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FLOOD RISK REGULATIONS 2009
PRELIMINARY FLOOD RISK ASSESSMENT FOR DORSET

July 2011

Director for Environment Miles Butler

Executive Summary

This report has been prepared to assist Dorset County Council meet its duties to manage local flood risk and deliver the requirements of the Flood Risk Regulations (2009). Dorset County Council, defined as a Lead Local Flood Authority (LLFA) under the Regulations, is an upper tier authority covering six district and borough councils. The Preliminary Flood Risk assessment (PFRA), comprising this document, the supporting spreadsheet and GIS layer represents the first stage of the requirements of the Regulations.

The PFRA process is aimed at providing a high level overview of flood risk from local flood sources, including surface water, groundwater, ordinary watercourses and canals. It is important to note that local flooding excludes flooding from the sea, main rivers and reservoirs, for which the Environment Agency (EA) retains responsibility. The methodology for producing this PFRA has been based on the Environment Agency's Final PFRA Guidance and Defra's Guidance on selecting Flood Risk Areas, both published in December 2010.

The Environment Agency has used a national methodology, which has been set out by Defra, to identify Indicative Flood Risk Areas across England. As flood risks reported under the Regulations must be "significant" in a European context, a significance threshold of 30,000 people affected has been set by Defra for defining Flood Risk Areas. Of the ten Indicative Flood Risk Areas that have been identified nationally, none are located within Dorset County Council's administrative area. Within a Flood Risk Area, the Regulations require two subsequent key stages:

- Preparation of flood hazard maps and flood risk maps; and
- Preparation of flood risk management plans.

Because there are no Flood Risk Areas of European significance identified in Dorset the subsequent stages will not be required. Notwithstanding this, it must be noted that there is a high risk of flooding from local sources across Dorset, particularly from surface water. Based on national surface water modelling, approximately 22,300 properties 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.

In order to develop a clear overall understanding of the local flood risk across Dorset, flood risk data and records of historic flooding were collected from local and national sources including the six district and borough councils, the Environment Agency, water companies, emergency services and other risk management authorities.

Comprehensive details on flood extents and consequences of past events are largely unavailable. The historic flood events that have been considered to have had 'significant harmful consequences' are recorded in Annex 1 of the Preliminary Assessment Spreadsheet.

Cover Photograph: Flooding in Sixpenny Handley 6/1/2003

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ABBREVIATIONS

Abbreviation	Definition
AStSWF	Areas Susceptible to Surface Water Flooding
AStGWF	Areas Susceptible to Groundwater Flooding
DCC	Dorset County Council
Defra	Department for Environment, Food and Rural Affairs
CFMP	Catchment Flood Management Plan
CSO	Combined Sewer Overflow
EA	Environment Agency
EC	European Commission
FRIS	Flood Reconnaissance Information System
FMfSW	Flood Map for Surface Water
FWMA	Flood & Water Management Act 2010
GHG	Greenhouse Gas
GIS	Geographical Information Systems
IDB	Internal Drainage Board
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
NFCDD	National Flood and Coastal Defence Database
NRD	National Receptors Database
PPS25	Planning and Policy Statement 25: Development and Flood Risk
PFRA	Preliminary Flood Risk Assessment
RFDC	Regional Flood Defence Committee
SAB	SuDS Approving Body
SFRA	Strategic Flood Risk Assessment
SPA	Special Protection Areas
SAC	Special Areas of Conservation
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
UKCP09	UK Climate Projections 2009

1 INTRODUCTION

1.1 Scope

The Preliminary Flood Risk Assessment (PFRA) is an initial screening exercise that reviews historical and future (potential) flood risk and determines Flood Risk Areas. This report assesses the local flood risk in Dorset. **Local flood risk includes flooding from surface water, ordinary watercourses, groundwater, canals, lakes and small reservoirs only. It excludes flooding from the sea, main rivers and reservoirs, for which the Environment Agency (EA) retains responsibility and is not considered in this report.** Refer to Section 4.1 for further information on the types of flooding. The report brings together existing and available information to determine the level of local flood risk throughout Dorset. In doing this, only floods with significant harmful effects are considered.

1.2 Aims, Objectives and Purpose

Dorset County Council, as Lead Local Flood Authority, has a duty to prepare a Preliminary Flood Risk Assessment under the Flood Risk Regulations 2009 (the Flood Risk Regulations). The assessment is a vital and critical step in understanding the local flood risk in Dorset and will be the foundation for future investment and action plans for flood risk management. The Flood Risk Regulations adopt a new institutional structure for the understanding and management of flood risk.

The Preliminary Flood Risk Assessment involves an assessment of local flood risk, the preparation of a Preliminary Assessment Report and the identification of any Flood Risk Areas. These are areas where the local flood risk is significant in a Europe wide context. Defra have set thresholds for defining Flood Risk Areas as:

Indicator	Threshold
Number of people	Set at 30,000 within a cluster where risk is most concentrated.
Critical services (including schools, hospitals, nursing homes, power and water services)	150
Non-residential properties (including shops and businesses).	3,000

The aim of the Flood Risk Regulations is to reduce the likelihood and consequence of flooding. They were developed in response to extreme flooding across Europe and came into force in England and Wales on 10th December 2009. They transpose 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. They establish four well defined stages of a flood risk management cycle:

- The Preliminary Assessment Report;
- Identifying Flood Risk Areas;
- Flood Hazard and Flood Risk Maps;
- Flood Risk Management Plans.

However, there are none of these Flood Risk Areas of European significance identified in Dorset and therefore the subsequent stages are not required.

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

The key objectives can be summarised as follows:

- Identify relevant partner organisations involved in future assessment of flood risk; and summarise means of future and ongoing stakeholder engagement;
- Describe arrangements for partnership and collaboration for ongoing collection, assessment and storage of flood risk data and information;
- Provide a summary of the systems used for data sharing and storing, and provision for quality assurance, security and data licensing arrangements;
- Summarise the methodology adopted for the PFRA with respect to data sources, availability and review procedures;
- Assess historic flood events within the study area from local sources of flooding (including flooding from surface water, groundwater and ordinary watercourses), and the consequences and impacts of these events;
- Establish an evidence base of historic flood risk information, which will be built upon in the future and used to support and inform the preparation of Dorset's Local Flood Risk Strategy;
- Assess the potential harmful consequences of future flood events within the study area;
- Review the provisional national assessment of Indicative Flood Risk Areas provided by the Environment Agency and provide explanation and justification for any amendments required to the Flood Risk Areas.

1.3 Introduction to the Study Area

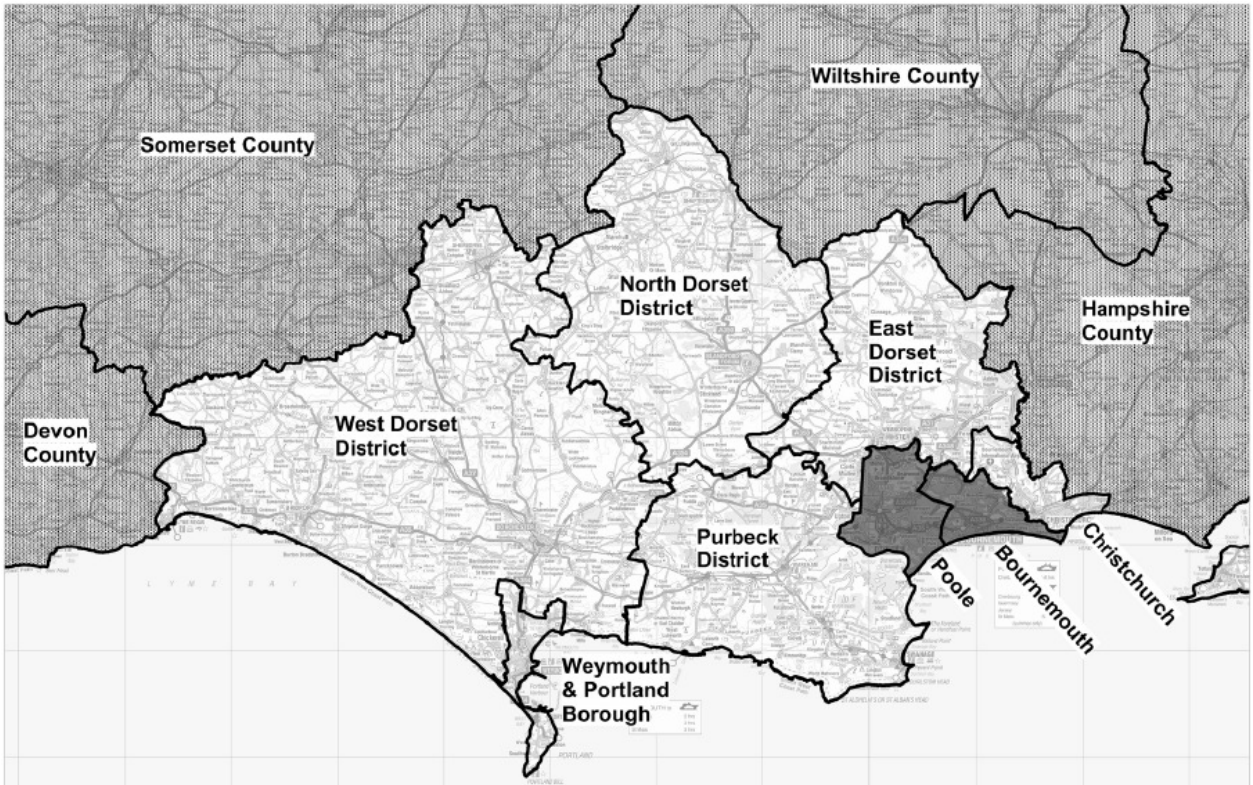


Fig 1.1 - Study Area

Dorset lies in the south east of the South West River Basin District as shown in Fig 1.1 Dorset County Council has an administrative area of approximately 2,542km^2 with land stretching from sea level on the South coast to a height of 277metres with an estimated population of 404,000, making the population density less than half that of the average for England. The main concentrations being in the borough areas of Weymouth & Portland (64,000) and Christchurch (47,000), together with the main towns of Dorchester (18,000), Gillingham (11,500), Wareham (7,000), Swanage (10,000), Wimborne (6,800), Blandford Forum (9,000), Shaftsbury (6,600), Sherborne (9,700) and Bridport (9,800). These populations may be inflated to varying degrees throughout the year by tourists that can increase the effective population by 25%.

In Dorset most of the rivers and streams flow from their source in the hills in the north of the catchment and flow in a more or less southerly or south-easterly direction down into a lowland floodplain before flowing out into the English Channel. Watercourses are typically steep, narrow and unconstrained in the uplands, while further downstream they are slower moving and more heavily constrained by flood embankments.

The District and Borough Council Strategic Flood Risk Assessments (SFRAs) and Environment Agency Catchment Flood Management Plans (CFMPs) that cover Dorset identify that many areas flood regularly but without significant risk to life or property. In fact high water tables and frequent small scale flooding is an important feature of the low-lying areas, as it benefits the local ecology and agriculture.

The SFRAs and CFMPs identify that flooding from rivers is a problem in many of the urban areas: Weymouth, Christchurch, Swanage, Blandford Forum, West Bay, Bridport, Wool, Gillingham and Wimborne. Surface water flooding is also identified as a problem in the catchments, often caused by runoff from agricultural land and exacerbated when the capacity of drainage systems is insufficient or when blockages occur.

A brief description of the main river catchments follows (refer to Figure 1.2 for location).

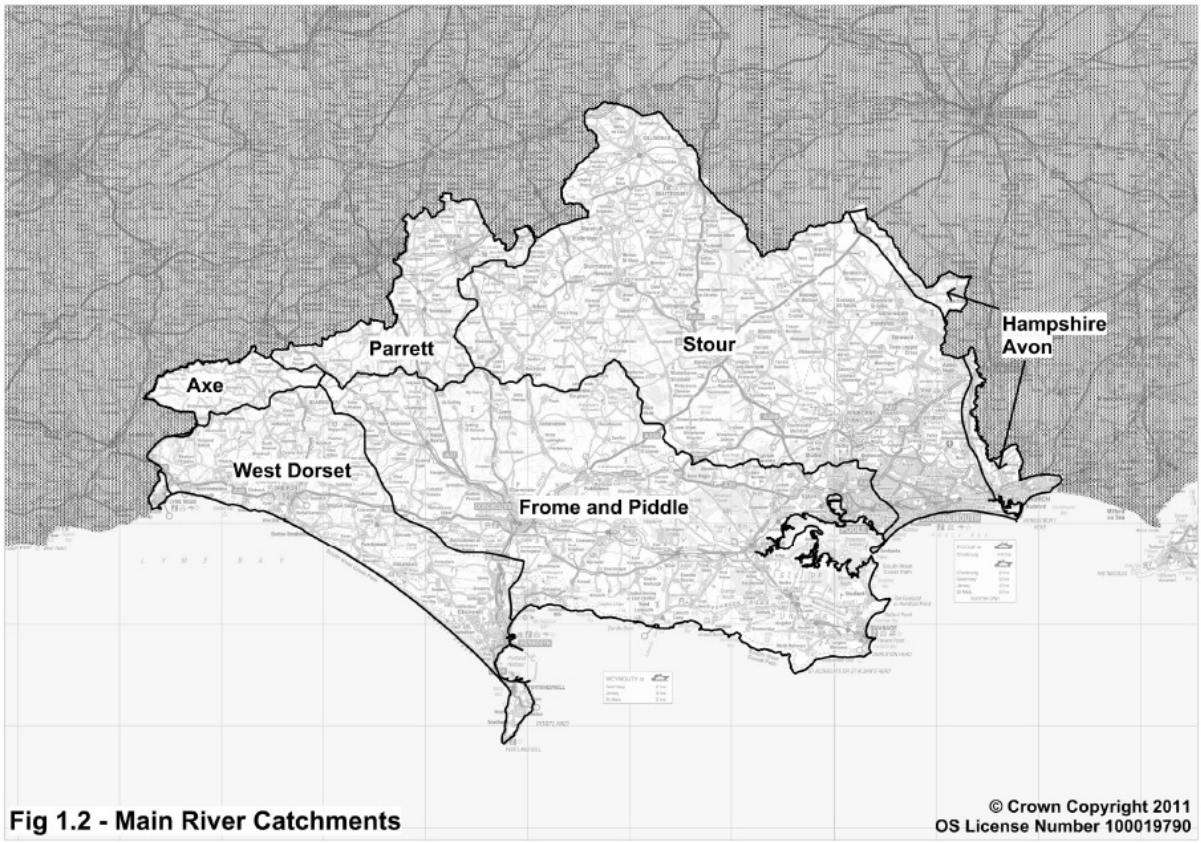


Fig 1.2 - Main River Catchments

Stour: The Stour catchment is 1300km^2, the majority of which lies within the study area. The River Stour is fed by many tributaries including the Rivers Crane, Allen, Tarrant, Winterbourne, Lydden, Cale, and Lodden, Caundle Brook, Shreen Water and the Moors River. The River Stour passes through several towns including Gillingham, Blandford Forum, Wimborne Minster, West Parley, Bournemouth and Christchurch, each of which has been affected by flooding. Additionally there are several villages within the Stour catchment which have suffered varying degrees of flooding. Within Christchurch there are significant flooding issues relating to coastal inundation.

Avon: The Hampshire Avon catchment is 1750km^2, of which a small proportion is within the study area. The River Avon flows through Salisbury, Fordingbridge, Ringwood and Christchurch. There are also a number of villages which lie on the floodplain of the River Avon. The lower Avon, south of Salisbury, is characterised by a complex network of artificially controlled channels, and is fed by a number of small tributaries. At Christchurch the Avon joins the River Stour on flowing into Christchurch Harbour.

Frome / **Piddle**: The catchment of the Frome and Piddle is about 900km^2, falling entirely within the administrative area of Dorset. It is a rural catchment, flowing only through Dorchester and Wareham of note. At Wareham it flows into Poole Harbour where it enters the Christchurch and Poole Bays Shoreline Management Plan (SMP) area. Also included in the Frome and Piddle catchment area are the Sherford and Corfe River which run into Poole Harbour and Swan Brook which runs directly into the sea. The upper part of the catchment is underlain by chalk geology, which locally has an important role in public water supply.

West Dorset Rivers: The principal rivers in West Dorset are the Char, Brit, Bride and Wey, and their combined catchments cover 370km^2. The principal settlements they flow through are Charmouth, Bridport, Burton Bradstock and Weymouth, respectively. Although situated close together these rivers each have individual characteristics with the Char and Brit responding rapidly to rainfall and the Bride and Wey being slower responding, chalk-fed watercourses.

Parrett: The Parrett catchment is approximately 1700km^2, mostly outside the study area in Somerset. Only the headwaters lie in Dorset, principally the upper River Yeo in the vicinity of Sherborne.

2 LEAD LOCAL FLOOD AUTHORITY RESPONSIBILITIES

2.1 Introduction

The preparation of a PFRA is just one of several responsibilities of LLFAs under the new legislation. This section provides a brief overview of other responsibilities Dorset County Council is obliged to fulfil in its role as a LLFA.

2.2 Coordination of Flood Risk Management

In his Review of the summer 2007 flooding, Sir Michael Pitt stated that *"the role of local authorities should be enhanced so that they take on responsibility for leading the coordination of flood risk management in their areas*". This recommendation was taken forward into the Flood Risk Regulations and the Flood and Water Management Act. As the designated LLFA, Dorset County Council is therefore responsible for leading local flood risk management across Dorset.

Much of the local knowledge and technical expertise necessary for Dorset County Council to fulfil its duties as LLFA lies with the District and Borough councils and other partner organisations. It is therefore crucial that Dorset County Council works alongside these groups and organisations as they undertake their responsibilities to ensure effective and consistent management of local flood risk throughout the County and to contribute to the provision of a coordinated and holistic approach to flood risk management across the study area.

As LLFA, it is the role of Dorset County Council to forge effective partnerships with the Districts and Borough Councils, Wessex Water, South West Water and the Environment Agency, as well as other key stakeholders and Risk Management Authorities.

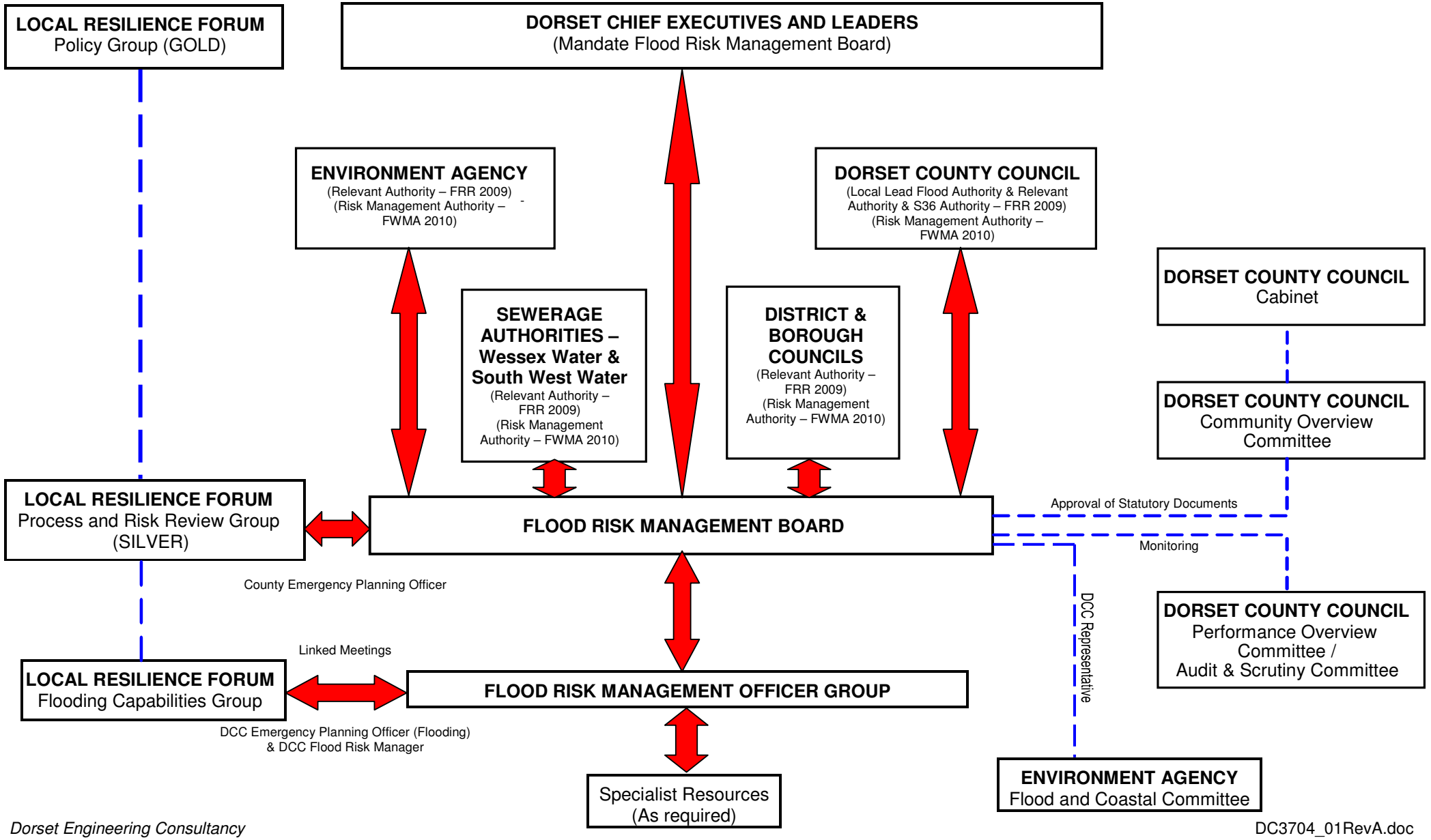
In order to assist with this, Dorset County Council has set up boards and groups working across the different organisations. The Dorset Chief Executives and Leaders Group has mandated a Flood Risk Management Board to oversee the delivery of the LLFA's obligations and each organisation has nominated a senior technical manager to sit on the Board. The County Emergency Planning Officer will also sit on the Board to provide a direct link with the Local Resilience Forum Process and Risk Review Group. The Dorset Chief Executive invited the Environment Agency and the Water and Sewerage Companies to nominate representatives.

The Board is chaired by DCC's Head of Service responsible for flood risk management. Its main function is to provide strategic direction to the work and demonstrate clear commitment of the organisations represented.

A Flood Risk Management Officer Group comprising officers from the organisations represented on the Board oversees the detail preparation of statutory documents and provision of the ongoing services. It has close links with the LRF Flooding Capabilities Group and many members are common to both groups The County Council's Emergency Planning Officer (Flooding) and Flood Risk Manager are members of both groups.

The overall governance structure proposed is set out below, which also shows that following approval by the Board, the statutory documents produced (Preliminary Assessment Report, Flood Hazard Maps, Flood Risk Maps, etc.) will be considered by the Community Overview Committee and approved by Cabinet. Ongoing monitoring of plans and the other duties associated with the role of LLFA will be undertaken by the Board, reporting to the Performance Overview Committee and Audit and Scrutiny Committee.

FLOOD RISK MANAGEMENT PROJECT – GOVERNANCE DIAGRAM



2.3 Stakeholder Engagement

As part of the PFRA, Dorset County Council has sought to engage stakeholders representing the following organisations:

- Christchurch Borough Council
- East Dorset District Council
- North Dorset District Council
- Purbeck District Council
- West Dorset District Council
- Weymouth and Portland Borough Council
- Environment Agency
- Wessex Water
- South West Water
- Highways Agency

2.4 Further Responsibilities

Aside from forging partnerships and coordinating and leading on local flood management, there are a number of other key responsibilities that have arisen for Lead Local Flood Authorities from the Flood & Water Management Act and the Flood Risk Regulations. These responsibilities include:

- **Investigating flood incidents** – LLFAs have a duty to investigate and record details of significant flood events within their area. This duty includes identifying which authorities have flood risk management functions and what they have done or intend to do with respect to the incident, notifying risk management authorities where necessary and publishing the results of any investigations carried out
- **Asset Register** – LLFAs also have a duty to maintain a register of structures or features which are considered to have a significant effect on a flood risk, including details on ownership and condition as a minimum. The register must be available for inspection and the Secretary of State will be able to make regulations about the content of the register and records.
- **SuDS Approving Body** – LLFAs are designated the SuDS Approving Body (SAB) for any new drainage system, and therefore must approve, adopt and maintain any new sustainable drainage systems (SuDS) within their area.
- **Local Strategy for Flood Risk Management** – Each LLFA is required to develop, maintain, apply and monitor a local strategy for flood risk management in its area. The local strategy will build upon information such as national risk assessments and will use consistent risk based approaches across different local authority areas and catchments.
- **Works powers** – LLFAs have powers to undertake works to manage flood risk from surface runoff and groundwater, consistent with the local flood risk management strategy for the area.
- **Designation powers** – LLFAs, as well as district councils and the Environment Agency have powers to designate structures and features that affect flooding or coastal erosion in order to safeguard assets that are relied upon for flood or coastal erosion risk management.

3 METHODOLOGY AND DATA REVIEW

3.1 Approach and Methodology

This PFRA has been prepared by Dorset County Council in consultation with district councils and water companies within Dorset, the Highways Agency and the Environment Agency. The approach taken has been to collate records of flooding to build up a picture of flood risk in the County. No new analysis or hydraulic modelling has been undertaken, in accordance with published guidelines and the requirements of the regulations.

The core aim of the task is to identify what existing and readily available local data can be used to improve the national understanding of flood risk.

Some information, although digital, was stored in a format that made it difficult to analyse. This included the flood consequences not being recorded making it impossible to distinguish between minor and significant floods. This highlights the need to carefully define how data is to be collected in the future.

3.2 Information held by DCC

As Dorset County Council has had only limited responsibility with respect to flooding, relatively little relevant information on historic flooding is available internally and this is limited to records of highway flooding. However, as the data was recorded for highway maintenance reasons, the records do not contain the information needed to identify significant harmful consequences.

As the Minerals and Waste planning authority, Dorset has undertaken a county wide Strategic Flood Risk Assessment (SFRA). This pulled together the district councils' SFRAs into a single assessment. As a strategic planning document it concentrated on the major flood risks, which in Dorset's case are fluvial and coastal flooding as shown by the Environment Agency's Flood Zones. It contained little information on local flood risk.

3.3 Information held by Partner Organisations

Data available from district councils included:

- Strategic Flood Risk Assessments – Level 1 and Level 2
- Records of flooding incidents
- Records of requests for sandbags
- Studies relating to provision of flood defence schemes

Dorset Fire and Rescue Service hold records of callouts to 'flooding' incidents. However, often the source of flooding is not listed and can include flooding due to a burst water supply pipe.

Wessex Water and South West Water hold registers of incidents of flooding from public sewers, the DG5 register. This data is supplied in a format that does not allow individual properties to be identified.

Local data available from the Environment Agency included the Flood Reconnaissance Information System (FRIS) and Catchment Flood Management Plans (CFMP).

3.4 National Data

The data provided by the Environment Agency consisted of the follow GIS layers:

Flood Map (Rivers and the Sea)
Showing the extent of flooding from rivers with a catchment of more than 3km^2 and from the sea, including Flood Zone 2 – areas where risk of flooding is greater than 0.1% and Flood Zone 3 – areas where risk of fluvial flooding is greater than 1% or flooding from the sea is greater than 0.5%.

Areas Susceptible to Surface Water Flooding (AStSWF)
The first generation (updated release July 2009) national mapping, outlining areas of risk from surface water flooding across the country with three susceptibility bandings (less, intermediate and more).

Flood Map for Surface Water (FMfSW)
The updated (second generation) national surface water flood mapping which was released at the end of 2010. This dataset includes two flood events (with a 1 in 30 and a 1 in 200 chance of occurring) and two depth bandings (greater than 0.1m and greater than 0.3m).

Areas Susceptible to Groundwater Flooding (AStGWF)
Coarse scale national mapping showing areas which are susceptible to groundwater flooding.

Historic Flood Map
Attributed spatial flood extent data for flooding from all sources

National Receptor Database
A national dataset of social, economic, environmental and cultural receptors including residential properties, schools, hospitals, transport infrastructure and electricity substations.

Indicative Flood Risk Areas
Nationally identified flood risk areas, based on the definition of 'significant' flood risk described by Defra and Welsh Assembly Government.

PFRA CD of supporting information
Information on property counts in flood risk clusters and designated sites at risk of flooding.

3.5 Public Data

No data was collected from the public as part of this process. However there is an ongoing project that will collect information on past floods from parish councils.

3.6 Data Limitations

Inconsistent Recording Systems
The lack of a consistent flood data recording system across Dorset County Council and the District and Borough councils has led to major inconsistencies in the recording of flood event data. This has resulted in incomplete, or sometimes nonexistent, flood record datasets. Only data that was adequately geo-referenced has been used in this report.

Incomplete Datasets
As a result of the lack of consistent flood data recording arrangements (as described above), many councils have kept flood records that do not contain all the information required for this study. Some of the datasets collated are not exhaustive and it is felt that they are unlikely to accurately represent the complete flood risk issues in a particular area.

Records of Consequences of Flooding
Very few data providers were able to provide comprehensive details of the consequences of specific past flood events, which made accurately assessing the consequences of historic flooding difficult.

3.7 Data Storage

All data collected has been stored within the council's GIS system. This system is MapInfo based but access to view the data is via a web based application, Dorset Explorer. By this means, the district councils have access to the data. A username and password are required to view the data thereby ensuring security is maintained.

A system is being developed whereby the reporting of flood incidents can be made directly into the GIS system, enabling flood risk partners to view live information. This system is being developed in conjunction with the Environment Agency.

4 PAST FLOOD RISK

4.1 Types of Flood Risk

Surface Water Flooding
Surface water refers to rainfall that has been intercepted by the ground or roofs but has not yet entered a natural watercourse system. Surface water flooding occurs when heavy rainfall exceeds the capacity of the local drainage network and water flows across the ground. This occurs either due to blockages in the drainage system or during very high intensity storms when water builds up before it can reach the surface water drainage system.

The Pitt Review highlighted the impact of surface water during flood events and the recommendations have led to the LLFAs being given greater responsibility for surface water management within the Act.

Groundwater Flooding
Groundwater is water which is below the surface of the ground and groundwater flooding occurs as a result of water rising up from the underlying aquifer or from water flowing from 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 usually occurs in areas underlain by major aquifers, but can be associated with more localised floodplain sands and gravels. The solid geology of Dorset County is dominated by the chalk with gravels in the Stour and Frome river valleys.

A number of Strategic Flood Risk Assessments have been completed by the District and Borough Councils within Dorset and many indicate the potential for groundwater flooding. The CFMPs carried out within Dorset also identify the potential for groundwater flooding.

Flooding from Reservoirs
The EA is responsible for regulating large raised reservoirs under the Reservoirs Act 1975. They currently regulate reservoirs over 25,000 m^3 in capacity. This will reduce to10,000 m^3 through provisions of the Act. Reservoirs below this size are unlikely to present significant flood risks in the context of the Regulations. On this basis there is no need for LLFAs to include information on reservoirs in their PFRAs.

Sewer Flooding

Sewer flooding is often caused by excess surface water entering the drainage network. The sewerage system comprises foul sewers, which do not accept surface water runoff, surface water sewers that do and combined sewers, which accept a combination of surface water and foul sewage. Flood risk management strategies need to take account of both surface water and combined sewer capacity as these impact on surface water drainage and should seek to reduce the number of Combined Sewer Overflow (CSO) spills if at all possible.

LLFAs do not need to assess flooding from sewers, unless wholly or partly caused by rainwater or other precipitation entering or otherwise affecting the system. Floods of raw sewage caused solely, for example, by a sewer blockage do not fall under the Regulations. The Regulations also do not apply to floods from water supply systems, e.g. burst water mains.

Ordinary Watercourse Flooding

An ordinary watercourse is any river, stream, ditch, drain, cut, culvert, dike or sluice through which water flows that is not designated as Main River.

4.2 Locally Significant Harmful Consequences

National guidance issued by Defra sets thresholds for defining areas where the flood risk is significant. No guidance has been issued for defining locally significant harmful consequences and it is up to each LLFA to set its own definition. It has been suggested by the Environment Agency that the threshold should be an order of magnitude below the significance criteria for determining flood risk areas. They also recommend that, as a minimum, it should involve flooding of a number of properties, on more than one occasion.

The following definition has been proposed by DCC and agreed by the South West Flood Risk Managers Group (via the communities of practice web-site) as a consistent definition for use in South West PFRAs.

For the purpose of reporting past floods, a flood is deemed significant if it:

1) caused internal flooding to five or more residential properties, or
2) flooded two or more business premises, or
3) flooded one or more items of critical infrastructure, or
4) caused a transport link to be totally impassable for a significant period.

The definition of “significant period” is dependant on the transport link affected as follows (Highway categories are as set out in Table 1 of the UKRLG Code of Practice for Highway Maintenance).

a. Category 1 highways (motorways) and major rail links – 2 hours or more
b. Category 2 and 3a highways and other railway links – 4 hours or more
c. Category 3b and 4a highways – 10 hours or more
d. Category 4b highways – 24 hours or more

The reasoning behind these criteria is as follows:

- Defra set a threshold of 200 persons or 20 businesses per km grid square flooded to a depth of 300mm during a 1 in 100 flood.
- An order of magnitude less can be considered as 20 persons, which would average 8.5 properties (based on a national occupancy rate of 2.34 persons per property).
- Recognising the rural nature and generally low population density in Dorset and the other South West Counties, a threshold of 5 properties has been adopted.

- The number of business premises has not been reduced beyond two (the order of magnitude suggested by the EA), as this would have reduced the threshold to 1, which could result in very isolated, minor flooding being considered significant.
- Using the km square grouping criterion of 30,000 persons an order of magnitude less would result in a threshold of 3,000 persons or 1,300 properties and for Dorset would give no significant past events. This is not considered appropriate.
- The 2-hour period for closure of a motorway or a major railway link is based on a figure suggested by a Highways Agency representative for all parts of the trunk road and motorway network.
- The 4-hour period for closure of a category 2 or 3a highway or other railway link equates to an event affecting one peak period in a working day. (08.00 to 18.00)
- The 10-hour period for closure of a category 3b or 4a highway equates to an event affecting both peak periods in a working day. (08.00 to 18.00)
- The 24-hour period for closure of a category 4b highway equates to an event cutting off small numbers of properties and impacting some rural businesses.
- Major rail links have twin tracks carrying several trains per hour in each direction, a number of which are “through trains” (not stopping at minor stations).

4.3 Christchurch Borough Council

The most significant floods experienced in Christchurch have been from Main River and tidal events that are beyond the scope of this report. There are some records of local flooding in Christchurch but the only evidence of any floods with significant harmful consequences was an event in Burton on 12/12/2000 when a minor watercourse flooded 9 properties. Christchurch is susceptible to local flooding when the surface water system cannot discharge due to high river and/or tide levels. A joint probability analysis is required to determine the impacts of combined flooding.

4.4 East Dorset District Council

There are a number of locations throughout East Dorset where local flooding has been recorded but these have mostly affected individual properties and minor roads. The most significant flooding has been recorded in Wimborne, Cranborne and Sixpenny Handley. In Wimborne, up to 14 commercial properties have been affected by intense rainfall events flooding the highway and then entering properties. In Cranborne 11 properties have been affected when surface water carried mud from fields and flooded the road and properties. Groundwater and surface water flooding has affected 8 properties in Sixpenny Handley but the risk is managed by the monitoring of groundwater levels in a borehole.

4.5 North Dorset District Council

The most serious floods in North Dorset have been through Main River flooding and therefore not reported here. Groundwater flooding has been reported in the Tarrant and Winterborne Valleys. The only recorded event of significant local property flooding occurred on 12/12/2000 when 12 properties in Winterborne Stickland were flooded from surface water and groundwater. There is a groundwater flooding problem in Stubhampton, but this only affects the highway as the properties are higher up the valley sides. In Pimperne groundwater enters the sewers and causes surcharging, but no property flooding. A combination of Main River, groundwater and highway runoff places properties in Milborne St Andrew at risk of flooding and 5 properties are believed to have been flooded in 1996. Milton Road in Milborne St Andrew was flooded from 12-18/12/2000 by a combination of Main River and groundwater.

4.6 Purbeck District Council

The greatest flood risk in Purbeck is from Main River and the tide. A significant local event occurred on 9th September 2002 in Swanage when a severe rainfall event, estimated to have been a 1 in 275 storm, led to surface water flooding of 12 residential and 5 commercial properties. Other areas with known local flooding issues are West Lulworth (highway and field runoff), Corfe Castle (a combination of Main River and surface water) and Upton (lack of surface water drainage system).

4.7 West Dorset District Council

West Dorset has kept local flooding records since 1994. There have been many instances of local flooding although the vast majority are very minor. There was a significant flood in Bridport in 1979 with 35 properties affected by flooding from an ordinary watercourse. However the watercourse has since become Main River. Areas of known local flood risk where further action is considered desirable include Burton Bradstock, Chickerell and the 'Little Egypt' area of Piddletrenthide.

4.8 Weymouth & Portland Borough Council

WPBC hold fairly comprehensive records of past flooding. Much of the flood risk is main river and tidal, but there are significant surface water, groundwater and ordinary watercourse risks. The most notable event to affect the area was 18 July 1955 when, until recently, the highest daily total rainfall in the UK was recorded. The heaviest rain was centred on Martinstown to the north of Weymouth but the most devastating flooding was recorded in the Wey catchment. Other notable events occurred in 1908, 1977 (twice), 1979, 1983, 1993, 2004 and 2008. The majority of the flooding has been from Main River. However areas of Upwey and Southill are affected by ordinary watercourse flooding and Elwell Street, Church Street and Puddledocks Lane experience surface water flooding. Weymouth is susceptible to local flooding when the surface water system cannot discharge due to high tide levels. Further investigation will be required in the near future to determine the impact of climate change on the local drainage.

4.9 Highways Agency

Highway Agency roads in Dorset are the A35 (Devon border to Bere Regis), the A31 (Bere Regis to the Hampshire border) and a short section of A303. The only record of possible significant local flooding relates to an event on 20/10/2000 when the A31 was blocked for over two hours near Henbury. However it is not clear whether this was due to Main River, local runoff or a combination of the two.

4.10 Wessex Water and South West Water

Sewer flooding is often caused by excess surface water entering the drainage network. Wessex Water and South West Water supplied details from their DG5 registers of incidents of property flooding caused by rainfall. The records show that there have been a total of 54 incidents of properties affected by sewer flooding since 1994, however most of these have been solved through improvement works. There is an ongoing problem at Piddletrenthide with groundwater entering the sewer system and putting 21 properties at risk of flooding. This is temporarily managed by pumping when the water table is high but this is not a sustainable solution.

4.11 Consequences of Historic Flooding

As a result of the issues discussed in Chapter 3, insufficient data is available to draw definitive conclusions on the impacts and consequences of historic flood events on people, the economy and the environment, as this information has not been consistently recorded in the past.

The historic flood events that have been considered to have had 'locally significant harmful consequences' are recorded in Annex 1 of the Preliminary Assessment Spreadsheet. However, a more comprehensive, although possibly incomplete, record of locations where internal property flooding is known to have occurred is shown below in Table 4.1 and will be kept by Dorset County Council as a 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 Dorset's Local Flood Risk Management Strategy. Figure 4.1 shows all reported flood incidents in Dorset based on the Environment Agency's FRIS database, including Main River. Location of floods with significant harmful consequences are shown on Figure 4.2.

Table 4-1: History of Local Flooding

Date	Flood location	Estimated no. of properties affected (Internal)	Source
24/10/1908	Weymouth	Many	Surface water
18/07/1955	Weymouth and area to north	500	Main river/ordinary watercourse/surface water
12/07/1977	Westham and Wyke Regis	2	Surface water
30/05/1979	Sturminster Newton	4	Surface water
30/12/1993	Elwell Street	6	Surface water
30/12/1993	Puddledock Lane, Duck Pond / Sutton Road, Sutton Poyntz, Weymouth	10	Surface water/ordinary watercourse/main river
01/06/1997	Frogmore Lane, Sixpenny Handley	2	Highway runoff
24/12/1999	Burton Bradstock	3	Surface water/ordinary watercourse
24/12/1999	Hinton Martell	4	Minor watercourse
24/12/1999	Romford Mill, Verwood	1	Minor watercourse
24/12/1999	White Cottage, Horton Heath	1	Highway runoff
24/12/1999	Horton Village, Horton	4	Minor watercourse
07/05/2000	Cranborne Square	11	Surface water
01/11/2000	Piddlehinton/Piddletrenthide	16	Groundwater/Surface water
02/11/2000	Winterborne Stickland	3	Surface water
09/12/2000	Milborne St Andrew	2	Groundwater
11/12/2000	Sherborne	2	Surface water
12/12/2000	Winterborne Stickland	12	Groundwater/Surface water
12/12/2000	Charminster	4	Surface water
12/12/2000	Burton, Christchurch	9	Minor watercourse
09/09/2002	Swanage	19	Surface water
06/01/2003	Dean Lane, Sixpenny Handley	6	Groundwater
01/01/2003	Sturminster Newton	1	Surface water
30/10/2003	Blandford	2	Surface water
10/05/2004	Littlesea	Industrial Estate and 2 residential	Surface water
01/10/2006	Wimborne Town Centre	14	Surface water
23/10/2006	Keats Meadow, Sixpenny Handley	2	Surface water
01/01/2007	Silverstone House, Old Barn Farm Rd. and Woolsbridge Industrial Est.	1	Minor watercourse
02/11/2007	Bridport	1	Surface water
13/12/2008	Southill	15	Ordinary watercourse.
04/08/2009	Bridport	2	Surface water

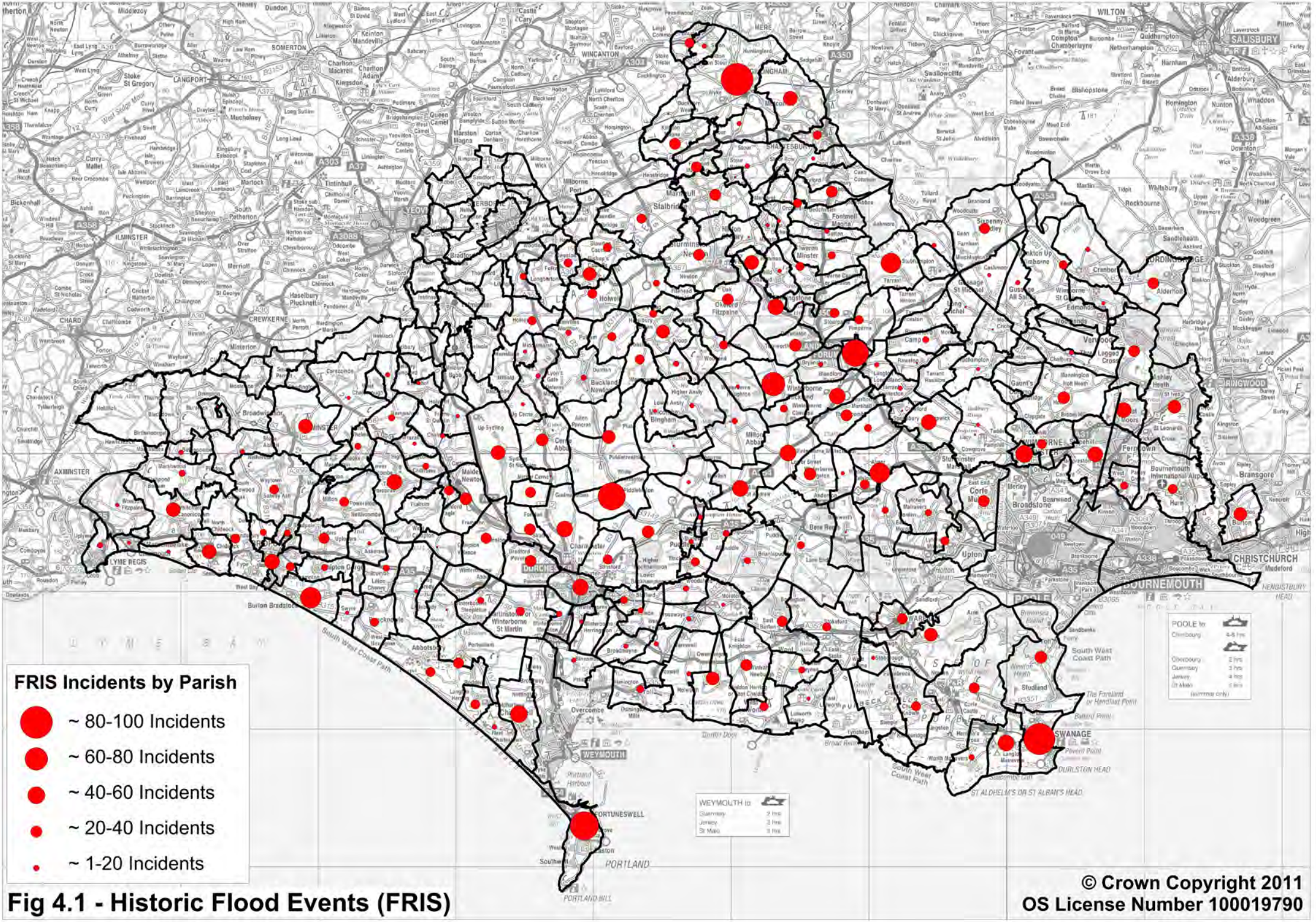
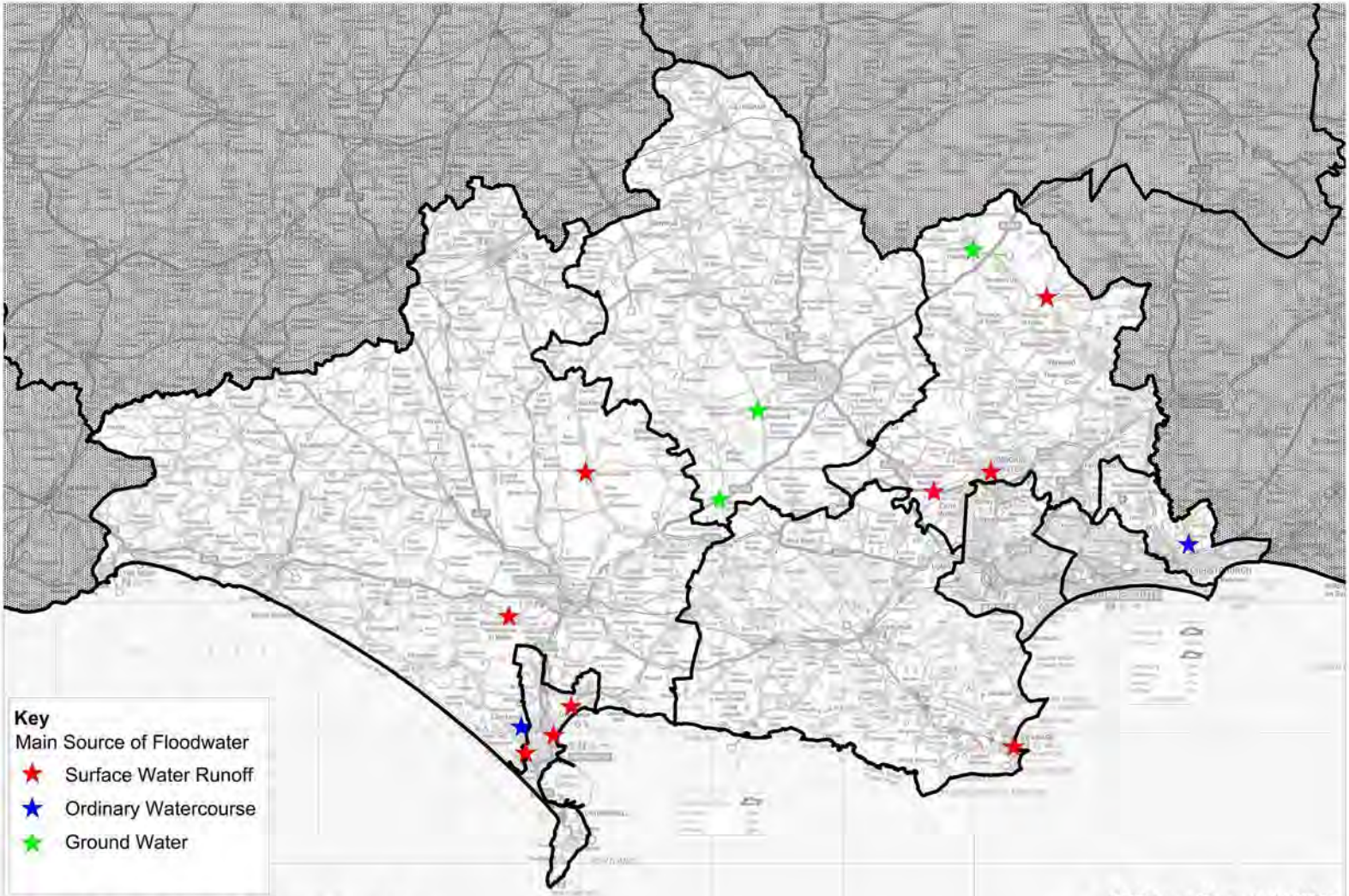


Fig 4.1 - Historic Flood Events (FRIS)



Significant Past Flood Events Fig 4.2

5 FUTURE FLOOD RISK

This section summarises all relevant information on future floods. It is essential to consider future, or potential, flood risk as well as past flooding. Just because there is no record of flooding at a location, it does not mean there is no flood risk.

5.1 Information available on Future Floods

In Dorset, there have been no studies to assess the flood risk from surface water. There have been a number of studies in connection with flood alleviation schemes on ordinary watercourses, but these have very limited coverage. The Environment Agency has produced a national assessment of surface water flood risk in the form of two national mapping datasets. The first generation national mapping, Areas Susceptible to Surface Water Flooding (AStSWF), contains three susceptibility bandings for a rainfall event with a 1 in 200 chance of occurring in any year (herein after referred to as a 1 in 200 chance). The national methodology has since been updated to produce the Flood Map for Surface Water (FMfSW), a revised model containing two flood events (1 in 30 chance and 1 in 200 chance) and two depth bandings (greater than 0.1m and greater than 0.3m). The Flood Map for Surface Water is illustrated in Figure 5.1, highlighting areas at risk of surface water flooding in the future.

It should be noted that the Environment Agency's surface water flood maps give an indication of the broad areas likely to be at risk of surface water flooding but **are not suitable for identifying whether an individual property will flood**. This is because the modelling only gives an indication of broad areas at risk, and because information on floor levels, construction characteristics or designs of properties is not held. This would be needed, along with other detailed information, to be able to say whether flooding of certain depth would enter into an individual property and cause damage.

The capacity of the local drainage system in Dorset is unknown. In general the surface water sewer system is designed to accommodate the 1 in 30 chance flow. The ultimate capacity will depend on conditions at the outlet and in the 1 in 100 chance conditions being considered in this PFRA, these are unknown but will be investigated as part of the local strategy.

5.2 Locally agreed Surface Water Information

In the absence of any detailed local information, the locally agreed surface water information is based on the Environment Agency's 1 in 200 chance, greater than 300mm deep Flood Map for Surface Water (Fig 5.1). The district councils and water companies have been consulted to check the FMfSW shows a 'reasonable' representation of surface water flood risk. At this stage it has not been possible to undertake any verification of the data.

5.3 Future Floods and their Possible Consequences

By analysis of the datasets the number of properties at risk of surface water flooding within Dorset has been estimated. For a rainfall event with a 1 in 200 chance of occurring, 57,400 properties are at risk from flooding to depths greater than 0.1m and 22,300 properties are at risk of flooding to depths greater than 0.3m. Of these properties at risk, over two thirds are residential properties. These figures are higher than may be expected given the limited degree of flooding shown in the historical data. This is due to the extreme nature of the rainfall event being modelled and in reality such events tend to be very localised and not affect wide areas such as the whole of the county. However the modelling does give a good indication of areas likely to be at risk and worthy of further investigation. Further details on the potential harmful consequences of future flooding are included in Annex 2 of the Preliminary Assessment Spreadsheet. Table 5-1 includes a comparison of the estimated number of properties at risk of surface water flooding across Dorset with those in adjacent LLFAs.

Table 5-1: Properties at risk from surface water flooding

LLFA	Estimated number of properties at risk of surface water flooding *(flooding to a depth of 0.3m from a 1 in 200 event)*
Bournemouth	4,000
Poole	3,400
Hampshire	46,600
Wiltshire	22,500
Somerset	31,800
Devon	50,000
Dorset	**22,300**

The following Table 5.2 ranks areas meeting the Defra threshold for 'places where flood risk is an issue' by population. The Defra threshold is greater than 200 people, 20 businesses or more than one critical service may be flooded to depth of 300mm. Adjacent qualifying 1km grid squares have been combined. It should be noted that small communities spanning grid squares may be under reported and the number of non-residential properties includes all buildings such as sheds and barns etc and in rural areas this distorts the figures as one small farm can have enough sheds to allow the threshold to be met, but the risk may not be significant. The primary indicator is the number of people affected. The Defra assessment included an analysis of areas where a 3km by 3km grid contained a minimum of five qualifying 1km squares. In Dorset, three such 'clusters' were identified, Dorchester, Weymouth and Bridport and these are the top three in the ranking. Sherborne is very close to Bridport in terms of number of people at risk, but this did not form a cluster as the risk area is contained within four grid squares.

Table 5-2: Areas above Defra flood risk threshold from FMfSW

Rank	Location	No People	Number Residential Properties	Number Critical Services	Number Nonresidential Properties
1	Dorchester	2321	992	8	268
2	Weymouth	1697	725	4	79
3	Bridport	1254	536	7	171
4	Sherborne	1243	531	10	314
5	Blandford	873	373	3	100
6	Beaminster	625	267	5	115
7	Portland	625	267	3	35
8	Shaftesbury	515	220	0	66
9	Swanage	503	215	1	65
10	Preston (Weymouth)	498	213	3	20
11	Lyme Regis	487	208	0	66
12	Verwood	452	193	1	28
13	Ferndown	384	164	0	96
14	Chickerell (Weymouth)	302	129	0	7
15	Piddletrenthide	257	110	2	63
16	Winterborne Stickland	243	104	1	33
17	Pimperne	229	98	0	52
18	Maiden Newton	222	95	2	41
19	Winterborne Whitechurch	220	94	1	68
20	Cerne Abbas	215	92	1	49
21	Sydling St Nicholas	192	82	2	54
22	Sixpenny Handley	176	75	0	22
23	Cranborne	161	69	2	23
24	Milborne St Andrew	147	63	1	27
25	Bradford Abbas	147	63	0	21
26	Lulworth	143	61	4	42
27	Winfrith Newburgh	131	56	1	29
28	Wimborne Minster	129	55	3	58
29	Winterbourne Abbas	112	48	1	50
30	Nether Compton	96	41	1	22
31	Bere Regis	89	38	1	22
32	Puddletown	77	33	2	24
33	Stratton	73	31	0	27
34	Tarrant Gunville	73	31	0	21
35	Chetnole	63	27	0	31
36	Alton Pancras	59	25	0	21
37	Thornicombe	54	23	0	45
38	Christchurch	49	21	0	24
39	Symondsbury	35	15	2	19
40	Netherbury	30	13	1	27
41	Wareham	30	13	0	25
42	Milton Abbas	26	11	0	37
43	Chaldon Herring	26	11	0	27
44	Tarrant Hinton	21	9	0	21
45	Milton on Stour	16	7	0	35
46	Higher Waterston	16	7	0	23
47	Forston	14	6	0	26
48	Cann	14	6	0	21
49	Hedge End	12	5	0	24
50	Chettle	9	4	2	11
51	Piddlehinton	2	1	0	24
52	Wynford Eagle	2	1	0	23

53	Owermoigne	2	1	0	22
54	Shilvinghampton	2	1	0	21
55	Nr Burton Bradstock	0	0	0	24
56	Ash (Stourpaine)	0	0	2	5
	Totals	15395	6579	77	2714

Of the 14,000 residential properties at risk, only 6,579 (47%) of these are within the qualifying grid squares. The remainder are dispersed throughout the county with few properties in each location, illustrating the distributed nature of the surface water flood risk.

The same analysis using the AStSWF map gave similar results, with 50,800 properties at risk from flooding to a depth greater than 0.1m and 25,300 properties are at risk from flooding to a depth greater than 0.3m. Again approximately two thirds are residential properties. There were two locations where there was significant difference between the two flood maps, Wimborne Minster and Ameysford. At these locations the AStSWF showed a much higher number of properties affected, as shown in the table below. However, on close examination of the maps it was felt that the FMfSW was more representative in these areas.

Table 5-3: Additional Areas above Defra flood risk threshold from AStSWF

Location	No People	Number Residential Properties	Number Critical Services	Number Nonresidential Properties
Wimborne Minster	1317	563	8	279
Ameysford	1338	572	6	152

Comparing the number of residential properties in the 1 in 30 chance greater than 300mm deep to the 1 in 200 chance greater than 300mm deep above shows a reduction in the number of residential properties at risk of nearly 40%, from 14,000 to 8,750.

There is no local information available which provides evidence on future groundwater flood risk across Dorset. The Environment Agency's national dataset, Areas Susceptible to Groundwater Flooding, has been used to form the basis of the assessment of future flood risk from groundwater. This dataset is illustrated in Figure 5.2 and areas at high risk from groundwater flooding are identified. The areas at highest risk are the low lying areas already at risk of river and/or surface water flooding.

The potential consequences on key flood risk indicators have been assessed by the Environment Agency; this information has been included in Annex 2 of the Preliminary Assessment Spreadsheet.

5.4 The Impacts of Climate Change

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 chance, or rarer) could increase locally by 40%.

Key Projections for South West 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 17% (very likely to be between 4 and 38%)
- Precipitation on the wettest day in winter up by around 12% (very unlikely to be more than 24%)
- Relative sea level at Plymouth very likely to be up between 12 and 42cm from 1990 levels (not including extra potential rises from polar ice sheet loss)
- Peak river flows in a typical catchment likely to increase between 11 and 21% 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. 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. There is a risk of flooding from groundwater in the district. Recharge may increase in wetter winters, or decrease in drier summers.

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 against deeper 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.

5.5 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."

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).

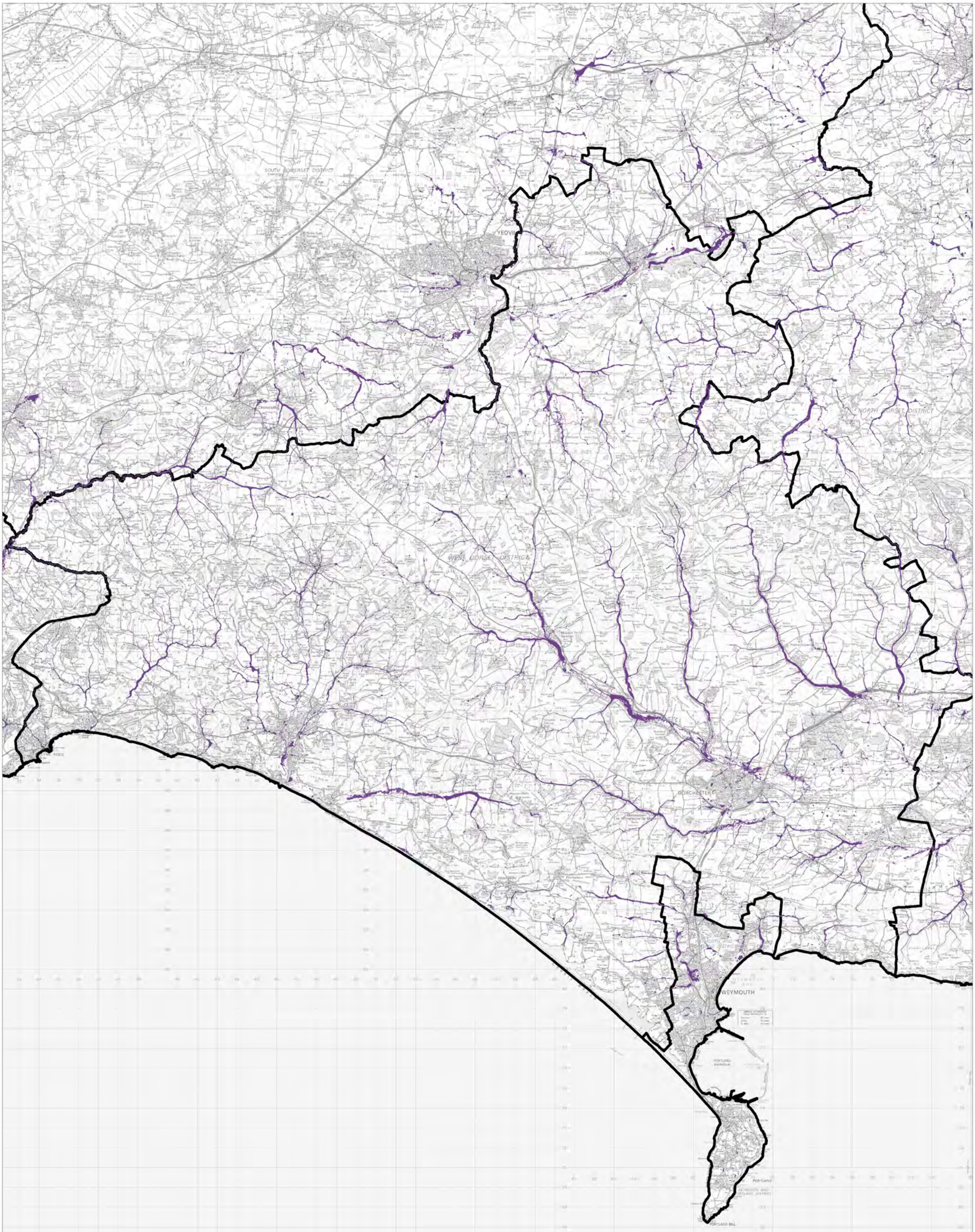


Fig 5.1a - Locally Agreed Surface Water Information (FMfSW 200 Yr Deep) - West Dorset and W&P District

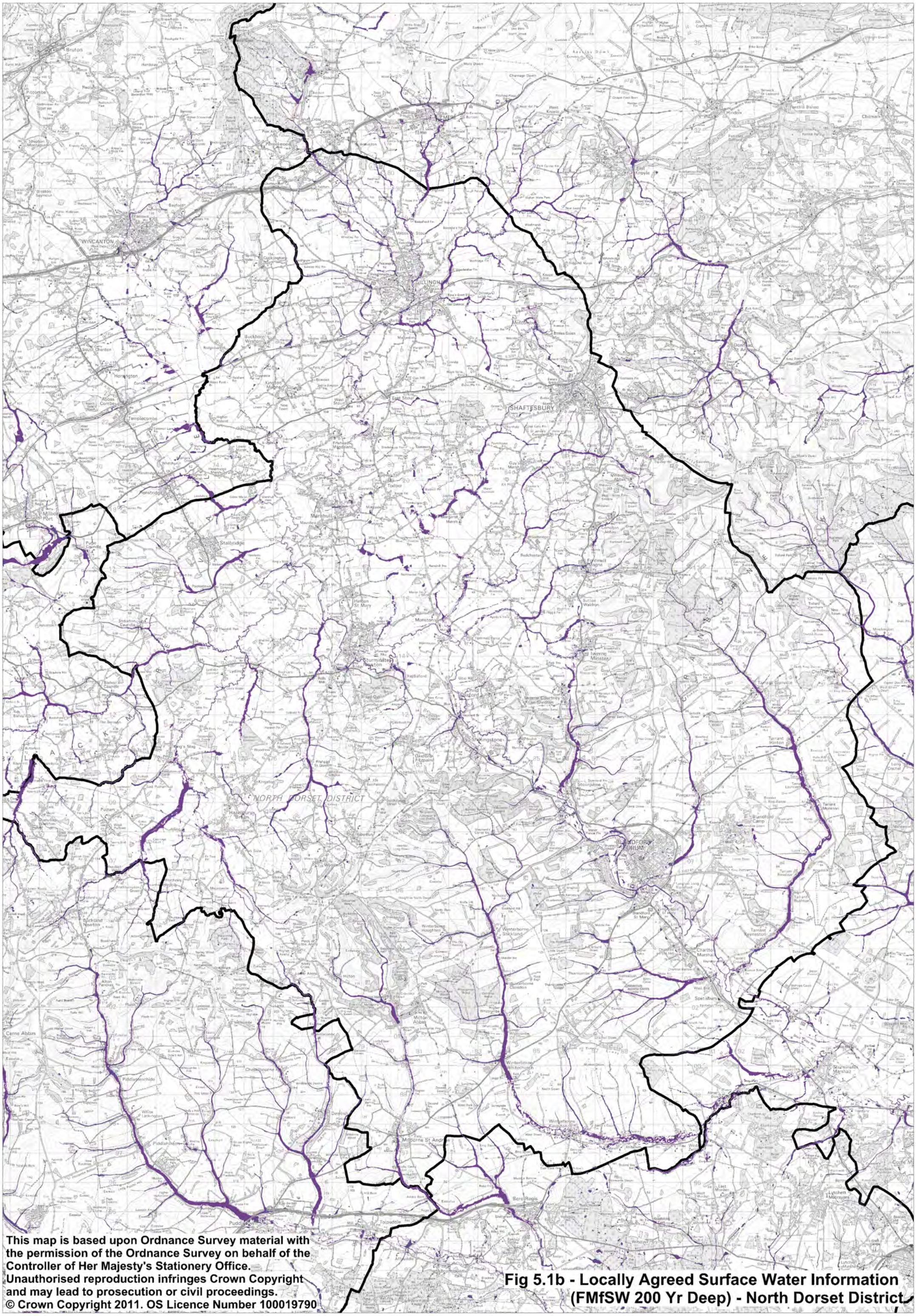


Fig 5.1b - Locally Agreed Surface Water Information (FMfSW 200 Yr Deep) - North Dorset District

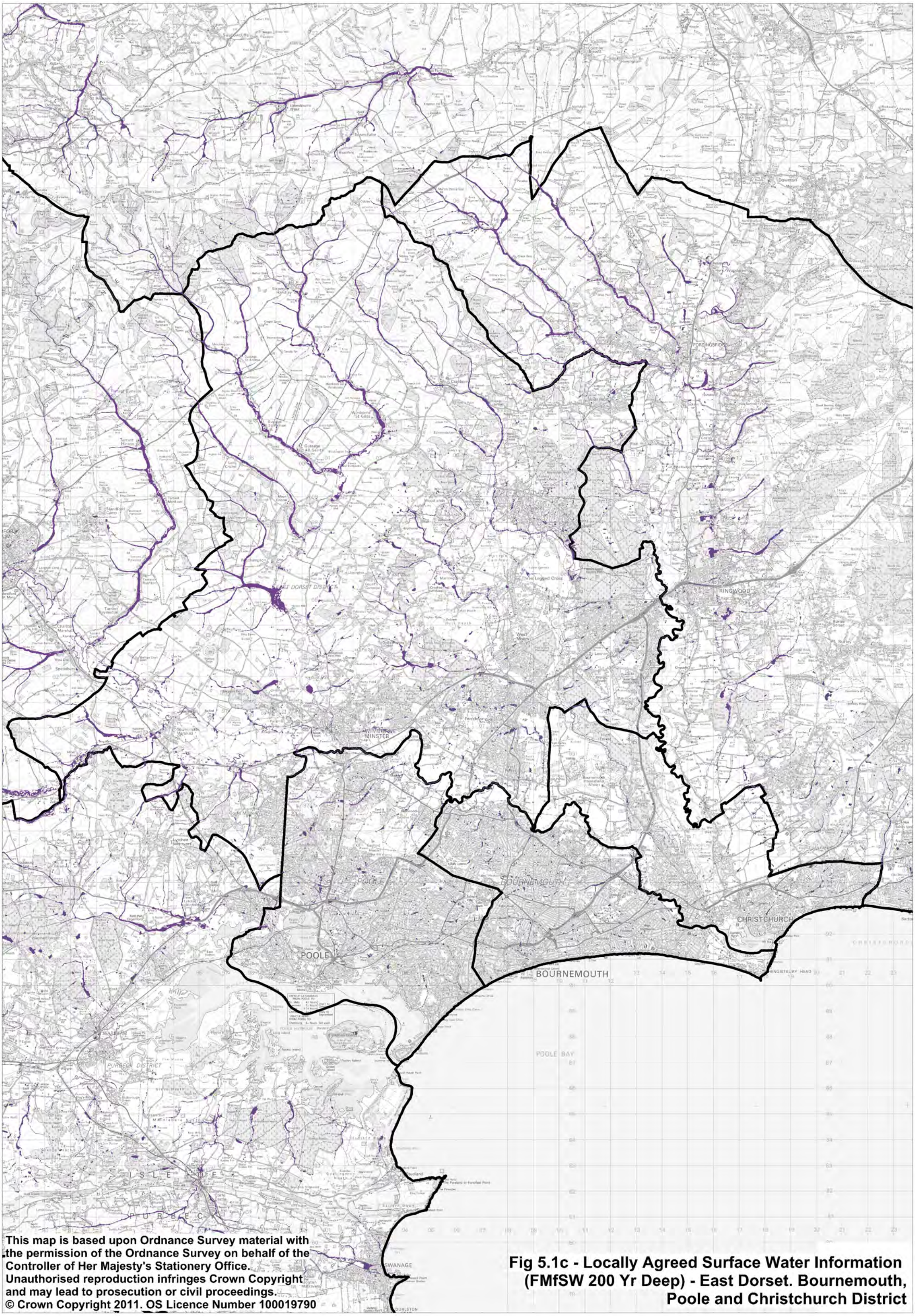


Fig 5.1c - Locally Agreed Surface Water Information (FMfSW 200 Yr Deep) - East Dorset. Bournemouth, Poole and Christchurch District

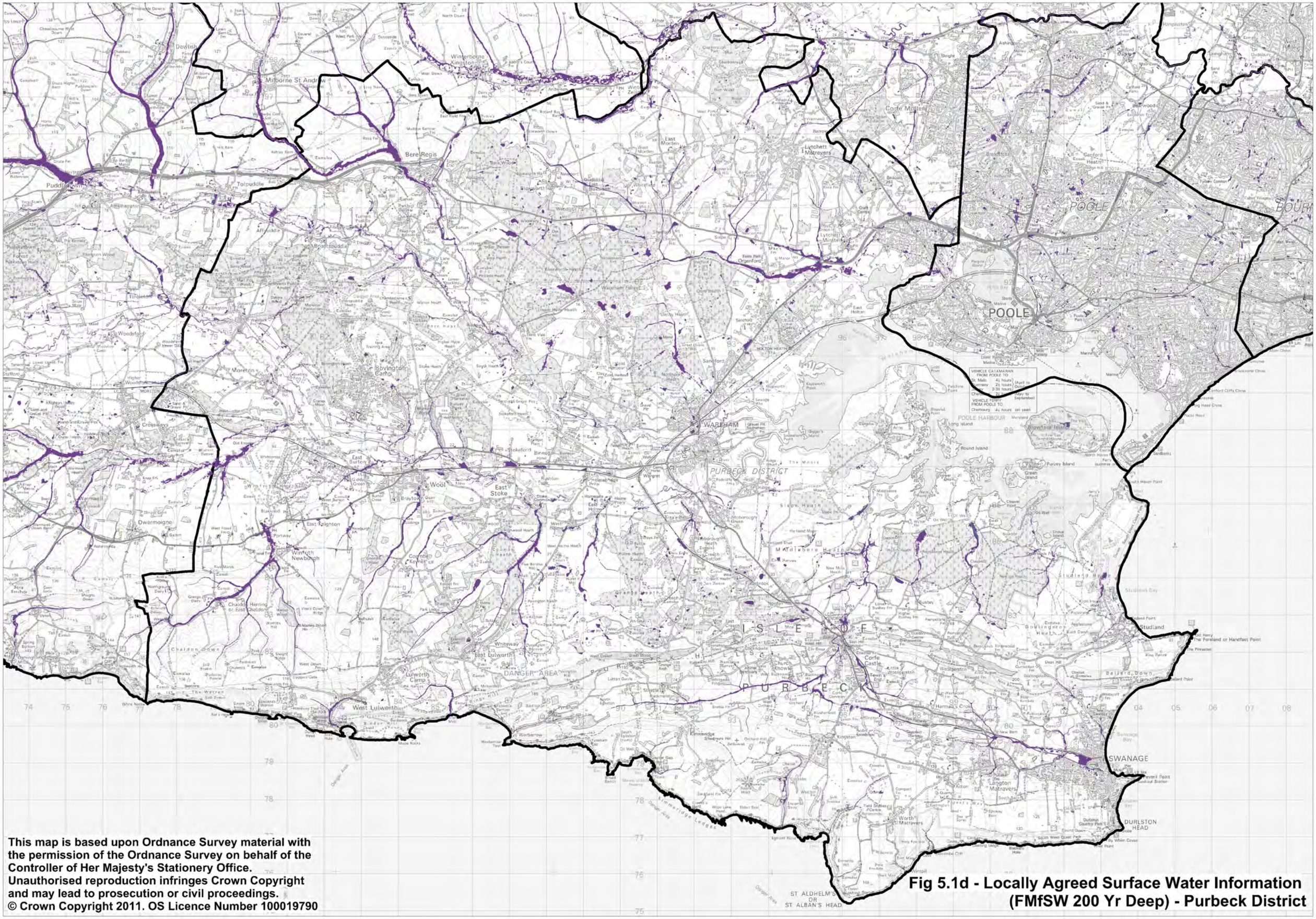


Fig 5.1d - Locally Agreed Surface Water Information (FMfSW 200 Yr Deep) - Purbeck District

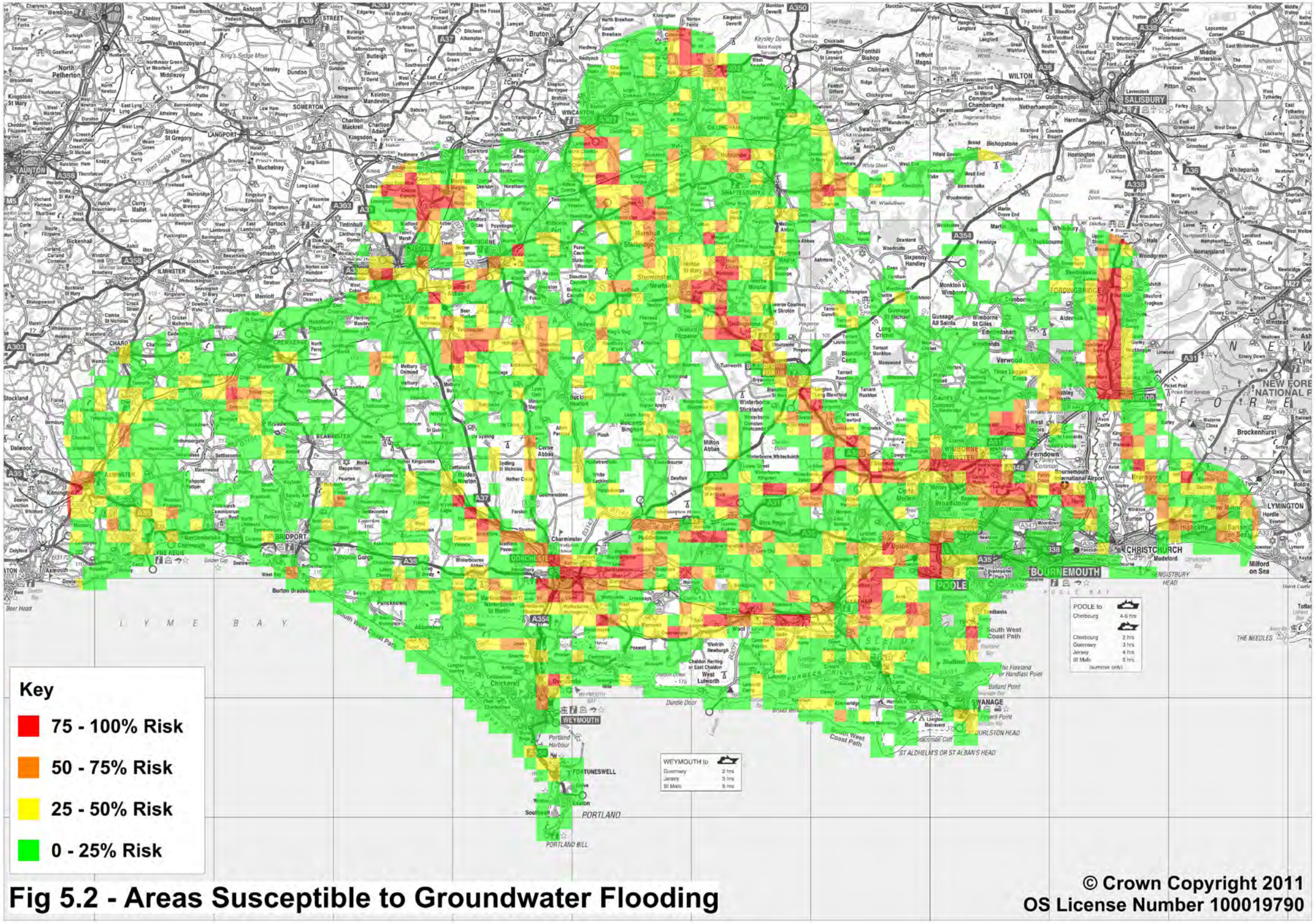


Fig 5.2 - Areas Susceptible to Groundwater Flooding

6 REVIEW OF INDICATIVE FLOOD RISK AREAS

No Indicative Flood Risk Areas have been identified by the Environment Agency in Dorset.

7 IDENTIFICATION OF FLOOD RISK AREAS

No additional Flood Risk Areas have been identified because nowhere in Dorset does the local flood risk meet the significance threshold of 30,000 people affected set by Defra.

For this initial round of assessments, Flood Risk Areas only comprise areas in England and Wales with the most significant local flood risks. Areas lying outside the proposed Flood Risk Areas will still have flood risk issues. Appropriate risk management measures for these areas will be considered as part of the work in preparing a Strategic Surface Water Management Plan that will, in turn, inform the Local Flood Risk Management Strategies under the Flood and Water Management Act 2010.

8 NEXT STEPS

As there are no Flood Risk Areas in Dorset there is no requirement to produce hazard and risk maps by 2013 or Flood Risk Management Plan by 2015. The four stage process of undertaking a Preliminary Flood Risk Assessment (PFRA), identifying Flood Risk Areas, preparing flood hazard and risk maps and preparing flood risk management plans starts again in 2016, so it is important to ensure that information is maintained and kept up to date for future use and to support other flood risk assessments (such as SWMPs, SFRAs) and as part of local strategies. In the next cycle, the recording of more information will be mandatory for floods that occur after 22 Dec 2011.

In order to continue to fulfil its role as Lead Local Flood Authority, Dorset County Council is required to investigate future flood events and ensure continued collection, assessment and storage of flood risk data and information.

It is likely that the District and Borough councils will continue recording events in their respective administrative areas. However, it is crucial that all records of flood events are documented consistently and in accordance with the INSPIRE Directive (2007/2/EC). It is recommended that a centralised database will be kept up to date by Dorset County Council, which has the overall responsibility to manage flood data through the whole administrative area of Dorset County. This will require, where possible, the translation of existing data on past floods into the new system as well as the inputting of records for new flood incidents. This can be used as an evidence base to inform future assessments and reviews.

Local areas of high flood risk will be identified through a Strategic Surface Water Management Plan and investigated further. Part of this process will include the verification of the Flood Map for Surface Water in those locations.

9 REVIEW AND APPROVAL PROCESS

This report has been reviewed by the Flood Risk Management Officer Group and the Flood Risk Management Board. It was subsequently reviewed and recommended for approval by the Community Overview Committee on 20 June 2011. Cabinet confirmed Council approval to publish on 6 July.

10 REFERENCES

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Environment Agency (2009) Hampshire Avon Catchment Flood Management Plan

Environment Agency (2009) Parrett Catchment Flood Management Plan

Environment Agency (2009) West Dorset Catchment Flood Management Plan

Halcrow (2010) Minerals and Waste Strategic Flood Risk Assessment

Annex 1: Records of past floods and their significant consequences (Preliminary Assessment Report Spreadsheet)
Details the past significant flood events identified for DCC, also discussed in Chapter 4.1. In order to make it more readable, the attached Annex 1 is an abstract of the Preliminary Assessment Report Spreadsheet. Please refer to the digital computer file for the full version.

Annex 2: Records of future floods and their significant consequences (Preliminary Assessment Report Spreadsheet)
Details of floods and their significant consequences are discussed in Chapter 5. In order to make it more readable, the attached Annex 2 is an abstract of the Preliminary Assessment Report Spreadsheet. Please refer to the digital computer file for the full version.

Annex 3: Records of Flood Risk Areas and their rationale (Preliminary Assessment Report Spreadsheet)
Please refer to Annex 3 of the Preliminary Assessment Report Spreadsheet computer file. However there have been no Flood Risk Areas identified for DCC therefore none have been recorded in this section.

Annex 4: Preliminary Flood Risk Assessment Checklist
Please refer to Annex 4, PFRA Checklist computer file, which contains the Preliminary Flood Risk Assessment Checklist that has been provided by the Environment Agency to act as a checklist for reviewing PFRA submissions.

ANNEX 1: consequences (preliminary assessment report spreadsheet)

Field:	Flood ID	Summary description	Name of Location	Start date	Main source of flooding	Additional source(s) of flooding	Significant consequences	Human health consequences - residential	Significant economic consequences	Number of non-residential properties	Other economic consequences	Significant consequences to the environment	Significant consequences to cultural heritage	European Flood Event Code
Mandatory / Format:	Mandatory	Mandatory	Mandatory	Optional for first	Optional for first cycle	Optional	Mandatory	Optional	Mandatory	Optional	Optional	Mandatory	Mandatory	Auto-populated
	Unique number	Max 5,000 characters	Max 250 characters	'yyyy' or 'yyyy-mm' or 'yyyy-mm-dd'	Pick from drop-down	Max 250 characters, same source terms	Pick from drop-down	Number between 1-	Pick from drop-down	Number between 1-	Max 250 characters	Pick from drop-down	Pick from drop-down	Max 42 characters
Notes:	A sequential number starting at 1 and incrementing by 1 for each record.	Description of the flood and its adverse or potentially adverse consequences. Where available, information from other fields (Start date, Days duration, Probability, Main source, Main mechanism, Main characteristics, Significant consequences) should be repeated here.	Name of the locality associated with the flood, using recognised postal address names such as streets, towns, counties. If the flood affected the whole LLFA, then record the name of the LLFA.	The date when the flood commenced when land not normally covered by water became covered by water.	Pick the source from which the majority of flooding occurred. Refer to the PFRA guidance for definitions of sources.	If flooding occurred from, or interacted with, any other sources (other than the Main source of flooding), report the source(s) here, using the same source terms.	Were there any significant consequences to human health when the flood occurred, or would there be if it were to re-occur?	Record the number of residential properties where the building structure was affected either internally or externally by the flood, or that would be so affected if the flood were to re-occur.	Were there any significant economic consequences when the flood occurred, or would there be if it were to re-occur?	Record the number of non-residential properties where the building structure was affected either internally or externally by the flood, or that would be so affected if the flood were to re-occur.	If there were other Significant economic consequences, describe them including information such as the area of agricultural land flooded, length of roads and rail flooded.	Were there any significant consequences to the environment when the flood occurred, or would there be if it were to re-occur?	Were there any significant consequences to cultural heritage when the flood occurred, or would there be if it were to re-occur?	This field will autopopulate using the LLFA name provided on the "Instructions" tab, and the Flood ID. It is an EU-wide unique identifier and will be used to report the flood information. Format: UK<ONS Code><P or F><LLFA Flood ID>. "ONS Code" is a unique reference for each LLFA. "P or F" indicates if the event is past or future. "LLFA Flood ID" is a sequential number beginning with 0001.
Records begin here:	1	On the 9 September 2002 an intense rainstorm produced surface water flooding in and around Swanage. Flooding lasted up tp 12 hours and 12 residential and 7 nonresidential properties were recorded as having suffered internal flooding. A total of 132mm of rain was recorded, with 70.6mm falling within a 2 hour period. The probability of the rainfall event was assessed as 1 in 276 years.	Swanage	09/09/2002	Surface runoff		Yes	12	Yes	5		No	No	UKE09000002P0001
	2	On 24 October 1908 a very sudden, severe storm followed a summer of drought. The rain started just after 9am and rained solidly for three hours. The drainage system in Weymouth was unable to cope with the volume of water and torrents rushed through the Dorchester Road district. Streets were flooded to depths of 0.30 – 0.75m and many properties were flooded internally. The worst hit areas were Hardwicke Street, Upper and Lower Chelmsford Street, Brownlow Street, Charles Street, Walpole Street and Penny Street. In total 100mm of rain fell in approximately five hours.	Weymouth	24/09/1908	Surface runoff		Yes		No			No	No	UKE09000002P0002
	3	An extreme rainfall event on 18 July 1955 produced the highest rainfall ever recorded in the UK at Martinstown Dorset The unprecedented intensity started after 5pm on the 18 July 1955, following weeks of very little rain. The water level rose in parts of Weymouth to several feet, entered many properties and caused damage to Westham Bridge and other structures in the area. In total approximately 180mm of rain fell in 21 hours.	Martinstown	18/07/1955	Surface runoff	Main River, Ordinary Watercourses	Yes	500	Yes			No	No	UKE09000002P0003
	4	30 December 1993 when 35mm rain fell in 24 hours but was concentrated in approximately 5 hours. This was estimated to be a 1 in 10 year event and mainly affected the River Jordan and Preston Brook, although Broadwey and Upwey were also affected. A total of 16	Weymouth	30/12/1993	Surface runoff	Ordinary Watercourse	Yes	16	Yes			No	No	UKE09000002P0004
	5	10 May 2004 when a heavy, localised storm caused overland flows from the Littlesea Industrial Estate and 2 residential properties	Weymouth	10/05/2004	Surface runoff		No	2	Yes			No	No	UKE09000002P0005
	6	13 December 2008. Exceptional rainfall caused internal and external flooding to properties and businesses in the Chickerell and Southill areas of Weymouth.	Weymouth	13/12/2008	Ordinary watercourses	Surface runoff	Yes	15	Yes			No	No	UKE09000002P0006
	7	On 1/1/2003 a period of prolonged heavy rain lead to spring water running down the road through the village and flooding 6 residential properties	Sixpenny Handley	01/01/2003	Groundwater	Surface runoff	Yes	6	Yes			No	No	UKE09000002P0007
	8	7/5/2000 Mud washed along highway from fields during heavy rain blocked highway drains and flooded 11 residential properties.	Cranborne	07/05/2000	Surface runoff		Yes	11	No			No	No	UKE09000002P0008
	9	Period of prolonged wet weather followed by heavy rain on 1/11/2000 lead to groundwater and surface runoff flooding 16 properties when the sewerage system was overwhelmed	Piddletrenthide	01/11/2000	Surface runoff	Groundwater	Yes	16	No			No	No	UKE09000002P0009
	10	Period of prolonged wet weather followed by heavy rain on 1/11/2000 lead to groundwater and surface runoff flooding 12 properties	Winterborne Stickland	12/12/2000	Groundwater	Surface runoff	Yes	12	No			No	No	UKE09000002P0010
	11	9 residential properties Burton Christchurch were flooded on 12/12/2000 from a minor watercourse when high levels in the River Stour prevented it from discharging	Christchurch	12/12/2000	Ordinary watercourses		Yes	9	No			No	No	UKE09000002P0011
	12	On 1/10/2006 a high intensity rainfall event flooded the highway and then 14 adjacent commercial properties in Wimborne	Wimborne	01/10/2006	Surface runoff		No		Yes	14		No	No	UKE09000002P0012
	13	Flooding of the A31 trunk road near Henbury for over 2 hours on 20/10/2000 due to a combination of high river levels in the Stour and local runoff	Henbury	20/10/2000	Main rivers	Surface runoff	No		Yes	0	Trunk road blocked	No	No	UKE09000002P0013
	14	A combination of Main River and groundwater led to flooding of Milton Road, Milborne St Andrew for 5 days from 12/12/2000 following a period of prolonged wet weather	Milborne St Andrew	12/12/2000	Groundwater	Main Rivers	No	2	Yes		Road blocked	No	No	UKE09000002P0014

ANNEX 2: Consequences (preliminary assessment report spreadsheet)

Field:	Flood ID	Description of assessment method	Name	Probability	Main source of flooding	Additional source(s) of flooding	Adverse consequences to human	Human health consequences - residential	Adverse economic consequence	Number of non-residential properties	Adverse consequences to the	Adverse consequences to cultural	European Flood Event Code
Mandatory	Mandatory	Mandatory	Optional	Mandatory	Mandatory	Optional	Mandatory	Optional	Mandatory	Optional	Mandatory	Mandatory	Auto-populated
Format:	Unique number between 1-9999	Max 1,000 characters	Max 250 characters	Max 25 characters	Pick from drop-down	Max 250 characters, same	Pick from drop-down	Number between 1-10,000,000	Pick from drop-down	Number between 1-	Pick from drop-down	Pick from drop-down	Max 42 characters
Notes:	A sequential number starting at 1 and incrementing by 1 for each record.	Description of the future flood information and how it has been produced. Cover Regulation 12(6) requirements of (a) topography, (b) the location of watercourses, (c) the location of flood plains that retain flood water, (d) the characteristics of watercourses, and (e) the effectiveness of any works constructed for the purpose of flood risk management. Information from other relevant fields (Probability, Main source, Name) should be repeated here.	Name of the model or map product or project which produced the future flood information	The chance of the flood occuring in any given year - record X from "a 1 in X chance of occurring in any given year".	Pick the source which generates the majority of flooding. Refer to the PFRA guidance for definitions of sources.	If the flood is generated by, or interacts with, any other sources (other than the Main source of flooding), report the source(s) here, using the same source terms.	Would there be any significant consequences to human health if the future flood were to occur?	Record the number of residential properties where the building structure would be affected either internally or externally if the flood were to occur.	Would there be any significant economic consequences if the future flood were to occur?	Record the number of non-residential properties where the building structure would be affected either internally or externally if the flood were to occur.	Would there be any significant consequences to the environment if the future flood were to occur?	Would there be any significant consequences to cultural heritage if the future flood were to occur?	This field will autopopulate using the LLFA name provided on the "Instructions" tab, and the Flood ID. It is an EU-wide unique identifier and will be used to report the flood information. Format: UK<ONS Code><P or F><LLFA Flood ID>. "ONS Code" is a unique reference for each LLFA. "P or F" indicates if the event is past or future. "LLFA Flood ID" is a sequential number beginning with 0001.
Records begin here:	1	• Topography is derived from LIDAR (in larger urban areas, on 1, 2 and 3m grids; original accuracy ± 0.15m) and Geoperspective data (original accuracy ± 1.5m), processed to remove buildings and vegetation, then degraded to a composite 5m DTM. Manual edits applied where flow paths clearly omitted e.g. below bridges. • Flow routes dictated by topography; no allowance made for manmade drainage. The DTM may miss flow paths below bridges. • Areas that may flood are defined by dynamically routing a 6.5 hour duration storm with 1 in 200 chance of occurring in any year, over the DTM using JBA's JFLOW–GPU model. • Manning's n of 0.1 is used throughout, to allow broad scale effects of buildings and other obstructions to be approximated. • No allowance made for drainage, pumping or other works constructed for the purpose of flood risk management. • The 'less susceptible' layer shows where modelled flooding is 0.1-0.3m deep; you must not interpret this as depth of flooding, rather as indicative of susceptibility to flooding	Areas Susceptible to Surface Water Flooding (AStSWF) - Less	200	Surface runoff		Yes	34100	Yes	16700	No	No	UKE09000002F0001
	2	• Topography is derived from LIDAR (in larger urban areas, on 1, 2 and 3m grids; original accuracy ± 0.15m) and Geoperspective data (original accuracy ± 1.5m), processed to remove buildings and vegetation, then degraded to a composite 5m DTM. Manual edits applied where flow paths clearly omitted e.g. below bridges. • Flow routes dictated by topography; no allowance made for manmade drainage. The DTM may miss flow paths below bridges. • Areas that may flood are defined by dynamically routing a 6.5 hour duration storm with 1 in 200 chance of occurring in any year, over the DTM using JBA's JFLOW–GPU model. • Manning's n of 0.1 is used throughout, to allow broad scale effects of buildings and other obstructions to be approximated. • No allowance made for drainage, pumping or other works constructed for the purpose of flood risk management. • The 'intermediate susceptibility' layer shows where modelled flooding is 0.3-1.0m deep; you must not interpret this as depth of flooding, rather as indicative of susceptibility to	Areas Susceptible to Surface Water Flooding (AStSWF) - Intermediate	200	Surface runoff		Yes	16200	Yes	9100	No	No	UKE09000002F0002
	3	• Topography is derived from LIDAR (in larger urban areas, on 1, 2 and 3m grids; original accuracy ± 0.15m) and Geoperspective data (original accuracy ± 1.5m), processed to remove buildings and vegetation, then degraded to a composite 5m DTM. Manual edits applied where flow paths clearly omitted e.g. below bridges. • Flow routes dictated by topography; no allowance made for manmade drainage. The DTM may miss flow paths below bridges. • Areas that may flood are defined by dynamically routing a 6.5 hour duration storm with 1 in 200 chance of occurring in any year, over the DTM using JBA's JFLOW–GPU model. • Manning's n of 0.1 is used throughout, to allow broad scale effects of buildings and other obstructions to be approximated. • No allowance made for drainage, pumping or other works constructed for the purpose of flood risk management. • The 'more susceptible' layer shows where modelled flooding is >1.0m deep; you must not interpret this as depth of flooding, rather as indicative of susceptibility to flooding because	Areas Susceptible to Surface Water Flooding (AStSWF) - More	200	Surface runoff		Yes		Yes		No	No	UKE09000002F0003
	4	• Topography is derived from 64.5% LIDAR (on 0.25m-2m grids; original accuracy ± 0.15m) and 35.5% NEXTMap SAR (on 5m grid; original accuracy ± 1.0m), processed to remove buildings & vegetation, then combined on a 2m grid; buildings added with an arbitrary height of 5m based on OS MasterMap 2009 building footprints, then resampled to a 5m grid DTM. Manual edits applied where flow paths clearly omitted e.g. below bridges. • Flow routes dictated by topography; a uniform allowance of 12mm/hr has been made for manmade drainage in urban areas. Infiltration allowance reduces runoff to 39% in rural areas and 70% in urban areas. • Areas that may flood are defined by dynamically routing a 1.1 hour duration storm with 1 in 30 chance of occurring in any year over the DTM using JBA's JFLOW–GPU model. • Manning's n of 0.1 in rural areas; 0.03 in urban areas, to reflect explicit modelling of buildings in urban areas. • No allowance made for local variations in drainage, pumping or other works constructed for the purpose of flood risk management.	Flood Map for Surface Water (FMfSW) - 1 in 30	30	Surface runoff		Yes		Yes		No	No	UKE09000002F0004
	5	• Topography is derived from 64.5% LIDAR (on 0.25m-2m grids; original accuracy ± 0.15m) and 35.5% NEXTMap SAR (on 5m grid; original accuracy ± 1.0m), processed to remove buildings & vegetation, then combined on a 2m grid; buildings added with an arbitrary height of 5m based on OS MasterMap 2009 building footprints, then resampled to a 5m grid DTM. Manual edits applied where flow paths clearly omitted e.g. below bridges. • Flow routes dictated by topography; a uniform allowance of 12mm/hr has been made for manmade drainage in urban areas. Infiltration allowance reduces runoff to 39% in rural areas and 70% in urban areas. • Areas that may flood are defined by dynamically routing a 1.1 hour duration storm with 1 in 30 chance of occurring in any year over the DTM using JBA's JFLOW–GPU model. • Manning's n of 0.1 in rural areas; 0.03 in urban areas, to reflect explicit modelling of buildings in urban areas. • No allowance made for local variations in drainage, pumping or other works constructed for the purpose of flood risk management.	Flood Map for Surface Water (FMfSW) - 1 in 30 deep	30	Surface runoff		Yes	8750	Yes		No	No	UKE09000002F0005
	6	• Topography is derived from 64.5% LIDAR (on 0.25m-2m grids; original accuracy ± 0.15m) and 35.5% NEXTMap SAR (on 5m grid; original accuracy ± 1.0m), processed to remove buildings & vegetation, then combined on a 2m grid; buildings added with an arbitrary height of 5m based on OS MasterMap 2009 building footprints, then resampled to a 5m grid DTM. Manual edits applied where flow paths clearly omitted e.g. below bridges. • Flow routes dictated by topography; a uniform allowance of 12mm/hr has been made for manmade drainage in urban areas. Infiltration allowance reduces runoff to 39% in rural areas and 70% in urban areas. • Areas that may flood are defined by dynamically routing a 1.1 hour duration storm with 1 in 200 chance of occurring in any year over the DTM using JBA's JFLOW–GPU model. • Manning's n of 0.1 in rural areas; 0.03 in urban areas, to reflect explicit modelling of buildings in urban areas. • No allowance made for local variations in drainage, pumping or other works constructed for the purpose of flood risk management.	Flood Map for Surface Water (FMfSW) - 1 in 200	200	Surface runoff		Yes	38700	Yes	18700	No	No	UKE09000002F0006
	7	• Topography is derived from 64.5% LIDAR (on 0.25m-2m grids; original accuracy ± 0.15m) and 35.5% NEXTMap SAR (on 5m grid; original accuracy ± 1.0m), processed to remove buildings & vegetation, then combined on a 2m grid; buildings added with an arbitrary height of 5m based on OS MasterMap 2009 building footprints, then resampled to a 5m grid DTM. Manual edits applied where flow paths clearly omitted e.g. below bridges. • Flow routes dictated by topography; a uniform allowance of 12mm/hr has been made for manmade drainage in urban areas. Infiltration allowance reduces runoff to 39% in rural areas and 70% in urban areas. • Areas that may flood are defined by dynamically routing a 1.1 hour duration storm with 1 in 200 chance of occurring in any year over the DTM using JBA's JFLOW–GPU model. • Manning's n of 0.1 in rural areas; 0.03 in urban areas, to reflect explicit modelling of buildings in urban areas. • No allowance made for local variations in drainage, pumping or other works constructed for the purpose of flood risk management.	Flood Map for Surface Water (FMfSW) - 1 in 200 deep	200	Surface runoff		Yes	14000	Yes	8300	No	No	UKE09000002F0007
	8	• Areas Susceptible to Groundwater Flooding (AStGWF) is a strategic scale map showing groundwater flood areas on a 1km square grid • This data has used the top two susceptibility bands of the British Geological Society (BGS) 1:50,000 Groundwater Flood Susceptibility Map, which was developed on a 50m grid from: • NEXTMap 5m grid DTM. • National Groundwater Level data on a 50m grid • BGS 1:50 000 geological mapping, with classifications of permeability • It covers consolidated aquifers (chalk, limestone, sandstone etc.) and superficial deposits. • Flood plains are not explicitly identified; the mapping identifies where groundwater is likely to emerge, and not where the water is subsequently likely to flow or pond. • No allowance is made for engineering works, or for groundwater rebound or abstraction to prevent groundwater rebound. • Shows the proportion of each 1km grid square which is susceptible to groundwater emergence, using four area categories.	Areas Susceptible to Groundwater Flooding (AStGWF)	Unknown	Groundwater		Yes		Yes		No	No	UKE09000002F0008
	9	• Modelling developed from combination of national (2004) and local (generally 1998-2010) modelling. • Topography derived from LIDAR (on 0.25m-2m grids; original accuracy ± 0.15m), NEXTMap SAR (on 5m grid; original accuracy ± 1.0m), processed to remove buildings & vegetation. For local modelling, topography may include ground survey. • Location of watercourses and tidal flow routes dictated by topographic survey. • Areas that may flood are defined for catchments >3km² by routing appropriate flows for that catchment through the model to ascertain water level and thus depth and extent. • Manning's n of 0.1 used for national fluvial modelling; variable (calibrated) values for national tidal modelling; appropriate values selected for local modelling. Channel capacity assumed as QMED for national fluvial modelling; local survey methods used for local modelling. • For the purpose of flood risk management, models assume that there are no raised defences.	Flood Map (for rivers and sea) - flood zone 3	100	Main rivers	Sea, ordinary watercourses	Yes		Yes		No	No	UKE09000002F0009
	10	• Modelling developed from combination of national (2004) and local (generally 2004-2010) modelling. • Topography derived from LIDAR (on 0.25m-2m grids; original accuracy ± 0.15m), NEXTMap SAR (on 5m grid; original accuracy ± 1.0m), processed to remove buildings & vegetation. For local modelling, topography may include ground survey. • Location of watercourses and tidal flow routes dictated by topographic survey. • Areas that may flood are defined for catchments >3km² by routing appropriate flows for that catchment through the model to ascertain water level and thus depth and extent. • Manning's n of 0.1 used for national fluvial modelling; variable (calibrated) values for national tidal modelling; appropriate values selected for local modelling. Channel capacity assumed as QMED for national fluvial modelling; local survey methods used for local modelling. • For the purpose of flood risk management, models assume that there are no raised defences.	Flood Map (for rivers and sea) - flood zone 2	1000	Main rivers	Sea, ordinary watercourses	Yes		Yes		No	No	UKE09000002F0010

Preliminary Flood Risk Assessment Checklist					
LLFA Name:	**Dorset County Council**				
	Checklist questions	**Notes for completion**	**LLFA**	**Environment Agency area review**	**Environment Agency national review**
Step 1	**Set up governance and develop partnerships**				
1.1	Have appropriate governance and partnership arrangements been set up?	Refer to section 2.3 of guidance. Governance and partnership arrangements should be to the satisfaction of the LLFA.	Yes		
1.2	Who in the LLFA reviewed the PFRA and when was it done?	Please state the review and approval process and when approval was gained e.g. Officer, Scrutiny Committee, Cabinet. Refer to Section 5 of the guidance.	Flood Management Board 11/5/11 Community Overview Committee 20/6/11 Cabinet Approval 06/7/11		
Step 2	**Determine appropriate data systems**				
2.1	Has a data management system been established and implemented?	See Annex 5 for information about data standards	Yes		
Step 3	**Collate information on past and future floods and their consequences**				
3.1	Has information been requested from all relevant partners?	See Flood Risk Regulations Part 6 Co-operation.	Yes		
3.2	Are there any gaps in available information? (This could include gaps which could have been filled but weren't, or gaps which couldn't be filled because the information wasn't available)	LLFAs - Are there gaps in certain locations, or for certain events that you are aware of, or for certain sources of flooding (such as groundwater). Respond with Yes/No and provide comments on any missing information. EA Review - Has all available information has been gathered and included?	Yes - Lack of recording of source, duration and consequence on many past flood events		
Step 4	**Determining locally agreed surface water information**				
4.1	Which dataset (or combination of datasets) has been determined as "locally agreed surface water information"?	LLFAs - Select from drop down. Refer to "Locally agreed surface water information" text box in section 3.5.1 (p.17) of guidance. EA review - Has this been agreed?	Flood Map for Surface Water		
4.2	Has the locally agreed surface water information been clearly stated and presented (on a map) in the Preliminary Assessment Report?	LLFAs - Select Yes/No from drop down list. Refer to "locally agreed surface water information" text box in section 3.5.1 (p.17) of guidance.	Yes		
4.3	If available, what is the total property count for locally agreed surface water information in the LLFA?	If known, please enter the total number of properties at risk in the LLFA.	22300		
4.4	If applicable, has the method for counting properties been described in the Preliminary Assessment Report?	Refer to text box on page 17 of guidance	N/A		
4.5	Has available information on local drainage capacity (where used to inform the determination of locally agreed surface water information) been included in the report?	Refer to text box on page 17 of guidance. Information provided on drainage may inform options for any future improvements to the Flood Map for Surface Water.	N/A		
Step 5	**Complete Preliminary Assessment Report Document**				
5.1	Does the Preliminary Assessment Report cover all the content described in Annex 1 of the Environment Agency's PFRA guidance?	LLFAs - If the Preliminary Assessment Report contains all the content described in Annex 2 of the PFRA guidance, respond with a 'Yes'. If there are some elements missing, please provide a brief explanation. EA Review - Include comments on any missing content.	Yes		
5.2	Has a summary table of flood events been produced?	Refer to section 3.4 and 3.5 of guidance	Yes		
5.3	Has a description of past flood events been included?	Refer to section 3.4 and 3.5 of guidance	Yes		
5.4	Has additional information been included on climate change and long term developments?	Refer to 3.6 of guidance. Standard text has been provided for Preliminary Assessment Reports which meets the minimum requirements of the Flood Risk Regulations. Please respond with Yes or No, and if additional information has been included, please state the information source(s)	Yes		
Step 6	**Record information on past and future floods with significant consequences in spreadsheet**				
6.1	Are records of past flooding with significant harmful consequences recorded on the Preliminary Assessment Report spreadsheet (Annex 1 of Prelminary Assessment Report) ?	LLFAs - past flooding should be recorded on the spreadsheet and included as Annex 1 of the Preliminary Assessment Report. EA review - Are all the mandatory fields complete?	Yes		
6.2	Are there any past floods with significant harmful consequences that have not been recorded? If so, please explain why not.	LLFAs - Respond with Yes or No. If No, provide additional information e.g. anecdotal information on flood, but not enough evidence to include EA review - Do you agree with LLFA response and comments?	No		
6.3	Have any additional records of future flooding (other than the national dataset information which is already completed) been recorded on the future flooding Preliminary Assessment Report spreadsheet (Annex 2 of Preliminary Assessment Report)	LLFAs - future flooding information should be recorded on the spreadsheet and included as Annex 2 of the Preliminary Assessment Report. EA review - Are all mandatory fields complete?	No		
Step 7	**Illustrate information on past and future floods**				
7.1	Have summary maps been produced for past and future floods?	Refer to section 3.4 and 3.5 of guidance	Yes		
Step 8	**Review indicative Flood Risk Areas**				
8.1	Is your LLFA within an indicative Flood Risk Area?	Indicative Flood Risk Areas were provided to LLFAs by the Environment Agency in December 2010.	No		
8.2	If the answer to 8.1 is yes, have you reviewed it using the locally agreed surface water information, and relevant local information in the Preliminary Assessment Report?	Refer to section 4 of guidance. LLFAs should identify whether they have reviewed against local information or just used the indicative Flood Risk Area information provided by the Environment Agency.			
Step 9	**Identify Flood Risk Areas**				
9.1	Is a Flood Risk Area proposed?	LLFA - select a response from the drop down list and then complete the relevant questions 9.1.1 - 9.1.5. (NB. Indicative Flood Risk Areas can be amended due to Geography, past flooding and/or future flooding.)	No - no Flood Risk Area is proposed (go to question 9.3)		
9.1.1	If the proposed Flood Risk Area is exactly the same as the indicative Flood Risk Area, please confirm.	LLFA - please confirm that the boundary of the indicative Flood Risk Area has not been changed and no change has been made to the flood risk indicators. EA review - please confirm			
9.1.2	If changes have been made to the indicative Flood Risk Area because of geography, please identify what changes have been made.	Use the drop down list to identify the reasons for the change. Options are the same as the table on page 26 of the PFRA guidance. EA review - please confirm evidence supports change			
9.1.3	If changes have been made to the indicative Flood Risk Area because of past / historic flooding, please indicate the changes and the reasons why.	LLFA - identify the scale of the changes made e.g. major/minor increase or decrease in size of Flood Risk Area and the source of information used e.g. records of historic flooding. EA review - confirm scale of the changes made and provide indication of confidence in the evidence provided e.g. anecdotal evidence versus detailed report on flooding event.			
9.1.4	If changes have been made to the indicative Flood Risk Areas because of future flooding, please indicate the changes and the reasons why.	LLFA - identify the scale of the changes made e.g. major/minor increase or decrease in size of Flood Risk Area and the source of information used e.g. detailed modelling as part of SWMP. EA review - confirm scale of the changes made and indication of confidence in the evidence			
9.1.5	If a new Flood Risk Area is being proposed, does it meet the Defra / WAG thresholds?	Criteria and thresholds are set out in the Defra/WAG guidance on selecting and reviewing Flood Risk Areas for local sources of flooding EA review - identify the evidence provided to support this and indicate degree of confidence in the evidence.			
9.2	Does the proposed Flood Risk Area include flooding from interactions with main river, reservoirs or the sea?	LLFAs should respond with Yes or No. EA Review - Summarise the location and nature of interactions i.e. river or sea.			
9.3	Has an indicative Flood Risk Area been deleted?	LLFA - Respond with Yes/No and if an indicative Flood Risk Area has been deleted please provide a short description why. EA - confirm the evidence presented to support this is aligned to 'locally agreed surface water information'	No		
Step 10	**Record information including rationale - ONLY COMPLETE IF ANSWER TO 9.1 IS YES**				
10.1	If proposing Flood Risk Areas, have the mandatory fields in the spreadsheet been completed?	LLFAs - the spreadsheet indicates mandatory columns to be completed. EA Review - Are all mandatory fields complete?			
10.2	Has a rationale and evidence for amending/adding/deleting Flood Risk Areas been included in the Preliminary Assessment Report?	LLFAs - Refer to Table 5 on page 26 of the PFRA guidance and Annexes A-D of the Defra/WAG Guidance. Rationale should be included in "Identification of Flood Risk Areas" section of Preliminary Assessment Report. EA Review - Confirm that supporting evidence for any amendments/additions/deletions has been provided in the Preliminary Assessment Report and annexes			