Flooding in Guildford 2013/2014 – the findings of the Flood Review Group

Officer recommendation:

That the Committee acknowledges the work of the Flood Review Group and approves the findings and supports the proposed Action Plan, and that the committee recommends that the Executive:

1. Acknowledges the work of the Flood Review Group and approves the findings and supports the Action Plan in Appendix 6 of this report.

2. Agrees that the Flood Review Group continues to meet and deliver the actions detailed in the Action Plan.

3. Agrees that the Executive Head of Environment and the Executive Head of Housing and Health, in liaison with the Lead Councillor for Community Safety and Health, submit a capital bid into the 2015/16 budget as part of the business planning process to request funding of £100,000 for the purchase of temporary flood defences or a contribution to a more permanent flood defence, subject to a further report to the Executive.

Reason(s) for Recommendation:
To ensure that our response to future flooding incidents is robust.

1. Executive summary

1.1 Guildford town centre and other parts of the borough experienced flooding because of severe weather conditions in December and January 2013/14. A number of domestic properties and businesses in various locations were affected by flooding. The situation, especially on Christmas Eve, was made worse by the loss of power that resulted in traffic light failure and the subsequent widespread congestion in the town centre.
1.2 The Executive agreed to the formation of the Flood Review Group (FRG) at its meeting on 7 January 2014. The FRG is chaired by the Lead Councillor for Community Safety and Health and the group consists of representatives from all relevant partner organisations. The FRG agreed the scope of the review looking at the events during the December and January period, the actions taken by partners in accordance with their relevant plans and assessing their effectiveness at that time. The FRG then looked at future planning for flooding events and has put together an Action Plan detailing the actions that will assist in this process.

1.3 The Committee will see that the FRG found that the conditions were extreme and challenging. The FRG was aware of concerns about the management of sluices and the impact on the flooding in Guildford. The FRG concludes that the rapid rise in the river levels was as a result of significant rainfall and resulting flow of the River Wey and its tributaries, and not because of the operation of the sluice gates. In relation to the execution of flood and emergency plans, it was found that these were followed well, especially in relation to relocating residents and activating a rest centre. Sandbags had been provided in advance of the event and during the event, but it is acknowledged that this was hampered by the widespread traffic congestion on the 24 December. The FRG is clear in its view, that Council staff, and our partners, showed great commitment and professionalism throughout the period, and tried their best to address the issues and support those affected by the floods. The costs relating to the impact of the flooding are also highlighted within the report.

1.4 The FRG needed to be fully aware of all of the areas affected by flooding. Not all of the flooding happened in the town centre, so the FRG was keen to ensure that it had a full view of the issues that needed to be addressed. The flooding experienced was not just from the River Wey. Surface water flooding and ground water flooding also occurred across the borough. A lot of work was undertaken to find all of the areas and properties that had been flooded. This was through site visits, attending community meetings, asking councillors to collate information from their wards, surveys carried out by the EA and other partners, flood trailer events, and an open event at the Guildhall. This work has allowed the FRG and partners to target our attentions to areas that require specific work and projects. This future work is listed in the Action Plan in Appendix 6. This work is also supported by the Surface Water Management Plans (SWMP) for Ash and Guildford.

1.5 The FRG has worked hard to ensure that the issues have been investigated thoroughly, or will be, and is confident that the Action Plan will result in improvements to the management of future flooding events. It is proposed that the FRG will continue to work together and manage the delivery of the Action Plan.
The key headlines in relation to this review are:

- the creation of the FRG
- the FRG has thoroughly examined the events of December and January 2013/14 and found that the extreme conditions and rainfall were the contributing factors to the surge on the Wey on the 24 December 2013. It was not related to the operation of the weir gates
- the FRG has looked at the effectiveness of emergency and flood plans. It has concluded that they were followed successfully and effectively but acknowledges that traffic congestion on 24 December 2013 hampered efforts to get sandbags to areas that required them urgently
- the review identified high levels of commitment and professionalism from staff from all partner organisations during this period
- the FRG has produced an Action Plan that has a number of actions for the future
- individual property surveys have been carried out on houses in William Road and area and Walnut Tree Close with a view to proposing property level protection
- the EA is about to spend £1 million on repairs on the River Wey. Due to the high water flows, the river carried a large amount of sand, and as it receded this settled around bridges and within the channel of the river and the floodplain. In some areas this reduced the channel width and the storms made the situation worse as large numbers of trees fell down. The EA's funding will allow it to start removing the trees and clearing areas where the sand has built up, with the work being carried out over the summer. Initially this work will be focused between Guildford and Godalming, with the second phase moving downstream of Guildford and upstream of Godalming near to Elstead and Tilford.
- the EA will be carrying out a study looking to provide potential options to minimise the risk of flooding in Guildford Town centre
- this Council is going to build a bund to protect properties in Ash Green. Work will start in September 2014 subject to the legal formalities being resolved
- this Council’s Engineers are looking at areas where sandbags can be stored in the town centre. This takes away the need to transport them in times of emergency
- this Council’s Engineers are looking at options for temporary flood defence equipment. We will trial some in the winter of 2014. We will put in a capital bid for £100,000 for 2015/16 and, after careful assessment with the EA, will select and procure appropriate equipment as required, or this could be contributed towards a more permanent form of flood defence
- the FRG is looking at how we can improve on giving warnings to the public about flooding. This includes looking at options like sirens and further promoting the EA’s warning system
- we are looking to launch a new scheme called ‘Flood Lookouts’. This involves volunteers who could assist in raising flood awareness at times of flooding and provide information as required
- the FRG formalising the process of review for all flood plans through the FRG on an annual basis to ensure they are relevant
- this Council’s officers will be reviewing stand-by staffing arrangements for periods of flooding
- we will be working with the Business Improvement District (BID) working with businesses in the town centre with a view to highlighting the need for better flood protection for their properties
• Surface Water Management Plans and studies have been produced and highlight areas at risk of surface water flooding and propose schemes to address those issues. These plans and studies cover the whole borough.

2. Strategic Priorities

2.1 The management of flooding falls within the themes of ‘Economy’, ‘Development’, ‘Society’, ‘Sustainability’, ‘Infrastructure’ and our ‘Council’. Flooding on the scale that we experienced has an impact on residents, businesses and visitors to our borough. This Council, along with all of our partners and the community as a whole, have a responsibility to ensure that we do as much as we can to effectively plan for flooding events in the future.

3. Background

Executive meeting 7 January 2014

3.1 We experienced extreme weather conditions from 22 December 2013 until after the New Year. Heavy prolonged rain and strong winds led to flooding, loss of power and damage to residential property and businesses.

3.2 The Executive considered an item of urgent business at its meeting on 7 January 2014, which detailed the action taken by the Council and the arrangements put in place by Corporate Management Team to review our response to the flooding that took place over the Christmas and New Year period.

Flood Review Group

3.3 The Executive agreed that a borough-wide review be undertaken, led by the Lead Councillor for Community Safety and Health, supported by the Executive Head of Environment and the Executive Head of Housing and Health, and that the outcome of the review be submitted to the Customer and Community Scrutiny Committee for consideration. We have been working closely with the Environment Agency and the National Trust in writing this report.

3.4 The Flood Review Group (FRG) met for the first time on 7 January 2014. This report informs the committee of the findings and recommendations of the FRG.

3.5 The membership of the FRG at the first meeting was:
Councillor Richard Billington, Lead Councillor for Community Safety and Health (Chair)
Councillor Matt Furniss, Lead Councillor for Environment
James Whiteman, Executive Head of Environment
Philip O’Dwyer, Executive Head of Housing and Health
Helen Barnsley, Health and Safety Team Leader
Tim Pilsbury, Engineering and Transportation and Projects Manager
John Martin, Head of Housing and Community Care Services
3.6 The FRG has now extended membership to:
Justine Glynn, Environment Agency, replacing Ian Tomes
Mark Howarth, SCC Asset Management Group
John Gibson, National Trust
Chris Reynolds, Climate Change and Energy Manager.

We are also liaising with the Police.

3.7 **Scope of the FRG** - The review will look at all aspects of the floods including locality of affected properties and businesses, areas of responsibility, the action taken in relation to the flooding, the effectiveness of existing plans and strategies and the recommendations for the future.

The following terms of reference for the review were agreed:

1. To investigate the period of flooding and heavy storms that occurred in December and January 2013/14 and to provide a timeline of events.
2. To review the extent of the flooding and to identify where domestic and commercial properties were affected.
3. To confirm the responsibility of each of the relevant organisations, businesses and domestic property owners in relation to flooding.
4. To confirm the relevant and existing flood plans, strategies and arrangements in place in relation to flooding and to examine the effectiveness of those plans, arrangements and strategies during this period of flooding.
5. To seek feedback directly from ward councillors, partner organisations, residents and businesses to inform the review through the use of contact mediums including questionnaires, telephone or face to face interviews and group meetings.
6. To provide a report detailing the findings of the review that will also include recommendations for the future planning for flooding in Guildford.

3.8 **Types of flooding and responsibilities** – The FRG felt it important to understand the types of flooding and the roles and responsibilities of different organisations and individuals, in order that plans could be tailored to address specific types of flooding. These are listed in **Appendix 1**.

3.9 **Existing flood and emergency plans** – The FRG wanted to ensure that plans were relevant, up to date and controlled, developed and maintained. The plans are listed in **Appendix 2**.

4. **Main issues examined by the FRG**

**Part 1 – Floods over Christmas and New Year period 2013/2014**

*What happened*

4.1 The latter half of December 2013 was exceptionally wet. Environment Agency (EA) rain gauges in Cranleigh and Guildford recorded daily totals on 23

4.2 Strong wind caused issues on 23 and 24 December 2013. A number of trees were blown over and many properties lost power. Power was also lost to the Stoke junction traffic lights and by late morning on the 24th, the build up of traffic, together with rapidly rising river levels and consequent flooding, brought traffic to a virtual standstill by early afternoon. This severely hampered the response of the various agencies on Christmas Eve.

4.3 Cleansing crews were brought back to the Depot to distribute sandbags to the town centre, but the speed by which the river rose, and the traffic problems, made it impossible to get the sandbags in place in accordance with the Engineers’ Flood Plan until later on the 24th, by which time, many properties had flooded. It is worth mentioning that sandbags were also being distributed across the borough at this time. In the weeks before the flooding we had ensured that our stockpiles of sandbags across the borough were topped up. See Appendix 5 for locations.

4.4 The EA has looked into the events and commented:

4.4.1 “We aim to give at least two hours notice from when we issue a Flood Warning before the onset of property flooding, but this is not always possible. Rivers can rise extremely quickly in response to heavy and persistent rainfall, and in such cases, we may have less than two hours notice that a river will flood.

4.4.2 In the 24 hour period between 0600 on the 23 December 2013 and 0600 on the 24 December 2013 our rain gauges recorded 57mm in Cranleigh and 52mm rain in Guildford.

4.4.3 In response to this significant amount of rain on already saturated ground, the River Wey at Guildford rose very sharply from 0946 on 24 December 2013, passing through all of our trigger points where we would issue a Flood Warning, within the space of one hour. This coincided with a rapid rise in flows on the Tillingbourne at Shalford and the Cranleigh Waters at Bramley, which both discharge, into the Wey upstream of Guildford. This rapid rise in levels is very uncharacteristic of the River Wey, and resulted in flooding at Guildford.

4.4.4 Flooding mostly affected areas in and around the town centre, with Friary Bridge, High Street, Mary Road, William Road, and Walnut Tree Close the worst affected. Other areas of the borough experienced flooding but not from the River Wey; we are carrying out separate investigations across the borough.

4.4.5 We have responded to enquiries from people concerned about increased flood risk from the operation of weirs and sluices along the River Wey. The National Trust and other private asset owners operate the sluices and weirs along the River Wey. We have obtained the records from the asset owners that show that the sluices and weirs were operated appropriately before the flooding on Christmas Eve 2013.

4.4.6 The Westbrook Mill weir system is situated upstream of Godalming. The weirs are operated by Parsons Brinkerhoff. Information from our telemetry system and
from records taken by the operators show that the gates were not fully opened until the morning of the 25 December 2013, therefore the operation of this gate would not explain the rapid rise seen in Guildford on Christmas Eve, which coincided with a rapid rise in flows on the Tillingbourne at Shalford and Cranleigh Waters at Bramley that discharge into the River Wey between Westbrook Mill and Guildford Town Centre”.

4.4.7 The conclusion of all partners is that the rapid rise in river level was due to the significant rainfall and resulting flow in the River Wey and its tributaries and not the operation of sluice gates. For more details of the weirs on the Wey and their operation, see **Appendix 10**.

4.4.8 Figure 1 shows the rise in water level at the EA gauging station in Guildford. The bottom horizontal line is the Flood Alert Threshold, the middle line is the Flood Warning Threshold and the top line is when a Flood Warning would be issued. It can be seen that the river rose rapidly through all of these trigger points in a very short space of time. See **Appendix 11** for a larger scale version of figure 1.

![River Wey Levels at Guildford December 2013](image)

**Fig. 1**

4.5 **Table 1.**

Timeline compiled by the Council’s Health and Safety Team Leader (HSTL).

| Sunday 22 December 2013 | Notified by met office of an amber warning for rain wind and floods.  
Contacted by Surrey County Council Emergency Management team in accordance with the severe weather plan.  
Informed that the rain and wind were likely to hit Surrey at about 7am.  
Executive Head of Environment contacted as there was concern that 7am would be a key time for the refuse service. As it was, this did not |
prove to be an issue on Monday 23 December and the rounds were completed without incident.

**Monday 23 December 2013**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30am</td>
<td>Telephone conference with the Environment Agency. No alerts for Wey. Potential to issue a Flood Warning on 24th for Guildford discussed.</td>
</tr>
<tr>
<td>3pm</td>
<td>Telephone conference with SCC emergency planners. HSTL circulated the sandbag distribution plan for the town centre if the Wey flooded in Guildford to the Local Resilience Forum.</td>
</tr>
</tbody>
</table>

**Tuesday 24 December 2013**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.30am</td>
<td>Telephone conference with SCC emergency planners. A Strategic Coordinating Group (SCG) was called to meet by teleconference at 12:30pm. The main focus at this time was on the Mole but a warning had been issued for Guildford by this time.</td>
</tr>
<tr>
<td>3pm</td>
<td>Further SCG by telephone conference, discussion regarding the need for a rest centre in Guildford. Mole Valley had a rest centre set up that was not being used as people were making alternative arrangements. Specific flooded roads in Guildford discussed including Walnut Tree Close, Mary Road, William Road and Leas Road.</td>
</tr>
<tr>
<td></td>
<td>Senior housing managers and environmental health officers started delivering letters to properties in those roads. The letters advised people that flooding was likely and they should think about making appropriate arrangements.</td>
</tr>
</tbody>
</table>

**Wednesday 25 December 2013**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5am</td>
<td>Fire and Rescue evacuated Walnut Tree Close by boat. 12 people, 2 dogs and a cat taken to Park Barn Day Centre, later a care home in Waverley was also evacuated to Park Barn Day Centre.</td>
</tr>
<tr>
<td></td>
<td>The mayor visited the day centre.</td>
</tr>
</tbody>
</table>

*Where did it actually flood?*

4.6 Investigation has clarified where flooding took place, and what flooded. The type of flooding has been categorised as internal property flooding, including basements, or non-internal flooding of grounds and gardens.

4.7 A number of approaches were taken to confirm where flooding had occurred:
the FRG asked GBC councillors to provide details of any properties or businesses that had contacted them about flooding. See Appendix 3

the EA carried out a survey in January 2014 to identify which residential properties and businesses flooded. See Appendix 4

the FRG used its own observations about what was seen from numerous site visits throughout the period

the CSC had received calls about flooding

the operational crews that deployed sandbags fed back information

local media provided information.

4.8 Information gathered from the National Flood Forum (NFF) trailer is also included in this report. The NFF provided a flood recovery trailer to various boroughs and districts throughout Surrey. It visited Guildford borough three times, twice in Guildford town centre on 11 and 24 March and once near the Avondale estate in Ash Vale on 18 March. The EA also held a flood forum in the Guildhall in May.

Issues considered by the FRG

4.9 The FRG wanted to understand what had happened on the 24 December 2013.

4.9.1 Were flood warnings given in appropriate time?

Response.

It is clear that not all residents around the William Road area and Walnut Tree Close were aware that river levels were rising. The rapid rise in the river level cut through all the trigger levels the EA set for preparing to issue flood warnings. By the time the warning was issued there was little time to plan any action. This is not a criticism of the EA it just highlights the rapid rise in levels.

4.9.2 Why did the surge in water happen? Was it due to the operation of the weir gates? Was Guildford flooded to protect other areas, as was suggested by some residents?

Response.
See EA comments in paragraph 4.4, in particular 4.4.6 and 4.4.7.

4.9.3 Is there a clear picture of where flooding occurred? Are we sure we know what happened across the whole borough?

Response.

We do have a good idea where flooding occurred, see Appendices 3 and 4.

4.9.4 Are we sure about how many businesses were affected?

Response.

These are listed in Appendices 3 and 4

4.9.5 What arrangements were in place for re-housing families?

Response

We have procedures in place to provide temporary accommodation for individual households. The scale of this incident however calls for a different response. Again we have an established plan to set up and operate rest centres to provide immediate shelter for displaced persons.

In this case evacuated residents were taken to Park Barn centre. The rest centre remained open for around 12 hours to enable alternative arrangements to be put in place for those affected. Some households made their own arrangements whilst some were accommodated in either a sheltered unit or local hotel. Neither are really suitable for families of any size and/or where a long stay is involved.
4.9.6 Was there enough capacity if more families had to be relocated?

Response

The rest centre could have handled more people as shown by the fact that we were able to offer the facility to Waverley Borough Council later in the day. If necessary a second rest centre could have been opened. The more challenging issues arise when people are unable to return home within a reasonable period. In such circumstances we would look to the private sector to accommodate affected people. In practise many households make alternative arrangements themselves with the assistance of relatives and their household insurers.

4.9.7 Did the rest centre arrangements meet the specific needs of the community; were the facilities adequate?

Response

The arrangements worked well this time, but see comments in 4.9.5 and 4.9.6.

4.9.8 What staffing arrangements had to be made?

Response

The rest centre plan sets out how they are set up and operated. As a precautionary measure we placed a number of staff on standby on the 24 December 2013 as the situation continued to deteriorate during the day. This enabled the rest centre to be set up very quickly once we were asked to do so.

4.9.9 If the period had been longer, could this have been sustained?

Response

We operated the rest centre with the minimum of staff. If the centre needed to remain open longer we would have arranged for more staff to come in. Social Services would also have provided additional support. Though the centre had to open on Christmas Day we are fortunate in having staff who responded without hesitation.

4.9.10 Were the emergency numbers publicised clearly?

Response

They were on our website, but we did have to make them even clearer. We also used social media to promote them, which was also picked up and broadcast by local radio.
4.9.11 Were there any reports that people could not get through on the emergency numbers?

Response

We have not received any reports that people could not get through. Our out of hours contact centre operated by Forestcare was open throughout.

4.9.12 Do we offer sandbags to businesses?

Response

We did offer sandbags to those that called.

Should we continue to do this? We should encourage businesses to make their buildings more resilient because it is their responsibility to protect their businesses. Sandbags can be provided if available, but domestic properties, especially those at risk of internal flooding, are the priority. Please note, it is the householder’s responsibility to protect their property, but it has been a long-standing approach of this Council to assist wherever possible.

4.9.13 Did we have enough stock of sandbags?

Response

Yes, we also gave other boroughs in Surrey some of our stock to help them out.

4.9.14 Should sandbags remain as our frontline defence in these situations, or should we consider something more permanent, or more effective approaches?

Response

The FRG recommends that we should look at other methods of flood protection. We will look at locating sandbags or other flood defences nearer to where they are needed. The EA is reviewing options to minimise the risk of flooding in Guildford Town Centre and will work with us and others to identify the most appropriate solution.

4.9.15 Were the difficulties in getting sandbags to affected areas avoidable?

Response

It was very difficult to get sandbags to all affected areas in time. This was due to the rapid rise in river level and because the traffic was at a standstill at the critical time. At the time, there was no obvious answer to getting around these difficulties.

4.9.16 Did flooding occur as a result of the grilles blocking, or did our cleaning regime prove to be effective?

Response – yes, our cleaning regime was effective. We have plans to improve the grille in Merrow Lane.
4.9.17 Are the Council's out of hours arrangements adequate?

Response

Given the scale of flooding, we believe that the out of hours arrangement worked. The incident did highlight the extent to which we rely on a couple of key staff being available at all times on a voluntary basis. The degree of resilience is therefore quite limited and something we are reviewing. This will not only extend to the how we resource emergency planning and our responses to an incident, but the support mechanisms needed. For example one feature of large scale incidents, not immediately apparent, is the need for frequent co-ordination meetings between agencies arrangements. This in itself can be demanding in terms of resource.

4.9.18 Was working with our partners effective? Are improvements needed?

Response

The FRG believes that there was effective working but certain areas such as closer working with the Police and the National Trust could be developed further.

Flooding, before, during and afterwards

Grille clearance

4.10 Between October 2013 and January 2014, we cleared important grilles at least five times, as well as reactive clearance work. Although most of the grilles are the responsibility of riparian owners, we have cleared them for a number of years. The strong winds contributed to the amount of tree debris and leaves that built up in watercourses and grilles.

Should we continue to clear grilles, or should we notify the riparian owners of their responsibility to clear them? Note: The clearance of grilles is not related to the flooding in Guildford town centre, as there are no grilles along the river. We will review whether we should continue to clear grilles and watercourses.

Sandbags

4.11 Although we have no statutory duty to provide sandbags, we ensured that our sandbag stocks at locations across the borough were topped up.

4.11.1 See Appendix 5 for location of sites. We also had stocks of bags outside Woking Road Depot from the 24 December and then throughout the Christmas and New Year period. Staff, who had already completed a full day’s work, made up sandbags until 10pm on Christmas eve. Our stand-by crews were then out delivering sandbags and carrying out repairs until 4 am Christmas morning. Our staff then came in, made more sandbags and delivered on Boxing Day onwards. We continued to make up sandbags into the first week of 2014. We also gave sandbags to other boroughs in Surrey. Sandbags are not the most effective method of flood prevention, but they are relatively easy to make up and distribute. There may be an opportunity to engage with Send Prison to see if help can be provided to fill sandbags.
4.11.2 Alternatives to sandbags are available. For instance, sand bag size sacks are available, filled with an absorbent polymer, which on contact with water, swell in size. The approximate cost of a sandbag is £1.50 whereas the polymer-filled bag is £12.

The FRG has asked if we should continue to provide (and collect) sandbags and also if we should provide and collect sandbags for businesses when stock is available? The FRG has concluded that we should.

Opening of rest centres

4.12 We opened our emergency rest centre at Park Barn in the early hours of Christmas Day morning to accommodate residents from Walnut Tree Close evacuated by Surrey Fire and Rescue service. Twelve people, two dogs and a cat were taken to our Park Barn Centre. Our community transport team helped to transport those affected. We also helped Waverley Borough Council (WBC) with the evacuation of a care home on Christmas Day. WBC made alternative accommodation arrangements for them and the rest centre closed at 6pm. This was in accordance with the Emergency Plan.

Procedures in response to flood alerts and warnings (The Engineers’ Flood Plan)

4.13 This plan has agreed locations where sandbags should be distributed as river levels reached certain points. In most areas, sandbags were delivered, but it is true to say that this operation was restricted by the gridlock of traffic on 24 December 2013. The gridlock also prevented many residents from being able to drive to Woking Road Depot or local builders yards to pick up sandbags, or even sand for bags on that day. This meant that unfortunately a number of properties were not as protected as they could have been on that day, albeit that sandbags do not offer complete protection against flooding.

The EA response

4.14 The EA sent four flood ambassadors to Guildford to provide advice and guidance to those who had been, or were at risk of flooding. EA staff also monitored culverts and cleared weirs where necessary and where safe to do so. There are no permanent flood defences in Guildford, but temporary defences were deployed near Debenhams after Christmas 2013.

Communications

4.15 Throughout the year, we have a flood emergencies page on our website, which includes locations of sandbags, how to prepare for flooding, the EA emergency number and links to other relevant and partner information. We also promote our website, social media and other contacts for help and information during severe weather in each winter edition of our About Guildford residents’ newspaper.

During the first phase of rapid flooding over Christmas, we worked according to the agreed emergency planning protocols to make sure we promoted the most urgent information. This involved the PR and Marketing Manager and team
working very closely with the HSTL, partners and other colleagues across the Council.

As well as issuing relevant updates to staff, councillors, the media and partners, we also used social media to reach as many people as quickly as possible. For example, tweeting for people to come back and remove their parked cars on Christmas Eve before car parks flooded. Our messages were also retweeted and promoted by the local media and led to far fewer cars being affected. We also focussed on promoting the EA website and emergency numbers to support the other activities such as doorstep leaflet dropping.

We arranged radio and other media interviews for appropriate lead councillors to help support the PR and promotion of key public information. Relevant communications and contact with the HSTL, partners and colleagues continued throughout the Christmas and New Year holiday.

During the later bouts of flooding in January and February, we again focussed on reaching as many people as possible making the best use of our online and other communication channels. We also promoted relevant information and contacts in the Spring 2014 edition of About Guildford, including how to get help after the flooding.

We are participating in the Surrey Local Resilience Forum review to see how we could improve communications across the county.

5. **Part 2 – Planning for the future**

The Action Plan in Appendix 6 sets out all of the future work that needs to be undertaken. We have set out some of the highest profile work below in more detail.

**William Road and area, including Walnut Tree Close, Guildford.**

5.1 We have secured Defra funding through the EA to carry out building surveys to see what Property Level Protection measures could be installed. These typically include things such as airbrick covers and flood doors. Some properties in William Road have basements however, so there is no one method for all situations. The surveys, carried out in June, have recommended a variety of measures. We are now working with the EA to understand how such measures could be implemented and how they might form part of a wider scheme for Guildford. We will also work with the Business Improvement District to encourage businesses subject to flooding to carry out property protection measures to their premises where practical.

**Tilthams Corner, Peasmarsh.**

5.2 Extensive flooding occurred around Tilthams Corner and the Riverway Industrial Estate. Outbuildings flooded in Tilthams Corner and there was internal flooding of an industrial unit on the Riverway Estate. SCC and the EA are investigating the causes and possible solutions. We are liaising with local residents and the Riverway Industrial Estate to keep them informed of progress. The EA is
preparing a briefing note on Tilthams Corner. This will be circulated at the
meeting if completed in time.

Send Lakes, Send.

5.3 There were issues with gardens flooding badly around Send Lakes. Although
there was no internal property flooding, it was close in some areas. We hired in
pumps in case we had to start reducing levels, but in the end, we did not have to
deploy them. This brief statement does not reflect the complexities of the issue,
or the concerns of local residents. We need to carry out further investigation to
see if we can find a better way of controlling the water levels.

Note: We are not responsible for controlling water levels, responsibility lies with
the landowners and the angling club that operate the lakes. Part of the legal
advice obtained states that the County Council has no enforcement powers and
cannot force the riparian owners or the Anglers’ Club to take action to prevent
flooding from the lakes. As a result, this Council has therefore taken the role of
liaison, consultation, facilitation and protector of these properties in the absence
of action from the responsible parties. We will continue to look at this over the
year.

Shawfield Road, Ash.

5.4 Internal property flooding from an open watercourse has occurred here in the
past and it was close to happening again. This area is on our list for
investigation.

Avondale estate

5.5 Large areas of the estate flooded together with internal property flooding.
Thames Water is currently surveying the sewer systems. Thames Water has
promised Michael Gove MP regular updates and we are in touch with the office
of Michael Gove MP and will receive updates on progress and outcomes.

Ash Green

5.6 The Ash Green flood alleviation scheme is included in the approved list of capital
schemes. The work involves the construction of an earth bund to protect
properties from flooding. We are currently working through the legal aspects of
the scheme but anticipate work starting in September 2014.

Burpham

5.7 There was significant flooding in Burpham during the Christmas period, notably in
Gosden Hill Road and in New Inn Lane near to the new development at
Raynham Close, the latter being a foul water issue. Burpham is highlighted
in the SWMP as an area potentially vulnerable to flooding. We are putting a bid
together to the EA for funding for a detailed investigation of the area. Temporary
repairs have been carried out to the grille in Merrow Lane, just upstream of
Gosden Hill Road. We will be rebuilding the grille structure later this year.
**Surface Water Management Plans (SWMP)**

5.8 We have been leading on producing a SWMP for Guildford and a study for the Ash area catchment. These documents, in draft form at present, are included in the list of evidence documents in the draft local plan. See Appendix 2, item 4 for a definition of a SWMP. The action plans for the Guildford SWMP and the Ash Study are included in Appendix 8 and 9.

**EA funded schemes**

5.9 We have received funding from the EA for the following schemes:

5.9.1 Ash Surface Water Scheme - £20,000. Further detailed study and recommendations for future work.

5.9.2 Ashenden Road Surface Water Scheme - £60,000. Detailed study, cctv surveys of the system and remedial works as necessary.

5.9.3 Flexford Flood Relief Scheme - £215,000. Works to be determined following completion of current study.

5.9.4 Mill Lane, Pirbright - study and design of potential flood alleviation measures.

**Local flood defences and temporary flood defences**

5.10 Local flood defences - the Environment Agency will be carrying out a review of potential options to minimise the risk of flooding in Guildford Town Centre. The EA have previously looked at a number of options for reducing flooding in the Guildford area, the most recent being the draft River Wey Flood Risk Management Strategy 2010. Their conclusions at the time were that large scale flood defences were not economically viable.

5.10.1 Following the recent flooding the EA will be re-visiting these options including ones not previously considered and assessing whether the new partnership funding mechanism for flood defences make these more viable. An initial assessment of options will be completed this year.

5.10.2 The EA recently announced that it had received £1 million to repair the damage done to the river by the 2013/14 flooding. The work will mainly be removing fallen trees and removing silt that was washed down and has reduced the channel capacity.

5.10.3 Temporary flood defences – our Engineers are looking at a number of options for temporary defences (similar to those used by the EA near Debenhams) or other items like inflatable ‘bladders’ that could be used. We will look to buy some items for trial this winter. These will be procured using existing budgets. We will then use those experiences to inform any procurement for future equipment of this nature for 2015/16. A provisional capital sum of £100,000 has been proposed for 2015/16. The effectiveness of any of this equipment will have to be assessed so we will be working closely with the EA before any procurement is undertaken. The other option would be to build permanent defences as a result of findings.
from the EA’s study. It is therefore proposed that the £100,000 capital bid will be either for temporary defences or as a contribution to permanent defences.

Traffic movement

5.11 Apart from the rapid rise in river level, one of the main problems on 24 December 2013 was getting help to where it was needed due to the wide spread congestion. We need to work with the Police and Surrey County Council to establish whether there are any solutions to this. Could certain roads be closed to all but essential traffic for instance?

Surrey Local Resilience Forum (SLRF) de-brief

5.12 The SLRF is working through a learning points register. This covers a number of key themes such as situational awareness (who is on the ground providing information, who do they tell?) and ensuring that there is good communication between partners and the public. The FRG will develop an action plan for ongoing improvements to our future planning for flooding and our response to it.

Planning process

5.13 The SWMP will inform the Local Plan evidence on surface water management.

Flood lookouts

5.14 It is clear that during flooding events the need to communicate with residents and businesses is very important. There is also a need to have ‘eyes and ears’ out on the ground throughout affected areas providing feedback about water levels, new incidents of flooding, or other community issues. It is proposed that the FRG look at developing a scheme called ‘Flood lookouts’, where we recruit volunteers from all areas of the community to assist in this role. See Appendix 7 for further details.

Flood warnings

5.15 Guildford will be included as part of the Upper Wey Flood Alert area from July 2014. Until now Guildford has been covered by the Lower Wey flood alert area. This change will mean that Flood Alerts covering Guildford will be issued much earlier than they have been up until now which will give the residents greater time to prepare for potential flooding. Flood Alerts are issued when there is a possibility of flooding. Guildford will continue to be covered by its own Flood Warning area which are issued when flooding is expected.

6. Rate relief and repair and renew grant

Business rates

6.1 So far, we have received 26 applications for business rate relief, although more are expected. The majority of applications have now been processed totalling £225,000 in business rate relief. We will reclaim the full cost of providing business rates relief from Central Government as part of the year end business rates return (known as NNDR3).
Council Tax

6.2 We have received 64 applications for a reduction in Council Tax. The applications processed total £46,223 in council tax relief. The full cost of providing council tax relief will be reclaimed from Central Government in 2014/15.

Repair and renew grant

6.3 This work is being managed by SCC. Details will be circulated at the meeting if available.

Business Support Grant

6.4 The Council successfully applied for funding to support local businesses to develop and implement business recovery plans. The grant will be used to provide payments to eligible businesses to help with immediate clean up, materials, exceptional business costs, temporary accommodation, non-recoverable insurance excesses, extra staff or security costs etc and business continuity planning. The scheme also covers those businesses in the flood affected area that were not flooded themselves, but that were negatively impacted by the floods. The Council was awarded £15,000 grant under this scheme.

6.5 The Executive Head of Financial Services (in consultation with the Head of Financial Services and the relevant Lead Councillors) has set up a scheme at Guildford Borough Council that meets the criteria set out by the Government and invited applications from local business for grant support. So far we have received 20 applications and anticipate distributing the grant to local businesses in 2014/15.

7. Financial implications

7.1 The cost of flooding and severe weather is set out in the following table:

<table>
<thead>
<tr>
<th>Costs of Flooding and Severe Weather</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff eg, Engineers and Overtime</td>
<td>82,560.15</td>
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<tr>
<td>Repairs and Maintenance</td>
<td>4,246.72</td>
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<tr>
<td>Tree Felling and Surgery</td>
<td>25,940.00</td>
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<tr>
<td>Materials eg, Sandbags and de-humidifiers etc</td>
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<td>Emergency Accommodation for residents</td>
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<tr>
<td>IT costs to administer business rates and council tax reliefs</td>
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<tr>
<td>Council Housing repairs (HRA)</td>
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<tr>
<td>other land drainage costs</td>
<td>1,455.00</td>
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<tr>
<td><strong>Total cost of the flooding and severe weather</strong></td>
<td><strong>162,838.56</strong></td>
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</table>

Grants claimed

<table>
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<tr>
<th>Grants claimed</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Weather Recovery Grant</td>
<td>51,496.00</td>
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<td>Bellwin Claim</td>
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<tr>
<td><strong>Net cost to the Council</strong></td>
<td><strong>60,865.16</strong></td>
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</table>
7.2 The Council incurred the majority of expenditure in relation to the flooding and severe weather that occurred in 2013/14 and therefore the net cost was financed in that year from the Council’s underspend at the end of the financial year.

8. Legal implications

8.1 Refer to Appendix 1 for legal responsibilities of the various organisations.

9. Key risks

9.1 It is likely that the events that occurred will be repeated at some point. All partners will be working through the Surrey Local Resilience Forum (see paragraph 5.11) to identify any improvements to our responses.

9.2 Following discussion at Surrey County Council’s full council meeting on 18 March 2014, Surrey County Councillors decided to establish a Task Group with the aim of looking at the lessons learned from recent flooding events and making recommendations as to what additional support and arrangements would help in cases of future flooding. We will be supporting this work.

10. Consultation

10.1 We have consulted affected people through the National Flood Forum trailer, Local Flood Forums, councillor and resident feedback via telephone calls and email. When the Guildford Surface Water Management Plan and the results of the Ash Study are published, we will welcome public feedback through these documents.

11. Suggested issues for overview and scrutiny

The Committee is asked to:

11.1 Comment on the work of the FRG; has the review been thorough enough?

11.2 Endorse the content of the action plan.

11.3 Suggest anything not covered by the FRG that should be investigated.

12. Conclusion

12.1 The FRG found that the conditions in December and January 2013/14 were extreme and challenging, in Guildford, across Surrey and throughout the country. The FRG concludes that the rapid rise in the river levels was as a result of significant rainfall and resulting flow of the River Wey and its tributaries, and not because of the operation of sluices. In relation to the execution of flood and emergency plans, it was found that these were followed well, especially in relation to relocating residents and activating a rest centre.

12.2 Sandbags had been provided in advance of the event and during the event, but it is acknowledged that this was hampered by the widespread traffic congestion on the 24 December. The FRG is clear in its view that Council staff, and our
partners, showed great commitment and professionalism throughout the period, and tried their best to address the issues and support those affected by the floods.

12.3 It is inevitable that there will be repeated weather patterns as experienced over the December and January period 2013/14, and that the river may respond as it did then. By working through the actions in the Action Plan (Appendix 6), we hope to address some of these problems caused if at all possible.

13. **Background papers**

Executive report 7 January 2014, item 7.

14. **Appendices**

Appendix 1 – Types of flooding and responsibilities

Appendix 2 – Existing flood and emergency plans

Appendix 3 – Flooding reports received by email

Appendix 4 – Environment Agency list of flooding

Appendix 5 – Sandbag locations across the borough

Appendix 6 – Action plan

Appendix 7 – Flood lookouts

Appendix 8 – Guildford SWMP Action Plan

Appendix 9 – Ash Study Action Plan

Appendix 10 – Water Control and weir keeping (River Wey and Godalming Navigations)

Appendix 11 – River levels in December 2013
Types of flooding and responsibilities

1. **Flooding from main rivers (fluvial flooding)** – this occurs when the volume of water carried by a river exceeds the channel capacity and spills over into floodplains or other areas. This does not always occur at the same time as heavy rainfall. River levels depend on the amount of rainfall over the whole catchment area, and there are delays in rainfall falling on one part of the catchment reaching the main river.

   1.1 The Environment Agency (EA) is responsible for managing flood risk from designated main rivers, such as the River Wey, and the sea. The EA is also responsible for operating, maintaining and replacing flood risk management installations such as flood barriers, floodgates, and sluices. The EA has permissive powers to reduce flood risk by undertaking maintenance work to main rivers. The EA also owns a number of weirs along the River Wey.

2. **Flooding from open watercourses that are not main rivers** – these are known as ordinary watercourses. Open ditches and streams can cause flooding and must be maintained properly. It is the responsibility of the riparian owner to maintain these watercourses. If you own land or property next to a river, stream or ditch, you are a riparian owner. If you rent the land or property, you should agree with the owner who is responsible for maintenance.

3. **Flooding from piped watercourses** - these have limited capacity. When the capacity is exceeded, surcharging will occur which is where flood water forces up manholes and consequently follows a more natural path flooding any low points in the areas. Blockages in pipes can cause serious flooding problems within a short time periods as the capacity of the pipe can significantly decrease or become impassable. Grilles are sometimes installed to pipe inlets to prevent debris from entering the pipe. It is essential these grilles are well maintained. As with open watercourse, normally the riparian owner is responsible for maintaining piped watercourse and grilles.

4. **Surface water runoff and highway flooding** - this normally occurs during heavy or prolonged rainfall. Highway drainage systems can be overwhelmed by surface water runoff and debris. SCC normally cleans highway gullies once a year, but more frequently in known problem areas and in major roads. It is important that people do not misuse highway gullies for the disposal of oil, paint and cement. This causes pollution and blockages.

5. **Flooding from sewers** – there are two types of sewers, foul and surface water. These are mainly separate systems but under flood conditions, surface water may enter the foul system and vice versa. This is sometimes due to illegal connections or people lifting covers in an attempt to get rid of excess water. If sewage flooding occurs then it has particularly serious consequences if it enters properties. Sewers are either the responsibility of the property owner or Thames Water, depending on how many properties a particular sewer run drains.

6. **The Basingstoke Canal** – this is a major body of water jointly owned by Surrey and Hampshire County Councils. In the borough it runs through Pirbright and Ash Vale.
7. **Surrey County Council** – under the Flood and Water Management Act 2010 SCC is the lead local flood authority for Surrey. Some of the responsibilities of a lead local flood authority are:

- develop and keep updated, a strategy for local flood risk management
- strategic leadership of flood risk management authorities. These include the Boroughs and Districts of Surrey, the EA and Thames Water
- a duty to investigate and publish reports on flood incidents where appropriate and necessary, to identify which authorities have ownership of the incident and what they have done or intend to do. These investigations do not necessarily identify the cause of flooding or its remedy; they just identify the authority that should do something.
- power to do works to manage flood risk from surface water runoff or groundwater
- decision making responsibility for whether third party works on ordinary watercourses that affect water flow can take place.

8. **Borough and district councils** – under the Land Drainage Act 1991, borough and district councils have permissive powers, but no specific responsibility, to maintain or improve flood risk management works, or to construct new works on ordinary watercourses.

8.1 To help prevent flooding, boroughs and districts can undertake ditch and grille clearance where it is in the interest of the wider public good. This does not remove the responsibility for maintenance from the riparian owners. Between October 2013 and January 2014, we cleared important grilles at least five times, as well as reactive clearance work.

8.2 Guildford Borough Council owns and operates two weirs on the River Wey, the weir opposite the Boathouse and the boards in the Toll House.

9. **National Trust** – the NT manages a number of weirs along the River Wey to regulate river levels to enable the safe passage of boats. When river levels are high, the NT stops boating and starts operating its weirs and the large capacity EA weirs. The NT also provides a coordination service for all weir operators.
Existing flood and emergency plans


   This plan sets out the procedures for the activation of the Borough Emergency Management Team who will lead the Borough Council’s response to a major incident. It is prepared for the guidance of Guildford Borough Council officers, who may be required to provide additional services to meet the demands of a major peacetime emergency in order to minimise the impact of an event on the community, protect lives, the environment and ensure continuity of service provision. Details of rest centres in an emergency are listed in the plan.

   Note: The plan is easy to find on the GBC website by typing ‘Emergency Plan’ in the search box. It has been updated to reflect changes in management but in places still lists Heads of Service rather than Executive Heads.


2. **Multi Agency Flood Plan**

   Each of the Surrey districts and boroughs put together a MAFP as part of the work carried out by the Surrey Local Resilience Forum (2010). Its aim was to ensure a joined-up approach to looking at the risk of flooding in the area, managing the flood risk and managing the consequences of flooding within the community. The plan is reviewed annually each August and after any major flooding incident and reissued to those on the distribution list when amended versions are produced. New versions will be produced in hard copy, on disk and via the Council’s Intranet.

   Note: This is a restricted document as it contains personal contact details for people.

3. **Procedures in response to flood alerts and warnings (The Engineers’ Flood Plan)**

   This is a restricted document as it contains home and mobile numbers for officers. It details the practical response to flooding such as where to place sandbags when the river reaches certain levels.

   Note: The river rose so rapidly that it was not possible to place sandbags in time to all locations.

4. **Surface Water Management Plans (SWMP)**

   The Flood and Water Management Act 2010 (FWMA) gave county councils and unitary authorities the new statutory role of Lead Local Flood Authorities, which have new responsibilities for leading in local flood risk management. At district and borough council level, we have the general duty under the Land Drainage Act 1991, as well as the FWMA, to work in partnership with other risk management authorities, such as Surrey County Council (SCC) and the
Environment Agency (EA). The production of a SWMP forms a key part of flood risk management in many locations.

A SWMP is a process by which organisations, can better understand flooding from surface water (not river), and identify cost effective actions to manage flood risk. The outputs from a SWMP are long-term plans about how to manage surface water in areas at risk.

5. **Sandbox**

http://www.guildford.gov.uk/sandbags

We have 21 sites around the borough where sandbags are kept. People can help themselves in times of flooding. At present, we also deliver sandbags to vulnerable people or those unable to collect them. This is a discretionary service. We also collect sandbags; again, this is a discretionary service.

Note: The web page listing locations is easy to find by typing ‘Sandbags’ in the search box.
Flooding reports received by email

<table>
<thead>
<tr>
<th>Area</th>
<th>Email date/time</th>
<th>Area</th>
<th>Email date/time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avondale, Ash Vale</td>
<td>7/1/14 10:37</td>
<td>Long Reach j/w Ockham North</td>
<td>31/1/14 08:35</td>
</tr>
<tr>
<td>Vale Road, Ash Vale</td>
<td>12/1/14 16:53</td>
<td>Ockham Rd North, north of Horsley railway bridge</td>
<td>31/1/14 08:35</td>
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<tr>
<td>Stringers Avenue, Jacobs Well</td>
<td>16/1/14 07:17</td>
<td>Ockham Rd North</td>
<td>31/1/14 08:35</td>
</tr>
<tr>
<td>Tilhams Corner Road, Peasmarsh</td>
<td>17/1/14 13:37</td>
<td>Ockham Rd North, north of Horsley railway bridge</td>
<td>31/1/14 08:35</td>
</tr>
<tr>
<td>Millbrook, Guildford</td>
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<td>Wisley Airfield/Snakesfield</td>
<td>31/1/14 08:35</td>
</tr>
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<td>Peasmarsh</td>
<td>31/1/14 09:41</td>
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<td>Walnut Tree Close, Guildford</td>
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<td>Send Marsh</td>
<td>31/1/14 15:26</td>
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<td>Boxgrove Road, o/s Baker Tilly</td>
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<td>Cranley Road by Lanesborough</td>
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<td>Walnut Tree Close/William Road/Mary Road</td>
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<td>London Road, entrance to Stoke Pk</td>
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<td>Queen Eleanor’s Road, Guildford</td>
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<td>Enterprise Estate, Station</td>
<td>17/2/14 06:53</td>
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<td>Chapel Lane, Pirbright</td>
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<td>Ockham Road North</td>
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## Environment Agency list of flooding

<table>
<thead>
<tr>
<th>Count</th>
<th>Year</th>
<th>Extent</th>
<th>Source type</th>
<th>Source name</th>
<th>EA / Public reported or confirmed?</th>
<th>House name/number</th>
<th>Street</th>
<th>Locality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2014</td>
<td>Internal property flooding</td>
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<td>Public</td>
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<td>William Road</td>
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<td>Public</td>
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<td></td>
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<tr>
<td>3</td>
<td>2014</td>
<td>Gardens and grounds</td>
<td>Non-main river</td>
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<td>Peasmash</td>
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<td>2014</td>
<td>Internal property flooding</td>
<td>Main river: fluvial</td>
<td>Wey</td>
<td>Public</td>
<td>Walnut Tree Close</td>
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<td>Main river: fluvial</td>
<td>Wey</td>
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<td>Millmead</td>
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<td>Source name</td>
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Agenda item number: 5 (Appendix 5)

Sandbag locations across the borough

- **Recreation Ground, Ash Hill Road, Ash** - Located at the entrance of the Ash Centre car park.
- **Guildford Road, Normandy** - Located near the car park at the crossroads of Hunts Hill Road and Glaziers Lane.
- **The Street, Shackleford** - Located within the village car park.
- **Lower Eashing, Eashing** - Located at the lay-by before the Eashing bridges Southbound.
- **Guildford Rugby Club, Old Portsmouth Road, Shalford** - Located within the car park.
- **Peaslake Lane, Peaslake** - Located at the junction of Peaslake Lane and Mackies Hill.
- **Pond Lane, Peaslake** - Located within the car park.
- **Lower Street, Shere** - Located by the seating area.
- **Parish Council Office, Station Road, Gomshall** - Located by the alley way behind.
- **Recreation Ground, Gomshall Lane, Shere** - Located by the car park entrance.
- **Village Hall, Kingston Avenue, East Horsley** - Located to the right of the building.
- **Lower Road, Effingham** - Located opposite the Howard of Effingham School.
- **Effingham Common Road, Effingham** - Located to the right of the pond outside Lower Farm.
- **Hyde Lane, Ockham** - Located near the junction with Ockham Lane.
- **West End Cottages, High Street, Ripley** - Located near the entrance.
- **Felday Glade, Holmbury St Mary** - Located in the village hall car park.
- **Avondale Estate, Ash Vale** - Located by the play area at the end of Avondale
- **Onslow Arms Inn, The Street, West Clandon** - Located in the car park
- **Pirbright Hall, Guildford Road, Pirbright** - Located within the car park
- **Vapery Lane, Pirbright** - Located in the lay-by by the junction with School Lane
- **Fairlands Medical Centre, Fairlands Avenue** - Located to the rear of the medical centre
### Action Plan

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<tr>
<th>Ref.</th>
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<th>Who?</th>
<th>Target date or milestones</th>
<th>Resources required</th>
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<tbody>
<tr>
<td>1.</td>
<td>Awareness</td>
<td>Raise awareness of what is happening to the river and its tributaries, together with past, present and future weather patterns. Communicate with weir operators during wet weather.</td>
<td>This will help operational staff plan better for possible flood events.</td>
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<td>2.</td>
<td>Partnership</td>
<td>Develop closer working arrangements with the National Trust. Incorporate any changes in procedure in the flood plan.</td>
<td>The NT has experienced staff that may be able to help in flood situations. We will continue to work with Flood Forums.</td>
<td>FRG</td>
<td>Over 2014 onwards</td>
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<tr>
<td>3.</td>
<td>Partnership</td>
<td>Involve the Police in our flood plan. Can roads be closed off so that essential services such as sandbag deliveries get to where they are needed?</td>
<td>The wide spread congestion hampered sandbag deliveries. The Police will be invited to be members of the FRG</td>
<td>FRG</td>
<td>July 2014 and then on-going development of plans and arrangements</td>
</tr>
<tr>
<td>4.</td>
<td>Flood lookouts</td>
<td>Develop a network of people who will monitor what is happening on the ground.</td>
<td>We need to ensure that when reporting back, the flood lookouts are clear of the various responsibilities. For instance, if a main sewer is surcharging, the responsibility lies with Thames Water.</td>
<td>FRG</td>
<td>August 2014 to start developing the scheme and looking to recruit and train</td>
</tr>
<tr>
<td>5.</td>
<td>Flood products</td>
<td>Investigate alternatives to sandbags and look at and consider temporary defences that could be used.</td>
<td>There are numerous products available. We will liaise with the EA and the NFF to find the best products. We will then decide whether we should have stocks of these. We may also trial some products in 2014 and then consider wider use for 2015/16.</td>
<td>GBC Engineers, EA, FRG</td>
<td>July/August September 2014</td>
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<tr>
<td>6.</td>
<td>Location of flood products</td>
<td>Review locations of sandbags or flood products in the town centre.</td>
<td>It would have helped to have had sandbag stocks nearer to where needed in the town centre.</td>
<td>GBC Engineers</td>
<td>July/August September 2014</td>
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<tr>
<td>7.</td>
<td>Riparian owners</td>
<td>Remind people of their responsibilities to maintain watercourses and keep grilles clear. Session at Swan Lane in October 2014.</td>
<td>We may need to keep maintaining watercourses and keeping grilles clear to maintain a good standard.</td>
<td>FRG</td>
<td>July/August September 2014</td>
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<td>8.</td>
<td>River Wey tributaries</td>
<td>Investigate with the EA if there is scope to restrict flows from tributaries.</td>
<td></td>
<td>EA/GBC Engineers</td>
<td>By March 2015</td>
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<td>9.</td>
<td>River level monitoring</td>
<td>Investigate remote monitoring of river levels. Although the EA website has up to date details of river levels, what happens when there is a power cut?</td>
<td>EA/GBC Engineers and IT</td>
<td>By March 2015</td>
<td>TBC</td>
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<tr>
<td>10.</td>
<td>Raising warnings</td>
<td>To look at options including sirens, signs and also to further promote the EA’s text warning service. Sign up for Floodline Warnings Direct at <a href="http://www.environment-agency.go.uk">www.environment-agency.go.uk</a>. The text service is effective and should be promoted as much as possible. The siren option will be considered but it is likely that the ‘lookouts’ proposal may be more practical. To be confirmed.</td>
<td>FRG</td>
<td>By December 2015</td>
<td>TBC</td>
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<tr>
<td>11.</td>
<td>Communications</td>
<td>Review our communication process. Ensure that timely messages are posted on the web site. What happens when there is no power?</td>
<td>GBC</td>
<td>By December 2014</td>
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<tr>
<td>12.</td>
<td>William Road and area, Walnut Tree Close</td>
<td>Carrying out building surveys for property level protection and looking to implement schemes as appropriate. This work has to link into the EA’s Guildford study</td>
<td>EA/GBC Engineers</td>
<td>By December 2014</td>
<td>EA funding approved</td>
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<td>13.</td>
<td>Tilthams Corner</td>
<td>Investigating causes of flooding and possible solutions</td>
<td>EA/SCC</td>
<td>TBC</td>
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<td>14.</td>
<td>Send Lakes</td>
<td>To continue liaising with relevant organisations with a view to implementing arrangements for flood defence. This is not GBC responsibility but we are working to ensure the relevant parties meet their responsibilities.</td>
<td>GBC and relevant parties</td>
<td>By December 2014</td>
<td>Should be no cost to GBC but pumps were hired by GBC in 2014 £3,000</td>
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<tr>
<td>15.</td>
<td>Shawfield Road</td>
<td>To investigate reasons for flooding and possible solutions</td>
<td>GBC/SCC</td>
<td>By March 2015</td>
<td>TBC</td>
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<td>16.</td>
<td>Avondale Estate</td>
<td>Thames Water is investigating the reasons for flooding.</td>
<td>Thames Water</td>
<td>TBC</td>
<td>TBC</td>
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<td>17.</td>
<td>Ash Green Bund</td>
<td>Building of a bund to protect nearby properties. Negotiations with the relevant landowner are ongoing.</td>
<td>GBC Engineers</td>
<td>October 2014</td>
<td></td>
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<td>18.</td>
<td>Burpham</td>
<td>Areas for action have been identified.</td>
<td>GBC Engineers</td>
<td>TBC</td>
<td>TBC</td>
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<td>19.</td>
<td>Surface Water Management Plans and studies</td>
<td>To adopt and then implement agreed actions through approved schemes. These plans consist of detailed studies of all areas affected by surface water flooding. Proposed projects are also included within the plans to address the issues.</td>
<td>GBC Engineers, EA, Thames Water, SCC, Network Rail</td>
<td>TBC</td>
<td>TBC</td>
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<tr>
<td>20.</td>
<td>Local Flood Defences</td>
<td>The EA is looking at a study for Guildford</td>
<td>EA</td>
<td>TBC</td>
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<td>21.</td>
<td><strong>Arrangements for reviewing flood plans</strong>&lt;br&gt;To set an annual review date for reviewing all of the relevant plans to ensure they are up-to-date</td>
<td></td>
<td>FRG</td>
<td>November 2014</td>
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<td>22.</td>
<td><strong>Business Improvement District</strong>&lt;br&gt;Work with the BID to see if property level protection can be installed in premises at risk of flooding.</td>
<td>This would cover areas including Friary Street and Bridge street</td>
<td>FRG</td>
<td>By December 2014</td>
<td>BID to confirm</td>
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<td>23.</td>
<td><strong>Surrey 4x4 Response</strong>&lt;br&gt;Ascertain if there is a role for Surrey 4x4 Response.</td>
<td>Some areas were cut off by flooding. Use of 4x4 would allow access</td>
<td>FRG</td>
<td>By Dec 2014</td>
<td>TBC</td>
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<td>24.</td>
<td><strong>Review stand-by arrangements</strong>&lt;br&gt;Although overtime payments and some standby arrangements were in place, many staff volunteered to work over the flood period. We need to look at formalising those arrangements.</td>
<td></td>
<td>GBC/FRG</td>
<td>To start process by December 2014</td>
<td>TBC</td>
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<td>25.</td>
<td><strong>Sandbag filling</strong>&lt;br&gt;Look at opportunities for Send Prison to assist in filling sandbags.</td>
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<td>FRG</td>
<td>By Dec 2014</td>
<td>TBC</td>
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Proposal for Flood Lookouts

It is clear that during flooding events the need to communicate with residents and businesses is very important. There is also a clear need to have ‘eyes and ears’ out on the ground throughout affected areas providing feedback about water levels, new incidents of flooding or other community issues. It is therefore proposed that the FRG look at developing a scheme called ‘Flood lookouts’ where we recruit volunteers from all areas of the community to assist in this role.

Who are they and what would be their role?:

- Volunteers from a variety of organisations and areas including council staff, Business Improvement District, residents, councillors and businesses.
- Their role is, in times of flooding (flood warning), to operate in their allocated/agreed areas by warning shoppers, residents (especially in ‘at risk areas’, and businesses about the threat of flooding – through door knocking, letter drops (letters would be provided) or, in town, walking up the High Street etc. warning people.

How would they be managed or activated?

- EA warning – to GBC – activate lookouts – maintaining/stand down as required (This should probably be in diagram form?)

Do they have powers or responsibilities?

- No – they are just there to raise the alarm (only when asked to do so/activated), notify and advise as required and also pass on any relevant information to the council for action.

Would they be trained?

- Yes, we would confirm the parameters. We would never put them at risk and would never want them putting themselves at risk.

Would they be easily identifiable?

- Yes, we would supply them with hi-vis tabards showing them to be ‘lookouts’. They could also have ID cards.

How do we recruit?

- Contact partners, advertise, use any contacts/links local councillors may know of.

How would we keep in contact and develop these relationships?

- There could be a meeting twice a year and emails etc.

Would we provide phones etc.?

- This would need to be explored in more detail. If it is felt the scheme would be worthwhile then yes, it would be worth considering distributing phones during flooding periods.
## Appendix 8  Action plans for hotspot locations - Guildford SWMP

<table>
<thead>
<tr>
<th>Flexford</th>
<th>Map:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actions</strong></td>
<td><strong>Map:</strong></td>
</tr>
<tr>
<td>1.</td>
<td>A partial CCTV survey was undertaken in November 2012 which indicated partial blockages of the culvert on Beech Lane. However the survey could not get beyond 4m which would suggest more significant blockage. A further CCTV survey should be undertaken to confirm the extent of blockages in the culvert.</td>
</tr>
<tr>
<td>2.</td>
<td>The current CCTV survey has indicated that the culverts under Beech Lane are in poor condition with notable blockages and cracks in the pipes. Structural maintenance of the culvert is needed to ensure the current culvert can convey flows up to its full capacity.</td>
</tr>
<tr>
<td>3.</td>
<td>It is estimated the culvert under Beech Lane can currently convey flows up to a 1 in 20 year rainfall probability event (based on a conservative estimate). To upsize the culvert to convey flows up to and including a 1 in 75 year rainfall probability event it is estimated the culvert would need to be upsized to a 600mm OR In combination (or instead of) improvements to the culvert under the railway it may be feasible to store additional flood water in storm cells under the highway. To enable this to work permeable asphalt would need to be installed on parts of Beech Lane as well as installing storm cells under the highway OR Should improvements to the culvert under the railway not be technically or economically feasible it is recommended that property level resistance and resilience measures are installed for 7 properties which experience internal flooding for a 1 in 30 year rainfall probability event.</td>
</tr>
<tr>
<td>4.</td>
<td>Operation and maintenance of highway gullies on Orchard Close and Flexford Road seems to be the primary cause of flooding to properties. Additional maintenance and improvements to the highway drainage network are required in this location.</td>
</tr>
<tr>
<td>5.</td>
<td>Flood water is predicted to pond at the low spot of Orchard Close due to backing up against the railway. Further investigation is required to establish whether there is existing drainage (culvert or ditch) to drain water away from this location, as it poses a flood risk to properties.</td>
</tr>
<tr>
<td>6.</td>
<td>There is evidence of a 225mm culvert draining into a 150mm culvert which causes garden flooding to properties in the vicinity (Crossways). The entire length of the culvert needs uprating to a 225mm culvert. In addition, it is reported that tree root ingress is affecting pipe capacity which needs to be resolved. Enforcement on the riparian owner may be required to mitigate flood risk.</td>
</tr>
<tr>
<td>7.</td>
<td>During the course of the SWMP it has been difficult to ascertain the mechanism of flooding to properties on Westwood Lane. Further discussion with local residents should be undertaken to confirm the numbers of properties affected and the flooding mechanism. There is also evidence of a ditch to the eastern edge of the meadow on Beech Lane which should be investigated and cleared where necessary.</td>
</tr>
<tr>
<td>8.</td>
<td>There is an informal trash screen (an iron gate) on the inlet to the culvert under Westwood Lane to the north of Flexford. A new trash screen should be designed and implemented at this location.</td>
</tr>
<tr>
<td>9.</td>
<td>Work with local landowners to change farming practices to provide more natural attenuation of pluvial runoff. This would not prevent flooding but would mitigate the impacts by reducing the flow rate of pluvial runoff.</td>
</tr>
</tbody>
</table>

**Responsibility**

**Lead Organisation:** Guildford Borough Council  
**Partners:** Surrey County Council, Thames Water, Network Rail, BT, local residents and parish council

**Summary of costs and benefits**

- Total costs of proposed works are £180k  
- Estimated benefits = £460k
Partnership Funding Score (for FDGiA funding) = 46% (£96k required to secure FDGiA funding)

Funding strategy

Flood Defence Grant in Aid (FDGiA) funding has been secured to undertake further investigation and mitigation measures in Flexford. Whilst the SWMP has provided an enhanced understanding of flood risk in Flexford there remains uncertainty about some of the flooding mechanisms which should be further explored as part of the FDGiA funding available to confirm the exact scope and nature of mitigation measures. In particular further work is required to understand the location and condition of the highway drainage, which should be funded by Surrey County Council as the highways authority.
Fairlands

Actions
1. Undertake CCTV survey of the manhole to the south-east of the village hall car park (in vegetated area) to establish incoming pipes.
2. Reinstate historic ditch between watercourse that flows round the cricket pitch and the watercourse through the edge of the village.
3. Remove man-made obstruction (bridges over watercourse) in the rear gardens of properties on Gumbell’s Close to prevent blockage of the watercourse. Evidence from historic records indicate previous flooding to these properties may have been due to small bridges/culverts built over the watercourse in back gardens. Most have been removed already, but some remain.
4. Undertake an annual walkover of the watercourse required to check that homeowners have not put new culverts/bridges in without consent.

Responsibility
Lead Organisation Guildford Borough Council
Partners Local residents and parish council

Summary of costs and benefits
Estimated costs = £21k
Estimated benefits = £800k (although likely to be over-estimated due to uncertainties in hydraulic modelling)

Funding strategy
The mix of capital and operational measures proposed in the SWMP should be funded directly by Guildford Borough Council through procurement of survey contractors or officer time. Should further evidence emerge of flood risk in this location due to incapacity in the watercourses more significant capital works (e.g. flood defences or channel improvements) would be required. It would be likely that these would qualify for Flood Defence Grant in Aid funding.
### Applegarth

#### Actions

1. There is historical flooding on Hunts Close which appears to be related to highway and sewer flooding. The existing condition of the drainage network in the area should be assessed and maintenance enhanced where required.

2. There is significant evidence of debris and blockages in the watercourses to the west of Applegarth Avenue and north of Roman Farm Road. Annual clearance of these watercourses is required to reduce the risk of flooding.

3. Evidence from the site visits indicated a lack of highway gullies on the low spot on Hunts Close. Additional gullies should be added to provide increased drainage of flood water.

4. Evidence from the site visits indicate the culvert under Roman Farm Road was partially blocked. The blockages will need to be removed and a potential re-design of the culvert inlet is required to prevent future blockages.

5. Add a table top road hump between 28 and 39 School Meadow to divert water towards the watercourse and away from properties.

6. This involves constructing a flood embankment on the western edge of Kings College playing field to alleviate predicted flooding to 38-54 Pond Meadow. It would also help to alleviate potential flood risk to properties on Stoney Brook.

7. There is no anecdotal evidence of flooding on Hartshill, but it is in a natural depression so adequate maintenance of the existing highway drainage network is critical to ensure future flooding does not occur.

#### Potential future action

8. Should there be a residual flood risk following improvements to the highway drainage network, property level protection would be suitable in Hunts Close.

#### Responsibility

**Lead Organisation**

Guildford Borough Council and Surrey County Council

**Partners**

Environment Agency (to provide support for FDGiA funding)

#### Summary of costs and benefits

**Estimated costs** = £335k (£318k associated with embankment to east of Pond Meadow)

**Estimated benefits** = £1,500k (over £1,000k associated with embankment to east of Pond Meadow)

**Partnership Funding Score (for FDGiA funding for Pond Meadow)** = 73% (£78k required to secure FDGiA funding)

#### Funding strategy

The proposed capital works on Hunts Close are related to highway drainage improvements and should be funded by Surrey County Council. In addition, the maintenance of highway gullies on Hartshill should be funded through Surrey County Council.

Works on Roman Farm Road, School Meadow and the general maintenance of the watercourses in this catchment should be funded by Guildford Borough Council.

It is recommended that a funding application for FDGiA be submitted for the flood embankment to the east of Pond Meadow, although some local contributions will be required.
Ashenden Estate

Actions

1. The route, condition and capacity of the watercourse in this area is unknown. A CCTV survey of the entire culverted section should be undertaken as a high priority.

2. To support the development of a business case for Central Government funding (FDGiA) it is recommended that detailed integrated modelling of the watercourse is undertaken. The modelling could be used to justify the current damages due to flooding and support the design of the mitigation measure (SC-6).

3. The analysis undertaken for the SWMP has suggested that a storage area of approximately 3,200 m³ is required to store runoff up to and including the 1 in 75 year rainfall probability event, assuming a raised embankment storage is provided.

4. Should flood storage within the park area not be technically, socially or economically feasible, it is recommended that property-level protection be progressed.

Responsibility

Lead Organisation
Guildford Borough Council

Partners
Environment Agency (to provide support for FDGiA funding), Tesco

Summary of costs and benefits

Costs = £420k
Benefits = £1.370k
Partnership Funding Score (for FDGiA funding) = 87% (£50k required to secure FDGiA funding)

Funding strategy

It is understood that a funding application for FDGiA has already been submitted for this location. The evidence from the SWMP can be used to support enhancement of the funding bid. Given that there is historic evidence of flooding to the Tesco store and car park there is an opportunity to secure funding towards the scheme. This would significantly improve the potential to secure FDGiA funding.
**Actions**

1. The left bank of the watercourse contains a 900mm high embankment and appears to be designed to protect Oak Tree Close residences from high water levels; however a 10m long gap was found opposite 9 Oak Tree Close. This measure will reinstate the embankment.

2. Check condition of gullies along roads on Brookside to ensure there are enough and that they are adequately maintained. Resolve any issues.

3. The trash screen on the culvert inlet under Jacobswell road is cleaned up to 3 times a day by the parish council during heavy rainfall. To ease the burden on this culvert inlet an additional trash screen could be installed on the watercourse near Oak Tree Close to capture debris.

4. Between the A320 and the Oak Tree Close there is a meadow area that could be used as a natural storage area. However, further analysis of the ground levels indicates that the meadow and Oak Tree Close are at similar levels so creating a storage area would require raised embankments, which would not be economically viable.

**Responsibility**

**Lead Organisation**
Guildford Borough Council

**Partners**
Surrey County Council, parish council and Worplesdon Flood Forum

**Summary of costs and benefits**

Costs = £22k
Benefits = £380k

**Funding strategy**

It is recommended that the works at Jacobswell are funded by Guildford Borough Council and Surrey County Council. The Borough should focus funding on the embankment on Oak Tree Close and the potential for an additional trash screen, whilst the County Council should investigate highway flooding issues in Brookside. It is recognised that there is an active flood forum in Jacobswell who contribute to the management and maintenance of the watercourse. The Borough Council and flood forum should continue to work in partnership to manage flood risk from the watercourse, as blockages or obstructions could result in flooding to residential properties.
Send

**Actions**

1. Properties on Send Road appear to be vulnerable to flooding because they are lower than the highway and there is no highway drainage outside the properties. It is recommended that additional highway gullies (or an aco drain) be installed to prevent internal flooding to these properties. In addition, Send Marsh Road is also vulnerable to flooding because the highway gullies appear insufficient to drain water away. Further investigation and mitigation is required.

2. There is no evidence of the watercourses overtopping in this area, but regular maintenance and inspections of culverts will be required to minimise risks of blockages that could result in flood risk to properties and infrastructure.

3. Should there be a residual flood risk following improvements to the highway drainage network, property level protection would be suitable for properties on Send Road.

**Responsibility**

| Lead Organisation | Surrey County Council |

**Summary of costs and benefits**

- Costs = £20k (for highway works)
- Benefits = £120k (for highway works)

**Funding strategy**

The flood risk issues in Send appear to be localised and related to the condition and location of highway drainage within the area. Therefore it is recommended that Surrey County Council act as the lead organisation for further investigation and funding of the proposed mitigation measures. Should property level protection be progressed in this area, an FDGiA application could be submitted to secure funding for the scheme, although local contributions would be needed to secure FDGiA.

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**Map:**

![Map of Send Area with flooding risk areas highlighted]
**Ripley**

**Actions**

1. Evidence from the site visits indicated that the highway gullies along the High Street were in poor condition and needed additional maintenance. In addition the presence of highway gullies along the pavement indicates a historic problem in this area, which should be further investigated by Surrey County Council.

2. There is a localised ditch that runs alongside Grove Heath North (to the west of Ripley) and into a culvert under Portsmouth Road. The inlet to the culvert is completely blocked and needs to be cleared to prevent flooding onto the main road through Ripley, although this does not cause property flooding.

3. The natural wet area behind properties to the south of the High Street could be converted into an attenuation area. It is estimated that up to 5,300 m³ of storage is feasible at this location, assuming a maximum embankment height of 2m (no excavation). It is estimated that it could accommodate flows up to and including the 1 in 75 year rainfall probability event.

4. Work with local landowners to change farming practices to provide more natural attenuation of pluvial runoff. This would not prevent flooding but would mitigate the impacts by reducing the flow rate of pluvial runoff.

**Potential future action**

5. Should flood storage behind the High Street area not be technically, socially or economically feasible it is recommended that property-level protection be progressed.

**Responsibility**

- **Lead Organisation**: Surrey County Council and Guildford Borough Council
- **Partners**: Environment Agency (to provide support for FDGiA funding)

**Summary of costs and benefits**

- **Costs**: £355k (including highways works and design, construction and maintenance of storage areas)
- **Benefits**: £650k
- **PF Score**: 41% (£190k needed to secure FDGiA funding)

**Funding strategy**

Improvements to the existing highway drainage on High Street and the ditch network adjacent to Grove Heath North should be progressed and funded by Surrey County Council as the highways authority. Officers from Guildford Borough Council should take the lead on working with local landowners to improve the management of land to reduce runoff rates.

The most feasible funding opportunity for the flood storage area to the south of the High Street would be FDGiA. However, initial analysis of the Partnership Funding Score indicates that significant cost savings or external contributions would be needed to fund the scheme. Further work will be required to seek cost savings, as it is considered unlikely that £190k can be raised locally to support the scheme, in the absence of a recent flood history in the area.
### East Horsley

**Actions**

1. Improve maintenance of gullies in Kingston Avenue (at low spot) where flooding has occurred before and increase number if there are too few.

2. Undertake CCTV of the culverts under the railway, in the back gardens of 44-49 Kingston Ave and at the roundabout nr 16 Kingston Avenue.

3. Surface water mapping indicates potentially significant flood risk to properties in Horsley due to the watercourse which runs south to north. There is no anecdotal evidence of flooding along the watercourse, so no immediate mitigation measures are recommended. Rather, further liaison with local residents should be undertaken to establish if there is any flooding history from the watercourse. If there is any current (or future) evidence of flood risk due to the watercourse, further detailed hydraulic modelling of the watercourse would be necessary.

### Potential future action

4. Should improvements to the highway drainage network not resolve the flooding on Kingston Avenue, property level protection should be offered to properties which have flooded in the past.

**Responsibility**

**Lead Organisation** | Surrey County Council and Guildford Borough Council  
**Partners** | Environment Agency (to provide support for FDGiA funding) and local residents

**Summary of costs and benefits**

- **Costs for highway works** = £10k  
- **Benefits of highway works** = £240k  
- **Estimated costs for future hydraulic modelling** = £75k

**Funding strategy**

It is recommended that highway drainage improvements on Kingston Avenue are funded and delivered by Surrey County Council as the highways authority. A CCTV survey of the watercourse to the rear of Kingston Avenue should be undertaken by Guildford Borough Council.

Further investigation and detailed hydraulic modelling of the watercourse through East Horsley is recommended. Initially, Guildford Borough Council should undertake engagement and consultation with local residents to better understand historic flooding in the catchment. Subsequently, it is recommended that an application for FDGiA funding is submitted to undertake detailed hydraulic modelling of the watercourse and drainage network in East Horsley to improve understanding of flood risk and potential mitigation measures. A CCTV survey of the culverted watercourses may be required and should be funded by Guildford Borough Council.

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**Map:**

![Map of East Horsley](image)
Burpham

Actions

1. The culvert and headwall to the rear of 92/94 Gosden Hill Road is showing imminent signs of collapse and urgent work is required to rectify this.

2. Ongoing maintenance of the culvert under New Inn Lane is required because the culvert is prone to blockage and causing flooding.

3. There remains significant uncertainty about the watercourses which drain to Merrow Lane. Several outlets were observed during the site visit but it was not possible to follow the route of each watercourse/ditch as part of the SWMP. It is recommended that a detailed watercourse walkover survey is undertaken to establish the source and pathway of each of the watercourses/ditches which drain towards Merrow Lane. Cross sections (of open sections and culvert inlets/outlets) should be taken at various points of the survey and the watercourses should be mapped to enable further hydraulic modelling work to be progressed.

4. The route of the watercourse downstream of New Inn Lane is uncertain due to historic development in the area. A CCTV survey (and review of adopted surface water sewer maps) should be undertaken to confirm the route and size of the network.

5. Downstream of London Road there is evidence of bank erosion, scour and deposition of sediment within the watercourse. Maintenance is required to remove vegetation and accumulated sediment, as well as to manage bank erosion and scour.

6. Along watercourses downstream of London Road there is evidence of misconnections which need to be assessed.

7. Once the watercourse survey has been undertaken it is recommended that a detailed integrated hydraulic model of the catchment is produced to better understand flooding mechanisms. The model will help to justify the business case for further funding. The model would represent the entire hotspot area.

8. Subject to the watercourse survey and detailed integrated hydraulic modelling, it is recommended that upstream storage to the east of Merrow Lane be provided. It is estimated that 8,300m³ of storage can be provided at this location which would offer flood storage between a 1 in 50 year and 1 in 75 year rainfall probability event.

Potential future action

9. Should flood storage upstream of Merrow Lane area not be technically, socially or economically feasible it is recommended that property-level protection be progressed.

Responsibility

Lead Organisation
Guildford Borough Council

Partners
Surrey County Council, Environment Agency (to provide support for FDGiA funding), and local residents

Summary of costs and benefits

Costs = £20k for structural repairs to culvert near Gosden Hill Road
Costs = £12k per annum for maintenance of watercourse downstream of London Road, and £4k per annum for maintenance of culvert under New Inn Lane
Costs = £530k for flood storage to the east of Merrow Lane
Benefits (only benefits of flood storage quantified) = £1,000k

PF Score = 53% (£290k needed to secure FDGiA funding)
Funding strategy

It is recommended that the following proposed mitigation measures are progressed and funded by Guildford Borough Council:

- works to repair the culvert and headwall to the rear of Gosden Hill Road;
- walkover survey (including taking cross sections) of all watercourses within the area;
- undertake works to alleviate bank erosion, bed scour and deposition of sediment on the watercourse downstream of London Road;
- undertake pro-active maintenance of the culvert near New Inn Lane which is prone to blockage and causes property flooding, and;
- commission a CCTV survey of the watercourse to trace the route of the culvert downstream of New Inn Lane.

A funding application for FDGiA should be submitted to develop the flood storage area to the east of Merrow Lane. Detailed hydraulic modelling should be undertaken of the study area to support the economic appraisal and design of the proposed flood storage area. This would include a more detailed hydrological analysis to improve confidence and certainty of flows arriving at Merrow Lane.
## Appendix 9  Action plans for hotspot locations - Ash Study

### Ash Vale North

<table>
<thead>
<tr>
<th>Actions</th>
<th>Map:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Local evidence indicates the culvert could not discharge during December 2013 because the outlet was blocked on the western side of the railway. Guildford Borough Council should investigate whether the culvert is flowing freely, and ensuring there are no restrictions</td>
<td></td>
</tr>
<tr>
<td>2. There is a channel which is located at the toe of the National Rail embankment to the west of the study area. This need to be well maintained by Network Rail to maximise conveyance of surface water away from properties</td>
<td></td>
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<tr>
<td>3. There was some evidence on site of blocked highway gullies and these need to be well maintained to ensure flows are effectively conveyed away from properties</td>
<td></td>
</tr>
<tr>
<td>4. Maintenance of the channel and balancing pond near Lysons Avenue should be undertaken</td>
<td></td>
</tr>
<tr>
<td>5. The route of surface water sewers from Fir Acre Road area (Ash Vale South hotspot) is unclear. If they discharge under the railway and ultimately discharge into the drainage channel near Wellesley Close there is a possibility the culvert would not have sufficient capacity to pass forward flows. Therefore a CCTV Survey should be undertaken to establish the connectivity of the network in this area</td>
<td></td>
</tr>
<tr>
<td>6. Preliminary calculations suggest that upsizing it to a 1.6 x 1.6m culvert would provide sufficient capacity to pass forward all flows (assuming surface water sewers discharge from Ash Vale South hotspot). This has not been costed at this stage, until the contributing area can be better defined</td>
<td></td>
</tr>
<tr>
<td>7. The downstream end of the catchment suffers flooding because of excess surface water which cannot be drained away. Therefore measures are proposed to reduce the amount of surface water generated upstream by introducing localised storage in green areas around Birch Way and Cypress Grove. Area around Birch Way and Cypress Grove is approximately 18000m². Assuming 10% of this can be utilised as localised above ground storage this gives a total stored area of 1800m². As this is a residential areas, the depth of the any above ground storage are limited to 0.5m. Hence this gives a total water stored of 900m³.</td>
<td></td>
</tr>
<tr>
<td>8. Wellesley Close was severely flooded as surface water backed up from the drainage channel. This measure seeks to store surface water in underground storm cells near garages on Wellesley Close to store flows in storm events. Wellesley Close is approximately 150m in length, take 80% of the length as available for underground storage which is 120m. Assuming the width of the storm cells to be 3m with a depth of 0.5m gives a total volume of storm cells to be 180m³.</td>
<td></td>
</tr>
<tr>
<td>9. The intrusion of surface water into the foul water network causes overloading to the foul water network assets. Most importantly, the pumping station is then required to operate outside its designed operating conditions. The proposed measure here is to increase the capacity of the pumping station and this will provide relief to the foul water system and reduce flood risk to properties on Wellesley Close</td>
<td></td>
</tr>
<tr>
<td>10. There is evidence of surface water ingressing into the foul network through manholes. It is recommended that sealing of foul manholes is undertaking to reduce surface water ingress into the foul network. This will reduce the likelihood of the foul pumping station being overwhelmed by surface water</td>
<td></td>
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<tr>
<td>11. There is anecdotal evidence suggesting that misconnections of surface water into the foul water network are present. Identifying the misconnections will help to reduce the risk of</td>
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foul water flooding which is more onerous than surface water flooding.

<table>
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<tr>
<th>Responsibility</th>
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<tr>
<td>Lead Organisation</td>
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<tr>
<td>Partners</td>
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</table>

**Summary of costs and benefits**

Total costs of proposed works are £239,000, although some measures have not been costed at this stage (e.g. pumping upgrades or improvements to the culvert under the railway) Estimated benefits = £1.1 million (assuming 20 properties can have a standard of protection of 1 in 25 years)

**Funding strategy**

The flood risk issues in Ash Vale North are localised and primarily relate to the operation of the existing drainage system within the area, particularly how surface water is discharged via the drainage ditch and foul water via the existing pumping station. Thames Water are the asset owners and operators for the sewerage network, and would be responsible for funding improvement works to their network subject to the work being cost-beneficial for Thames Water. The drainage ditch to the west of the hotspot is owned and maintained by Network Rail, so improvements to the ditch or culvert might be funded by Network Rail. Guildford Borough Council could make a contribution towards improvement works and progress this scheme as jointly funded with Thames Water and Network Rail. CCTV Survey work should be funded by Guildford Borough Council.
Ash Vale South

Actions

1. The open watercourse which runs north-east to south-west from Vale Road was flowing freely during the site visit. This watercourse is critical to drainage of this area, so the watercourse and 450mm culvert need must continue to be well maintained to ensure adequate conveyance of surface water from the north of the hotspot.

2. Along Fir Acre Road there was significant evidence of blocked highway gullies with resultant standing water. Given Fir Acre Road is a natural conveyance route for excess surface water it is vital that highway gullies are well maintained to reduce flood risk to properties.

3. It is assumed that improved maintenance of gullies on Fir Acre Road will be sufficient to reduce flood risk in this area. However, should further flooding occur, additional highway gullies may be required to convey surface water away from properties and into the 450mm culvert under the railway.

4. Based on an initial assessment of capacity it is possible that the 450mm culvert under the railway which drains surface water from the north of this hotspot is under-sized and could result in backing up and flooding. There is no anecdotal evidence of this occurring so Guildford Borough Council should engage with local residents and Network Rail in the first instance to gather local evidence of flooding. Should there be evidence the culvert is under capacity improvement works may be required but have not been costed at this stage.

5. Implement property level protection for affected properties

Responsibility

Lead Organisation
Guildford Borough Council
Partners
Surrey County Council, Network Rail

Summary of costs and benefits

The estimated costs of maintenance for actions 1 to 3 are £12,000 per annum. It is not possible to quantify the monetary benefit from this maintenance.

Property level protection has been assumed to implemented to 15 homes (based on an uptake ratio of 50%), which would cost £82,500 based on £5,500 per property. Total benefits of property level protection would be £450,000 over a 20 year period.

Funding strategy

Maintenance of the open watercourse is believed to be undertaken by Network Rail as the asset owner, and therefore Network Rail should fund ongoing maintenance of this watercourse. Improvements to highway gullies on Fir Acre Road should be funded by Surrey County Council as the highways authority.

Property level protection could be funded by Guildford Borough Council, or a Flood Defence Grant in Aid (FDGIA) application could be submitted. Defra’s FDGIA Calculator indicates property level protection could qualify for up to £64,500 to protect 15 properties. This would mean £18,000 would need to be secured from Guildford Borough Council or local residents to secure Central Government funding through FDGIA.
Ash Station Area (Harpers Road)

### Actions

1. There is some discrepancy between the Thames Water sewer maps and anecdotal evidence about the size of the culvert which was the historic watercourse. As a result, the capacity of this culverted section of the watercourse is uncertain until further CCTV is undertaken.

2. Downstream of the railway, it is worth noting that there was significant overgrowth of the watercourse once it emerged to the west of the railway. It was not possible to observe the culvert outlet. Therefore, improved maintenance of watercourse on the d/s side of railway (near Murrell Road) should be undertaken to ensure the watercourse can flow freely and that the culvert outlet is kept clear.

3. A flood storage area to the east of Ash Hill Road would reduce the risk of surcharge and overtopping of the culvert which would cause flooding to properties along the natural valley of the historic watercourse. A proposed site, bounded by Ash Hill Road to the west, Guildford Road to the north and the railway to the south, has been identified in a natural depression. The land is naturally quite flat, so the level embankment approximately 650m is proposed, tying into a level of 75.7m AOD. The maximum height of the embankment would be 1m, and the average height above existing ground level would be 0.25m. This would provide storage in the region of 10,000 to 11,000 m³, subject to further analysis and design.

4. Following completion of the CCTV Survey, it is recommended that a detailed integrated hydraulic model of the catchment is produced to better understand flooding mechanisms. The model will help to justify the business case for further funding. The model would represent the entire hotspot area and would include Thames Water sewer data to understand exceedence from the surface water sewer network.

5. Pluvial runoff from the wooded area may drain onto Ash Hill Road and subsequently onto Miles Road. It is anticipated that the existing network should have sufficient capacity to drain any pluvial runoff, assuming the network is well maintained. Therefore, the condition of the highway and surface water sewer network should be checked to ensure it is in good condition.

6. Work with owners of Ash Station Area (Harpers Road) to provide more natural attenuation of runoff on their land. This would not prevent flooding but would mitigate the impacts by reducing the flow rate.

7. Should measures SC-6 or SC-1 described above not be feasible it is recommended that property level protection be implemented for properties at risk upstream of the railway. There are 37 properties at risk based on ISIS 2D modelling for the 1 in 30 year rainfall event. Assuming an uptake ratio of 50% this measure would implement property-level protection for up to 19 homes.

### Responsibility

**Lead Organisation**
- Guildford Borough Council

**Partners**
- Surrey County Council, Thames Water

### Summary of costs and benefits

- **Estimated costs**
  - The estimated cost of the proposed storage area is £280,000 (based on initial concept), with CCTV Survey and identified maintenance adding a further £8,000 per annum, and detailed hydraulic modelling costing £25,000-£30,000.

- **Estimated benefits**
  - £830,000 (assuming 40 properties will have a 1 in 30 year standard of protection)

### Funding strategy

- Guildford Borough Council and Surrey County Council should provide funding for CCTV Survey and identified maintenance, although Thames Water may be willing to contribute towards the CCTV Survey of their asset.

- For the flood storage area, it is recommended that a Flood Defence Grant in Aid (FDGiA) application be made.
submitted. However, the cost-benefit ratio for the scheme is relatively low. Based on the FDGiA calculator there is potential to secure £165,000 towards the scheme from FDGiA funding, which would leave a funding gap for the improvement works in the region of £100,000 (excluding the hydraulic modelling). It is unclear how the funding shortfall can be met.
1. As a first step Guildford Borough Council should ensure that culvert inlets which capture runoff from the south of Ash Lodge Drive are well maintained. Local residents confirmed that during times of heavy rainfall the main culvert inlet needs to be maintained daily to avoid blockage of the culvert, which would exacerbate flood risk.

2. To support the development of the business case it is recommended that CCTV Survey of the key 900mm and 1050mm surface water sewers be undertaken, as well as at key pinch pints in the network (e.g. Ash Church Road, South Lane).

3. Surface water sewers at the head of the catchment (Ash Church Road / Ash Street) are rapidly exceeded during times of heavy rainfall which causes exceedance flows to run down Ash Church Road and Ash Street before flowing onto Ash Lodge Drive, Loddon Way, Lea Close and Grange Road/South Lane. It is worth noting that these surface water sewers have not been adopted by Thames Water and it is believed this is because they are considered to be under-sized. Local evidence indicates the sewers are 150mm to 225mm. At this stage it is proposed to upsize the sewer along Ash Church Road / Ash Street to a 450mm before it connects into Ash Lodge Drive to alleviate exceedance flows at the head of the catchment, but this would need to be confirmed via modelling.

4. East of South Lane sewer maps indicate the surface water sewers drain to the low spot on South Lane into a 375mm sewer, before flowing into the 1050mm surface water sewer which runs to the south of Ash Lodge Drive. The initial capacity assessment for the 375mm sewer indicates this is a potential pinch point in the network where flooding would occur. The sewer should be up sized to at least a 600mm to reduce flood risk from this point in the network.

5. To alleviate risk of surcharging of the 900mm surface water sewer to the south of Ash Lodge Drive it is recommended that additional flood storage is provided in the fields to the south of the disused railway near Bin Wood. This could be achieved by throttling the culvert under the disused railway such that it can only pass a 1 in 2 year flow (approximately 200 to 400 l/s) and storing flood water behind the existing embankment. The existing embankment will need to be raised to minimise the risk of overtopping in more extreme rainfall events.

6. Should further flood storage be required to compensate for up sizing the drainage network upstream or to provide an enhanced level of protection the existing green space bounded to the north by Ash Lodge Drive and to the west by Manor Road should be utilised. The Flood Risk Assessment for the proposed development south of Ash Lodge Drive has identified a detention basin will be provided in this location to manage surface runoff from the development site. There is sufficient scope in this location to upsize the proposed detention basin. An overflow from the 1220mm surface water sewer could be provided into the detention basin to alleviate risk of surcharging and backing up from this sewer.

7. There is evidence of surface water ingress to the foul network causing foul system to flood properties. Sealing of the foul network around Southlands Road would reduce flood risk from the foul network.

8. Following completion of the CCTV Survey it is recommended that a detailed integrated hydraulic model of the catchment is produced to better understand flooding mechanisms. The model will help to justify the business case for further funding. The model would represent the entire hotspot area and would include Thames Water sewer data to understand exceedance from the surface water sewer network.

9. Local evidence indicates that the balancing pond near South Lane which was built to attenuate runoff from The Briars development is potentially under-sized. A review of the balancing pond size compared to predicted inflows should be undertaken to confirm whether the balancing pond is providing sufficient attenuation, and whether up sizing...
may be required

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<td>10</td>
<td>Should measures described above not be feasible it is recommended that property level protection be implemented for properties at risk upstream of the railway. There are 118 properties at risk based on ISIS 2D modelling for the 1 in 30 year rainfall event. Assuming an uptake ratio of 50% this measure would implement property-level protection for up to 59 homes.</td>
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**Responsibility**

**Lead Organisation** Guildford Borough Council

**Partners** Thames Water, local residents, Bewley Homes (developers)

**Summary of costs and benefits**

Estimated costs = £750,000 (excluding action 7 which has not been costed at this stage, action 9 which is unknown until improvement works are scoped through a high level investigation, and action 10 which is an alternative approach)

Estimated benefits = £2.4 million (assuming 120 properties will have a standard of protection of 1 in 50 years)

**Funding strategy**

Guildford Borough Council should fund the following mitigation measures:

- Improve maintenance of the culvert inlets of watercourse from the south of Ash Lodge Drive;
- CCTV Survey of the surface water sewer network (although Thames Water should be engaged to identify whether they would contribute), and;
- Investigation of the balancing pond near South Lane.

For the significant capital investment measures (upsizing the network and providing storage near Bin Wood) it is recommended that a Flood Defence Grant in Aid (FDGiA) application be submitted. However, the cost-benefit ratio for the scheme is relatively low. Based on the FDGiA calculator there is potential to secure £500,000 towards the scheme from FDGiA funding, which would leave a funding gap for the improvement works in the region of £186,000. The funding gap would need to be sourced from external sources, including Guildford Borough Council, Thames Water and Bewley Homes.
There are isolated reports of flooding in this area based on Guildford Borough Council’s data. In the south of the hotspot, there is reported flooding on New Road, The Street, and in a cul-de-sac off Lambourne Way. The available evidence indicates that flooding in these locations was due to blocked drainage, which is assumed to be blocked highway gullies in the absence of other data. In addition, Surrey County Council have reported a flooding problem on Poyle Road near the junction with The Street, although it should be noted that this system was cleared in 2008. Throughout the hotspot, there are other areas where surface water is predicted to pond, although it is not predicted to result in property flooding. This includes: Grange Road near the junction with Lambourne Way, Newton Way, The Street near the junction with Manor Road. Given these data it is recommended that the function of highway gullies and pipes are key to ensuring surface water are adequately drained in this area.

There is previous evidence of overtopping of the watercourse on Poyle Road although this is believed to be as a result of poor maintenance rather than hydraulic capacity. Therefore, it is critical that the watercourse is well maintained. This includes maintenance of the culverted sections.

There is little evidence that the watercourse to the south of Poyle Road has overtopped due to hydraulic incapacity. Therefore capital investment to reduce peak flows arriving to this watercourse should only be undertaken if evidence emerges if hydraulic incapacity.

To reduce peak flows (if required) there are two potential options identified:
- intercepting pluvial runoff from the playing fields to the south of Poyle Road with a low embankment, or;
- providing upstream flood storage.

Guildford Borough Council should monitor water levels on the watercourse during times of heavy rainfall and engage with local residents to gain additional local knowledge about the watercourse.

Responsibility
Lead Organisation: Guildford Borough Council and Surrey County Council
Partners: Local residents

Summary of costs and benefits
The estimated costs of maintenance for actions 1 and 2 are: £20,000 per annum. It is not possible to quantify the monetary benefit from this maintenance.
Action 3 is associated with officer time from Guildford Borough Council and no costs for improvement works has been undertaken at this stage.

Funding strategy
At this stage only maintenance improvements are recommended to be taken forward in the absence of further evidence of historic flooding to properties. Investigation and maintenance of the highway system should be undertaken by Surrey County Council, whereas the maintenance of the watercourse south of Poyle Road should be undertaken by Guildford Borough Council. Should enhancement works be required to manage flows into the watercourse this should be funded by Surrey County Council or Guildford Borough Council. It is unlikely that any enhancement works would receive Central Government funding because few properties would benefit from the scheme, based on current evidence.
Water level management along the River Wey and Godalming Navigations

Water control and weir keeping

There are 30 regulating weirs or structures along the navigations:

- 9 National Trust (including 2 flood gates and 1 lock adapted for flood alleviation)
- 11 Environment Agency
- 10 Privately owned.

The objective of water control is, depending upon factors such as time of year, saturation of soil, level of the water table and current weather conditions, to slowly and in a managed manner release water down through the river system to the River Thames. Once all weir gates are fully open if the river level is still rising it is probably that flooding will occur when the capacity of the river channel is no longer large enough to contain the volume of water flowing through the river.

The Lengthsman Team operate twenty three regulating structures along the Wey: - nine sets of Environment Agency weirs for flood relief, five privately owned structures and 9 Trust structures (including 2 flood locks and 1 adapted lock). Weir keeping is a most important part of a Lengthsman’s job. They are responsible during normal, increasing and decreasing river flows for maintaining levels in their length of navigation. The Lengthsman records all adjustments made to weir gates and they telephone their colleagues operating adjacent weirs to advise them that the water will be rising or falling.

The Lengthsmen are supported by a Mobile River Warden, who provides annual leave cover, and by Seasonal Relief Weir Keepers during periods of flood and high flows necessitating extended weir operating hours. There is one set of weirs operated by a contractor on behalf of the Trust. It is the role of the Head Lengthsman to co-ordinate all of these weir operators to ensure that the levels are managed. The Environment Agency has responsibility for fluvial flood risk management from Main Rivers such as the River Wey. The National Trust operates EA weirs under contract and the Head Lengthsman has a close working relationship with EA officers.

Water levels along the Navigations are affected by different factors. For example, in heavily built up areas like Guildford, surface water running off the roads and car parks can contribute to rising water levels. In other areas tributary streams to the Wey such as, Cranleigh Waters and Tillingbourne at Shalford, or the Hoe Stream at Pyrford, all add flow to the Wey Navigation. During flood conditions, it takes some time for rainwater to discharge into the river system and for changes in water level to work their way downstream. A rise in water level at Godalming can take up to thirty hours or more before it is felt at Weybridge.

Each set of weirs are different and the local Lengthsman must know what factors can cause a change in his levels, and how the operation of his weir will affect his length of river. Water levels can rise and fall very rapidly and the Lengthsmen need to keep a very close check on the level of the river, in case they need to adjust their weirs. During periods of high rainfall, checks need to be made every two hours, morning and night. Christmas Day and New Year are no exceptions and over the last few winters, the Lengthsmen have been very busy over the holiday period.
River Wey Levels at Guildford December 2013

- Flood Warning Issued
- Flood Warning
- Flood Alert Threshold

River Level (mSf)

23/12/13  24/12/13  25/12/13  26/12/13  27/12/13