risk Areas in Conwy, that is, areas satisfying the Welsh Assembly Government's criteria of more than 5,000 people considered to be at risk of flooding.
- 6.2 The information provided by the EAW has been reviewed and agreed with them and no changes to indicative Flood Risk Areas have been identified.

7. Identification of Flood Risk Areas

- 7.1 No Flood Risk Areas have been identified, that is, areas satisfying the Welsh Assembly Government's criteria of more than 5,000 people considered to be at risk of flooding.

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.
- 8.2 **EAW Flood Mapping**
The list of receptors, which are property, critical infrastructure and cultural or environmental assets, within the EAW 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, places above the flood risk threshold and management strategies.
- 8.4 **Reported flooding incidents**
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.

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)

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