Technical Overview
London Borough of Redbridge Surface Water Management Plan

A Surface Water Management Plan (SWMP) is a technical document. To increase its readability, some of the more technical detail of the SWMP has been removed from the webpages and presented in this separate document instead.

Under the Flood Risk Regulations (2009), county councils and unitary authorities have responsibilities for a leadership role in local flood risk management, of which the SWMP forms a key part.

DEFRA Guidance

The Department of Environment, Food & Rural Affairs (DEFRA) issued SWMP Technical Guidance in 2010. The guidance provides a clear and logical framework which should be adopted. The framework has four phases.

1. Preparation – scoping the requirements of the study and as assessment of available information.

2. Risk assessment – identification of areas more vulnerable to surface water flooding through Basins, Catchments and Hotspots.

3. Options – identification of options to alleviate the risk of surface water flooding.

Implementation & Review – the preparation and implementation of an action plan.
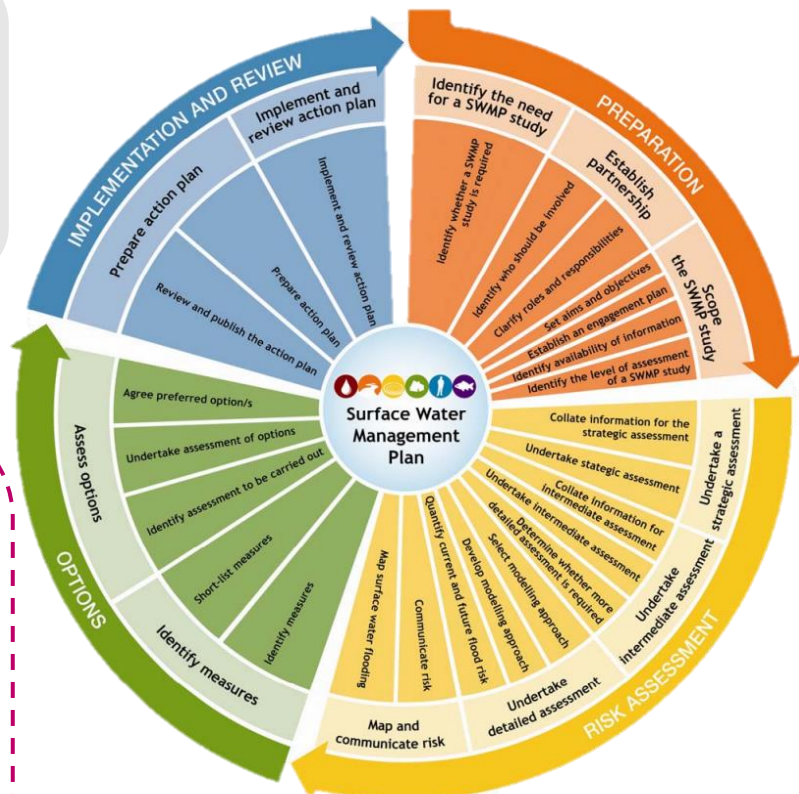

Figure 1: Wheel diagram of SWMP framework. Source – SWMP Technical Guidance (DEFRA)

Catchment Approach

The Catchment-based approach is a key part of the DEFRA framework which promotes the idea that Catchments are the natural scale in which to consider the water environment. Collaborative working between authorities is encouraged at the Catchment level. This means that a variety of stakeholders can work together to reduce flood risk within the natural flow paths of surface water.

As well as aligning to the updated framework, this method uses more accurate hydraulic modelling and allows for hydrological processes to be better represented. The Basins and Catchments identified in this updated SWMP cover the whole geographic area of the borough and extend into neighbouring boroughs, as flow paths do not follow administrative boundaries. The previous Redbridge SWMP from 2011 was produced before this framework was updated and applied a Critical Drainage Area approach. More information on the updated Catchment-based approach can be viewed in the following pages.

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Data underpins the four phases of the SWMP framework. The preparation phase includes an assessment into the available information which involved engaging with stakeholders such as the Environment Agency and Thames Water. Data also forms the basis of the mapping and other outputs of the SWMP. *Table 1* outlines the data used in the SWMP, their sources and use.

Table 1: Data used for the updated SWMP with their sources and use.

Source	Data	Use in SWMP
British Geological Survey (BGS)	Geological Map	To understand and map the context
	Groundwater Flooding Susceptibility	To understand and map the flood risk from groundwater
Environment Agency (EA)	LiDAR Composite DTM 2020 – 2m	To understand and map the topographical context which impacts on surface water flow paths
	Main River Map and Detailed River Network	To understand and map the context
	Properties at Risk of Flooding for the 1 in 30, 1 in 100 and 1 in 1000-year rainfall event return periods (2014)	To map the flood risk from multiple sources and understand the properties predicted to be at risk from surface water flooding
	RoFSW Flood Extent for the 1 in 30, 1 in 100 and 1 in 1000-year return periods (2020)	To map the flood risk from multiple sources and understand the areas predicted to be at risk from surface water flooding
	Flood Map for Planning Rivers and Seas – Zone 2 and Zone 3 (2023)	To understand and map the flood risk from multiple sources
	Recorded Flood Outlines	To understand and map the flood risk from multiple sources
	Reservoir Flood Extents – Wet Day (National)	To understand and map the flood risk from multiple sources
	Reduction in Risk of Flooding from Rivers and Sea due to Defences	To understand and map the flood risk from multiple sources
LB Redbridge	Land Use	To understand the land use contact of flood risk in Redbridge
	Flood Incident Data	To understand flood risk and validate predicted flood risk data in the borough
Thames Water Utilities Limited (TWUL)	Sewer Flooding Incident Data	To understand and map the flood risk from sewers
	Drainage Asset Data	To understand the sewer network and how this may impact on Catchment and Basin extents

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A Catchment-based approach has been adopted for the updated Surface Water Management Plan (SWMP). This differs to the previous 2011 SWMP which identified Critical Drainage Areas (CDAs) and Local Flood Risk Zone's (LFRZs) in the London Borough of Redbridge (LB Redbridge). The Catchment-based approach aligns with the Environment Agency's (EA) recommendations for flood risk management and was introduced as part of a Department for Environment, Food and Rural Affairs (DEFRA) policy framework in May 2013. The framework promotes the idea that Catchments are the natural scale in which to consider the water environment and encourages collaborative working at this level. The objectives for the Catchment-based approach are:

- To deliver positive and sustained outcomes for the water environment by promoting a better understanding of the environment at a local level

- To encourage local collaboration and more transparent decision-making when both planning and delivering activities to improve the water environment

To identify the Basins and Catchments, elevation data was analysed using a Geographic Information Systems (GIS) tool. GIS is a computer software that supports viewing, editing and analysis of geographical data. The tool identifies the natural low points in which water would flow towards, which helps to identify the boundaries of the Basins and Catchments. A Basin is defined as a larger area in which rainfall should flow towards the same natural low point. The Catchments are smaller areas with more local flow paths that link together to form the wider Basin. The boundaries were then refined manually using the following data as a guide:

- Topography

- River network

- The sewer system and flow directions

- Railways and major roads

- Historic flooding reports

- The Environment Agency's (EA) Risk of Flooding from Surface Water (RoFSW) mapping

Using this approach, six Basins and twelve Catchments were produced. These can be viewed on the online mapping tool.

Following the identification of Basins, Catchments and the highest risk areas, the options to mitigate the risk from surface water flooding were explored. There are three types of mitigation interventions that have been considered based on the source-pathway-receptor model.

- Source options aim to capture water at the top of the Catchment to prevent it from travelling towards areas of greater risk. Potential options include swales, detention basins, or wetlands.

- Pathway options manage routes through which water moves towards areas of increased risk. Potential options include improved maintenance of gullies and drains, managing overland flow via preferred paths, or de-culverting watercourses to slow their flow through the catchment.

- Receptor options influence land-use within the areas at risk to prioritise low-risk activities. This could be achieved by influencing the type of developments in the area through planning or increasing education and awareness about flooding in the area. Potential options include Property Flood Resilience (PFR) measures.

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