West Dorset District Council SFRA

Strategic Flood Risk Assessment - Level 1
Executive Summary
August 2008

Halcrow Group Limited

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Contents Amendment Record

This report has been issued and amended as follows:

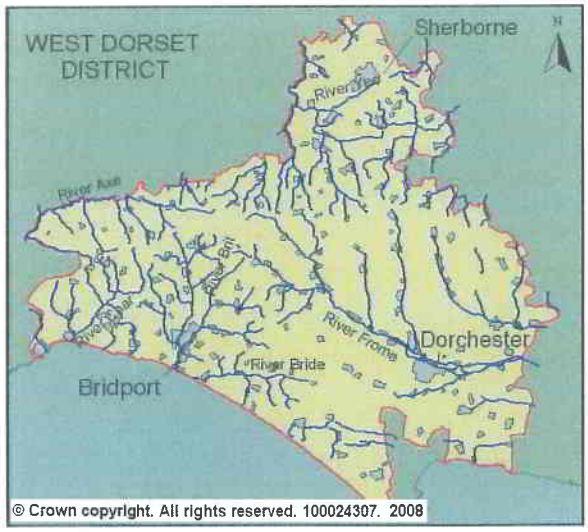
Issue	Revision	Description	Date	Signed
1	0	Executive Summary	August 08	JMD

Executive Summary

1.1 Introduction

1.1.1 Background

In June 2007, West Dorset District Council commissioned Halcrow to produce a Level 1 Strategic Flood Risk Assessment (SFRA).



The SFRA has been prepared to support the application of the Sequential Test outlined in Planning Policy Statement 25: Development and Flood Risk (PPS25), and to provide information and advice in relation to land allocations and development control.

The SFRA has assessed all forms of flood risk: fluvial (rivers), tidal, surface water, groundwater, sewer and flooding from artificial sources (reservoirs), both now and in the future given the likely impacts of climate change.

This document provides a summary of the SFRA and is accompanied by maps of the flood risks.

1.1.2 Purpose of the SFRA

- Inform the sustainability appraisal so that flood risk is taken into account when considering options in the preparation of strategic land use policies;
- Propose appropriate policy recommendations for the management of flood risk within the Local Development Documents;
- Determine the acceptability of flood risk in relation to emergency planning capability;
- Identify the level of detail required for future site-specific Flood Risk Assessments (FRAs) that support planning applications.

1.1.3 Structure of the SFRA document

This document comprises two separate volumes:

- **Volume 1** is the main report which provides a summary of the catchments within West Dorset, relevant policies, current flood risks, the potential impacts of climate change, flood risk management practices and policy recommendations.
- **Volume 2** contains the SFRA maps that illustrate all the flood risks in the study area.

This SFRA report is a 'living' document in that as new information becomes available updates will be made to both the main report and the Executive Summary to ensure that the best information is used to guide the site selection process for future developments. In particular, Environment Agency flood zones can be updated every three months due to changes in flood

modelling results or information from site specific flood risk assessments. For this reason users of this SFRA are recommended to check that they are using the latest SFRA version and the latest flood zone maps associated with this study. This SFRA uses Environment Agency Flood Zones from May 2007.

1.1.4 *Key sources of flood risk data*

In order to assess flood risks, West Dorset District Council and the Environment Agency have provided data and have been closely involved with this SFRA. In addition, other key stakeholders have been consulted (Wessex Water, South West Water, Dorset County Council, Dorset Fire & Rescue Service and Parish Councils) and they have provided data on known flood incidents.

1.2 *Planning Policy Statement 25: Development and Flood Risk (PPS25)*

PPS25 on development and flood risk, published as part of the Governments 'Making Space for Water' strategy, seeks to provide clearer and more robust guidance to ensure that current and future flood risk is taken into account at all levels of the planning system.

PPS25 recognises that, although flooding cannot be wholly prevented, its impacts can be avoided and reduced through good planning and management. Flood risk is required to be taken into account at all stages in the planning process to avoid inappropriate development in areas of flood risk and to direct development away from areas of highest risk. This is referred to by PPS25 as the sequential approach.

1.2.1 *The Sequential Test*

A key aim of a Level 1 SFRA is to guide development to the appropriate Flood Zone using the Sequential Test. This is a process whereby preference is given to locating a new development in Flood Zone 1 (Low probability). If there is no reasonably available site in Flood Zone 1, the flood vulnerability of the proposed development can be taken into account in locating development in Flood Zone 2 (Medium Probability) and then Flood Zone 3 (High Probability).

Within each Flood Zone:

- New development should be directed to sites with lower flood risk (towards the adjacent zone of lower probability of flooding) from all sources as indicated by the SFRA maps.
- Flood vulnerability of the development should be matched to the flood risk of the site, e.g. higher vulnerability uses should be located on parts of the site at lowest probability of flooding.

The Sequential Test demonstrates whether there are any reasonably available sites, in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed. PPS25 summarises the appropriate uses of each zone, as well as Flood Risk Assessment (FRA) requirements and policy aims for each.

Where it is not possible, or consistent with wider sustainability objectives, for development to be located in Flood Zones of lower probability of flooding, the Exception Test can be applied for wider sustainability reasons to avoid social or economic blight. The Exception Test therefore provides a method of managing flood risk while allowing necessary development to occur.

1.2.2 *Level 2 SFRAs*

A Level 2 SFRA involves a more detailed review of flood hazard (flood probability, flood depth, flood velocity, rate of onset of flooding) taking into account the presence of flood risk management measures such as flood defences. These are used in exceptional circumstances where lower flood risk sites are not available or the variation in flood risk across a site requires further analysis.

1.3 *Planning Policy*

Flood related planning policy at national, regional and local levels is detailed in the main report (Volume 1). This highlights that flood risk must be taken into account at every hierarchical level within the planning process. A series of policy recommendations are made, and information contained in the SFRA provides evidence to facilitate the preparation of robust policies for flood risk management.

1.4 *Key findings of the SFRA*

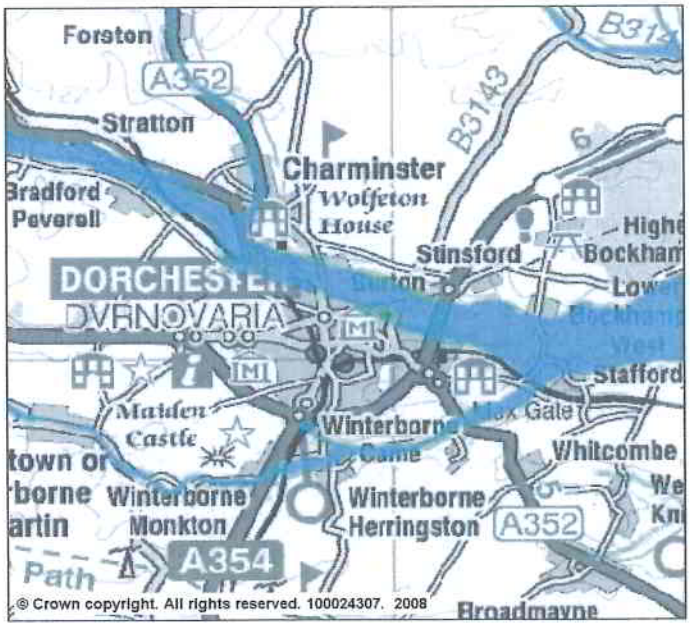
1.4.1 *Flood risks - all types*

The SFRA has assessed all sources of flooding using the information supplied by the District Council, Environment Agency and key stakeholders.

In order to present the best available flood information, the SFRA Flood Zones (fluvial and tidal areas combined) were derived using several sources, a) where new detailed hydraulic modelling of rivers and coastal areas has been undertaken and approved by the Environment Agency, the modelled flood extents were used in preference to the b) published Environment Agency Flood Zones.

The various sources of data are detailed in the main report (Volume 1). SFRA flood maps are presented (Volume 2) to provide a detailed picture of the extent of all sources of flooding.

The maps of Flood Zones are defined based on the best available information and show:



Environment Agency Flood Zone outlines in Dorchester

- **Flood Zone 1** –All areas that are not considered to be at risk of fluvial or tidal flooding. Whilst fluvial flooding and tidal flooding is not a concern in these areas, the risk of flooding from other sources, such as surface water, groundwater, sewers and artificial sources (reservoirs) may still be an issue.
- **Flood Zone 2** – Shows areas at risk of flooding in an extreme fluvial or coastal flood event. This zone shows those areas with a risk of flooding between a 1% (fluvial) or

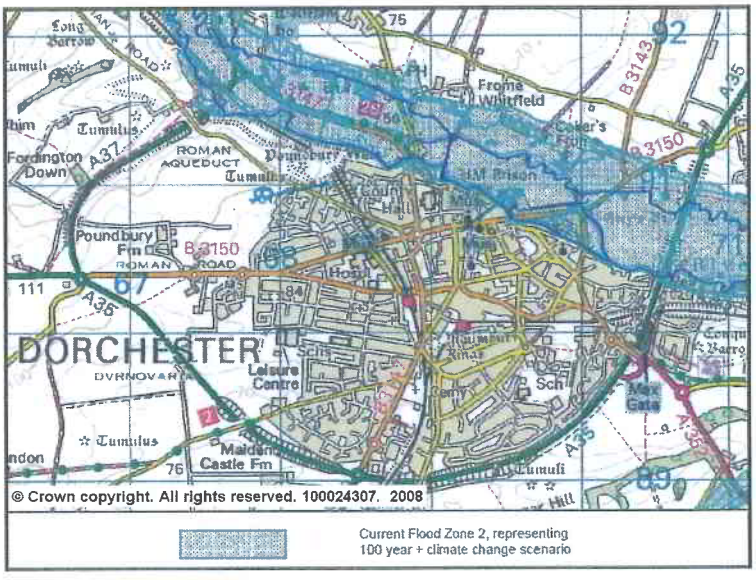
0.5% (tidal) and 0.1% Annual Exceedence Probability (AEP), i.e. between a 1 in 100 year, and a 1 in 200 year probability.

- **Flood Zone 3a** – This represents the area that is part of Flood Zone 3, but outside Flood Zone 3b (Functional Floodplain). This zone identifies the areas at risk from a 1% AEP fluvial flood event or a 0.5% AEP flood event caused by flooding from the sea, i.e. between a 1 in 200 year, and a 1 in 100 year probability.
- **Flood Zone 3b** (Functional Floodplain) – The functional floodplain shows areas of land that are frequently flooded. This is a recent PPS25 requirement and is not currently available for West Dorset.

The maps show significant areas of Beaminster, Bridport (including West Bay), Chetnole, Dorchester, Lyme Regis, Sherborne, Winterbourne Abbas & Winterbourne Steepleton, and Yetminster are currently at risk of fluvial and/or tidal flooding.

1.4.2 *Flood risks – climate change*

There is increasing scientific evidence that our climate is changing as a result of human activity. The potential impact of climate change has been considered for the fluvial reaches and coastal areas. The assumption has been made that the current Flood Zone 2 extent is a reasonable proxy for mapping the future Flood Zone 3a.



1.4.3 *Flood risks - surface water, groundwater & sewer flooding*

In addition to the extent of fluvial and tidal flooding there are areas in the District affected by surface water, groundwater and sewer flooding. It is expected that these types of flood risks will generally increase due to the expected wetter winters (causing more frequent and prolonged groundwater flooding) and the incidence of short-duration high intensity rainfall events associated with summer convective storms (causing more frequent surface water and sewer flooding).

1.4.4 *Flood risks - artificial sources*

The reservoirs situated within the SFRA area are detailed in **Table 1**. Reservoirs built specifically for flood detention are also included.

Table 1 Formal reservoirs within West Dorset

Name	Location	Type	Capacity (m^3)
Lucerne Lake	Near Evershot	Impounding	44600
Melbury Lake	Near Evershot	Impounding	27720
Sherborne Lake	Near Sherborne	Impounding	475000
Beaminster Flood Retention Reservoir	Beaminster	Non-impounding	43500
Cerne Abbas Flood Regulation	Near Cerne Abbas	Impounding	67500

All but one of the reservoirs are impounded. The risk of failure of reservoirs need not constrain the location of development, but it is likely that should any major development be proposed in the area downstream of these reservoirs then an extended scope SFRA (Level 2) will be required to determine the risk posed by overtopping or breach of the embankment and to inform appropriate mitigation measures.

1.4.5 Sites for future development

West Dorset District Council has identified sites allocated for development in the local adopted plan. These are split into the type of land-use (residential, employment or mixed). All of these sites (in Flood Zones 1, 2 and 3) have been included on the 'Flooding from all sources' maps (Drawing set B, Volume 2) to allow the likely flood risk to be assessed.

Table 2 provides a summary of these sites according to the PPS25 Flood Zones. It should be noted that the Sequential Test has not yet been undertaken because the local plan was adopted prior to publication of PPS25. These sites allocated for development will be reviewed through the preparation of the Local Development Framework which will replace the local plan. For this reason the classifications detailed in **Table 2** may change.

Table 2 Flood Zone classification of the areas of development

Sites allocated for development	Location	Proposed land use	Flood Zone(s) intersecting with development area
West Bay Core Area	West Bay	Mixed use	2 and 3
Coach Station Square	Bridport	Mixed use	2 and 3
Rope Walks	Bridport	Mixed use	2 and 3
St Michael's Trading Estate	Bridport	Mixed use	2 and 3
Priory Mills	Bridport	Residential	2 and 3
Land off St Swithin's Road	Bridport	Residential	2 and 3
Site adjoining St Andrew's Road	Bridport	Employment	2
North Mills	Bridport	Employment	2 and 3
New Zealand	Bridport	Residential	2 and 3
Land north of Bridport	Bridport	Residential	2 and 3
Gasworks Hill	Sherborne	Employment	2 and 3
Site west of Beaminster	Beaminster	Employment	2 and 3
Dorchester sewerage works	Dorchester	Sewerage works extension	2

In allocating sites for development the District Council will be required to undertake the Sequential Test if any areas lie within Flood Zones 2 or 3 at any point throughout the

development's life. This will apply when further sites are allocated in the future, when reviewing existing site allocations, and when considering planning applications. By applying the Sequential Test the more vulnerable uses of land can be allocated to the lowest risk sites.

Only where there are no reasonably available sites in Flood Zones 1 or 2 should the suitability of sites in Flood Zone 3 be considered, taking into account the flood risk vulnerability of land uses and applying the Exception Test if required.

The majority of the sites allocated for future development and located within Flood Zone 2 or Flood Zone 3 are sited within existing urban areas. The developed areas with the greatest number of properties at risk as identified by the Flood Zone extents are shown in **Table 3**.

Table 3 Developed areas within West Dorset with significant* numbers of properties within Flood Zone 2

Location	Primary source of fluvial/tidal flood risk	Location	Primary source of fluvial/tidal flood risk
Beaminster	River Brit Several tributaries of River Brit	**Piddlehinton**	River Piddle
Bradford Peverell	River Frome	**Puddletown**	River Piddle
Bridport	River Brit River Asker River Simene Tidal flooding	**Pymore**	River Brit
Burton Bradstock	River Bride	**Sherborne**	River Yeo Minor tributary of River Yeo
Cerne Abbas	River Cerne	**Stratton**	River Frome
Charminster	River Cerne	**Sydling St Nicholas**	Sydling Water
Chideock	River Winniford	**Toller Porcorum**	River Hooke Tributary of River Hooke
Dorchester	River Frome	**West Bay**	River Brit Tidal flooding
Lyme Regis	River Lim	**West Milton**	Mangerton River
Maiden Newton	River Frome River Hooke	**Winterborne Monkton**	South Winterborne
Martinstown	South Winterborne	**Winterbourne Abbas & Winterbourne Steepleton**	South Winterborne
Osmington Mills	Un-named watercourse	**Yetminster**	Wriggle River

* At least 10 properties at risk of flooding

1.4.6 *Potential for Flood Defence Failure*

Defences provide localised protection against flooding in a number of areas within West Dorset. The location of the defences as identified from the Environment Agency's National Flood and Coastal Defence Database (NFCDD) are shown on Drawing A, Volume 2. As with any flood defence there is a residual risk that a defence may fail, as a result of either overtopping and/or a breach.

Should such an event occur it may result in rapid inundation of the local community behind the flood defence, and may pose a risk to life. In the event that the Sequential Test needs to be applied to specific site allocations behind a flood defence, the scope of the SFRA should be extended to a Level 2 assessment to refine information on the flood hazard in the location.

1.4.7 *Raising the standard of protection of existing defences*

An additional requirement of the Level 1 SFRA was to make a broad-scale assessment of the likely costs associated with raising the standard of protection of existing defences on the River Brit and tributaries to 1% Annual Exceedance Probability (AEP). This work made use of modelled flood extents from the Environment Agency's Areas Benefitting Defences (ABD) study. Four areas were identified where the existing defences are below the required standard of protection:

- River Brit at West Bay – affecting the Caravan Park, Quayside and George Street.
- River Brit East bank, near Wych – affecting land and property adjacent to West Bay Road.
- River Asker at East Bridge - affecting land and property to the south-west of the roundabout.
- River Asker at East Bridge – affecting land north-east of the roundabout

Indicative costs for raising the standard of protection of the relevant defences are included within the main report.

1.5 ***Development Implications***

The SFRA has established that there are significant areas within West Dorset that are at risk of flooding.

In order to minimise the flood risks posed to all potential future development the Sequential Test will need to be applied for all future land use allocations. It is recommended that surface water and sewer flooding should not necessarily be a limit on future development, but that all potential development locations are checked to ensure that capacity exists within the drainage networks to reduce the risk of flooding from these sources. The SFRA does however underline the importance of Sustainable Drainage Systems (SuDS) in new development.

Across the whole of the study area, developers should seek to minimise surface water runoff from sites. This is because large increases in impermeable areas contribute to significant increases in surface runoff volumes and peak flows.

There are numerous different ways that SuDS can be incorporated into a development to manage surface water drainage to avoid increases in peak flows and volumes, but the appropriate application of a SuDS scheme to a specific development is heavily dependent upon the topography and geology of a site and the surrounding areas. The SFRA recommends that all developments in all flood zones should use SuDS.

1.6 ***Concluding Remarks***

The risk of flooding within the study area arises from river, surface water, groundwater, sewer and tidal/coastal flooding. The SFRA flood maps with an allowance for climate change

(Drawing set C, Volume 2) show that many urban areas within the study area are at risk of flooding from a 1% fluvial or 0.5% tidal annual probability flood extent (Flood Zone 3). The Sequential Test should be applied to direct any development away from the areas of higher flood risk, but where this is not possible a Level 2 SFRA will be required to inform flood risk and the Exception Test must be passed.

The SFRA output is relevant not only to planning and development control, but also site specific flood risk assessments and mapping for emergency planning, alleviation of flood risk within existing urban development and surface water management plans.