

# Billingshurst Surface Water Management Plan (SWMP)

## Non-Technical Summary

### What is a SWMP?

Surface Water Management Plans, or SWMPs for short, look at flooding that occurs in response to rainfall when:

- sewers and drains become inundated;
- waterlogged ground leads to runoff from land;
- small rivers and/or ditches overflow, and;
- water contained within rocks under the ground rises up above the surface (this is called groundwater flooding).

A SWMP sets out a long-term action plan for dealing with these types of flooding.

### The Billingshurst SWMP

The SWMP for the Billingshurst area has been prepared by CH2M HILL on behalf of West Sussex County Council. Work began in May 2015 and the final report was issued in June 2016.

The study area is shown in Figure 1 below. The study area covers the town of Billingshurst within the catchment. Flow in the catchment generally is from east to west, originating from the high ground to the east of Billingshurst and ultimately ending up flowing into the Par Brook.

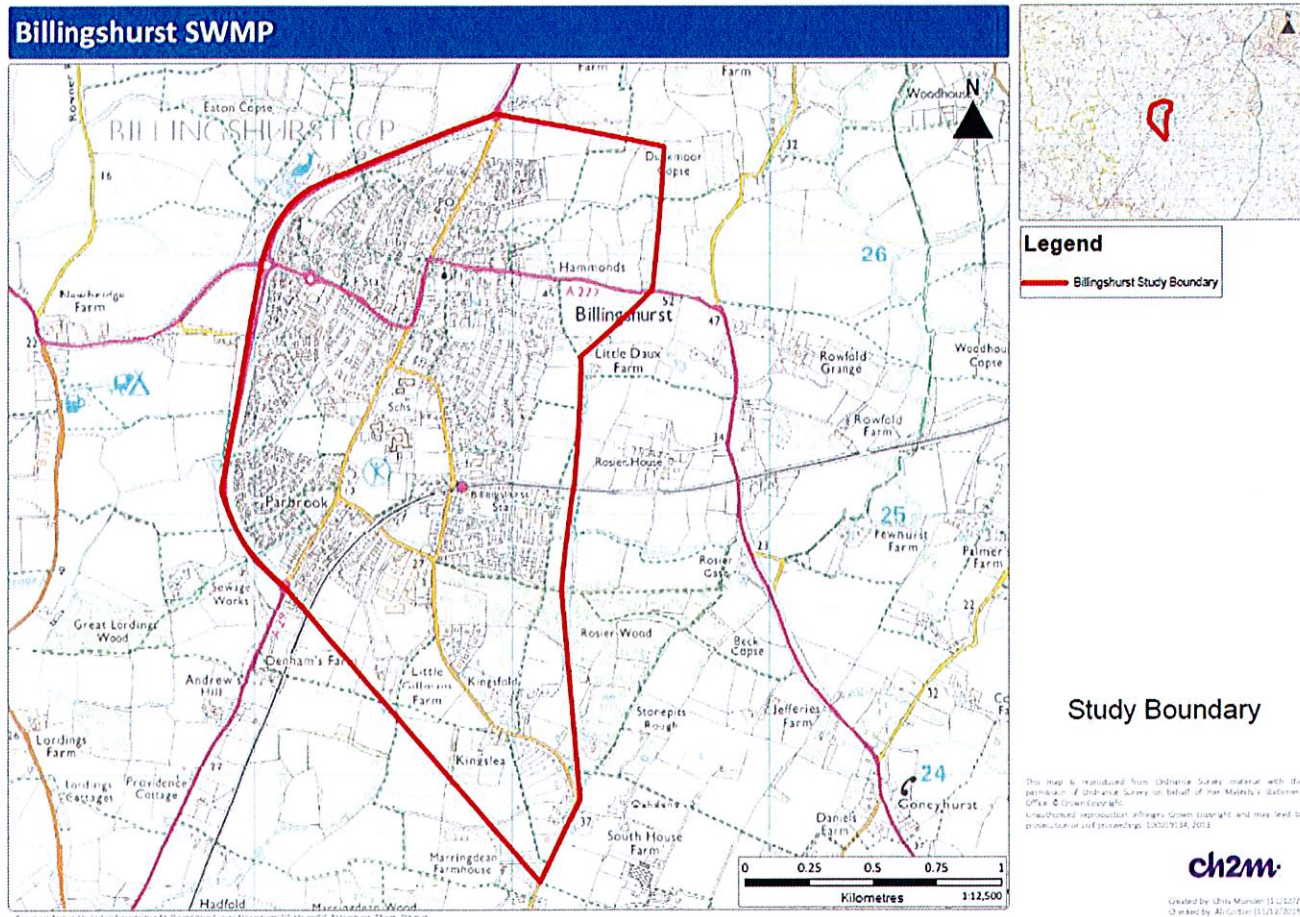


Figure 1 – Billingshurst SWMP Catchment Boundary



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During the development of the SMWP there has been engagement with key stakeholders, including West Sussex County Council (WSCC), Horsham District Council, the Environment Agency, Southern Water and the Billingshurst Flood Action Group.

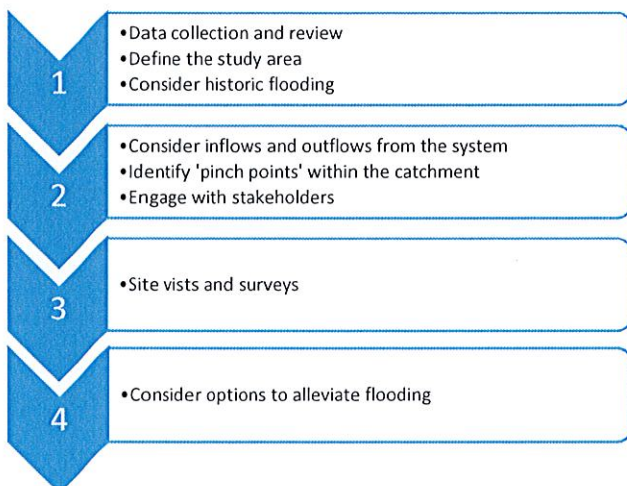
## Objectives

The objectives of the Billingshurst SWMP were to:

- evaluate the causes and severity of historical flooding within the catchment;
- understand the surface water drainage network and potential pinch points, and;
- identify potential improvement works to reduce flood risk to local communities.

## Methodology

The methodology for the project broadly follows the SWMP Technical Guidance published by Defra in 2010. The key project stages were as follows:



## Data

A wide range of data were collated and analysed to help understand the local flooding issues. This included data from previous studies in Billingshurst (e.g. Par Brook CCTV report, Southern Water Authority Flood Survey Report, proposed development plans), historic flooding data, information on historic rainfall, topography, and drainage. All of this information was compiled and mapped using computer based Geographic Information Systems.



*Flooding at Natts Lane in Billingshurst*

## Recent flooding issues

There is good anecdotal and photographic evidence of flooding within Billingshurst for various flood events from October 2013 to June 2015. Flooding in Billingshurst has been a long-standing problem, but the best anecdotal evidence of flooding is from the last two to three years. Given that 2013/14 was the wettest winter on record it is reasonable to assume that the available anecdotal evidence from the past two to three years provides a good basis to assess the flooding impacts. The table below provides an overview of the key locations affected by flooding in Billingshurst. It is not clear from historic records exactly how many properties have flooded internally during these events.

Location	No. properties flooded internally	Other impacts
Area 1: Bowling Alley to High Street	Up to 9 (although not recorded in most recent flood events)	Flooding occurs to properties and highways on the Bowling Alley field, Rosehill, Little East Street and the High Street. Gardens of homes and a car park also flood.
Area 2: Broomfield Drive to Daux Road	1 property (although not recorded in most recent flood events)	Flooding to gardens on Broomfield Drive, and ponding on highways.
Area 3: Daux Road to Natts Lane	None (although 1 property on Daux Road has been very close)	Mainly highway flooding, with some flooding to driveways and gardens.
Area 4: Natts Lane to Stane Street	None	Significant highway flooding.



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## Causes of flooding

The causes of flooding have been identified through site visits, stakeholder engagement, ditch surveys and surveys of selected manholes. Billingshurst is vulnerable to flooding primarily from the surface water drainage network exceeding its capacity due to various restrictions in the system. The table below summarises the key causes of flooding at the locations which are most vulnerable to flooding in Billingshurst.

Location	Causes of flooding
Area 1: Bowling Alley to High Street	<ul style="list-style-type: none"><li>• Exceedance from the drainage network, resulting in ponding on roads and near buildings on High Street</li></ul>
Area 2: Broomfield Drive to Daux Road	<ul style="list-style-type: none"><li>• Exceedance from the drainage network resulting in ponding of water on roads and near to houses</li><li>• The main drainage ditch becoming partially blocked with silt causing a restriction in its capacity</li></ul>
Area 3: Daux Road to Natts Lane	<ul style="list-style-type: none"><li>• Localised exceedance of drainage systems causing ponding in driveways and roads</li><li>• Capacity restriction at small 225mm diameter pipe south of the railway line on the east side of Billingshurst</li></ul>
Area 4: Natts Lane to Stane Street	<ul style="list-style-type: none"><li>• Potential blockages in the system as suggested by the ditch and manhole survey</li><li>• Potential exceedance from the drainage network (capacity at some locations is currently unknown)</li></ul>

## Potential measures

In previous years, there has been a significant amount of work undertaken by WSCC and the Environment Agency to reduce flooding to people, property and infrastructure in Billingshurst. This has included:

- Construction in the 1980s of the Par Brook Flood Alleviation Scheme to provide a route for the Par Brook through a large underground box culvert;
- some Property Level Protection at several properties on High Street which have suffered regular flooding in the past;
- installing an additional trash screen behind 41a High Street; and
- an Operation Watershed funding bid in March 2015 to carry out some minor works within Billingshurst including ditch and pipe clearance on Little East Street and east of Daux Road, and an alarm on the trash screen behind 41a High Street to provide an alert when it is becoming blocked and therefore likely to cause flooding.



*Par Brook Flood Alleviation Scheme in Billingshurst*

The SWMP has considered potential additional measures to reduce flood risk. The level of investment to mitigate flood risk must be proportional to the damage to property and infrastructure caused by flooding. In Billingshurst few properties are currently affected by internal flooding, and the proposed mitigation measures are reflective of this.

Even with all of these measures in place Billingshurst will still be at risk of flooding during more extreme weather events. This is because drainage systems (both natural and man-made) and any other flood risk infrastructure will become overwhelmed during extreme weather events. Across the catchment, the proposed measures in the SWMP to manage flooding are split up into four areas of Billingshurst.

Area 1 is the northeast part of the town from the Bowling Alley field to High Street. The proposed measures are as follows:

- Construction of a flood storage area in the "Bowling Alley" field to store water during a storm and release it downstream at a manageable rate which would not cause flooding;
- WSCC to consider integrating this measure with a flood storage area proposed by the residential development plan in this area, and;
- Southern Water to activate the Emergency Action Plan (EAP) when required;

Area 2 of the study area consists of the area between Broomfield Drive and Daux Road in the eastern part of the town. The proposed measures in this area are as follows:

- Increase the size of one of the underground drainage pipes below Broomfield Drive to provide some storage of flood water within the



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system. This prevents more water being sent downstream and simply transferring the flooding elsewhere;

- clearing silt from the ditch which flows from north to south through the back gardens of many properties on Broomfield Drive, to enable it to operate at its intended capacity, and;
- engagement with homeowners to ensure that they maintain the part of the ditch which runs through their gardens in order to prevent future blockages.

Area 3 is the part of the town between Daux Road and Natts Lane. In the urban part of this area the Par Brook Flood Alleviation scheme has broadly addressed the flooding issues, therefore the proposed measures here are limited to:

- Increasing the size of a pipe in the drainage channel to the east of the town just downstream of the railway line, in order to remove a current pinch point within the system. The size will be increased from 225mm diameter to 450mm diameter.

Area 4 is the area between Natts Lane and Stane Street (and Natts Lane itself). The manhole surveys carried out as part of the SWMP failed to establish how the drainage system is connected as some manhole covers were unable to be lifted and others were full of water, obscuring view of the pipes flowing in and out. Therefore the measures in this area are as follows:

- Jetting of the pipe network in order to clear any blockages;
- re-survey of the manholes within the area to establish how the drainage system is connected and then use this information to suggest further mitigation measures;
- ensure that manholes which are currently full of water are clear and can be examined as part of the survey, and;
- develop mitigation measures of similar scale to those suggested in the other areas of Billingshurst in order to reduce the risk of flooding.

## Implementation plan

It is recommended that within three months of publication of this report that WSCC produce an implementation plan. The implementation plan will set out who will undertake the recommended actions from the SWMP, the timetable for doing so, and the funding mechanism.