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|  | London Borough of Sutton  Local Flood Risk Management Strategy  Draft for Consultation  July 2014  Church Hill 7 |



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| Rev | Date | Details | Prepared by | Checked by | Approved by |
| 01 | April 2014 | Draft for Comment | Sarah Littlewood  Consultant  Edward Byers  Assistant Flood Risk Consultant | Sarah Kelly  Principal Consultant | Jon Robinson  Operations Director |
| 02 | July 2014 | Final for Consultation | Joanna Bolding  Assistant Hydrologist | Sarah Kelly  Principal Consultant | Carl Pelling  Associate Director |

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Project Number

47069163

Contact Details

URS Infrastructure and Environment UK Ltd

6-8 Greencoat Place

London

SW1P 1PL

United Kingdom

Telephone: +44(0)20 7798 5000

Fax: +44(0)20 7798 5001

Foreword

In response to the flood events during 2007, the Government commissioned Sir Michael Pitt to undertake a review. The outcome of this, *Learning Lessons from the 2007 Floods* outlined the need for changes in the way England is adapting to the increased risk of flooding and the role different organisations have to deliver this function.

The Flood Risk Regulations 2009 and the Flood and Water Management Act 2010, enacted by Government in response to the recommendations of The Pitt Review, gave unitary and county councils, as Lead Local Flood Authorities, new responsibilities for leading and co-ordinating the management of local flood risk; namely the flood risk arising from surface water, groundwater and smaller watercourses and ditches, known as ordinary watercourses. This includes a statutory duty to develop, maintain, apply and monitor a strategy for the management of local flood risk.

Sutton Council is the Lead Local Flood Authority for the London Borough of Sutton. This Local Flood Risk Management Strategy (‘the Strategy’) offers the first opportunity for us to formalise our longer term vision and flood risk management priorities to shape a Strategy that delivers the greatest benefit to the people, property and environment of Sutton.

Sutton has a history of surface water flooding. In 2007 significant surface water flooding occurred throughout the Borough, including in Cheam, Worcester Park, Carshalton, Wallington, Mitcham Junction and Sutton Town Centre. Sutton is at risk of flooding from surface water, sewer and groundwater sources and it is predicted that this will increase in the future; influenced by climate change and increasing pressures on development and housing need.

In December 2013 the Environment Agency published national surface water flood mapping. This Strategy has identified that within the London Borough of Sutton up to 16,300 residential properties and 1,500 non-residential properties could be at risk of surface water flooding; of these, up to 2,000 residential properties and 270 non-residential properties could be at high risk, defined as a rainfall event with a 1 in 30 probability of occurring in any given year.

Since April 2011 we have been working closely with communities, businesses, and other risk management authorities, including our neighbouring boroughs, the Environment Agency and Thames Water, to improve our understanding of flood risk in Sutton and deliver measures that improve community resilience alongside nationally funded strategic schemes that deliver flood and environmental benefits to communities, businesses and infrastructure.

In developing this Strategy, we have consulted with communities, businesses, neighbouring boroughs and risk management authorities to develop a coordinated Strategy for local flood risk management across Sutton. We recognise that communities now play a much greater role in the flood risk management decision making process. The Strategy outlines the priorities for local flood risk management and provides a delivery plan to manage the risk over the next six years. We have given consideration to the roles and responsibilities of other risk management authorities in Sutton, including the Environment Agency who have responsibility for managing the risk arising from main rivers, including the River Wandle, Pyl Brook and Beverley Brook, and Thames Water, who have responsibility for managing sewer flooding. Both these sources of flooding interact and influence ordinary watercourse, surface water and groundwater flood risk within Sutton.

Our Strategy complements and supports the *National Strategy* published by the Environment Agency which outlines a National framework for flood and coastal risk management. The Environment Agency has a strategic overview role of all flood and coastal erosion risk management. In addition, the Local Strategy is aligned with the corporate priorities of Sutton’s strategic plans including One Planet Sutton. We have taken the guiding principles from these strategies into account when setting the objectives for the management of local flood risk.

**London Borough of Sutton Local Strategy Objectives**

1. Improve our understanding and data holdings regarding mechanisms of flooding in Sutton,
2. Build on relationships with Risk Management Authorities and maximise joint working opportunities for multiple benefits,
3. Proactively encourage sustainable practices and identify opportunities for holistic water management across the Borough,
4. Reduce the number of homes and businesses at risk of flooding, and
5. Support local residents to increase their own resilience to flooding.

The Strategy is accompanied by an Action Plan setting out how we will deliver the objectives of the Strategy over the next six years and a Strategic Environmental Assessment (SEA) assessing the impacts of the Strategy on the environment.

Over the next six years we will continue to work with communities and businesses to help them understand the risks they face and what can be done to manage them. A range of individual, community and council-led actions and improved awareness will help manage both the likelihood and impact of flooding and consequently lead to social, economic and environmental benefits to Sutton’s communities.

Longer term strategic development across Sutton will integrate consideration of flood risk and sustainable drainage into planning and development control systems. Inappropriate development which could increase flood risk will be avoided, as will inappropriate development in areas of significant flood risk.

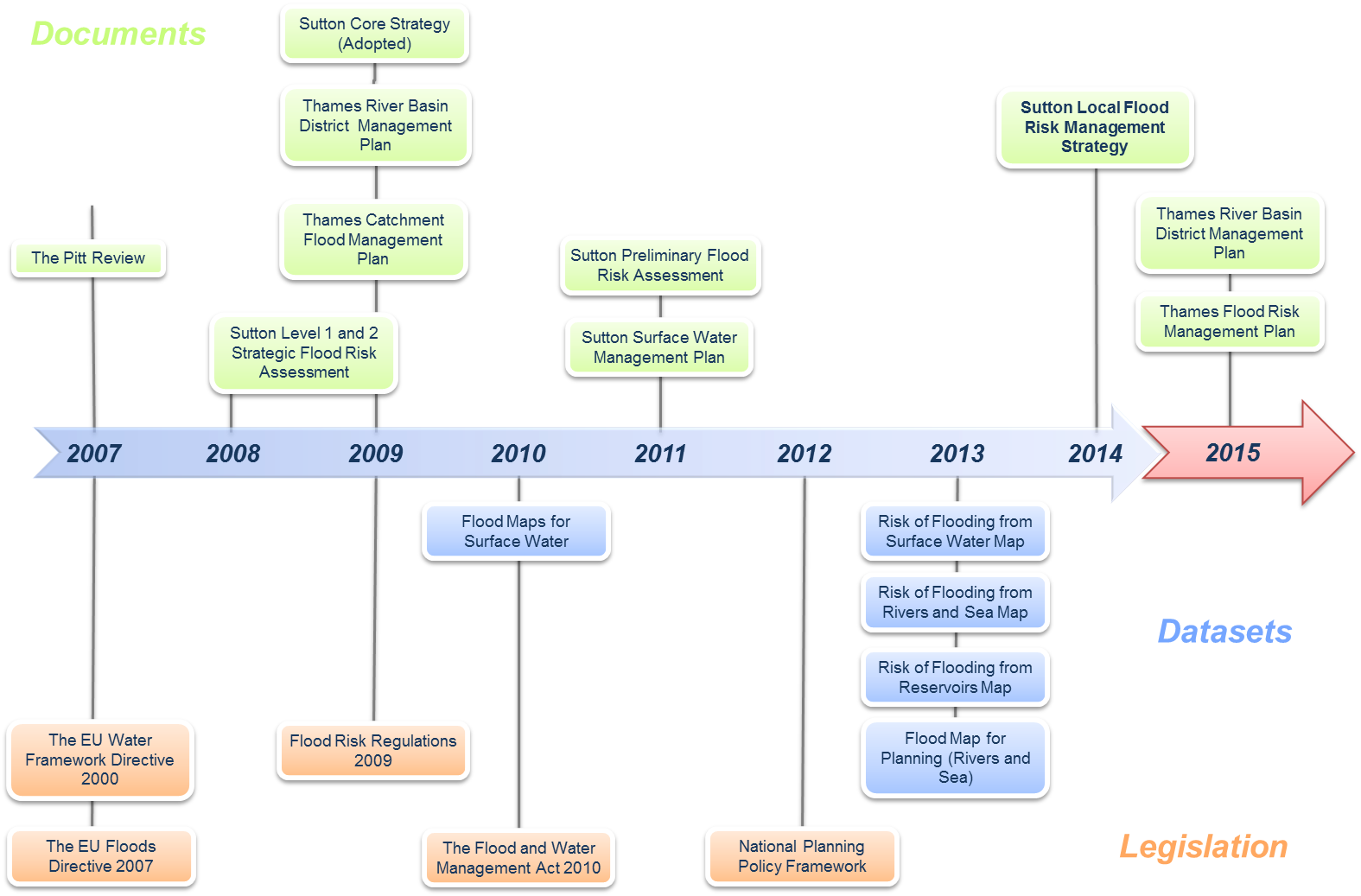
The Strategy will be reviewed periodically to ensure that its content and emphasis remains relevant.

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| Table of contents | [1. Introduction 1](#_Toc393726763)  [1.1 Flood Risk in South West London 1](#_Toc393726764)  [1.2 Flood Risk Management in South West London 1](#_Toc393726765)  [1.3 The London Borough of Sutton Strategy 2](#_Toc393726766)  [1.4 Community Engagement and Consultation 4](#_Toc393726767)  [1.5 Supporting Plans and Documents 4](#_Toc393726768)  [2. Flood Risk in the London Borough of Sutton 7](#_Toc393726769)  [2.1 What is Flood Risk? 7](#_Toc393726770)  [2.2 Sources of Flood Risk in the London Borough of Sutton 7](#_Toc393726771)  [2.3 Impact of Climate Change 20](#_Toc393726772)  [2.4 Summary 21](#_Toc393726773)  [3. Responsibilities for Flood Risk Management 22](#_Toc393726774)  [3.1 Overview 22](#_Toc393726775)  [3.2 Responsibilities of Risk Management Authorities 22](#_Toc393726776)  [3.3 Flood Risk Management Responsibilities for Others 25](#_Toc393726777)  [4. Objectives for Managing Local Flood Risk 27](#_Toc393726778)  [4.1 London Borough of Sutton’s Local Objectives 27](#_Toc393726779)  [4.2 Guiding Principles for Setting Objectives 27](#_Toc393726780)  [5. Delivery of Local Flood Risk Management 30](#_Toc393726781)  [5.1 Overview 30](#_Toc393726782)  [5.2 Delivery of Local Flood Risk Management to Date 30](#_Toc393726783)  [5.3 Delivery of Legislative Duties 32](#_Toc393726784)  [5.4 Delivery of Local Flood Risk Management Measures 36](#_Toc393726785)  [5.5 Prioritising Local Flood Risk Management Measures 40](#_Toc393726786)  [5.6 Funding for Local Flood Risk Management 41](#_Toc393726787)  [5.7 What can communities, residents and businesses do to prepare for flooding? 44](#_Toc393726788)  [6. Delivery of Wider Environmental Objectives 45](#_Toc393726789)  [6.1 Overview 45](#_Toc393726790)  [6.2 Strategic Environmental Assessment 45](#_Toc393726791)  [6.3 Habitats Regulations Assessment 46](#_Toc393726792)  [6.4 Water Framework Directive 46](#_Toc393726793)  [7. Strategy Delivery, Monitoring & Review 48](#_Toc393726794)  [7.1 Delivery 48](#_Toc393726795)  [7.2 Annual Monitoring 48](#_Toc393726796)  [7.3 Review 48](#_Toc393726797)  [Glossary & Abbreviations 49](#_Toc393726798)  [Appendix A – Flood Risk Maps 52](#_Toc393726799)  [Appendix B – Action Plan 53](#_Toc393726800)  [Appendix C – Summary of Community Engagement 54](#_Toc393726801) |

1. Introduction
   1. Flood Risk in South West London
      1. In England, 5.2 million properties are at risk of flooding. Of these, 1.4 million are at risk from rivers or the sea, 2.8 million are at risk from surface water and 1 million are at risk from both[[1]](#footnote-2). This risk was realised in many parts of the country during the summer floods of 2007, which resulted in 55,000 properties flooding, 7,000 rescues by emergency services, 13 deaths and an estimated £3billion of damages. The severity of this event generated changes in the way flooding should be managed by local and national organisations.
      2. Across South West London there are risks of flooding from a range of sources, including surface water runoff and ponding, groundwater, sewer surcharging and flooding from main rivers and ordinary watercourses, and reservoirs. In some cases more than one of these sources of flooding can combine to cause a flood event.
      3. Risks from tidal and river flooding associated with the River Thames, Beverley Brook, the River Wandle and the River Graveney are relatively well understood and have been managed for many years by the Environment Agency. However, flood risk from more local sources, including surface water runoff and ponding, groundwater and small ditches and land drains are less well understood; these are typically very localised events which are often difficult to predict, and with sparse historical records available to provide supporting evidence.
      4. Parts of South West London have a particular susceptibility to surface water and sewer flooding due to the urbanised nature of the area and the complexity of the sewer system leading to a high potential for constrictions, blockages and failure. Over recent years, severe surface water flooding has been experienced across the area causing damage to property and disruption to businesses and services. Details of historic flood records are provided in [Section 2](#Section2).
      5. In December 2013 the Environment Agency published the Risk of Flooding from Surface Water mapping[[2]](#footnote-3) which maps surface water flood risk across England and Wales The mapping builds on modelling undertaken as part of the London Borough of Sutton SWMP, and high-level, Borough-wide property counts undertaken to support this Strategy indicate that up to 16,300 residential properties and 1,500 non-residential properties could be at risk of surface water flooding across the Borough, with up to 2,000 residential and 270 non-residential properties at high risk, defined as having a 1 in 30 chance of surface water flooding occurring in any given year. Further details are provided in [Section 2](#Section2).
      6. Typically, reactive mitigation measures have been implemented in response to past flood events, usually with the construction of new drainage infrastructure. However, climate change and continued urbanisation are likely to increase flood risks in the future unless action is taken to mitigate or adapt to that risk.
   2. Flood Risk Management in South West London
      1. In response to the severe flooding across large parts of England and Wales in summer 2007, the Government commissioned Sir Michael Pitt to undertake a review of flood risk management. The Pitt Review – Learning Lessons from the 2007 Floods[[3]](#footnote-4) and subsequent progress reviews outlined the need for changes in the way the UK is adapting to the increased risk of flooding and the role different organisations have to deliver this function.
      2. [The Flood and Water Management Act 2010[[4]](#footnote-5)](http://www.legislation.gov.uk/ukpga/2010/29/contents) (‘the Act’) and the [Flood Risk Regulations 2009](http://www.legislation.gov.uk/uksi/2009/3042/made)[[5]](#footnote-6) (‘the Regulations’) make provision for unitary authorities and county councils, including all London Boroughs, as Lead Local Flood Authorities (LLFAs). As LLFA, Sutton Council has a number of duties and responsibilities in relation to managing local flood risk, as required by the Act and the Regulations. Local flood risk is defined as the risk of flooding from surface water runoff, groundwater and small ditches and watercourses (collectively known as Ordinary Watercourses).
      3. The Act also formalises the flood risk management roles and responsibilities for other organisations including the Environment Agency, water companies and highways authorities. The responsibility to lead and co-ordinate the management of flood risk from main rivers, the sea and other tidal sources (such as estuaries) remains that of the Environment Agency. Further details regarding responsibilities and functions in relation to their flood risk management in South West London is provided in [Section 3](#Section3).
      4. As LLFAs, each of the unitary authorities across South West London has a statutory duty to develop, maintain, apply and monitor a strategy for local flood risk management (‘the Strategy’).
      5. The six LLFAs covering South West London, (namely, London Borough of Croydon, The Royal Borough of Kingston upon Thames, London Borough of Merton, London Borough of Sutton, London Borough of Richmond upon Thames and London Borough of Wandsworth), have chosen to partner together to commission the preparation of their Strategies in a coordinated manner. This partnership approach will encourage collaboration and enable flood risk across South West London to be managed more effectively and holistically. Further details of the South West London Strategic Flood Group in are included in [Section 5](#Section5).
   3. The London Borough of Sutton Strategy
      1. The purpose of the London Borough of Sutton Strategy is to set out the approach to managing flood risk from local sources (i.e. surface water, ground water and ordinary watercourses) in both the short and longer term, with proposals for actions that will help to manage the risk in a way that delivers the greatest benefit to its residents, businesses and the environment.

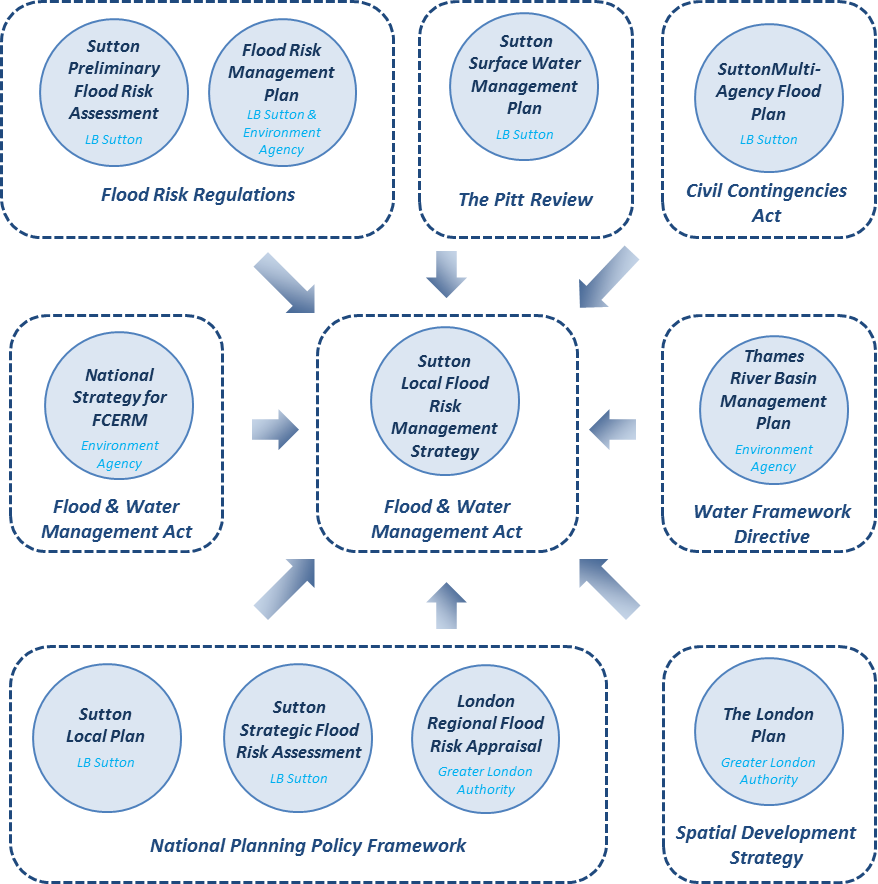
*Figure 1-1 Structure of the London Borough of Sutton Strategy*

* + 1. The Strategy complements and supports the [National Strategy](https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england)[[6]](#footnote-7), published by the Environment Agency, which outlines a National framework for flood and coastal risk management, balancing the needs of communities, the economy and the environment.
    2. This Strategy has been developed by Sutton Council in partnership with Risk Management Authorities, including the Environment Agency and Thames Water, and local communities and neighbouring boroughs. Further details of Risk Management Authorities and other organisations with responsibilities for flood risk management are provided in [Section 3](#Section3).
    3. In delivering flood risk management, Sutton Council has the opportunity to deliver wider environmental objectives and requirements, as set out in European legislation including the [Water Framework Directive](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:EN:NOT)[[7]](#footnote-8) (WFD). The WFD was transposed into UK national law through [The Water Environment](http://www.legislation.gov.uk/uksi/2003/3242/contents/made) Regulations 2003[[8]](#footnote-9) and states that Sutton Council should have regard to the River Basin Management Plans (RBMPs) when exercising its functions as a public body. The approach for addressing this, including the preparation of a Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment Screening exercise, is outlined in [Section 6](#Section6).
  1. Community Engagement and Consultation
     1. A community engagement exercise was undertaken between December 2013 and April 2014 offering residents and businesses the opportunity to shape the development of the Strategy and future flood risk management priorities. Details of the outcomes from the community engagement activities are included in [Appendix C](#AppendixC).
     2. This report forms the draft Strategy which will undergo a period of public consultation, offering the opportunity for residents, businesses and risk management stakeholders to provide feedback. Following the public consultation, the Strategy will be updated in line with comments received and finalised before being adopted and published by Sutton Council.
  2. Supporting Plans and Documents
     1. Over recent years, a number of documents have been prepared detailing the assessment and management of flood risk within Sutton (Figure 1-2). Each of these have built on emerging evidence, assessments and modelling techniques to improve the knowledge of flood risk across the Borough.



*Figure 1-2 Timeline of supporting documents, datasets and legislation for the Strategy*

* + 1. The Strategy forms a key document in this suite of flood risk management plans, drawing together existing flood risk studies and plans into a single document that outlines how Sutton Council will manage local flood risk going forwards (Figure 1-3).
    2. As part of the assessment of flood risk, the Strategy draws on technical information and historic records of flooding presented in the Surface Water Management Plan (SWMP), [Level 1 Strategic Flood Risk Assessment](https://www.sutton.gov.uk/CHttpHandler.ashx?id=4447&p=0)[[9]](#footnote-10) (SFRA), [Level 2 SFRA](https://www.sutton.gov.uk/CHttpHandler.ashx?id=5743&p=0)[[10]](#footnote-11) and the [Preliminary Flood Risk Assessment](https://www.sutton.gov.uk/CHttpHandler.ashx?id=15497&p=0)[[11]](#footnote-12).(PFRA). These same documents and the partnerships forged between Risk Management Authorities during their preparation are also built upon and formalised as part of the Strategy.
    3. The Strategy also draws from wider environmental plans covering the Thames catchment including the [Thames River Basin District Management Plan](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289937/geth0910bswa-e-e.pdf)[[12]](#footnote-13) and the [Thames Catchment Flood Management Plan[[13]](#footnote-14)](https://www.gov.uk/government/publications/thames-catchment-flood-management-plan) to ensure a coordinated approach to flood risk management across South West London.



*Figure 1-3 Legislative Drivers and Supporting Documents for the Strategy*

Flood Risk Management Plan

* + 1. As well as the duties under the Act to prepare the Strategy, Sutton Council has legal obligations under the [EU Floods Directive](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007L0060:EN:NOT)[[14]](#footnote-15), which was transposed into UK Law through [the Regulations](http://www.legislation.gov.uk/uksi/2009/3042/made).
    2. As part of the Greater London Flood Risk Area, Sutton Council, as the LLFA for the London Borough of Sutton, is required to contribute to the preparation of a Flood Risk Management Plan for the Thames River Basin District outlining significant flood risk, receptors and consequences across their administrative area.
    3. This Strategy has been prepared to meet the requirements of the Regulations as well as the Act, and thereby avoid duplication of work.

1. Flood Risk in the London Borough of Sutton
   1. What is Flood Risk?
      1. Flood risk is not just the likelihood of flooding occurring, but also the potential damage a flood could cause. Assessing risk in quantifiable, financial terms can help prioritise where available funding should be directed, as well as support applications for additional external funding.
      2. However, it should also be borne in mind that the consequences of flooding can be far reaching and not always easy to value, particularly the social impacts of displacement, loss and fear of repeat events. All available information and past experiences have been considered in developing the objectives for managing future flood risk.

**What is Flood Risk?**

Flood Risk is the likelihood of a particular flood happening (probability) e.g. ‘there is a 1 in 100 chance of flood in any given year in this location’, multiplied by the impact or consequence that will result if the flood occurs.

The evaluation of risk takes into account the severity of impacts from a flood event, which can be highly variable in terms of social, economic and environmental consequences. Consequences are often measured by number of properties flooded and level of economic damage. It will also be influenced by vulnerability (i.e. a basement flat or a key emergency service station is more vulnerable than a commercial warehouse)

There will only be a risk if there is a means (pathway) of connecting the source of the flood with the people, property and land that may be affected (receptors). Source, pathway and receptor must all be present for there to be a risk.

*Figure 2-1 Definition of Flood Risk*

* 1. Sources of Flood Risk in the London Borough of Sutton
     1. The London Borough of Sutton is at risk of flooding from both local sources of flooding and other sources, including main rivers, sewers surcharging and artificial sources. The greatest risk from these often arises where different sources of risk combine to exacerbate flooding.
     2. For each of the flooding sources a description of the source and mechanism of flooding has been provided and an assessment of the risk has been made drawing on historical records, outcomes from the community engagement (refer to [Appendix C](#AppendixC)), as well as assessments detailed in existing technical studies addressing both current and future risk. [Appendix A](#AppendixA) provides a series of maps showing the historic records of flooding and flood risk, where information is available.

Surface Water

| **Table 2-1 Flooding from Local Sources –Surface Water Flooding** | |
| --- | --- |
| Description of Source | Surface water flooding usually occurs when high intensity rainfall generates runoff which flows over the surface of the ground and ponds in low lying areas, before the runoff enters a watercourse or sewer. It can be exacerbated when the soil is saturated and natural drainage channels or artificial drainage systems have insufficient capacity to cope with the additional flow.  Runoff from roads or impermeable areas and flooding from road gullies were identified as the main sources of flooding perceived by respondents to the Survey, with runoff from new development also identified as a key flood source within Sutton. |
| Supporting Documents | London Borough of Sutton SWMP  [London Borough of Sutton PFRA](https://www.sutton.gov.uk/CHttpHandler.ashx?id=15497&p=0)  [Environment Agency Flood Risk from Surface Water Map](http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?lang=_e&topic=ufmfsw&layer=default&scale=2&x=357683&y=355134#x=357683&y=355134&scale=2)[[15]](#footnote-16) |
| Historic Flooding | Specific episodes of surface water flooding are recorded in the following locations (Figure 1, [Appendix A](#AppendixA)):   * Worcester Park * North Cheam * Cheam * St Helier * Wallington * North of The Royal Marsden Hospital * Hackbridge (flooding from multiple sources, including surface water)   Significant surface water flooding occurred in Sutton in the summer of 2007. The SWMP indicates that drainage systems have been overwhelmed across the Borough in 2007, 2008, 2009 and 2010, in particular in Beddington, Hackbridge, Worcester Park and Wallington.  The online survey carried out to support this Strategy indicated that respondents perceive the main cause of flooding experienced has been heavy rainfall and the resultant surface water runoff from impermeable surfaces as well as blocked roads gullies and drains. This has predominantly occurred in July 2007 and on a number of occasions since the summer of 2012. Gullies and drains that appear to be blocked can often be due to a lack of capacity in the main sewer system rather than a physical blockage (see [Table 2-5](#Table2pt5)).    *Flooding at Wallington Railway Bridge Flooding on Revell Road, Sutton*  *(source:* [*www.yourlocalguardian.co.uk*](http://www.yourlocalguardian.co.uk)*) (source: Sutton Borough Council)* |
| Future Flood Risk | The PFRA and SWMP identify parts of Sutton to be particularly susceptible to surface water flooding, including Manor Road, where surface water passes underneath the railway bridge near Wallington Station, properties along a number of streets to the north of The Royal Marsden Hospital and streets to the south of Sutton Town Centre.  The Environment Agency has undertaken national modelling of the risk of flooding from surface water and published the mapping outcomes on their website in December 2013. The Flood Risk from Surface Water Map, shown for Sutton in Figure 2 in [Appendix A](#AppendixA), identifies the risk of surface water flooding at a strategic scale and bands flood risk as follows:   * **High Risk** – at risk of flooding for a rainfall event with a 1 in 30 probability of occurrence in any given year, * **Medium Risk** – at risk of flooding for a rainfall event with a 1 in 100 probability of occurrence in any given year, * **Low Risk** – at risk of flooding for a rainfall event with a 1 in 1000 probability of occurrence in any given year, and, * **Very Low Risk** – at risk of flooding for a rainfall event with less than a 1 in 1000 probability of occurrence in any given year.   The Flood Risk from Surface Water Map improves on modelling and mapping undertaken as part of the Sutton SWMP in 2011. The mapping shows relatively good correlation with the surface water modelling presented in the SWMP, but shows surface water to be more constrained within roads and watercourse, which reflects the improved modelling approach. Based on available historic information, the dataset is considered to be more reflective of flood risk across Sutton and will be used as the surface water flood risk map for the Borough until such time as further updates or improved modelling of risk is undertaken.  An assessment of the risk to properties, critical infrastructure, transport, heritage and the environment in Sutton has been undertaken for the Strategy using the Environment Agency’s National Receptor Database. This is presented in the table below and Figures 7 and 8 in [Appendix A](#AppendixA).   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Number of properties that could be at risk from Surface Water Flooding**  *(based on ‘Flood Risk from Surface Water’ mapping, Environment Agency, December 2013)* | | | | | | **Type of Property** | | **Risk** | | | | **Low** | **Medium** | **High** | | **Residential** | | **16,300** | **5,200** | **2,000** | | **Non Residential** | Commercial & Industrial | 1,300 | 510 | 220 | | Critical Infrastructure  *Including emergency services (fire, police and ambulance), hospitals, schools, health care facilities, residential homes, sewage treatment facilities and electricity substations.* | 140 | 65 | 40 | | Other | 60 | 25 | 10 | | **Non-Residential Total** | **1,500** | **600** | **270** | | **Total** | | **17,800** | **5,800** | **2,270** |   The areas at greatest risk within Sutton have been identified as Critical Drainage Areas (CDAs).Twelve CDAs have been identified across Sutton (see Figure 6 in [Appendix A](#AppendixA) and overleaf).  The areas considered to be at greatest risk of surface water flooding are:   * Trafalgar Avenue (CDA 023), * Sutton Junction (CDA 026), * Worcester Park (CDA 022), * Hackbridge (CDA 033), and, * Carshalton Centre (CDA 028). |
| Figures -[Appendix A](#AppendixA) | Figure 1: Historic Flooding  Figure 2: Flood Risk from Surface Water  Figure 6: Surface Water Critical Drainage Areas  Figure 7: Flood Risk from Surface Water: Critical Services & Transport  Figure 8: Flood Risk from Surface Water: Environment & Heritage |

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| **Table 2-1 Flooding from Local Sources –Surface Water** |
| *Surface Water Flood Risk in the London Borough of Sutton and Critical Drainage Areas (CDAs)* |

Groundwater

| **Table 2-2 Flooding from Local Sources – Groundwater Flooding** | |
| --- | --- |
| Description of Source | Groundwater flooding occurs as a result of water rising up from the underlying aquifer or from water flowing from springs. This tends to occur after much longer periods of sustained high rainfall and can be sporadic in both location and time often lasting longer than flooding from river or surface water. High groundwater level conditions may not always lead to widespread groundwater flooding; however, they have the potential to exacerbate the risk of surface water and river flooding by reducing rainfall infiltration capacity, and increasing the risk of sewer flooding through groundwater interactions. |
| Supporting Documents | London Borough of Sutton SWMP  [London Borough of Sutton PFRA](https://www.sutton.gov.uk/CHttpHandler.ashx?id=15497&p=0) |
| Historic Flooding | With the exception of one groundwater flooding event in proximity to Sutton Police Station, all recorded groundwater flood incidents held by Sutton Council are located in the north-west of the Borough, north of the A232, and west of the rail line running through the Borough from Sutton station to Mitcham Junction station (Figure 1, [Appendix A](#AppendixA)).  The SWMP identifies the majority of recorded incidents occurred in 2001, noted as being a particularly wet period. Initial analysis in the SWMP identified a number of the flooding incidents as occurring over the London Clay Formation and therefore flooding may potentially be related to poor drainage over clayey soils following heaving rainfall as opposed to related to groundwater flow.  The high groundwater levels experienced from December 2013 to April 2014 caused the Carshalton Place Canal, Carshalton Park Canal and Westcroft Canal (tributaries of the River Wandle) to flow for the first time in over 10-15 years. Although flooding to properties was minimal during this time, work was required to manage the flows in The Grove and Carshalton Park and to avoid Carshalton High Street from being flooded.  Respondents to the online survey conducted to support this Strategy were asked to indicate what they thought was the cause of the flooding they have previously experienced. Just over 5% of these respondents indicated that they thought flooding was due to the presence of groundwater/springs. |
| Future Flood Risk | Groundwater flooding can be particularly difficult to predict due to the ‘hidden’ nature of the source of flooding and relatively longer period of build-up and emergence, often several days or weeks after heavy rainfall has fallen and river levels have receded. Basements and other below ground level installations are particularly vulnerable, although property and land above ground level can also be at risk.  Existing efforts to predict groundwater flooding events are based on monitoring water levels in boreholes in areas known to be at risk. These systems can give notice (typically days or weeks ahead) of impending events. Groundwater models can be used to provide early warning systems that can alert authorities to possible groundwater flooding in advance allowing authorities to plan their response and possibly even to implement mitigating measures. However, the monitoring of boreholes and development of groundwater flood models can be costly, and are only normally undertaken in those areas of greatest risk.  For the Sutton SWMP, an ‘Increased Potential for Elevated Groundwater’ dataset was derived from British Geological Survey, Environment Agency and Defra groundwater flooding datasets (Figure 3, [Appendix A](#AppendixA) and overleaf). The dataset identifies areas where there is increased potential for groundwater levels to rise to within 2 m of ground surface following periods of higher than average recharge and is intended as a high-level risk assessment, rather than detailed modelling of groundwater flood risk across the Borough.  Permeable superficial deposits with increased potential for elevated groundwater are located exclusively in the northern half of the Borough, particularly concentrated in the north-east of the Borough, with smaller dispersed areas in the north-west of the Borough. Consolidated Aquifers exist in a band running along the centre of the Borough concentrated in Wallington and Cheam. The SWMP also notes that future flood risk from groundwater may be impacted by the numerous water supply abstractions that are present within Sutton.  Recorded historic flood incidents do not appear to correspond with areas of increased potential for elevated groundwater or consolidated aquifers, with few recorded groundwater flooding incidents located in the north-east of the Borough. As discussed above, this may be due to a number of flooding incidents being incorrectly identified as having a groundwater source. Therefore groundwater flooding incidents may potentially occur outside these areas in the future. |
| Figures -[Appendix A](#AppendixA) | Figure 1: Historic Flooding  Figure 3: Flood Risk from Groundwater |

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| **Table 2-2 Flooding from Local Sources – Groundwater Flooding** |
| *Groundwater Flood Risk in the London Borough of Sutton* |

Ordinary Watercourses

| **Table 2-3 Flooding from Local Sources – Ordinary Watercourses (incl. small ditches and land drains)** | |
| --- | --- |
| Description of Source | Ordinary watercourses include every river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and passage through which water flows, above ground or culverted, which is not designated as a main river (see Table 2-4 Flooding from Other Sources – Main Rivers).  The responsibility for managing and maintaining ordinary watercourses falls to riparian owners who typically own land on either bank and therefore are deemed to own the land to the centre of the watercourse. Sutton Council, as the LLFA, has responsibility to manage the risk of flooding arising from the watercourses through engagement with riparian owners and enforcing maintenance responsibilities in accordance with the [Land Drainage Act 1991](http://www.legislation.gov.uk/ukpga/1991/59/contents)[[16]](#footnote-17) (see [Section 3.3](#Section3pt3) for further information).  In total there is approximately 20.5km of ordinary watercourse in Sutton, approximately 1.6km of which is culverted. Figure 5 in [Appendix A](#AppendixA) and overleaf shows the location of watercourses within Sutton.  Ordinary watercourses within Sutton are mainly located in and around Beddington Park and Beddington Sewage Treatment Works. Shorter sections of ordinary watercourse are located in the northern section of the Borough, most notably in Rosehill Park and Cheam Park. A number of these watercourses are small ditches located in parks, for which Sutton Council are the riparian owners as well as the Risk Management Authority. |
| Supporting Documents | London Borough of Sutton SWMP  [London Borough of Sutton PFRA](https://www.sutton.gov.uk/CHttpHandler.ashx?id=15497&p=0) |
| Historic Flooding | [Appendix A](#AppendixA) Figure 1 shows records of historic flooding from local sources, though does not show any recorded flooding incidents from ordinary watercourses. It is possible that flooding incidents have occurred but have not been reported to Sutton Council, and therefore not recorded.  Therefore it is possible that the occurrence of flooding originating from ordinary watercourses is under represented in Sutton Council records.  Respondents to the online survey conducted to support this Strategy were asked to indicate what they thought was the cause of the flooding they have previously experienced. Just over 5% of these respondents indicated that they thought flooding was due to the blocked ditches or streams. |
| Future Flood Risk | No modelling of the flood risk from ordinary watercourses has been undertaken to date across Sutton. Therefore future flood risk is based on the potential risk that might arise based on knowledge of known flooding hotspots and potential mechanisms for flooding. Often ordinary watercourses in combination with other sources of flooding, such as surface water or main river flooding can combine to exacerbate flood risk. Therefore it important to consider this source in combination with these, as shown in Figures 2 and 4 in [Appendix A](#AppendixA).  Within Sutton, 1.6km of ordinary watercourse are culverted, with trash screens often located on the upstream end of culverts. Trash screens and culverts have the potential to become blocked by items such as plant debris and rubbish. Blockages can restrict the natural flow of water, increasing the chance of water flowing out of bank and causing local flooding due to the reduced conveyance potential of the associated watercourse. Therefore the risk of flooding from ordinary watercourses can be very localised and is dependent on adopting appropriate inspection and maintenance regimes to ensure this risk is minimised where possible. |
| Figures -[Appendix A](#AppendixA) | Figure 1: Historic Flooding  Figure 2: Flood Risk from Surface Water  Figure 5: Main Rivers & Ordinary Watercourses |

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| **Table 2-3 Flooding from Local Sources – Ordinary Watercourses (incl. small ditches and land drains)** |
| *Ordinary Watercourses and Main Rivers in the London Borough of Sutton* |

Main Rivers

| **Table 2-4 Flooding from Other Sources – Main Rivers** | |
| --- | --- |
| Description of Source | River flooding occurs when water levels rise as a result of high or intense rainfall which flows into them, resulting in watercourses overflowing or bursting their banks. A main river is defined by the Environment Agency on its [Main River Map](https://www.gov.uk/government/organisations/environment-agency)[[17]](#footnote-18) and is usually a larger river or stream. The following main rivers are present within the London Borough of Sutton, as shown in Figure 5 in [Appendix A](#AppendixA);   * **River Wandle** – the two sources of the Wandle are springs at Carshalton and Waddon, which rise at the junction between the Chalk and the overlying Clays and Gravels. The Carshalton and Waddon branches combine at Hackbridge then flow through Mitcham, where a short tributary called the Beddington Corner branch also joins the main channel. This branch carries discharge from Beddington Sewage Treatment Works. * **Pyl Brook** – this watercourse is a tributary of the Beverley Brook. The Pyl Brook rises to the south of Sutton Common train station at the junction between the Chalk and the overlying Clays and flows south-east to north-west towards the London Borough of Merton. The Anton Crescent Wetland to the south of the watercourse is used as a formal flood storage area when required. * The **East Pyl Brook** (a tributary of the Pyl Brook) rises approximately 200m north of the Pyl Brook and flows approximately northwards towards Morden Park in the London Borough of Merton. Sections of both branches of the Pyl Brook are culverted (e.g. beneath the A217 and the railway line) and the channel is heavily engineered. * **Beverley Brook** – this watercourse passes along the western boundary of Sutton’s administrative area; the Beverley Brook rises in Cuddington Park and it subsequently culverted until Worcester Park Sutton. The channel of this watercourse has historically been heavily modified. The Beverley Brook flood alleviation scheme in Worcester Park was completed in 2012, utilising green spaces for temporary storage of flood waters. The scheme has raised the protection from flooding for approximately 90 properties. |
| Supporting Documents | [London Boroughs of Wandsworth, Merton, Sutton and Croydon Level 1 SFRA](http://www.merton.gov.uk/wmsc_level_1_sfra_-_main_report_2008.pdf)  [London Borough of Sutton SFRA](https://www.sutton.gov.uk/CHttpHandler.ashx?id=5743&p=0)  [Thames Catchment Flood Management Plan](https://www.gov.uk/government/publications/thames-catchment-flood-management-plan)  [Environment Agency Flood Map for Planning (Rivers and Sea)](http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=floodmap) |
| Historic Flooding | The Level 1 SFRA shows historic river flood extents from 1937 and 1968. These datasets show that flooding occurred along the river corridors of the Pyl Brook, the East Pyl Brook and the Beverley Brook on both occasions. Flooding recorded in 1968 was associated with the Beverley Brook in and around Worcester Park. Considerable flooding associated with the Beverley Brook and Pyl Brook was also experienced in July 2007. Historic flood records are shown on [Appendix A](#AppendixA) Figure 1. |
| Future Flood Risk | In December 2013, the Environment Agency published a new set of mapping called the [Risk of Flooding from Rivers and the Sea](http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=floodmap#x=357683&y=355134&scale=2), which shows the risk of flooding from rivers and the sea banded into High, Medium and Low Risk, in a consistent format with the Risk of Flooding from Surface Water and Reservoir Maps (see Table 2-1 and Table 2-6). Whilst this dataset is readily available to the public to understand their own flood risk, the Strategy uses the [Flood Map for Planning (Rivers and Sea)](http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=357683.0&y=355134.0&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=floodmap), also published by the Environment Agency, as the basis to determine future flood risk from rivers. The Flood Map for Planning (Rivers and Sea) defines Flood Zones and is used by Sutton Council, as the Local Planning Authority, to make planning decisions in line with national legislation.  The [National Planning Policy Framework (NPPF)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf)[[18]](#footnote-19) defines Flood Zones associated with tidal and river flooding based upon the probability of flooding. The extent of land adjacent to main rivers within Flood Zone 2 (between a 1 in 100 and 1 in 1000 chance of flooding in any given year) and Flood Zone 3 (greater than 1 in 100 chance of flooding in any given year) varies throughout the Borough, as shown in Figure 4 in [Appendix A](#AppendixA) and overleaf. This figure shows that within the northern part of the Borough, relatively large parts are within Flood Zones 2 and 3 and are at particular risk including:   * Industrial Estates around Beddington Lane, residential properties to the west of London Road (A237) between Wallington Bridge and Wandle Bridge. * Extensive areas of residential properties throughout Hackbridge through to Mill Lane. * Land and properties within the Beverley Brook river corridor including Green Lane, Central Road (A2043), Hazelmere Gardens and Green Lane Primary School. * Land and properties adjacent to the Pyl Brook on Hamilton Avenue and Trafalgar Avenue, Watson Avenue, Westbourne Avenue and Warner Avenue, Willow Walk and Sunnyhurst Close. * Land adjacent to the East Pyl brook including Glastonbury Road, Rosehill Recreation Ground and Glenthorne Recreation Ground.   According to the Environment Agency[[19]](#footnote-20), there are approximately 2,300 properties in areas at risk of river flooding in Sutton; around 3% of all properties in the Borough. The Environment Agency’s National Flood Risk Assessment shows that around 75% of the properties are in areas where likelihood of flooding is low.  The Environment Agency offers a free [flood warning service](http://apps.environment-agency.gov.uk/flood/31618.aspx), which gives advance warning of flooding via telephone, mobile SMS text, e-mail or fax. As of March 2013, 1,409 properties in Sutton were registered to receive flood warnings19. This does not include all properties at risk, though other media, such as local radio, the Environment Agency and Sutton Council websites also broadcast the warnings. |
| Figures -[Appendix A](#AppendixA) | Figure 1: Historic Flooding  Figure 4: Flood Risk from Rivers  Figure 5: Main Rivers & Ordinary Watercourses |

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| **Table 2-4 Flooding from Other Sources – Main Rivers** |
| *Flood Risk from Main Rivers in the London Borough of Sutton* |

Sewers

| **Table 2-5 Flooding from Other Sources – Sewer Flooding** | | |
| --- | --- | --- |
| Description of Source | During heavy rainfall flooding from the sewer system may occur if the rainfall event exceeds the capacity of the sewer system / drainage system, the system becomes blocked by debris or sediment and/or the system surcharges due to high water levels in receiving watercourses. Sewer flooding generally results in localised short term flooding.  Sewers are designed to cope with the vast majority of storms but occasionally rainfall can be so heavy that it overwhelms the system. When this happens, sewage can overflow from manholes and gullies and flood land, rivers and gardens. In the worst cases, sewage can even flood homes.  With the exception of combined sewers in Hackbridge / Beddington and the north-west of the Borough, the majority of Sutton is served by separate foul and surface water sewers with the surface water sewers typically be designed to accommodate a rainfall event with a 1 in 30 chance of occurring in any given year or less. During larger, more intense rainfall events when the capacity of the surface water sewer system is insufficient, many of the sewer systems in the south west of the Borough discharge directly, or via some degree of attenuation, into the natural watercourses of the area. These point discharges can locally increase flood levels in some reaches and, by delivering water rapidly to the watercourse, be an important component of overall flood volume. In the very south of the Borough, systems discharge to soakaways and therefore there is a limited surface water sewer network. | |
| Supporting Documents | London Borough of Sutton SWMP  [London Borough of Sutton PFRA](https://www.sutton.gov.uk/CHttpHandler.ashx?id=15497&p=0)  [Thames Water Utilities website](http://www.thameswater.co.uk/) | |
| Historic Flooding | As part of the SWMP, Thames Water provided information (through their DG5 register[[20]](#footnote-21)) on the total number of properties affected by sewer flooding (both internally and externally) based on historic flooding over the previous 10 years. Thames Water focus their efforts on removing properties from the DG5 register and therefore this dataset may not accurately represent those properties currently at risk. The information presented within the SWMP highlights the wards of Worcester Park, North Cheam, Rosehill and the northern part of Carshalton as having experienced a greater number of sewer flooding incidents than the rest of the Borough.  Sutton is also aware of a number of locations that have historically experienced problems with sewer flooding, including:   * Surcharging of surface water sewer system at Wallington Rail Bridge (photograph below). New soakaway chambers have been installed in this location to alleviate pressure on the sewer system. * Flooding along Cedar Road, Sutton, partially attributed to the design of the surface water sewers at this location. | |
| * Sewer flooding on Nightingale Close which is caused by surcharging of the surface water drainage outfall to the River Wandle during high water levels. This leads to the backing up of floodwater into Nightingale Close. * In Worcester Park, there are four large outfalls enter the channel of the Beverley Brook. The system may be surcharged during periods of high flow in the Beverley Brook resulting in flooding upstream. * In Trafalgar Avenue the largest pipe out falling to the Pyl Brook is a 457mm flowing from the south west; high water levels in the watercourse may result in flooding of the surrounding area. | *Flooding of Wallington Railway Bridge* (*Source:* [*www.yourlocalguardian.co.uk*](http://www.yourlocalguardian.co.uk)*)* |
| Future Flood Risk | Climate change is anticipated to increase the potential risk from sewer flooding as summer storms become more intense and winter storms more prolonged. This combination is likely to increase the pressure on the existing efficiency of sewer systems, thereby reducing their design standard and leading to more frequent localised flooding incidents. Any sewer flooding that may occur could be exacerbated as a result of surface water runoff during extreme rainfall events. However the risk from sewer flooding in the London Borough of Sutton is low as the majority of Sutton is served by separate foul and surface water sewers.  Thames Water will monitor the risk of sewer flooding and put plans in place to manage this, as required, based on their business plan and priorities. The London Borough of Sutton will work with Thames Water to identify flooding hotspots and locations of known sewer capacity issues where risk could be exacerbated.  Thames Water will prioritise investment for potential flood alleviation schemes depending on the severity and frequency of flooding, but this can only be identified where affected property owners report the incident to the water company.  The SWMP states that during high tide river outlets can be submerged, reducing the capacity for water to discharge into watercourses. Water has the potential to flow back up the sewer network and, if sewer capacity is reached, surcharge. The SWMP identifies this process as being of particular concern in Hackbridge where combined sewers outfall into the River Wandle.  However, overall, sewer flooding is not considered to be significant flood risk across the Borough. | |
| Figures -[Appendix A](#AppendixA) | Figure 1: Historic Flooding | |

Artificial Sources

| **Table 2-6 Flooding from Other Sources – Artificial Sources** | |
| --- | --- |
| Description of Source | Artificial sources include any water bodies not covered under other categories and typically include canals, lakes and reservoirs.  Artificial sources located in Sutton include lakes and ponds in Beddington Park.  A covered reservoir is located on Russell Hill, just to the south-east of Sutton in the London Borough of Croydon. In the highly unlikely event of a failure of Russell Hill Reservoir, there is the potential for wide-scale flooding downstream with high depths and velocities experienced, particularly in close proximity to the reservoir, during a worst-case scenario.  Thames Water is the reservoir undertaker for Russell Hill Reservoir. |
| Supporting Documents | [Environment Agency Flood Risk from Reservoirs Map](http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?topic=reservoir#x=357683&y=355134&scale=2)[[21]](#footnote-22)  [London Boroughs of Wandsworth, Merton, Sutton and Croydon Level 1 SFRA](http://www.merton.gov.uk/wmsc_level_1_sfra_-_main_report_2008.pdf)  [London Borough of Sutton Level 2 SFRA](https://www.sutton.gov.uk/CHttpHandler.ashx?id=5743&p=0) |
| Historic Flooding | There are no recorded incidents of flooding from artificial sources within Sutton. |
| Future Flood Risk | Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers on a yearly basis. As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency are responsible for ensuring that reservoirs are inspected regularly and essential safety work is carried out.  In the unlikely event that a reservoir dam failed, a large volume of water would escape at once and flooding could happen with little or no warning. The Risk of Flooding from Reservoirs map, published by the Environment Agency, shows the area and depths of flooding and flow velocities that could occur if a large reservoir were to fail and release the water it holds. A large reservoir is one that holds over 25,000 cubic metres of water, equivalent to approximately 10 Olympic sized swimming pools. Since this is a worst case scenario, it’s unlikely that any actual flood would be this large.  Within Sutton, in the unlikely event that Russell Hill Reservoir were to fail, flood waters would flow northward to the east of Bandon Hill and Church Paddock and into Beddington Park. Flood waters would also flow into the London Borough of Croydon. |
| Figures - [Appendix A](#AppendixA) | Figure 1: Historic Flooding |

* 1. Impact of Climate Change
     1. Current predictions of future rainfall indicate that increasing numbers of severe and extreme weather events are expected in the future. Intense storms are the main cause of surface water flooding, which would also increase in frequency. It is predicted that the frequency of heavy rainfall events could double by the 2080s according to the UK Climate Projections 2009[[22]](#footnote-23). By the 2080s, it is predicted that there could be around three times as many days in winter with heavy rainfall (defined as more than 25mm in a day) and that the amount of rain in extreme storms (with a 1 in 5 annual chance or rarer) could increase locally by 40%. Consequently, the number of properties, business and critical infrastructure at risk will also increase.

Implications for Flood Risk

* + 1. Climate changes can affect local flood risk in several ways. Impacts will depend on local conditions and vulnerability. Wetter winters and more of this rain falling in wet spells may increase river flooding in both rural and heavily urbanised catchments. More intense rainfall causes more surface runoff, increasing localised flooding and erosion. In turn, this may increase pressure on drains, sewers and water quality. Storm intensity in summer could increase even in drier summers, so it is essential to be prepared for the unexpected.
    2. Rising sea or river levels may increase local flood risk inland or away from major rivers because of interactions with drains, sewers and smaller watercourses. There is a risk of flooding from groundwater-bearing chalk and limestone aquifers. Recharge of the aquifers may increase in wetter winters, or decrease in drier summers.
    3. Where appropriate, local studies are needed to understand climate impacts in detail, including effects from other factors like land use. Sustainable development and drainage will help to adapt to climate change and manage the risk of damaging floods in future.

Adapting to Change

* + 1. Past emission means some climate change is inevitable. It is essential to respond by planning ahead. Sutton Council will prepare by understanding the current and future vulnerability to flooding, developing plans for increased resilience and building the capacity to adapt. Regular review and adherence to these plans is key to achieving long-term, sustainable benefits.
    2. Although the broad climate change picture is clear, the Council will have to make local decisions against deeper uncertainty. Sutton Council will therefore consider a range of measures and retain flexibility to adapt. This approach, embodied within flood risk appraisal guidance, will help to ensure that the vulnerability of communities and businesses across the Borough to flooding does not increase.

Including allowances for Climate Change in Flood Risk Management

* + 1. Existing flood risk studies, covering London Borough of Sutton and the wider catchment, have assessed the impacts of climate change and flood risk and provide the evidence base for understanding how this may impact current and future communities and businesses. Further information on how the Strategy takes into account the impacts of climate change is outlined in [Section 5.4](#Section5pt4).
  1. Summary
     1. This Section has afforded a summary of past and future flood risk associated with local sources in Sutton which are the primary focus of the Strategy. A summary of the past and future risk associated with other sources of flooding has also been provided to ensure a comprehensive appreciation of flood risk across the Borough. The sources of flood risk that are of most significance within Sutton are considered to be surface water and sewer water. This does not, however, indicate that the future flood risk from other sources is insignificant.
     2. Indeed, runoff from roads or impermeable areas during heavy rainfall and flooding from road gullies were identified as the main perceived sources of flooding experienced by respondents in the Survey. A smaller number of respondents to the survey also identified large rivers such as the River Wandle or Beverley Brook, blocked sewers or manholes and groundwater and blocked ditches or streams as sources of flooding in their local area. This indicates that surface water flooding is of major concern for respondents within the Borough, though a number of other flood sources are perceived to impact the Borough.

1. Responsibilities for Flood Risk Management
   1. Overview
      1. Flood events are often a complex interaction of flood source(s), pathway(s) and receptor(s), the responsibility for managing which can often lie with a number of different organisations or individuals. As a result, a clear definition of responsibilities and effective communication across these organisations and individuals is vital if the risk to people, property and the environment is to be managed effectively.
      2. The following organisations are designated Risk Management Authorities under the Act have a number of legal responsibilities for managing flood risk in the London Borough of Sutton:

* Sutton Council as the LLFA,
* Environment Agency,
* Thames Water Utilities as the sewerage undertaker, and
* Sutton Council and Transport for London (TfL) as Highways Authorities.
  + 1. All Risk Management Authorities have a duty to cooperate with the LLFA, and other Risk Management Authorities when exercising their flood risk management functions.
    2. In addition, other legislation (such as the [Highways Act 1980](http://www.legislation.gov.uk/ukpga/1980/66/contents)[[23]](#footnote-24), [Land Drainage Act 1991](http://www.legislation.gov.uk/ukpga/1991/59/contents)[[24]](#footnote-25), [Water Resources Act 1991](http://www.legislation.gov.uk/ukpga/1991/57/contents)[[25]](#footnote-26), [Civil Contingencies Act 2004](http://www.legislation.gov.uk/ukpga/2004/36/contents)[[26]](#footnote-27)) place duties and powers upon specific organisations and individuals of relevance to local flood risk management.
  1. Responsibilities of Risk Management Authorities

London Borough of Sutton

*…as the Lead Local Flood Authority*

* + 1. As the LLFA, Sutton Council has a number of duties and discretionary powers under the Act, the Regulations and Land Drainage Act 1991. Figure 3-1 presents the Council’s duties and discretionary powers as the LLFA.

*…as a Highways Authority*

* + 1. The highway drainage system is integral in the management and behaviour of surface water during heavy rainfall events. As a Highways Authority, the [Highways Act 1980](http://www.legislation.gov.uk/ukpga/1980/66/contents) requires that Sutton Council ensure that highways are drained of surface water and where necessary maintain all drainage systems.

*…as an emergency responder*

* + 1. Sutton Council is a Category 1 Responder under the [Civil Contingencies Act 2004](http://www.legislation.gov.uk/ukpga/2004/36/contents) and therefore has a responsibility, along with other organisations for developing emergency plans, contingency plans and business continuity plans to help reduce, control or ease the effects of an emergency. The complex and diverse nature of flooding and the consequences that arise, require a comprehensive and often sustained response from a wide range of organisations, and as such Sutton Council has prepared a multi-agency flood plan[[27]](#footnote-28) to allow all responding parties to work together on an agreed coordinated response to severe flooding.

*…as a Local Planning Authority*

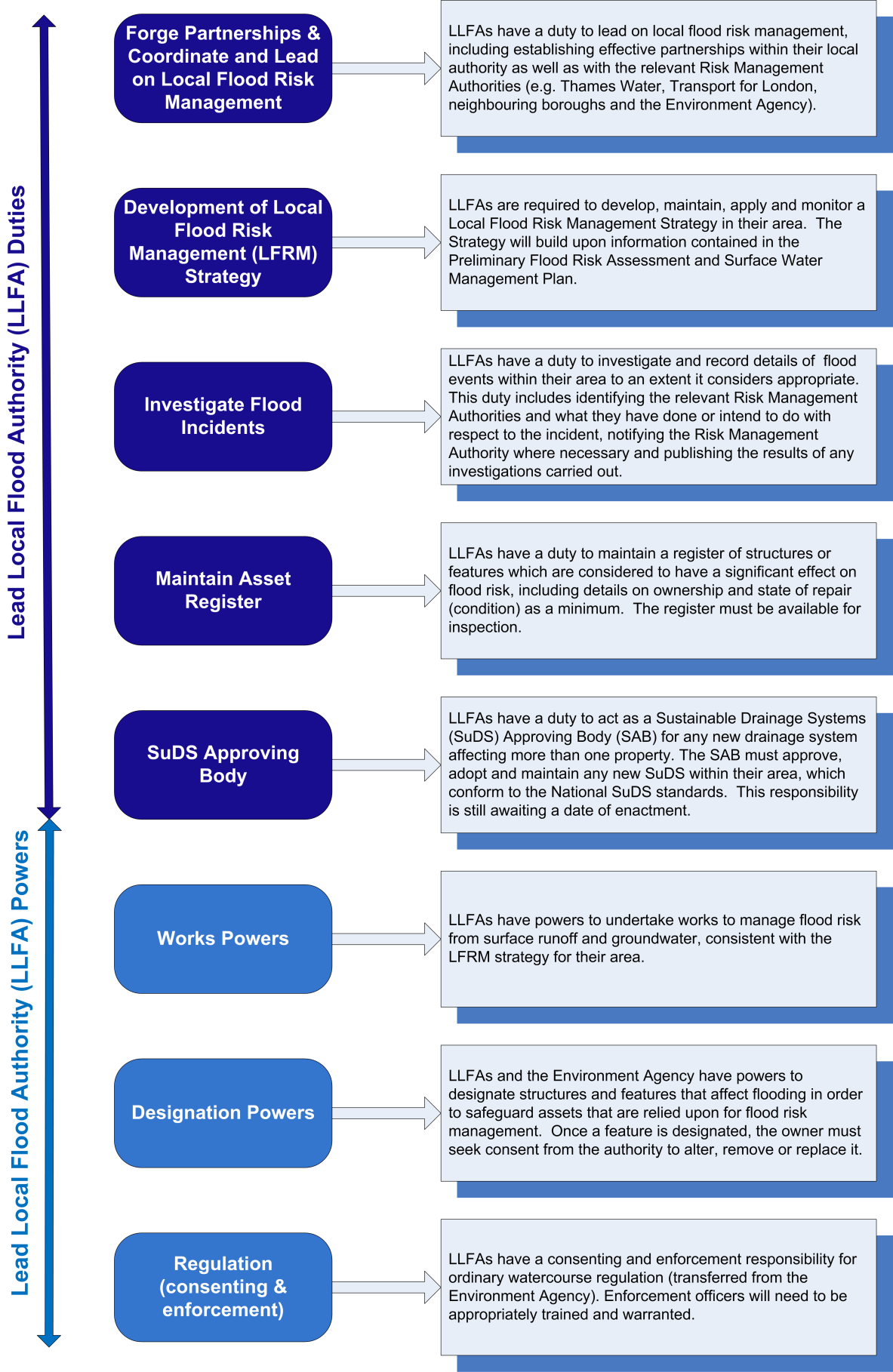
* + 1. As a Local Planning Authority Sutton Council has a responsibility to consider flood risk in their strategic land use planning and the development of their [Local Plan](https://www.sutton.gov.uk/index.aspx?articleid=651)[[28]](#footnote-29). Sutton Council is the ‘decision maker’ on flood risk for planning applications for development, taking into consideration technical advice from other Risk Management Authorities as statutory consultees.
    2. The National Planning Policy Framework[[29]](#footnote-30) (NPPF) and [supporting guidance](http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/)[[30]](#footnote-31) require Local Planning Authorities to undertake a SFRA and to use the findings, and those of other studies, to inform strategic land use planning and to steer development towards areas of lowest flood risk before considering development in areas more prone to flooding, through the application of the Sequential Test . The [London Boroughs of Wandsworth, Merton, Sutton and Croydon Level 1 SFRA](http://www.merton.gov.uk/wmsc_level_1_sfra_-_main_report_2008.pdf) was produced in December 2008 and the [London Borough of Sutton Level 2 SFRA](https://www.sutton.gov.uk/CHttpHandler.ashx?id=5743&p=0)[[31]](#footnote-32) produced in July 2009, both to support the Local Plan. When considering applications for development, site-specific flood risk assessments are a requirement of the NPPF. The London Borough of Sutton Level 2 SFRA outlines what a spite-specific flood risk assessment should include.

*…as an Asset Owner*

* + 1. Sutton Council is responsible for the maintenance of Council owned assets which have a role in flood risk management including drainage ditches, gullies, trash screens and culverts.

*…as the Regulator of Ordinary Watercourses*

* + 1. Sutton Council has powers in relation to ordinary watercourse regulation under the [Land Drainage Act 1991](http://www.legislation.gov.uk/ukpga/1991/59/contents). Any works (either temporary or permanent) that may alter or impact the flow or storage of water within an ordinary watercourse will require consent from the Council prior to any work being carried out. Sutton Council therefore has:
* The power to serve notice on riparian landowners along ordinary watercourses who need to carry out maintenance to reduce flooding, and
* The power to serve notice on a person to abate a nuisance in relation to an ordinary watercourse where that nuisance is an obstruction erected, raised or altered or any culvert erected or altered without prior consent as required under Section 23 of the Land Drainage Act 1991.



*Figure 3-1 Duties and Discretionary Powers for London Borough of Sutton under the Act*

Environment Agency

* + 1. The Environment Agency is responsible for managing flooding from main rivers, tidal sources and the sea and has a responsibility to provide a strategic overview for all flooding sources and coastal erosion. The Environment Agency take a risk based approach to flood risk management and have a number of roles and responsibilities including as a statutory consultee on flood risk throughout the planning process and regulation of third party works on main rivers.

Thames Water Utilities Ltd

* + 1. Thames Water is responsible for surface water drainage from development via adopted sewers and for maintaining public sewers into which much of the highway drainage (both Sutton Council’s and TfL’s) connects.
    2. In October 2011 water and sewerage companies in England and Wales became responsible for private sewers which were previously the responsibility of property owners. However, not all private sewers were included; there are some cases where the property owners remain responsible for the sections of pipe between the property and the transferred private sewer. Further information is available via [Thames Water’s website](http://www.thameswater.co.uk/)[[32]](#footnote-33).

Transport for London (TfL)

* + 1. Under the Highways Act 1980, TfL have responsibilities for the effectual drainage of surface water from adopted roads along red routes insofar as ensuring that drains, including kerbs, road gullies and ditches and the pipe network which connect to the sewers, are maintained.
  1. Flood Risk Management Responsibilities for Others
     1. Sutton Council recognises the vital role individuals, communities and businesses have in managing flood risk and the requirement for more information to be available to support these initiatives. The Strategy aims to promote and encourage personal responsibility by raising awareness of flood risk, how this risk can be reduced and by supporting community-based actions.

Sutton and East Surrey Water plc

* + 1. Flooding from burst water mains is excluded from the Act. However, under the [Water Industry Act 1991](http://www.legislation.gov.uk/ukpga/2014/21/contents/enacted), Sutton and East Surrey Water, as the water undertaker for the London Borough of Sutton, has a duty to ensure it maintains and improves its water mains and other pipes.

Property Owners and Residents

* + 1. It is the responsibility of householders and businesses to look after their property, including protecting it from flooding. It is important that householders, whose homes are at risk of flooding, take steps to ensure that their home is protected. Practical guidance can be found in the publication ‘Prepare your property for flooding’ available on the [Environment Agency website](https://www.gov.uk/prepare-for-a-flood)[[33]](#footnote-34).

Riparian Owners

* + 1. Property or land owners who own land which is adjacent to a watercourse or land which has a watercourse running through it, are riparian owners and have certain legal responsibilities to maintain the watercourse. Where a watercourse marks the boundary between adjoining properties, it is normally presumed the riparian owner owns the land up to the centre line of the watercourse.
    2. Risk Management Authorities have powers and responsibilities to manage flood risk and work with others to improve river environments. This may often affect riparian owners, who must also adhere to certain responsibilities including;
* To maintain the watercourse and to clear any obstructions (natural or otherwise) so the normal flow of water is not impeded,
* To maintain the banks and bed of the watercourse and any flood defences that exist on it,
* To accept the natural flow from their upstream neighbour and transfer it downstream without obstruction, pollution or diversion,
* To maintain any structures on their stretch of watercourse including culverts, weirs and mill gates, and
* To apply to Sutton Council for formal consent for any works in or adjacent to an ordinary watercourse, or to the Environment Agency for works within 8m of a main river.
  + 1. Sutton Council has permissive powers to carry out flood defence works for ordinary watercourses at their discretion, in a similar manner to those powers used by the Environment Agency for main rivers. Further information for riparian owners on their responsibilities is available in the Environment Agency publication ‘[Living on the Edge’](https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities)[[34]](#footnote-35) and on the [Environment Agency website](https://www.gov.uk/river-maintenance-and-drainage-charges-farmers-and-landowners)[[35]](#footnote-36). Further information about all of the Risk Management Authorities and their duties can be found on Sutton Council’s [website](https://www.sutton.gov.uk/index.aspx?articleid=18980)[[36]](#footnote-37).

Insurance Companies

* + 1. Insurers do not have any statutory duties or responsibilities under the Act. However, the Flood Reinsurance Scheme under the [Water Act 2014](http://www.legislation.gov.uk/ukpga/2014/21/contents/enacted)[[37]](#footnote-38), known as ‘Flood Re’, is a not-for-profit scheme proposed by the Association of British Insurers to safeguard the availability and affordability of flood insurance for properties at high risk. The scheme will cap the flood aspect of buildings insurance according to council tax band, and will be funded by an annual levy on all household premiums. Properties in Tax band H and properties built since 2009 are not covered by the scheme.

1. Objectives for Managing Local Flood Risk
   1. London Borough of Sutton’s Local Objectives
      1. The aim of the Local Strategy is to work in partnership with local communities, and organisations responsible for managing flooding, in order to better understand and reduce local flood risk in Sutton where it is economically, technically, socially, and environmentally feasible to do so. To achieve this aim a number of key objectives have been identified.

**London Borough of Sutton Local Strategy Objectives**

1. Improve our understanding and data holdings regarding mechanisms of flooding in Sutton,
2. Build on relationships with Risk Management Authorities and maximise joint working opportunities for multiple benefits,
3. Proactively encourage sustainable practices and identify opportunities for holistic water management across the Borough,
4. Reduce the number of homes and businesses at risk of flooding, and
5. Support local residents to increase their own resilience to flooding.

*Figure 4-1 Local Flood Risk Management Objectives*

* 1. Guiding Principles for Setting Objectives
     1. The objectives for the London Borough of Sutton Strategy have been developed in line with the Environment Agency’s [National Flood and Coastal Erosion Risk Management Strategy for England](https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england)[[38]](#footnote-39), the outcomes from the public engagement exercise undertaken to inform to the Strategy and discussions with Sutton Council and Risk Management Authority officers.

National Flood Risk Management Objectives

* + 1. The Environment Agency’s [National Strategy](https://www.gov.uk/government/publications/national-flood-and-coastal-erosion-risk-management-strategy-for-england) sets out the following national objectives for flood risk management:
* **Understand the risks** – understanding the risks of flooding and coastal erosion, working together to put in place long-term plans to manage these risks and making sure that other plans take account of them,
* **Prevent inappropriate development** – avoiding inappropriate development in areas of flood and coastal erosion risk and being careful to manage land elsewhere to avoid increasing risks,
* **Manage the likelihood of flooding** – building, maintaining and improving flood and coastal erosion management infrastructure and systems to reduce the likelihood of harm to people and damage to the economy, environment and society,
* **Help people to manage their own risk** – increasing public awareness of the risk that remains and engaging with people at risk to encourage them to take action to manage the risks that they face and to make their property more resilient, and
* **Improve flood prediction, warning and post-flood recovery** – improving the detection, forecasting and issue of warnings of flooding, planning for and co-ordinating a rapid response to flood emergencies and promoting faster recovery from flooding.

Guiding Principles for Local Flood Risk Management

* + 1. The National Strategy’s strategic aims and objectives are supported by six high-level principles, to guide decisions on risk management activities, and the process by which they are taken, at both a national and local level. Sutton Council has used these to guide the development of objectives and identification of measures to deliver local flood risk management within Sutton.

*Figure 4-2 Guiding Principles for Local Flood Risk Management*

* + 1. Sutton’s Strategic Plan ‘[One Planet Sutton](http://www.oneplanetsutton.org/)’ is a community-led vision for Sutton with the aim of encouraging sustainability in a wide range of areas. The One Planet Sutton Plan has been considered within this strategy, influencing a focus on the involvement of the community in flood risk management. The Strategy is aligned with the Plan, and in particular the one of the Plan’s targets ‘to better protect homes from flooding’.

Public Priorities for Local Flood Risk Management

* + 1. The outcomes from the online survey undertaken to capture community objectives and priorities for flood risk management ([Appendix C](#AppendixC)) were used to inform the development of the local objectives for local flood risk management. Beyond keeping people safe and protecting life, respondents to the Survey identified reducing the risk of flooding to homes and critical infrastructure as their priorities for flood risk management.

1. Delivery of Local Flood Risk Management
   1. Overview
      1. This section sets out how the local flood risk management objectives will be delivered over the next six years. A number of measures and actions have been identified to achieve this, and these are set out in the Action Plan that accompanies the Local Strategy as provided in [Appendix B](#AppendixB). These will help to improve the understanding of flood risk across the Borough and inform the way flood risk is reduced and planned for, and to increase resilience against the impacts of climate change.
      2. In delivering flood risk management, there is the opportunity to deliver environmental objectives and requirements, as set out in European Legislation including the [Water Framework Directive](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:EN:NOT). A Strategic Environmental Assessment and a Habitats Regulations Assessment Screening exercise has been undertaken to inform the Strategy development; further details are provided in [Section 6](#Section6).
      3. Specifically this section outlines:

* The delivery of local flood risk management in the London Borough of Sutton to date ([Section 5.2](#Section5pt2)),
* How Sutton Council will deliver their legislative duties under the Act ([Section 5.3](#Section5pt3)),
* How the London Borough of Sutton local flood risk management objectives will be delivered ([Section 5.4](#Section5pt4)),
* How local flood risk management measures will be prioritised ([Section 5.5](#Section5pt5)),
* How local flood risk management measures will be funded ([Section 5.6](#Section5pt6)), and,
* Steps communities, residents and businesses can take to prepare for flooding ([Section 5.7](#Section5pt7)).
  + 1. The [Sutton Council website](file:///\\sutton_data\civ_cifs01$\CIV-AS08\Shared\Flood%20Risk%20Management\2.%20FWMA%20Duties\1.%20Local%20Flood%20Risk%20Management%20Strategy\LB%20Sutton%20Council%20web%20pages%20for%20Flood%20Risk%20Management%20https:\www.sutton.gov.uk\index.aspx%3farticleid=18980)[[39]](#footnote-40) provides the latest information on flood risk management in Sutton.
  1. Delivery of Local Flood Risk Management to Date
     1. As the LLFA, Sutton Council has already undertaken a number of activities to deliver duties under the Act and the Regulations and take a proactive approach to delivering local flood risk management in Sutton. Some of the key activities undertaken to date include:
* Production of a Surface Water Management Plan,
* Production of a [Preliminary Flood Risk Assessment](https://www.sutton.gov.uk/CHttpHandler.ashx?id=15497&p=0),
* Setting up and attending quarterly meetings of the South West London Strategic Flood Group (see [Section 5.3](#Section5pt3) for further information),
* Applying for funding through the Drain London project, administered by the Greater London Authority, and the Environment Agency to undertake investigations into flooding risk, mechanisms and potential mitigation schemes in Critical Drainage Areas (CDAs). Table 5-1 shows Sutton’s CDA investigation work undertaken to date,
* Improving understanding of local flood risk through collating historic and emerging information on local flood risk and mechanisms, working with neighbouring authorities and Risk Management Authorities , and attending capacity building workshops run by Defra and the Environment Agency,
* Supporting community-led initiatives that deliver wider environmental objectives alongside flood risk management activities, e.g. [One Planet Sutton](http://www.oneplanetsutton.org/),
* Setting up procedures and delivering legislative duties as required under the Act and the Regulations (see [Section 5.3](#Section5pt3)), and,
* Undertaking a joint commission, with the South West London Strategic Flood Group, to deliver the South West London Flood and Water Management Act 2010 Roadmap, identifying the required legislative duties, proposed delivery route for these and opportunities for joint working across South West London Boroughs.

|  |  |
| --- | --- |
| **Table 5-1 – London Borough of Sutton CDA Investigations** | |
| **CDA** | **Status** |
| CDA 22 (Worcester Park) | No Sutton Council bids submitted to date. |
| CDA23 (Trafalgar Ave/Hamilton Ave) | Bid submitted for FCRM GiA funding in 2013.  No funding at present. |
| CDA24 (Sandy Lane, Cheam) | Bid submitted for FCRM GIA funding in 2011/12.  Detailed modelling completed March 2014. |
| CDA25 (York Road) | Bid submitted for FCRM GiA funding in 2013.  No funding at present. |
| CDA26 (Cedar Road/Brighton Road (Overton Grange)) | Bid submitted for FCRM GIA funding in 2011/12.  Detailed modelling completed March 2014.  Funding agreed for 2014/15.  Gained indicative funding for 2015/16 from the FCRM GiA. |
| CDA27 (Carshalton Beeches) | Bid submitted for Drain London (GLA) funding in 2011/12.  Detailed modelling completed March 2014 – part funded by Drain London (GLA) and Sutton Council.  Further FCRM GiA bid submitted 2014. Awaiting outcome. |
| CDA28 (Carshalton Centre) | Bid submitted for FCRM GiA funding in 2013.  Local Levy funding granted for 2014/15. |
| CDA29 (Beddington Gardens) | Bid submitted for FCRM GiA funding in 2014. Awaiting outcome. |
| CDA30 (Wallington) | No bids submitted to date. |
| CDA31 (South Beddington) | No bids submitted to date. |
| CDA32 (London Road, Hackbridge): | Bid submitted for FCRM GiA funding in 2011/12.  Detailed modelling completed March 2014. |
| CDA33 (Hackbridge Town) | Bid submitted for FCRM GiA funding in 2013.  Local Levy funding granted for 2014/15. |

* 1. Delivery of Legislative Duties
     1. Under the Act, Sutton Council has a number of duties and powers relating to the management of local flood risk. The existing procedures in place and the proposed measures to deliver these are outlined below.

Forge Partnerships and Lead on Local Flood Risk Management

*Internal Flood Group*

* + 1. The discharging of the duties and responsibilities associated with the Flood and Water Management Act is led by the Highways team at Sutton Council, which is part of the Environment and Neighbourhoods Directorate.
    2. Sutton Council has had an Internal Flood Group for a number of years following the flooding experienced in summer 2007. The Internal Flood Group set-up is currently being reviewed and it is planned that officers from a number of teams, including Highways, Planning (including Planning Policy), Emergency Planning, Sustainability, Building Control, Development Control, Conservation, Communications, Parks, and GIS will be part of the future Flood Group. In addition, representatives from the Wandle Trust, the Environment Agency and Thames Water will be invited to attend meetings of the Flood Group, as appropriate.

*South West London Strategic Flood Group*

* + 1. The Strategic Flood Group was formed in 2011 and reports to the Thames Regional Flood and Coastal Committee. The Group comprises the six LLFAs covering South West London, namely, London Borough of Croydon, The Royal Borough of Kingston upon Thames, London Borough of Merton, London Borough of Sutton, London Borough of Richmond upon Thames and London Borough of Wandsworth, and the Environment Agency and Thames Water Utilities Ltd.
    2. The Group meet quarterly to share best practice and understanding of flood risk across South West London, and, where possible, provide coordinated and collaborative management of flooding.

*Groundwater Solution Cell*

* + 1. This group was set up in 2014 during a period of unprecedented rainfall where rapidly rising groundwater was realised as a significant threat, and which needs to be approached at a regional scale. At the time of writing, the group is chaired by a member of London Fire Brigade, Bexley and comprises the Environment Agency and five LLFAs in South London, namely London Borough of Bexley, London Borough of Bromley, London Borough of Croydon, Royal Borough of Greenwich and London Borough of Sutton (although there is intention to involve further authorities as plans progress). The group has been formed to try to establish sustainable operational solutions for groundwater flooding at a regional scale through a multi-agency partnership and therefore reduce risk to people and property across the region.

*Regional Flood and Coastal Committee*

* + 1. The [Thames Regional Flood and Coastal Committee](https://www.gov.uk/government/groups/thames-regional-flood-and-coastal-committee)[[40]](#footnote-41) was established in accordance with the Act and is composed of elected members appointed by each LLFA and independent members appointed by the Environment Agency with relevant experience in the Thames Region. The Committee has three primary functions:
* To ensure there are coherent plans for identifying, communicating and managing flood and coastal erosion risks across catchments,
* To promote efficient, targeted and risk-based investment in flood and coastal erosion risk management that optimises value for money and benefits for local communities, and
* To provide a link between the Environment Agency, Lead Local Flood Authorities, other Risk Management Authorities, and other relevant bodies to engender mutual understanding of flood and coastal erosion risks in its area.
  + 1. The South West London Strategic Flood Group is represented on the RFCC by a Councillor from one of the six boroughs.

Investigate Flood Incidents

* + 1. Under Section 19 of the Act, Sutton Council as the LLFA, has a duty to report and investigate flooding incidents that are considered to be ‘significant’. For all flood incidents deemed ‘significant’, Sutton Council must investigate which Risk Management Authorities have relevant flood risk management functions and whether they have carried out, or intend to carry out, those functions. A Flood Investigation Report and a summary of the key findings will subsequently be published on the Sutton Council [website](https://www.sutton.gov.uk/index.aspx?articleid=18980) and the relevant Risk Management Authorities will be notified.

Sutton Council has three methods for receiving flooding incidents:

1. Notification from external agencies,
2. Notification from internal officers, or
3. Notification from members of the public (either directly or via the Call Centre or online tool ‘Report It’.
   * 1. A Section 19 Flood Investigation will take place if the incident meets the threshold criteria that have been defined by Sutton Council as follows:

* If **internal flooding of one property** has been experienced **on more than one occasion**,
* Where **internal flooding** of **five or more properties** has been experienced during a **single flood incident**, or
* Where **critical infrastructure** has been affected by flooding **more than once within a 12 month period** (e.g. main roads impassable to traffic).
  + 1. Investigations may also be carried out at the discretion of Sutton Council where the source of the flooding is ambiguous. Where the determination will not result in a formal investigation the Investigating Officer will attempt to assist members of the public in identifying the source of flooding and advise accordingly.
    2. Each investigation will include a history of flooding at the location, the reason for carrying out the investigation, identify the location on a map, record information about the flood event (i.e. what occurred, when, identifying possible causes), establish the drainage system in the area, the associated Risk Management Authorities (their roles and responsibilities and contact details), and any rainfall data about the storm event(s) that caused the flooding (where possible, from the Environment Agency). For each authority which is deemed to have a relevant function/responsibility a summary of what has been done and/or what is going to be done in response to the flooding incident will be specified.
    3. Upon completion of a flood investigation, a Flood Investigation Report will be completed. A summary of the key findings will be published on the council [website](https://www.sutton.gov.uk/index.aspx?articleid=18980).
    4. All flood incidents which are reported to Sutton Council will be recorded in Sutton Council’s Flood Incident Database, regardless of whether the flood incident has been deemed to be significant, to assist in understanding local flood risk and building an evidence base to take forward future projects or schemes, where funding is available.

Maintain an Asset Register

* + 1. The London Borough of Sutton Highways team have developed a simple register of structures and features which is available for the public to view at the Council's Denmark Road offices upon request. Presently it includes the location and details on bridges, culverts, trash screens and weirs owned by Sutton Council on ordinary watercourses.
    2. It is intended that more detailed information will be added to this register in the future as and when time and finances allow.

SUDS Approving Body

* + 1. The Act includes a commitment to bring in further legislation to make it compulsory for developments and redevelopments to include SuDS to manage surface water runoff. Suitable surface water mitigation measures will need to be incorporated into new and redevelopment plans in order to reduce and manage surface water flood risk to, and posed by, the proposed development and provide wider environmental benefits.
    2. SuDS are surface water management measures that take account of water quantity (flooding), water quality (pollution) and amenity issues. SuDS aim to mimic nature and typically manage rainfall close to where it falls. SuDS can be designed to slow water down (attenuate) before it enters watercourses, provide areas to store water in natural contours and allow water to soak (infiltrate) into the ground or evaporate. Benefits can include reducing flood risk, minimising diffuse pollution, maintaining or restoring natural flow regimes, improving water resources and enhancing amenity. Incorporation of SuDS measures can contribute to sustainable development and improve urban design, by balancing the different issues that influence the development of communities, whilst delivering wider environmental benefits.
    3. When enacted, Schedule 3 of the Act will establish Sutton Council as the SuDS Approving Body (SAB) for the London Borough of Sutton, and give the Council statutory responsibility for approving drainage applications and, in some cases adopting and maintaining, the approved drainage systems. Under this remit, they have power to refuse approval, and therefore prevent the commencement of the development until an approved drainage application has been submitted.
    4. Developers will be required to submit a drainage application to the SAB for any works that have a drainage implication, either as a stand-alone application or as part of a combined planning application. The drainage application must contain the full design, construction, operation and maintenance details of a drainage system to manage surface water which demonstrates compliance with the National SuDS Standards.
    5. Figure 5-1 outlines the likely process that developers would follow for SuDS approval.

*Figure 5-1 The SuDS Approval Process*

* + 1. Sutton Council will review the requirements for the SAB set up as information is made available from Central Government.
    2. However, Sutton Council has already made some progress in setting the foundations for delivering this duty including:
* Internal discussions have taken place regarding the best way to establish the SAB,
* Discussions are being held with neighbouring boroughs regarding the potential to establish a shared SAB resource through the South West London Strategic Flood Group, and
* Developing a SUDS Design and Adoption Guide specific to Sutton Council which includes local SUDS standards that developers will need to adhere to when submitting SAB applications.

Powers to do Works and Designate Structures

* + 1. Sutton Council has established a four stage procedure for designation of structures and features that affect flooding.

1. Identification of an asset (checking it meets the five criteria set by Sutton Council for designation, see below),
2. Consultation to establish the owner of the structure or feature,
3. Provisional designation, and
4. Official designation.

The five criteria for asset designation have been defined as follows:

* The designated feature is a structure or a natural or man-made feature of the environment,
* The designating authority thinks the existence or location of the structure or feature affects either flood or coastal erosion risk,
* The designating authority has flood or coastal risk management functions dealing with the type of risk considered present,
* The structure or feature is not already designated by another authority, and
* The owner of the structure or feature is not a designating authority.
  + 1. To date, Sutton Council has not designated any structure or feature. Any structures or features that are designated will be added to the Council's Asset Register with the relevant ownership details included.

Regulation of Ordinary Watercourses

* + 1. Sutton Council has established Consenting and Enforcement procedures for the Regulation of Ordinary Watercourses. The Ordinary Watercourse Consent Application form, as well as associated guidance documents, can be downloaded from the Council's [website](https://www.sutton.gov.uk/index.aspx?articleid=18986).
  1. Delivery of Local Flood Risk Management Measures

Overview

* + 1. Keeping people safe and protecting life is always the priority for flood management. Beyond this there are a number of measures that can be taken to manage the risk and impacts of flooding on local communities, businesses, infrastructure, heritage and the environment in line with the delivery of the Local Strategy objectives.
    2. A number of measures have been considered as part of the public engagement process and through discussions with Sutton Council and Risk Management Authority officers in forming this Strategy to deliver the local flood risk management objectives in Sutton over future years.

Public Priorities for Future Flood Risk Management in Sutton

* + 1. As part of the public engagement undertaken in developing this Strategy ([Appendix C](#AppendixC)), residents, communities and businesses were asked to identify how they thought the local flood management priorities they identified could be achieved within Sutton. The following were preferred by respondents:
* Working with planners to ensure new development does not make flooding worse,
* Focussing work on areas that are at risk of flooding, and
* Undertaking work where opportunities arise.

Measures to Deliver the Local Flood Risk Objectives

* + 1. Table 5-2 outlines the measures identified to deliver the local flood risk management objectives for the London Borough of Sutton and the flood risk management guiding principles that they achieve.

| **Table 5-2 London Borough of Sutton Local Flood Risk Management Objectives and Measures** | | |
| --- | --- | --- |
| **Objective** | **Measures proposed to deliver the objectives** | **Guiding Principles** |
| 1. *Improve our understanding and data holdings regarding mechanisms of flooding in Sutton.* | * Put a system in place to enable the capture and interrogation of information regarding historic flood risk. * Update and utilise existing flood studies to inform the understanding of flood risk across the Borough. * Improve understanding of the hydrological links between boroughs and work with neighbouring LLFAs where cross-boundary issues exist. * Improve how flood risk information is communicated in-house and influences different work streams of the Council. * Develop and prioritise area-wide action plans for critical drainage areas based on Surface Water Management Plan. * Gain better understanding of the threat groundwater poses in Sutton and its influence on SuDS and future development. | * Proportionate and risk based approach |
| 1. *Build on relationships with Risk Management Authorities and maximise joint working opportunities for multiple benefits.* | * Work with Risk Management Authorities and stakeholders to maximise partnership working opportunities to deliver flood remediation at catchment and local levels. * Continue to support the South West London Flood Group and seek opportunities for collaborative working and sharing of best practice across South West London. | * Multiple benefits * Community focus and partnership working * Catchment based approach |
| 1. *Proactively encourage sustainable practices and identify opportunities for holistic water management across the Borough.* | * Set up Sustainable Drainage System Approving Body (SAB). * Raise awa**r**eness and proactively identify opportunities for SuDS and source-control techniques. * Ensure sustainable water policy is being implemented effectively and the water environment managed holistically. | * Catchment based approach * Sustainability |
| 1. *Reduce the number of homes and businesses at risk of flooding.* | * Seek opportunities to carry out flood alleviation works to reduce the likelihood of flooding in Sutton. * Seek funding for further flood alleviation works. * Ensure council extreme weather event and flood recovery plans are kept updated. | * Proportionate and risk based approach * Beneficiaries encouraged to invest |
| 1. *Support local residents to increase their own resilience to flooding.* | * Educate residents to understand how they can influence and get involved in local flood risk management. * Encourage public understanding and acceptance of particular areas being designed to provide flood storage as well as other multiple benefits when dry. | * Community focus and partnership working * Sustainability * Multiple benefits |

Short Term Actions

* + 1. In the short term (the first 2 years of the Strategy), local flood risk management will focus on:
* Communication and education,
* Building flooding evidence and understanding,
* Continued delivery of investigations and schemes in higher surface water risk areas (CDAs) where funding has been secured, in line with ongoing investigations as outlined in Table 5-1,
* Identifying funding streams for undertaking investigations and schemes in other CDAs and high risk areas,
* Reviewing and updating the Flood Incident Database on a monthly basis and/or following a major flooding incident,
* Re-establishing the Sutton Internal Flood Group,
* Obtaining Defra Groundwater Emergence mapping and BGS dataset 'Infiltration for SUDS',
* Attending regular (3-monthly) South West London Strategic Flood Group Meetings and report outcomes to Sutton Flood Risk Management Team,
* Planning for required resources for SAB applications at Sutton,
* Developing a schedule to monitor funding sources and changing requirements on a monthly to 2 monthly basis to ensure opportunities are maximised, and
* Developing the Council’s flood risk management website to provide more flood risk advice, establishing a regular review process to allow for updates.

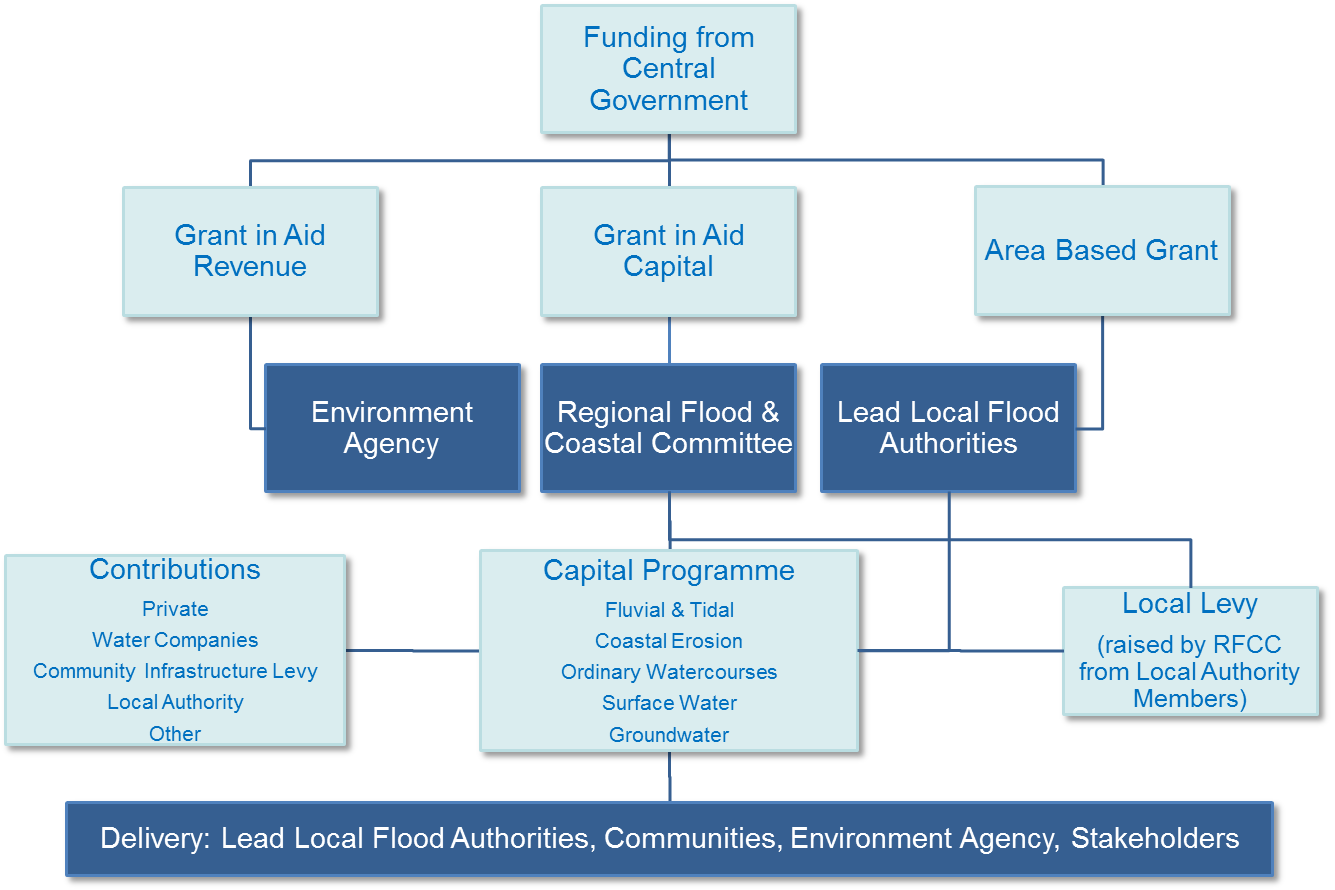
Medium Term Actions

* + 1. In the medium term to longer term, as flooding evidence and understanding increases, projects and schemes will be identified, developed and progressed, where funding allows, to address local flood risk in those areas at greatest risk. CDAs have been identified as areas within the Borough with a higher risk of flooding and schemes within these areas will be prioritised.
    2. The types of future schemes and mitigation for the different sources of flooding are likely to include those outlined in Table 5-3, though this list is not exhaustive.

| **Table 5-3 Example Measures for Managing Local Flood Risk** | |
| --- | --- |
| **Flood Source** | **Example Measures** |
| Surface Water | * Defined schemes or projects for specific areas of highest flood risk, which could include SuDS (particularly with new developments). Examples include; green roofs, soakaways, swales, permeable paving, rainwater harvesting and detention basins. * Communication and Education. * Planning control and policies, e.g. controlling paving of front gardens. * Individual actions, e.g. de-paving of front gardens. * Designing for exceedance approaches - using urban areas and infrastructure to help manage local flooding. Guidance is available in the [CIRIA Surface Water Management Guidance](http://www.susdrain.org/resources/ciria-guidance.html) (C738a)[[41]](#footnote-42). * Property Level Protection & Resilience Measures – Guidance on [Property Level Flood Resilience for Property Owners](http://www.bre.co.uk/filelibrary/pdf/projects/flooding/Property_owners_booklet_v2_web_(2).pdf)[[42]](#footnote-43) is available, and further information is provided through independent organisations including the [National Flood Forum](http://nationalfloodforum.org.uk/) and the [Environment Agency](https://www.gov.uk/prepare-for-a-flood/improve-your-propertys-flood-protection). * Highways maintenance regime. |
| Groundwater | Groundwater is particularly difficult to mitigate and manage. Engineering solutions to mitigate groundwater flooding are limited because of the large volumes of water and spatial areas involved, and because it is not contained or channelled.  Potential measures could include:   * Controlling groundwater levels in the subsurface through pumping. * Controlling groundwater levels at the surface by channelling and diverting the flow of water at the surface away from sensitive downstream receptors and dealing with pinch points where water is forced through a narrow corridor, such as an existing culvert, to avoid water backing up. * Dealing with the consequences of groundwater flooding through: * Strategic level actions, such as establishing a Community Flood Action Group of household level protection, or, * Site specific (property owner) actions, such as sealing floors, lower parts of walls and opening and installing sump and pump systems.   Guidance on how [property owners can help themselves to reduce the impact of flooding from groundwater](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297421/flho0911bugi-e-e.pdf)[[43]](#footnote-44) is available via the Environment Agency website. |
| Ordinary Watercourses | Poor maintenance of ordinary watercourses has the potential to increase the risk of flooding in the future. Due to an expected lack of funding for maintenance of ordinary watercourses in the future, prioritisation of ordinary watercourses within the Borough, along with gullies and other flood risk assets will be key to maximise the positive impact of flood risk management activities carried out by Sutton Council. As such, appropriate measures might be:   * Work with landowners and riparian owners to ensure they are aware of their rights and responsibilities and fulfil those. * Management and maintenance of watercourses, e.g. keeping watercourses clear of debris and vegetation to ensure that the flow of water is not impeded. * Ensuring culverts and trash screens are not blocked through regular inspection, particularly when heavy rainfall is expected. * Undertaking works to: * increase the size of culverts, where this does not increase flood risk downstream, * develop additional storage for flood water, and * de-culvert watercourses, where feasible to do so. |

Planning for Climate Change

* + 1. Sutton Council will seek to use the best available information and evidence on climate change to inform ongoing local flood risk management.
    2. In taking forward local flood risk management measures Sutton Council will:
* Seek to understand how climate change might impact flood risk to communities and businesses,
* Assess how climate change impacts on flood risk may affect the London Borough of Sutton objectives for managing flooding over the longer term,
* Explore what options could be used to manage those impacts of climate change on flood risk, and
* Raise awareness within communities and businesses on the causes and potential impacts of climate change and how they can reduce these by taking action now.
  1. Prioritising Local Flood Risk Management Measures
     1. It is not possible to prevent all flooding, and with limited resources and funding flood risk management work will need to be prioritised. The approach must be proportionate and risk based and all authorities have to ensure that environmental consequences are taken into account.
     2. Projects are likely to fall under three broad categories:
* Schemes with highest eligibility for national funding,
* Local priorities with lower eligibility for national funding, and,
* Ongoing programmes of work and maintenance schedules
  + 1. Each measure in this strategy has been split into a number of actions (as outlined in the Action Plan in [Appendix B](#AppendixB)) and these have been prioritised as High, Moderate or Low based on current understanding of local flood risk and resources and funding available to address this across the Borough.
    2. As understanding of flood risk improves specific mitigation schemes and activities will be developed to address flood risk in those areas at greatest risk. This will require a clear protocol in terms of identifying which actions or schemes should be taken forward given the limited local and national funding streams. In these cases the following will be important considerations:
* **Risk** - the risk of doing nothing in terms of economic, social and environmental terms,
* **Consequence** - how many people or properties the measure or scheme could impact, e.g. an individual property, ward or the Borough as a whole, and
* **Deliverability** - including costs and technical deliverability, e.g. providing information on flood resilience measures via the council website would be cheaper and technically easier to implement than designing and implementing a large flood alleviation scheme.
  + 1. Moving forward, to ensure funding and resources are targeted to those areas and actions of highest importance Sutton Council will prioritise local flood risk management activities based on the following, where:
* There is a historic and ongoing flood risk from local flooding sources (surface water, groundwater and smaller watercourses and ditches),
* Funding is available,
* There is an identified benefit to properties, communities, businesses and / or infrastructure,
* Funding is made available by partners, where perhaps traditional funding sources are not available or cannot fully fund the cost of the measure,
* The measure delivers benefit and mitigation to areas identified as being at risk through London Borough of Sutton's Strategy, SWMP, SFRA or PFRA, and
* Schemes deliver multiple benefits, including wider environmental benefits.
  + 1. The prioritisation of schemes and actions will be reviewed annually based on available funding, resources and local priorities, and published on the Sutton Council website.
  1. Funding for Local Flood Risk Management
     1. Local flood risk management measures will require funding from a variety of sources, both internal and external to the Council. The primary funding sources to date have been through central government funding, however, there are significant pressures on these funding sources in the current economic climate, and in the future there will be greater emphasis on LLFAs to fund activities and schemes from their own or alternative local sources of funding. There are a number of routes through which central government funding may contribute towards flood risk management activities, as detailed in Figure 5-1 and summarised below.



*Figure 5-2 Summary of LLFA Potential Funding Streams*

Funding for LLFA Responsibilities

* + 1. The Government has committed funding annually to support LLFAs in their ‘new’ flood management roles up to 2015. The funding is provided through ‘Area Based Grants’, which have been allocated by the Department for Environment and Rural Affairs (Defra) based on the individual flood risk each local authority faces. Beyond this period funding commitments are unclear and there are likely to be pressures on further funding given the significant challenges local government faces within the current spending review.

Funding for LLFA SuDS Approving Body Preparation

* + 1. Defra has made additional funding available, for 2014-2015, to assist LLFAs in setting up and preparing for their role as a SAB under Schedule 3 of the Act. The funding is intended to assist LLFAs to put the required systems, procedures and resources in place to fulfil their duties as a SAB, when they are enacted. The funding is a one-off payment and it is intended that future funding of this duty will, at least in part, be funded through application fees, prescribed by central government, for SuDS applications.

Funding for Flood Risk Management Studies and Schemes (Projects)

* + 1. In the main, flood risk management projects are funded by a combination of the following funding streams, which give priority to the protection of residential properties:
* National funding – Flood and Coastal Erosion Risk Management Grant in Aid (FCRM GiA),
* Regional funding – Local Levy, and
* Local / other funding contributions.

*Flood and Coastal Erosion Risk Management Grant in Aid (FCRM GiA)*

* + 1. FCRM GiA is the capital budget set aside by central government for flood defence projects across England. Following consultation during 2011, Defra introduced a new approach to the funding of flood risk management capital projects. This approach was termed the ‘Flood and Coastal Resilience Partnership Funding’ approach. The key benefits of the approach are:
* Communities, through their Regional Flood and Coastal Committees (RFCCs), can take decisions on which projects should progress based on local willingness to contribute towards the benefits that would be delivered,
* The programme of capital works will be prioritised based on the damage being prevented by the project, and
* A higher proportion of capital projects can be eligible for some government funding, subject to resources being available.

*Local Levy*

* + 1. This funding is raised by way of a levy on local authorities within the boundary of each RFCC. The Local Levy is used to support, with the approval of the committee, flood risk management projects that are not considered to be national priorities and hence do not attract full national funding through the FCRM GiA.
    2. The Local Levy allows locally important projects to go ahead to reduce the risk of flooding within each committee’s area.

*Other Sources of Funding*

* + 1. In order to maximise the benefits of the new approach to funding of flood risk management capital projects, Sutton Council will need to work closely with other organisations and bodies to attract alternative sources of funding. It is important to note that the likelihood of securing FCRM GiA of Local Levy can significantly increase when other sources of funding are secured.
    2. In taking forward flood risk management activities Sutton Council will need to consider securing funding from alternative sources, including Central Government, other Risk Management Authorities, stakeholders, private beneficiaries and contributions in kind. European and environmental grants may also be accessible where flood risk management schemes can deliver multiple benefits.
    3. One of the key aspirations of Sutton Council, is to maximise multi-beneficial outcomes of new schemes or activities. This could open up more avenues of internal revenue than purely flood risk management, particularly where measures address existing core activities for the Council.
    4. Table 5-4 highlights possible sources of funding that could contribute to the delivery of site specific and localised flood risk management projects or schemes.

| **Table 5-4 Possible sources of alternative funding for local flood risk management** | |
| --- | --- |
| **Funding Source** | **Description** |
| Private Contributions | Voluntary contributions from private organisations / individuals who benefit from flood risk management projects. This could include local businesses & landlords. |
| Water Company Investment | Water companies are able to contribute to some types of flood risk management projects where it can be demonstrated that joint benefits can be obtained and/ or there is increased resilience for their assets. |
| [Community Infrastructure Levy](https://www.gov.uk/government/policies/giving-communities-more-power-in-planning-local-development/supporting-pages/community-infrastructure-levy) (CIL)[[44]](#footnote-45) | A locally set general charge which local planning authorities can choose to implement. Levied on developers, per square metre of certain types of development across an authority’s area. Local communities set their own priorities on how the majority of this funding is allocated. |
| Developer Contributions through Section 106 Agreements | Planning obligations, or ‘Section 106 Agreements’ are a well-established mechanism for securing funding for agreed issues arising from a development proposal. |
| Other | There are a multitude of alternative funding sources available depending on the type of activity or scheme being proposed. For example, this could include delivery of WFD objectives, and will be dependent on the activity or scheme seeking funding. |

* + 1. It is clear from the above that funding to deliver capital projects will need to be sought from a variety of sources as government funding will be limited each year and is likely, in many cases, to be a contribution towards project costs rather than full funding. Timeframes for accessing funding sources will also strongly influence decisions to implement particular measures as well as the viability of certain options. Any projects are therefore likely to be developed through partnership working, with partners and organisation with relevant flood risk responsibilities or assets relating to the project engaged in the production of the scheme. Partnership working may also provide opportunities for reduction in costs through shared benefits.
    2. Further information on the different funding sources is available in the Defra guidance document [‘Partnership Funding and Collaborative delivery of local flood risk management’](http://randd.defra.gov.uk/Document.aspx?Document=9958_FD2643_Partnershipfundingguide.pdf)[[45]](#footnote-46).

Maintenance Activities

* + 1. In the current financial climate, there are significant pressures on the Council budget and funding for maintenance activities. Using the Strategy Action Plan, historic flood evidence and communication with residents, Sutton Council will look to prioritise maintenance for those assets which have the greatest effect on local flood risk and in those areas most at risk to maximise effectiveness of limited funding. At the same time, Sutton Council will seek to maximise income from external sources, including asset owners and riparian owners, for flood risk management.
  1. What can communities, residents and businesses do to prepare for flooding?

Protecting Properties from Flooding

* + 1. The National Flood Forum provides advice for homeowners and businesses on how to protect their property from flooding. This includes Property Level Protection (PLP) which includes measures such as installing barriers or replacing carpets with waterproof tiling.
    2. The [Environment Agency](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/292943/geho1009brdl-e-e.pdf)[[46]](#footnote-47), [Association of British Insurers (ABI)](https://www.abi.org.uk/Insurance-and-savings/Topics-and-issues/Flooding/Preparing-for-a-flood)[[47]](#footnote-48) and [Flood Protection Association (FPA)](http://thefpa.org.uk/flood-protection/)[[48]](#footnote-49) also provide information on how residents and businesses can prepare their property for flooding.

Get Insurance

* + 1. Advice on how to obtain flood insurance is provided by the National Flood Forum. Where properties are difficult to insure, the British Insurance Brokers’ Association can help find a broker that specialises in these properties. Defra provides [guidance on how to obtain suitable flood insurance in high risk areas](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69578/pb13082-flood-insurance.pdf)[[49]](#footnote-50).
    2. Insurance companies often ask for an Insurance Related Request Letter if a property is at risk of flooding to decide if they will offer an insurance policy and how much it will cost. The letter can be obtained from the Environment Agency, free for individuals and £60 for businesses. PLP measures can help towards getting property insurance and reducing the premium or excess. Where measures have been installed, a [Flood Risk Report](https://publications.environment-agency.gov.uk/ms/EbMpeA)[[50]](#footnote-51) should be completed to inform insurers or buyers how the measures affect flood risk to the property.

1. Delivery of Wider Environmental Objectives
   1. Overview
      1. In delivering the Strategy and local flood risk management there is the opportunity to contribute to the achievement of wider environmental objectives. In order to address this requirement a Strategic Environmental Assessment (SEA) of the Strategy has been undertaken in accordance with the European Union adopted [Directive 2001/42/EC](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32001L0042:en:NOT)[[51]](#footnote-52) on the assessment of the effects of certain plans and programmes on the environment (the ‘SEA Directive’). Alongside this a Habitats Regulations Assessment (HRA) Screening has been undertaken to assess the impacts of implementing the Strategy policies and measures on European Designated Sites within 10km of the London Borough of Sutton.
      2. Both the HRA and the SEA were developed alongside this Strategy and have been used to inform sustainable decision making throughout.
   2. Strategic Environmental Assessment
      1. SEA involves the systematic identification and evaluation of potential environmental impacts of specified plans and programmes before deciding which are adopted. Consideration should be made with regards to both the positive and negative impacts of options on wildlife and habitats, populations and health, soil, water, air, climate factors, landscape, cultural heritage and the inter-relationships between these receptors.
      2. The first stage of the SEA was to produce a combined Scoping Report for all six South West London Local Flood Risk Management Strategies[[52]](#footnote-53) to set out the framework for undertaking a SEA for the Strategies and the scope of the assessment. The next step was to produce the SEA Environment Report[[53]](#footnote-54) for the London Borough of Sutton that identifies the likely significant effects of the implementation of the Strategy on relevant environmental receptors. It also identifies how the Strategy can contribute to the achievement of wider environmental objectives, including WFD objectives.

SEA Outcomes

* + 1. The key findings of the SEA process are set out in the Environment Report for the Strategy. This broadly outlines how the local flood risk objectives and the identified measures might be expected to affect a number of different aspects of the environment (referred to as ‘receptors’). The SEA demonstrates that the Strategy is predicted to have positive impacts on the environment in the short and long term (i.e. beyond the life of the Strategy), since the Strategy takes a proactive approach to reducing and managing local flood risk within the London Borough of Sutton. Each of the Strategy objectives successfully supports the range of environmental objectives identified within the SEA framework, achieving a positive outcome for each SEA objective.
    2. The majority of Strategy objectives are likely to have indirect beneficial effects on the environment as they relate to improving knowledge, understanding and high level management of local flood risk rather than actual works or actions that could have an effect on the ground.
    3. Overall, the Strategy objectives and measures are considered to be beneficial for the environment, due to the likely outcomes of improved local flood risk management and subsequently reduced local flood risk to the natural and built environment within London Borough of Sutton.
    4. Figure 7 and Figure 8 in [Appendix A](#AppendixA) show the potential impact of local sources of flooding (surface water) on critical infrastructure and the environment and heritage sites, respectively, in the London Borough of Sutton.

* 1. Habitats Regulations Assessment
     1. A HRA screening assessment (as required by Article 6 of the [EC Habitats Directive 1992 (92/44/EEC)](http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm)[[54]](#footnote-55), and Regulation 48 of the [Conservation (Natural Habitats &c) Regulations 1994](http://www.legislation.gov.uk/uksi/1994/2716/contents/made)[[55]](#footnote-56)) was undertaken as part of the Strategy development. This screening exercise assessed the potential impacts of implementing the Strategy objectives and measures on European Designated Sites (Special Areas of Conservation, Special Protection Areas and Ramsar sites) within 10km of the London Borough of Sutton.

HRA Outcomes

* + 1. The key findings of the HRA Screening assessment are set out in the Habitats Regulations Assessment for the Strategy[[56]](#footnote-57). It concluded that the Strategy has been screened out as having no likely effects on any European sites due to a lack of pathways linking them to local flood risk management in the London Borough of Sutton and therefore no further HRA is required.

Figure 8 in [Appendix A](#AppendixA) shows the potential impact of local sources of flooding (surface water) on the environment in the London Borough of Sutton.

* 1. Water Framework Directive
     1. The Strategy will complement work that is currently underway to comply with the requirements of The European [Water Framework Directive (WFD)](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0060:EN:NOT)[[57]](#footnote-58). Although a formal WFD assessment is not a statutory requirement of the Strategy, WFD requirements have been considered as part of the SEA process, including where opportunities to improve WFD status exist.
     2. The Environment Agency is responsible for preparing management plans for river basin districts in England and Wales. The plans outline the characteristics of the river basin district, identify the pressures that the local water environment faces, and specify the actions that will be taken to address any problems before 2015.
     3. For the Thames River Basin District, the density of the population together with relatively low rainfall means that the water environment is stressed, with less water per person than many Mediterranean regions. This leads to over-extraction, and the high risk of pollution. Many of the rivers within the Thames river basin have been heavily modified as a consequence of development, flood risk management and for navigation. As a result only 23% of the assessed water bodies covered by the [Thames River Basin Management Plan](http://www.environment-agency.gov.uk/research/planning/125035.aspx) are regarded having an ecological status of at least “good”. There are no water bodies in the Thames river basin that were considered to exhibit “high” ecological status.
     4. Flood risk management activities are expected to have a significant impact on the ability of the UK to comply with the requirements of the WFD, as flood protection can involve substantial alteration to the natural properties of a river. The [Thames River Basin Management Plan](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289937/geth0910bswa-e-e.pdf) encourages the use of sustainable drainage systems as a means of reducing the physical impact of flood risk management works on the ecological status or potential of water bodies.

Outcomes

* + 1. Within Sutton, the River Wandle and Beverley Brook have been assessed to have poor ecological status under the WFD, primarily due to high levels of phosphate and poor fish habitat[[58]](#footnote-59). Both these waterbodies are defined as being ‘Heavily Modified’. The waterbodies must reach good ecological status by 2027.
    2. The Strategy seeks to alleviate local flood risk by encouraging best practice for the maintenance of flood prevention and drainage assets, however this practice may sometimes have adverse effects on biodiversity, for example clearance of vegetation may lead to habitat loss along river corridors and deterioration in water quality. There may be opportunities for multi beneficial schemes which have positive effects on water quality and subsequently biodiversity from small-scale measures such as implementation of SuDS or changes in drainage. There may also be cumulative benefits to biodiversity and water quality through strategic management of local flood risk, as enabling natural flood patterns to continue or extend in some areas can improve wetland habitats.
    3. Other plans and strategies provide mitigation to avoid impacts on designated sites, protected species and habitats as part of flood prevention measures. However, cumulative impacts may arise where a number of measures combine to alter hydrological systems or land use. For instance, many small changes to water levels may result in overall gains or losses in freshwater habitats or there may be cumulative effects on a particular species or type of habitat.
    4. Implementation of the SAB and requirement for new developments to incorporate SuDS under the Act will play an important role in contributing to the delivery of the Thames River Basin Management Plan and WFD objectives. Increased communications with riparian owners and improved mapping of the drainage ditches within the London Borough of Sutton will also contribute to the WFD by improving management of local watercourses that drain into larger river systems.

In assessing this Strategy for WFD compliance, the measures proposed are unlikely to have environmental effects and will not cause deterioration to water bodies. However, as projects and schemes are developed these may require site specific environmental assessment to identify any potential environmental effects (positive and negative).

1. Strategy Delivery, Monitoring & Review
   1. Delivery
      1. An Action Plan has been developed that details the measures and actions that will be taken to deliver the Strategy ([Appendix B](#AppendixB)). For each measure a number of actions have been identified and for each of these the proposed funding route, timescale for implementation, and delivery lead and partners have been identified.
   2. Annual Monitoring
      1. The Action Plan will be the key mechanism through which progress in meeting the Strategy will be monitored. Sutton Council proposes to monitor progress against the Strategy Action Plan annually. This will involve assessing which actions have been delivered, and determining whether there has been any change to the prioritisation of actions. Findings from this monitoring process will be presented to the Sutton Flood Group and the South West London Strategic Flood Group.
      2. Progress against the Strategy Action Plan will be reported to Elected Members through an Annual Monitoring Report submitted to the London Borough of Sutton Scrutiny Committee.
   3. Review
      1. The Strategy has been developed to deliver a short to medium (6-year) improvement plan to establish a sound evidence and knowledge base upon which to develop a longer-term investment plan for local flood risk management activities in the London Borough of Sutton.
      2. The Action Plan will be reviewed on an annual basis or following a significant flood event and updated, where applicable, to reflect current priorities, funding availability and timescales for delivery. Updates to the Action Plan will be discussed and agreed by the Sutton Flood Risk Management Team.
      3. It is proposed that the Strategy will be formally reviewed in 2020, and thereafter every six years (as a minimum) to coincide with the requirement under the Flood Risk Regulations 2009 to revise the Flood Risk Management Plan.
      4. However, the Strategy should be viewed as a dynamic strategy and may require review more regularly to recognise specific changes. Potential triggers for a review of the Strategy may include:

* Occurrence of a significant and widespread surface water flood event,
* Significant changes to datasets or information which may alter the understanding of risk within the study area,
* Significant amendments to the legal responsibilities and/or roles and functions of Risk Management Authorities and/or other organisations,
* Annual Monitoring identifies that the Strategy is not achieving its objectives,
* Changes to relevant national and European legislation, or
* Change in funding availability which has a significant effect on the Strategy Action Plan.

Glossary & Abbreviations

| Term | Definition |
| --- | --- |
| The Act | The Flood and Water Management Act 2010: <http://www.legislation.gov.uk/ukpga/2010/29/contents> |
| Aquifer | A source of groundwater comprising water bearing rock, sand or gravel capable of yielding significant quantities of water. |
| Attenuation | In the context of this strategy – the storing of water to reduce peak discharge of water. |
| Catchment Flood Management Plan | A high-level planning strategy through which the Environment Agency works with their key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of flood risk. |
| Category 1 Responders | As defined under Schedule 1 of the Civil Contingencies Act, Category 1 responders are “core responders” in the event of an emergency and include emergency services, local authorities, health bodies and Government agencies including the Environment Agency. |
| Civil Contingencies Act 2004 | Aims to deliver a single framework for civil protection in the UK and sets out the actions that need to be taken in the event of a flood. The Civil Contingencies Act is separated into two substantive parts: local arrangements for civil protection (Part 1) and emergency powers (Part 2). |
| Climate Change | Long term variations in global temperature and weather patterns caused by natural and human actions. |
| Critical Drainage Area | A discrete geographic area (usually a hydrological catchment) where multiple and interlinked sources of flood risk (surface water, groundwater, sewer, main river and/or tidal) cause flooding during severe weather thereby affecting people, property or local infrastructure. |
| Culvert / culverted | A channel or pipe that carries water below the level of the ground. |
| DG5 Register | A water-company held register of properties which have experienced sewer flooding due to hydraulic overload, or properties which are 'at risk' of sewer flooding more frequently than once in 20 years. |
| Flood Zone 1 | Low Probability of Flooding. In accordance with the NPPF, land assessed as having a less than 1 in 1000 annual probability of river or sea flooding (<0.1%) in any year. |
| Flood Zone 2 | Medium Probability of Flooding. In accordance with the NPPF, land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1-0.1%), or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5-0.1%) in any year. |
| Flood Zone 3a | High Probability of Flooding. In accordance with the NPPF, land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of sea flooding (>0.5%) in any year. |
| Flood Zone 3b | Functional Floodplain. In accordance with the NPPF, land where water has to flow or be stored in times of flood. |
| Environment Agency | Environment regulator for England and Wales. Risk Management Authority responsible for management of flood risk from main rivers, tidal and coastal sources of flooding and Reservoirs. |
| Flood Defence | Infrastructure used to protect an area against floods as floodwalls and embankments; they are designed to a specific standard of protection (design standard). |
| Floodplain | Area adjacent to river, coast or estuary that is naturally susceptible to flooding. |
| Flood Resilience | Resistance strategies aimed at flood protection. |
| Flood Risk | The level of flood risk is the product of the frequency or likelihood of the flood events and their consequences (such as loss, damage, harm, distress and disruption). |
| Flood Risk Assessment | Considerations of the flood risks inherent in a project, leading to the development actions to control, mitigate or accept them. |
| Flood Storage | A temporary area that stores excess runoff or river flow often ponds or reservoirs. |
| Flood Resilience | Resistance strategies aimed at flood protection. |
| Flood Zone | The extent of how far flood waters are expected to reach. |
| Functional Floodplain | Land where water has to flow or be stored in times of flood. |
| Greenfield | Previously undeveloped land. |
| Groundwater | Water that is in the ground, this is usually referring to water in the saturated zone below the water table. |
| Highways Act 1980 | Sets out the main duties (management and operation of the road network) of highways authorities in England and Wales. The Act contains powers to carry out functions / tasks on or within the highways such as improvements, drainage, acquiring land etc. |
| Hydraulic Modelling | A computerised model of a watercourse and floodplain to simulate water flows in rivers too estimate water levels and flood extents. |
| Infiltration | The penetration of water through the grounds surface. |
| Infrastructure | Physical structures that form the foundation for development. |
| Land Drainage Act 1991 | Sets out the statutory roles and responsibilities of key organisations such as Internal Drainage Boards, local authorities, the Environment Agency and Riparian owners with jurisdiction over watercourses and land drainage infrastructure. Parts of the Act have been amended by the Flood and Water Management Act 2010. |
| Local Flood Risk | Defined in the Flood and Water Management Act 2010 as flooding from surface runoff, ordinary watercourses and groundwater. |
| Lead Local Flood Authority (LLFA) | The statutory body defined under the Flood Risk Regulations 2009 Flood and Water Management Act 2010 responsible for the management of local flood risk, namely surface water runoff, groundwater and ordinary watercourses. |
| Local Planning Authority | Body that is responsible for controlling planning and development through the planning system. |
| Main River | Watercourse defined on a ‘Main River Map’ designated by DEFRA. The Environment Agency has permissive powers to carry out flood defence works, maintenance and operational activities for main rivers only. |
| Mitigation Measure | An element of development design which may be used to manage flood risk or avoid an increase in flood risk elsewhere. |
| Multi-Agency Flood Plan (MAFP) | Plan outlining how responding parties under the Civil Contingencies Act and key voluntary response organisations will work together on an agreed coordinated response to severe flooding in the London Borough of Sutton. |
| National Strategy | National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England, developed by the Environment Agency. |
| National Planning Policy Framework (NPPF) | National Planning Policy Framework (NPPF) for England, published by the Development for Communities and Local Government. This sets the government's planning policies for England and how these are expected to be applied. |
| Ordinary Watercourse | A watercourse that does not form part of a main river. This includes “all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows” according to the Land Drainage Act 1991. |
| Overland Flow | Flooding caused when intense rainfall exceeds the capacity of the drainage systems or when, during prolonged periods of wet weather, the soil is so saturated such that it cannot accept any more water. |
| The Regulations | The Flood Risk Regulations 2009: <http://www.legislation.gov.uk/uksi/2009/3042/made> |
| Residual Flood Risk | The remaining flood risk after risk reduction measures have been taken into account. |
| Return Period | The average time period between rainfall or flood events with the same intensity and effect. |
| Riparian Owner | Anyone who owns land or property alongside a river or other watercourse. Responsibilities include maintaining river beds/banks and allowing flow of water to pass without obstruction. |
| Risk | The probability or likelihood of an event occurring. |
| River Catchment | The areas drained by a river. |
| River Flooding | Flooding by a river or a watercourse. |
| SuDS Approving Body (SAB) | Statutory body responsible for the approval of Sustainable Drainage System (SuDS) systems in new planning applications, when enacted under the Flood and Water Management Act 2010. |
| Sewer Flooding | Flooding caused by a blockage or overflowing in a sewer or urban drainage system. |
| Standard of Protection | The flood event return period above which significant damage and possible failure of the flood defences could occur. |
| Sustainability | To preserve /maintain a state or process for future generations. |
| Sustainable Drainage System (SuDS) | Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques. |
| Sustainable Development | Development that meets the needs of the present without compromising the ability of future generations meeting their own needs. |
| Tidal | Relating to the actions or processes caused by tides. |
| Tributary | A body of water, flowing into a larger body of water, such as a smaller stream joining a larger stream. |
| 1 in 30 year event | Event that on average will occur once every 30 years.  Also expressed as an event, which has a 3.33% probability of occurring in any one year. |
| 1 in 100 year event | Event that on average will occur once every 100 years.  Also expressed as an event, which has a 1% probability of occurring in any one year. |

Appendix A – Flood Risk Maps

**Figure 1** Historic Flooding

**Figure 2** Flood Risk from Surface Water

**Figure 3** Flood Risk from Groundwater

**Figure 4** Flood Risk from Rivers

**Figure 5** Main Rivers & Ordinary Watercourses

**Figure 6** Surface Water Critical Drainage Areas

**Figure 7** Flood Risk from Surface Water : Critical Services & Transport

**Figure 8** Flood Risk from Surface Water : Environment & Heritage

Appendix B – Action Plan

Appendix C – Summary of Community Engagement

Purpose, Methodology and Response

*Purpose*

Sutton Council wished to engage with the local community at an early stage in developing their Local Flood Risk Management Strategy (‘the Strategy’) to gather information on local flooding incidents, flood preparedness, perceptions of flooding and local priorities for local flood risk management. The information collated through this exercise has been used to provide an evidence base to inform the Strategy.

**Online Survey**

A survey was developed to gather views and evidence, which was available online between 20th December 2013 and 30th April 2014.

Questions included in the survey covered 5 broad areas;

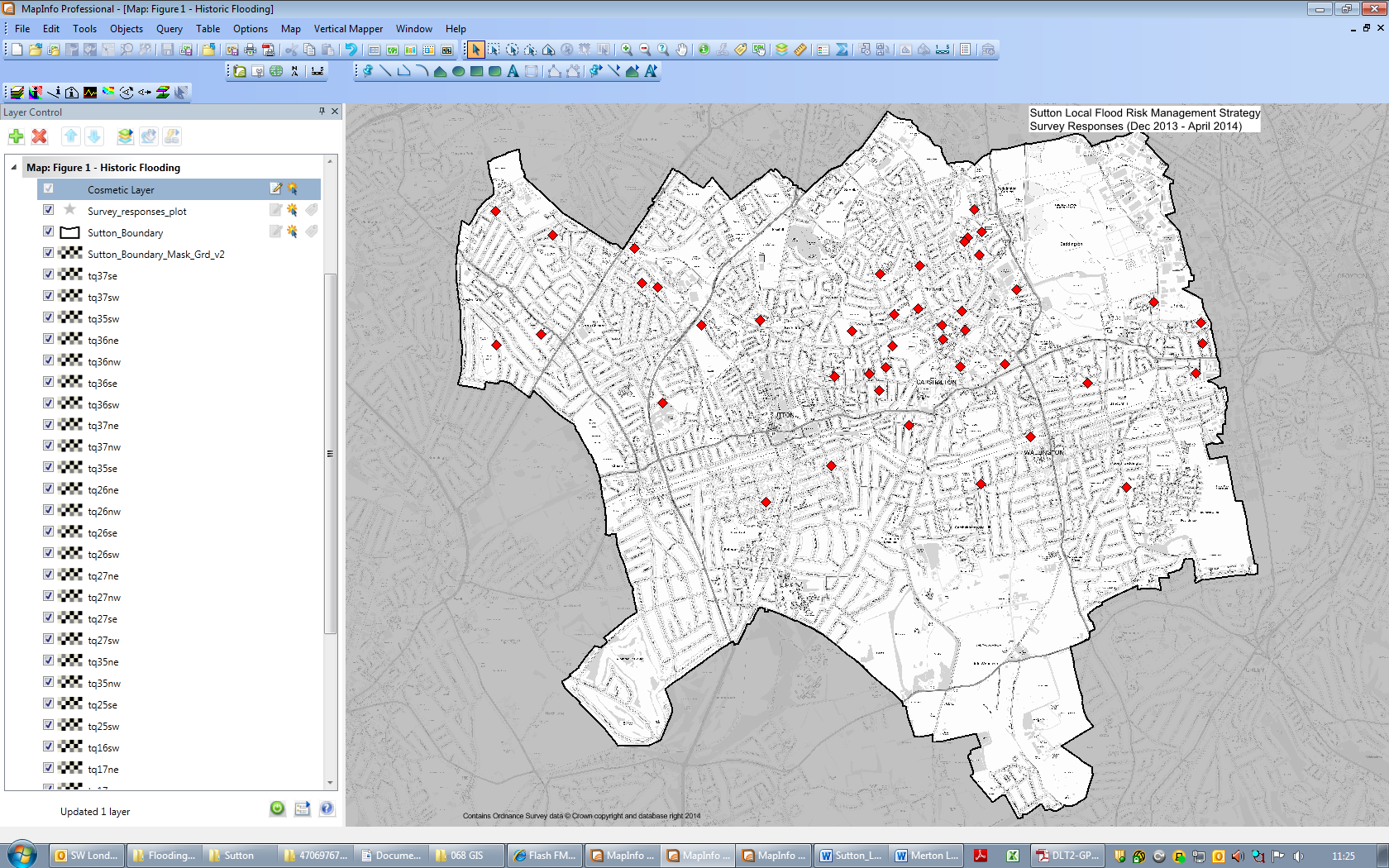
* Current understanding of flooding in the London Borough of Sutton,
* Previous experiences of flooding,
* Communication of flood risk information,
* Priorities for flood risk management, and
* Funding for flood risk management.

To promote the survey, Sutton Council carried out the following activities:

* A Twitter announcement,
* The survey was advertised on Sutton Council’s Flood Risk Management webpages, and
* The survey was promoted internally via the Council’s weekly e-news email.

*Response Rate*

In total the council received 48 completed surveys in response to this engagement process. Figure C-1 illustrates the distribution throughout the Borough of respondents to the survey.



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*Figure C-1 Sutton Strategy Survey Responses*

*General Caveats*

The results of this engagement are not statistically representative for the views of London Borough of Sutton residents due to the nature of the methodology used. The level of response, information gathered and views obtain provide a useful indicator of wider opinion and any important issues that will need to be considered.

Due to the software used and the different response options open to respondents, it was possible for people to submit more than one response. This has been monitored during the engagement period and analysis and it does not appear to have been abused or be a significant issue affecting the response.

Percentages used in this analysis have been rounded and may not add up to exactly 100%. For some survey questions, respondents could select more than one response which also means that percentages, if added together, can total more than 100%.

**Current understanding of flood risk in Sutton**

Respondents were asked to identify what they thought were the main sources of flooding in their local areas. Figure C-2 illustrates the perceived greatest sources of flooding in Sutton.

*Figure C-2 Sources of local flooding identified by survey respondents*

Responses from the public survey indicate that respondents are not concerned about one single source of flooding, but instead a number of different sources were identified as causes of flooding in the local area. Runoff from roads, as well as blocked gullies, sewers, large rivers and new development were all identified as sources of flooding by a number of respondents.

Historic records held by Sutton Council suggest that flooding from surface water is most prevalent throughout the Borough (see Figure 1, [Appendix A](#AppendixA)). This is reflected in the survey, with runoff from roads or impermeable surfaces, and blocked road gullies identified by a large percentage of respondents as sources of flooding. However the survey results also indicate that a number of other sources are also identified as sources of flooding, such as large rivers and surface or foul water sewers. Historic flooding records identify flooding from main rivers, and groundwater as being nearly as prevalent as surface water flooding.

**Experiences of flooding in Sutton**

Respondents were asked to provide information about previous flooding incidents. 23 respondents (48%) said that they had been directly affected by flooding in Sutton in the last ten years, and provided details on the perceived causes of the flooding. The causes of flooding were not always known and the responses were varied, although the four causes of flooding most frequently identified were as follows;

| **Reported flooding sources** | **Number of respondents** | **% of respondents** |
| --- | --- | --- |
| Heavy Rainfall | 17 | 77% |
| Blocked Gullies | 13 | 59% |
| Blocked sewers or manholes | 6 | 27% |
| Overflow of large rivers (e.g. River Wandle or Beverley Brook) | 6 | 27% |

Respondents who had experienced flooding were asked to indicate in what way they were affected by the flooding incident. The most commonly affected receptors were:

| **Most commonly affected receptors** | **Number of respondents** | **% of respondents** |
| --- | --- | --- |
| Gardens | 19 | 40% |
| Local Roads | 8 | 17% |
| Property (internally) | 6 | 13% |
| Local pavements / footpaths | 6 | 13% |

**Communication of flood risk information**

A key outcome from the survey was that respondents would like to receive more information on a number of topics, for example the existing local flood risk, who is responsible for dealing with different types of flooding and how to better protect themselves and their property from flooding. Only 4 respondents (8%) stated that they do not require more information of any kind in relation to flooding. Respondents were asked to indicate how they would like to receive information about flood risk management in Sutton. The preferred methods of communication with within Sutton regarding flooding were;

| **Method** | **Number of respondents** | **% of respondents** |
| --- | --- | --- |
| Council Website | 35 | 73% |
| Leaflet / letters through door | 29 | 60% |
| Local newspaper | 20 | 42% |

**Priorities for Flood Risk Management**

Respondents were asked to indicate how concerned they were about different consequences of flooding, ranging from not at all concerned to very concerned. Figure C-3 illustrates that respondents are most concerned about maintenance of watercourses and/or flood prevention assets as well as emergency planning and response carried out by Sutton Council.

*Figure C-3 Level of concern in relation to consequences of flooding*

Keeping people safe and protecting life is always the priority for flood management. Beyond this respondents were asked to identify what the priority for flood risk management within the Borough should be. The top three flood risk management priorities for residents and businesses in Sutton were identified to be:

| **Priority** | **Number of respondents** | **% of respondents** |
| --- | --- | --- |
| Reducing the risk of flooding to critical infrastructure | 45 | 94% |
| Reducing the risk of flooding to homes | 42 | 88% |
| Protecting local amenities, e.g. schools and community centres | 26 | 54% |
| Keeping transport networks functioning | 25 | 52% |

Having identified the priorities for flood risk management within Sutton, respondents were subsequently asked how they thought that flood risk management would be best achieved in Sutton. The following approaches were preferred by respondents:

| **Priority** | **Number of respondents** | **% of respondents** |
| --- | --- | --- |
| Working with planners to ensure new development does not make flooding worse | 37 | 77% |
| Focusing work on areas that are at risk of flooding | 29 | 60% |
| Undertaking work where opportunities arise, e.g. building flood management measures during street improvement / maintenance work | 27 | 56% |

**Funding for Flood Risk Management**

Respondents were asked to identify the steps they would be prepared to take to protect their property. The following measures had the greatest support from respondents:

| **Priority** | **Number of respondents** | **% of respondents** |
| --- | --- | --- |
| Install property-level protection to your property | 19 | 40% |
| Work with fellow residents and Sutton Council officers to provide local flood resilience assistance or communicate risk to local residents | 16 | 33% |
| Contribute alongside Sutton Council to install some property-level flood protection to your property | 15 | 31% |

**How has this feedback influenced the strategy?**

* Respondents to the survey indicated that they would like to receive more information on the flood risk in their local area. The Sutton Action Plan includes actions to develop Sutton’s flood risk management website, distribute educational materials and increase engagement with community groups, individuals and other stakeholders to increase understanding of flood risk in Sutton.
* Respondents indicated they would be prepared to install property-level flood protection measures and therefore the above actions will help educate residents on how best to protect their property by increasing knowledge and awareness of flood proofing measures.
* Respondents identified a number of different perceived sources of flooding within Sutton. A number of actions commit to increase the Council’s knowledge of relevant flooding sources, through updating or carrying out knew flood risk studies and working with Risk Management Authorities to improve information sharing and understanding.
* Surface water flooding was identified as being of greatest concern amongst respondents to the survey. The London Borough of Sutton is committed to encourage sustainable practices in relation to flooding, particularly surface water runoff, in the Borough through setting up the Sustainable Drainage System Approving Body (SAB) and ensuring sustainable water policy is implemented effectively.

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