

## **Appendix D – Cumulative Impact methodology**

### **1.1 Methodology**

#### **1.1.1 Catchments**

The WFD river catchments defined in the River Basin Management Plans and LIDAR data were used to divide Dorset into manageable areas on which to base a cumulative impact assessment.

#### **1.1.2 Current developed area**

OS Open Zoomstack data buildings layer was used to assess the current developed area in each catchment.

#### **1.1.3 Proposed level of growth**

To understand areas of Dorset that could experience the greatest pressure for future growth, all potential future development sites received for consideration though the Call for Sites have been analysed. The sites allocated through the Local Plans of neighbouring authorities have also been taken into account within the proposed level of growth for each catchment.

This allowed the calculation of the overall increase in development from the existing situation to identify catchments likely to be under the greatest pressure for development. The context for this being that in circumstances where the proportion of proposed new development is greater, then it is more likely to give rise to cumulative effects.

It should be noted that it was assumed that all sites will be developed, and that the entire site footprint would be developed.

#### **1.1.4 Historic flood risk**

A historic flood risk score was derived for each catchment within the study area using the total current number of National Receptor Database (NRD) properties within the Environment Agency's historic flood map extent in each catchment and data from Dorset council (LPA).

#### **1.1.5 Sensitivity to increases in flood flows**

This is the measure of the increase in the number of properties at risk of surface water flooding and fluvial flooding in a 1 in 100-year event to a 1 in 1,000-year event. It is an indicator of where local topography makes an area more sensitive to increases in flood risk that may be due to any number of reasons, including climate change, new development etc. It is not an absolute figure or prediction of the impact that new development will have on flood risk.

The National Receptor Database (NRD) dataset 2014 was used to identify all properties within the Dorset study area.

It is important to understand which catchments are most sensitive to increases in flood flows which may theoretically be caused by new development. Predicted flood risk was assessed using the following datasets:

- Total number of NRD properties within the merged 1% AEP surface water flooding extent and Flood Zone 3a for each catchment
- Total number of NRD properties within the merged 0.1% AEP surface water flooding extent and Flood Zone 2

The difference in the number properties at risk in these two datasets has then been used as an indicator to identify which catchments are more sensitive to increases in flood flows.

### 1.1.6 Ranking of catchments

To identify which catchments are more sensitive to cumulative impacts, each catchment was given a ranking for each of the three metrics (proposed level of growth, historic flood risk and properties sensitive to growth). These rankings were then combined to give an overall ranking which was divided into three categories - high, medium, and low according to how sensitive each catchment is to cumulative impacts relative to one another.

A summary of the datasets used to calculate the CIA for each catchment is shown in Table E-1 below.

**Table E-1: Summary of datasets used in the cumulative impact assessment**

Dataset	Coverage	Source of data	Use of data
Catchment Boundaries	Dorset study area	Water Framework Directive Catchments	Surface Water and Development Flood Risk
National Receptor Database (2014)	Dorset study area	Environment Agency	Assessing the number of properties at risk of surface water flooding within each catchment
Risk of Surface Water Flooding Mapping	Dorset Study Area	Environment Agency	Assessing the number of properties at risk of surface water flooding within each catchment
Future development areas	Dorset study area and neighbouring authorities.	Dorset Council (LPA)	Assessing the impact of proposed future development on risk of flooding.
Historic Flooding Incidents	Dorset study area	Dorset Council (LPA), Environment Agency	Assessing incidences of historic flooding within the Dorset study area.

### 1.1.7 Ranking the results

The results for each assessment were ranked into high, medium and low risk as shown in Table E-2 below.

**Table E-2: Ranked results of assessments**

Flood risk ranking	% of change in development	Average of % of development within a historic outline, and number of flood incidents	% increase of properties at risk of flooding due to an increase in flood risk (increased flood risk score)
Low risk	0-50%	1	0-25%
Medium risk	50-150%	1.5	25-50%
High risk	150+%	2+	50-100%

The ranking results were combined from all three assessments to give an overall high, medium and low ranking for all catchments within the district. Each catchment received

a score for its ranking in each category, which were totalled to give a total risk score as shown in table F-3 below.

**Table F-3: Final combined rankings**

Individual Rank	Score	Total Score (out of 9)	Final Rank
High Risk	3	7-9	High Risk
Medium risk	2	5-6	Medium Risk
Low Risk	1	3-4	Low Risk

### 1.1.8 Assumptions

The assumptions made when conducting the cumulative impact assessment are shown in Table E-4 below.

**Table E-4: Assumptions of the cumulative impact assessment**

Assessment aspect	Assumption made	Details of limitation in method	Justification of method used
Surface water flood risk	Total number of properties flooded	Assumption that all properties have been included in the 2014 NRD dataset. It may not include all new build properties.	This was the most up to date and accurate data available.
Historic Flooding incidents	Total number of historic events and severity of flooding	Only flooding incidents recorded that could be georeferenced with XY coordinates to produce GIS files. Each point represents a location where it is known there has been at least one flood incident. The severity of the historic flooding event relating to the point has not been considered, just the total number of points within each catchment where there has been a flood incident.	GIS data provided the most accurate results for the location of historic flooding incidents in Dorset and neighbouring authorities.

The results of the assessment and policy recommendations can be found Chapter 7 and Chapter 10 of the main SFRA report.